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At long last, the missing issue of the Phonetician is finally ready!! I think that I can safely say that no one is happier than the editorial staff. It is difficult to pinpoint any particular reason why this issue is so late, other than to say, we are extremely sorry for the delay. I will take this time to say that the Phonetician could get out more quickly if more people would volunteer to assist in its development. I know that this may sound harsh, but the reality is the Society NEEDS YOUR HELP! It is easy to complain when something is not done quickly enough or to provide suggestions to someone else in hopes that they will act upon them. But what have YOU done to make the Society stronger? There is a critical need for article submissions, reports about your Institute, descriptions of phonetics meetings that have occurred, as well as book reports. Have you contributed to the Phonetician lately? It is easy to do, just email me (rbahr@cas.usf.edu). I will see that your submission gets to the appropriate person. Better yet, volunteer to edit one issue. You can highlight your Institute and present research from your lab. I am sure that our constituency would find your issue very informative. Please think about it!

I would also like to thank Prof. Dr. Jens-Peter Köster for overseeing the publication of the Phonetician for so many years. Since taking over this responsibility in the late 1990s, Prof. Dr. Köster (and his staff at the University of Trier) changed a good magazine into an excellent one. He made it look more professional by increasing its length and adding a spine. It now looks like a real journal. In addition, he added more scientific content by including original, peer-reviewed research papers. The response to these changes has been very positive and has really become what our Society is known for. We owe him an extreme debt of gratitude for his untiring service.

Now that Prof. Dr. Köster has retired, who is going to step up and assist in preparing the Phonetician? We are now entering a new era – one of electronic submission and publication. As you know, the last issue of the Phonetician was placed on our website in January, 2009. Given the lateness of the distributing this issue, we determined that it was best to place this issue on line as well. The real advantage of publishing the Phonetician in this way is that we can put each issue up faster and even post the pieces of the Phonetician when they are ready while waiting for the rest of the issue to be complete. I think that this will greatly facilitate the dissemination of information. I hope that you will consider submitting something.

Ruth Huntley Bahr
The Computerized Speech Lab (CSL), Model 4500, is Kay's newest, most advanced hardware/software system for speech analysis. The latest generation CSL hardware is integrated with a rich array of speech analysis and biofeedback software packages used by the leading speech/voice professionals internationally. A highly robust input/output recording device for a PC, which complies with the rigorous specifications and features needed for the most exacting speech-processing requirements, Model 4500 is the culmination of many decades of experience that Kay brings to acoustic analysis instrumentation.

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For more information about CSL, Model 4500, contact Kay Elemetrics or your local representative.
Call for Papers

I would like to take this opportunity to extend a warm word of thanks to all those who have been making The Phonetician possible in the last couple of years. There is first of all Judith Rosenhouse who has been serving as Review Editor for many years and who has been doing a tremendous job. She has managed to find competent reviewers for most every relevant publication in the field of phonetics and thus contributed greatly to the information platform of The Phonetician. Tomáš Dubèda has been very successful in acquiring reports from any conferences which may be of interest to ISPhS members. Last, but not least, I would like to express my sincere gratitude to the "Trier team", consisting of Jens-Peter Köster, Hedwig Hinzmann and also several students of Phonetics at Trier who are taking a major part in the various stages of assembling The Phonetician.

It would not have been possible for me as an individual to mount The Phonetician without this invaluable assistance. This is why I would like to invite all ISPhS members to contribute to the service which we are currently providing through The Phonetician by submitting an article (see below) or submitting a conference report or notifying us of upcoming conferences or offering to review a publication or notifying us of interesting websites.

Let me remind you about the Call for Papers. The section “Articles and Research Notes” will be dedicated to the publication of brief research papers. Short papers in all areas of phonetics are welcome, including articulatory phonetics, acoustic phonetics, psychoacoustics, cross language and L2 phonetics, speech synthesis, phonetic modelling, speech signal processing, speech perception and production, etc. Contributions should primarily focus on experimental work, but theoretical and methodological papers will also be considered. Manuscripts should not exceed a maximum of 1500 words (including no more than 2 tables or figures), but exceptions to this rule are possible. Authors should follow the guidelines of the Journal of Phonetics for the preparation of their manuscripts. Manuscripts will be reviewed anonymously and authors will receive the reviews speedily.

The title page should include the authors' names and affiliations, address, e-mail, telephone, and fax numbers. Manuscripts should include an abstract of no more than 100 words and up to four keywords. The final version of a manuscript should be sent both as hard copy and in electronic form. It is the authors' responsibility to obtain written permission to reproduce copyright material. Manuscripts should be sent (preferably in electronic form) to:

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**Aligner:** The Aligner module will automate word and phonem segmentation on the base of a high technology HMM speech recognition system (LingSDK) and speech signal analysis software. Languages: UK and US English, German, French, Italian, Spanish. Single and batch file mode. Works with large audio files.

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**GHD:** The Göttinger hoarseness diagram is a automatic program that analyzes the voice sound and maps the voice quality. The results of irregularity and noise are shown in a two-dimensional diagram. The GHD is especially valuable for monitoring and documenting courses of voice therapies.
The perception of Japanese geminates by native and non-native listeners
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Abstract
A production and a perception experiment were conducted to examine the acoustic characteristics of Japanese geminates focusing on the timing features of the consonants /t/, /ts/ and /s/ and how these geminates are perceived by non-native speakers (German speakers). The acoustic analysis showed that the biggest length differential between singletons and geminates was found in /t/ and the smallest in /ts/. Of the three consonants, it was hypothesized that the geminate /t/ would be the easiest for non-native speakers to perceive, but this was contradicted (/s/ > /t/ > /ts/). Furthermore, an additional manipulation was conducted on the affricate /ts/ to investigate whether the shortening or the lengthening of the fricative portion influences the perception of geminate /ts/. Neither the lengthening nor the shortening helped the Japanese subjects to perceive geminate /ts/, but the lengthening helped the German subjects. These perceptual results indicate that the German subjects used both the closure and the frication duration as cues for the perception of geminate /ts/, whereas the Japanese subjects mainly focused on the closure duration. Moreover, our findings suggest that the German subjects were especially sensitive to frication when perceiving geminates.

Introduction

Constrastive Segment Length in Languages

Temporal features of speech, such as segmental length and rate of speech, play an important role in the transmission of information. There are many languages “in which the segmental duration serves as the primary cue for the distinction between certain classes of phonemes” (Fujisaki, Nakamura & Imoto 1975:197). This constrastive segment length, which functions as one of the phonological properties in a language, can occur in either vowels or consonants, or both.

The number of languages that possess contrasts between short and long consonants is limited: for instance, Italian, Hungarian, Finnish, Swedish, Estonian and Japanese have these differences (Laver 1994; Ladefoged 2001) whereas German and English do not (Bithell 1952). These long consonants are known as *geminates* and are characterized by a sequence of identical, adjacent consonants in a single morpheme (Esposito and Di Benetto 1999, Crystal 2002:164). Geminates can occur in various consonants and which consonants can occur as geminates depends on the specific language.

Japanese is one of the languages in which these kinds of segmental length contrasts can occur both in vowels and consonants. In Japanese there are five vowels /i, e, a, o, u/ and all of them can be short or long (Aoyama 2002). Japanese has sixteen consonant phonemes /p,
b, t, d, k, g, ts, m, n, η, r, s, z, h, j, w/ and basically only the voiceless stops /p, t, k/, the voiceless fricative /s/, the voiceless affricate /ts/ and the nasal /n/ can occur as geminates (Vance 1987; Aoyama 2002). However, due to the increase of loanwords, more voiced geminates can be observed in modern Japanese (Nakajyo 1989; Kawahara 2004). As in the case of vowels, the short and long contrasts only occur in quantity and not in quality (ex. [supai] ‘spy’ vs. [suppai] ‘sour’, [haken] ‘dispatch’ vs. [hakken] ‘discovery’, [itsu:] ‘stomach-ache’ vs. [ittsu:] ‘one letter’). Concerning the prosodic structure of Japanese, it is often said that the smallest pronounceable unit in the language is a mora and not a syllable. A mora is “a minimal unit of metrical time or weight” (Crystal 2002:248). An alternate definition is “a unit larger than a phoneme but smaller than a word, and is something similar but not identical to a syllable” (Han 1994:73). In mora-counting languages, “the length of an utterance phonologically depends on the number of moras” (Homma 1981:273). According to this moraic theory, a long vowel /R/ (chooboin in Japanese), a moraic nasal /N/ (hatsuonbin) and a moraic obstruent (sokuonbin) /Q/ (Vance 1987, Kindaichi 1991) are all counted as one mora. The latter two groups, i.e. the moraic nasals and obstruents, are known as geminates and are regarded as independent moraic consonants (tokushuhaku). This moraic construction in Japanese is also related to its orthography system (called kana) and each mora has its own kana.

**Acoustic Properties of Geminates**

There are many studies on geminates in various languages which have shown duration to be the most significant cue of gemination (Lahiri and Hankamer 1988; Aoyama 2003; Arvaniti and Tserdanelis 1999, 2000; Giovanardi und Di Benedetto 1998; Esposito et al. 1999; Mattei und Di Benedetto 2000; Faluschi und Di Benedetto 2001). Regarding the duration of V1, Hassan (2002, 2003) found in Arabic and Swedish that the shortening of V1 (i.e., the vowel preceding the geminate) was present in both languages. For Italian geminates this compensatory process between V1 and following consonant duration was also established by Giovanardi et al. (1998), Esposito et al. (1999), Mattei et al. (2000) and Faluschi et al. (2001). As for affricates both the closure durations of the plosive portion and the fricative portion were lengthened (Faluschi et al. 2001). Arvaniti and Tserdanelis (1999, 2000) also showed in Cypriot Greek that “the fricative portion of /ts/ was significantly longer for the geminate” (Arvaniti et al. 2000:560).

As for the quality of geminate consonants Local and Simpson (1999:597) showed that “geminate consonants have clearer (more palatalized) resonance than their non-geminate congeners”. They also found that gemination affects the quality of the preceding vowel, although according to Arvaniti et al. (2000), who investigated Cypriot Greek geminates, “gemination does not appear to affect the quality of either the vowel preceding or that following the geminate consonant” (Arvaniti et al. 2000:562). According to Arvaniti et al. (2000) no significant differences were observed in amplitude between singleton and geminate consonants. From earlier studies, we can assume that extended duration is the universal attribute of geminates, whereas other differences such as quality, phonation type, frequency and amplitude, may be language specific.

Extensive research has been carried out on geminates in Japanese, covering various aspects. Some investigated the acoustic properties of geminates produced by native speakers (Fukui 1978; Miwa & Yamamoto 2000; Hayes 2001; Aoyama 2001), while others dealt with geminates on the basis of language acquisition, in that they considered production of
geminates from both first language (L1) acquisition (Aoyama 2000) and second language (L2) acquisition (Han 1992; Mah & Archibald 2003; Toda 2003) perspectives. Furthermore, geminates in Japanese have also been discussed on the basis of mora-timing theory (Han 1962, 1994; Port, Al-Ani & Maeda 1980; Homma 1981; Beckman 1982). Fukui (1978) measured the duration of V1 and found that V1 duration preceding geminates was about 1.5 times longer than that before singletons. On the other hand, vowels following geminates (V2) were about 20% shorter than those after singletons. Hayes (2001), who carried out acoustic measurements of the stops /t/ and /k/ as well as the fricative /s/, revealed that “the length differential between singleton/geminate stops was larger than that of fricatives” (Hayes 2001:33): geminate stops were about 2.8 times longer than singletons, whereas the geminate fricative was just about twice as long as the singleton.

As mentioned before Japanese can be analyzed in terms of mora, and it is assumed that “Japanese morae have constant durations” (Beckman 1982:113) Homma (1981) focused on word duration and stated that the duration ratio of two-mora words (i.e. words containing singletons) and three-mora words (i.e. words containing geminates) was approximately in the ratio of 2:3, which could correspond to the number of mora.

**Earlier Perception Studies on Geminates**

A number of investigations have already been conducted concerning the perception of geminates in Japanese, both by L1 speakers and non-L1 speakers of Japanese. With regard to categorical perception by Japanese native speakers, Fujisaki et al. (1975) found that consonant duration played the most important role in the perception of geminates. Moreover, Fujisaki et al. (1975) reported some differences in singleton-geminate boundaries among these three types of consonants: geminate nasals were observed to be perceived earlier than geminate fricatives and plosives. Later, Toda (2003), who investigated the perceptual relationship between V1 and geminate duration (/t/, /k/ and /s/), revealed that the duration of V1 did not play any significant role in the perception of geminates. Furthermore, it was found that “perception of stops preceded fricatives” (Toda 2003:45).

This kind of perceptual study on geminates has also been carried out in some other languages. Most studies have shown that consonant duration is an important cue for the perception of singleton/geminate contrasts (O’Dell 1999; Kraehenmann et al. 2000). On the other hand, Esposito et al. (1999) reported that the duration of V1 influenced the perception of geminates in Italian: a shorter V1 duration required a shorter closure duration to allow the perception of a geminate consonant, whereas a longer closure duration was required in case of longer V1 duration. Obrecht (1965) compared the perception of stops in three consonants of Arabic and found that the sharpness of discrimination differed amongst these consonants: nasals were perceived more sharply than fricatives and stops.

Some researchers studied the categorical perception of the Japanese durational contrast from the aspect of L2-aquistion. According to Hayes (2001:40) “singleton/geminate contrasts whose length differentials are larger …… are easier for learners to perceive than singleton/geminate contrast with smaller length differentials” (Hayes 2001:40). Her results showed that [t] vs. [tt], which had the most significant durational contrasts, was easier for L2 learners to perceive than [s] vs. [ss] (/t/> /k/> /s/). Toda (2003:45) argues that the notion of typological markedness of consonants may affect the degree of perception. Her results
imply that the perception of the duration of fricatives is more challenging for L2 learners than that of stops since frication is more marked than voiceless stop closure duration.

So far, we have reviewed various investigations into both the acoustic and perceptual analysis of geminates. However, while stops, fricatives and nasals have been considered by many, affricates have hardly been investigated by Japanese researchers. Therefore, we will investigate the acoustic and perceptual characteristics of geminates of the voiceless stop /t/, the voiceless fricative /s/ and the voiceless affricate /ts/, which is basically the combination of a stop and a fricative. Our interest will be first to examine the acoustic features of geminates which may play a role in the perception (we will focus mainly on the time domain) and then to investigate how geminates are perceived by native speakers of a language which does not make use of this particular length contrast. In order to do this, we will compare two groups of native speakers of two languages (Japanese, which has geminates in its phonological categories and German, which does not). As Mackain et al. (1981:370) maintain, “lack of experience with a given phonological contrast should result in a poorly-defined perceptual boundary separating the two members of that contrast”. We will examine whether the presence or the absence of this phonological category in the respective language will cause marked differences in the perception of geminates.

Acoustic Analysis

Method

Subjects

Three Japanese adult speakers (1 male and 2 females) with no known articulatory or hearing impairment served as subjects. All of them were students at Philipps University Marburg and had spent between 2 to 5 years in Germany at the time of the recording. Subjects’ ages ranged from 26 to 29, with a mean of 27 years. The subjects all originated from the Tokyo area, where people are usually considered to speak Standard Japanese. Furthermore, none of them were familiar with linguistics or had any special knowledge about Japanese phonetics.

Materials

The material recorded for the acoustic analysis was a set of 15 minimal pairs, or 30 words, demonstrating the singleton/geminate contrast for the voiceless stop /t/, the voiceless affricate /ts/ and the voiceless fricative /s/. For each phoneme, five pairs for [t] vs. [tt], [ts] vs. [tt] and [s] vs. [ss] were selected.

All test words are basically formed by a set of Vowel-Consonant-Vowel (the singleton case) and Vowel-Consonant-Consonant-Vowel (the geminate case) words. Since geminates of these phonemes can only occur in the intervocalic position, target consonants were put only in this position. All five vowels in Japanese /a, i, u, e, o/ were used for the preceding vowels to vary the test words, while only /u/ and /e/ were chosen for the following vowels. This was due to the restricted phonological environment in which these phonemes can occur: /ts/ can only be followed by /u/, while /t/ can neither be followed by /i/ nor /u/. As for /s/, it cannot be followed by /i/. In order to create the same or at least a similar phonological environment, the following vowel /e/ was chosen to follow both for /t/ and /s/.
All of the test words are well-formed Japanese words but basically nonsense\(^1\). The use of nonsense words was preferred in order to have a symmetrical context in all cases and the same pitch accent pattern. In our recording, pitch accent was put on the first mora in all cases. Care was also taken for that the created test words would not sound too strange to both German and Japanese subjects. The test words were presented on their own, and not in a carrier sentence, because the stress and intonation pattern of a whole sentence could influence acoustic elements such as time-related parameters, which may be difficult to control.

**Recording Procedures**

The speech materials were produced by the three speakers individually using a Mini-Disk recorder (Kenwood DMC-M7R) with a microphone (Philips Stereo ME 570). Each speaker produced this set of test words three times. Each word was printed on a separate index card in the Japanese *Hiragana* orthography and presented to the subjects by the experimenter. These 30 words were shuffled every time by the experimenter in order to create a random order so that the words in pairs (singleton and geminate) did not appear one after another. Moreover, this method allowed the experimenter to control the reading tempo of subjects and prevent the subjects reading the words too fast.

Care was also taken to ensure that vocal effort and patterns of pitch accent and intonation were reasonably natural and consistent from word to word. The subjects were instructed to read the stimuli, putting the pitch accent on the first mora at a normal speaking rate. A total of 270 tokens \[3 \text{ consonants (}/t/, /ts/, /s/) \times 5 \text{ words} \times 2 \text{ types (singletons and geminates)} \times 3 \text{ subjects} \times 3 \text{ times} = 270 \text{ tokens}\] were collected and analyzed.

**Acoustic Measurements**

The acoustic measurements of sound data were performed using the computer programs *Cool Edit 2000*, *Speech Analyzer* (version 1.5) and *Praat* (version 4.2.17). To begin with, the digitalized data from the subjects, which were recorded on a Mini Disk in a mono format, were transferred to PC computer memory using *Cool Edit 2000*. The sampling rate was 44.1 kHz, and the sampled data were then analyzed acoustically using the programs *Speech Analyzer* and *Praat*. Sound spectrograms of all utterances and visual displays of the corresponding waveforms were made.

On the basis of previous research on geminates, both in Japanese and in other languages, it was decided to put the emphasis on the acoustic analysis of time-related parameters in this project. Due to the restricted number and range of subjects, the gender, the age and the social status differences will not be considered. The following items were examined and the average values and ratios of all these items were obtained using Microsoft Excel:

---

\(^1\) Due to the simple construction of the test words, some words (ex. *ase* = sweat, *utsu* = depression) can sound meaningful to Japanese people. However, it is difficult to understand these meanings without contexts or writing in Japanese character. Therefore, they are regarded as nonsense words.
1) The duration of the preceding vowels (V1):

The preceding vowel duration was analyzed in order to establish whether it changes in geminates. As far as the previous research on Japanese geminates indicates, a lengthening of the preceding vowel should be expected.

2) The duration of the intervocalic consonants:

Stop /t/

The closure duration and VOT were measured and analyzed respectively both in singletons and geminates. The average values and ratios of stop closure duration were calculated in two ways: closure duration including VOT and closure duration without VOT. It is expected that the closure duration will be longer in geminate cases.

Affricate /ts/

Separate measurements were taken for the closure duration, VOT and also frication of /ts/ both in singletons and geminates. On the basis of previous research on geminates in Italian (Faluschi 2001) and Greek (Arvaniti 1999, 2000), it is expected that both the closure and frication durations will be longer in geminate cases. However, the lengthening of the fricative portion may be less than that of closure duration if Japanese geminates behave similarly to Italian and Greek geminates.

Fricative /s/

The duration of the frication was measured. The lengthening of fricative duration is expected to be smaller than the closure duration of /t/ on the basis of previous research (Hayes 2001; Toda 2003).

3) The duration of the following vowels (V2):

According to the previous research, the duration of word-final vowels is not expected to change significantly between singletons and geminates.

4) Total word duration

It was examined whether the word duration of geminates differs significantly from that of singletons.

Results

Preceding Vowel (V1)

Regarding the preceding vowel (V1), no clear-cut contrast in duration between singletons and geminates was observed (see Table 1). The average V1 duration of geminate /t/ is slightly shorter than for the singleton /t/, while that of fricative /s/ is longer in geminates. However, the difference in /t/ is very small and not all subjects showed the shortening of V1. In comparison to /t/, the V1 of /s/ tends to be longer in geminates, although the lengthening of V1 is once again not observed for all subjects. The affricate /ts/ shows the medial value of these two consonants.

Intervocalic Consonant

There was a clear long/short contrast corresponding to the intervocalic consonants. All subjects showed a similar tendency: the biggest length differential was found in /t/ and the smallest in /ts/. Amongst these three consonants, the ratio of differential in /ts/ was even
smaller than two to one (1:1.72). In contrast, comparing the average duration of singletons, the duration of /ts/ is the longest and that of /t/ is the shortest (the differential is about 76 ms), i.e. /ts/ is originally long in singletons but not prolonged as long as /t/ and /s/ in geminates.

Concerning the various elements of the intervocalic consonants it was firstly established that VOT does not markedly change in either /t/ or /ts/. In both cases the ratio of differential was about 1:1.05, which indicates that the duration of VOT is almost constant between singletons and geminates. Secondly, an interesting trend was observed with respect to the fricative portion of /ts/. Although the closure duration of /ts/ is prolonged markedly in geminates, the fricative portion becomes shorter on average. Although the shortening of fricative portion was not observed for all subjects, two of them clearly showed the shortening of the frication phase by about 10 to 20 percent.

### Table 1: Results of acoustic analysis (in ratio of singletons vs. geminates)

<table>
<thead>
<tr>
<th>V1</th>
<th>no significant changes, mostly dependant on the individual subjects</th>
<th>/s/</th>
<th>/ts/</th>
<th>/t/</th>
</tr>
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<tr>
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<td>1.08</td>
<td>0.97</td>
</tr>
<tr>
<td>VOT</td>
<td>no significant changes for both /t/ and /ts/</td>
<td>/t/</td>
<td>/ts/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.05</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Fricative portion in /ts/</td>
<td>slightly shorter</td>
<td>/ts/</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>no significant changes, mostly dependant on the individual subject</td>
<td>/s/</td>
<td>/t/</td>
<td>/ts/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.01</td>
<td>0.92</td>
<td>0.91</td>
</tr>
<tr>
<td>Word Duration</td>
<td>significantly longer in geminates</td>
<td>/t/</td>
<td>/s/</td>
<td>/ts/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.55</td>
<td>1.50</td>
<td>1.38</td>
</tr>
</tbody>
</table>

**Following Vowel (V2)**

As with the preceding vowel, no clear length contrasts between singleton and geminate were observed for the following vowel. Firstly, comparing the average duration of V2 with that of V1, it was found that the average duration of V2 in both singletons and geminates was generally longer than that of V1 for all consonants. However, there are marked differences among subjects. Secondly, the shortening of V2 was observed for both /t/ and /ts/, but not for /s/. V2 duration for /s/ was almost constant between singletons and geminates. From the fact that both /t/ and /s/ had the same following vowel /e/, it can be assumed that choice of vowel had no effect on the lengthening or shortening of V2. It may depend on individual speakers just as is the case for V1.
**Word Duration**

The total duration of words containing geminates was clearly longer than those containing singletons for all consonants. Amongst the three consonants, /t/ showed the most marked differential ratio (1:1.55), while /ts/ showed the smallest (1:1.38). As far as the relationship between the number of moras and the word durations is concerned, the differential ratio of /t/ and /s/ corresponded to the number of moras, i.e. two-mora (singleton) and three-mora (geminate) expressions (in both consonants more than 2:3) but not that of /ts/ (2:2.76). The ratio may depend on the type of consonant.

**Perception Test**

**Method**

**Subjects**

A perception test was carried out with subjects who were students at the Universities of Marburg and Trier. None of the subjects had hearing or speaking disorders. There were two groups of subjects:

*Group 1: Native speakers of Japanese*

There were 17 participants in total and all of them were students at the University of Marburg. There were 4 males and 13 females in this group, aged between 21 and 34, with a mean of 27 years. The length of the stay in Germany varied from two months to six years, with a mean of about 2 years. All of them were able to speak Standard Japanese but linguistically and experimentally naïve, i.e. none of them were trained to observe phonemic contrasts linguistically in their own language.

*Group 2: Native speakers of German without Japanese training*

There were 34 participants in total, of which 13 subjects were students at the University of Marburg and 21 were students at the University of Trier. All subjects, who spoke German as their first language, had never learned Japanese as a second language. Half of the subject group were students of linguistics or phonetics but none of them were familiar with the phonetics or phonology of Japanese. There were 10 males and 24 females in this group, aged between 21 and 37, with a mean of 25 years.

**Sound Stimuli**

All stimuli for the perception test were taken from the material recorded for the acoustic analysis. From the three subjects who participated in the recording, the data from a female participant were chosen as stimuli for the perception test since her data were generally close to the average durational behaviour. The perception test was motivated by and designed according to the following three research questions:

1) How are the original singleton/geminate stimuli perceived by native speakers and non-native speakers? Are non-native speakers able to perceive geminates correctly, even though they do not know anything about the language? Are there any perceptual differences between the three consonants /t/, /ts/ and /s/?

2) When do people start to perceive geminates, i.e. where is the perceptual boundary between singletons and geminates? Are there any differences between the two groups of subjects and the three different consonants?
3) What is perceptual mechanism of the affricate /ts/? Does the fricative portion also play a role in the perception of geminates? According to the acoustic analysis, the fricative portion is sometimes shortened in geminates. Does the shortening of the fricative portion help to perceive geminates? Are there any cross-language differences?

For the first research question, the originally recorded words beginning with /i, u, e, o/ were used. There were eight words for each consonant (four singletons and four geminates), which means 24 stimuli were used to test the first research question. Secondly, the original singleton words beginning with /a/ were manipulated to produce the sound stimuli for the second research question. These words with VCV construction were manipulated to create words with VCCV construction, i.e. geminates. Therefore, the originally recorded geminate words were not used as stimuli. An effort was made to select the words whose durations were relatively close to the overall average, but attention was also paid to the quality of the recordings. For this research question, we decided to manipulate only the durations of segments that were most markedly changed in the acoustic analysis (/t/ and /ts/ = closure duration, /s/ = frication).

On the basis of this concept, the VCCV stimuli of each consonant were created by lengthening the duration of the intervocalic consonant. Using the waveform editor Cool Edit 2000, the closure duration of /t/ (original length: 139 ms), and /ts/ (135 ms) and the frication of /s/ (154 ms) were lengthened in steps of 12 ms and 12 versions of each consonant in total were created. For all consonants, the stimuli in step 12 were about twice as long as the original (ratio: /t/ 1:2.04, /ts/ 1:2.07, /s/ 1:1.94). The length (12 ms) and number of steps (12 steps) was determined from a pilot study conducted prior to the real perception test. This pilot study showed that geminates started to be perceived when the intervocalic consonants became about 1.5 times longer than the original and it hardly changed when it became more than twice their length. Moreover, a step of 20 ms was revealed to be too easy to perceive even for non-native speakers, thus the step of 12 ms was chosen to satisfy our conditions.

For the last research question, we decided to create two series of manipulations: one series created by shortening the fricative portion by 40 ms (FR - 40 ms series) and the other series by lengthening the fricative portion by 40 ms (FR + 40 ms series). Both series were combined with an expanding closure duration, since without that geminates would possibly not be perceived. The amount of 40 ms was chosen for the manipulation because the difference between the expanded and reduced series should be perceptible but the stimuli should still sound highly natural to native speakers.

In order to investigate these three research questions, a total of 89 stimuli were created: 65 manipulated stimuli for both the second and the third research questions (13 steps × 5 series) and 24 original stimuli for the first research question. In addition, about 10% of the stimuli (10 words) were chosen at random and played twice, to check if the subjects gave the same answer twice. This so-called reliability check was conducted to make sure that the subjects were not answering by guesswork only. The results from the subjects who did not seem to satisfy this criterion were not used for analysis. These 99 stimuli were randomized together and only one perception test was created. The duration of the entire test was about 9 minutes. Between two subsequent stimuli, there was a silent interval of 4 seconds to allow the subjects to answer and there was a signal after every 10 stimuli to help with orientation. In randomizing the stimuli, care was taken not to put the same stimuli one after another.
Since the 10 stimuli for reliability check were randomized and mixed with the others, the subjects were presumably not aware of hearing the same stimuli twice.

**Procedure**

The experiment was carried out in a quiet room in the Phonetics Department at the Universities of Marburg and Trier, and the stimuli were played to subjects using the computer waveform program *Multispeech* via speakers. The experiment was run for German and Japanese subjects separately. In each session, 5-6 subjects did the experiment at the same time but they were asked to work individually.

First, the subjects were given an instruction to read. They were told that all words had Vowel-Consonant-Vowel (VCV) constructions and the length of the intervocalic consonants was either short or long. Then some examples of short and long consonants, which were not included in the real test, were played to the subjects. Their task was to identify whether they heard a short or a long consonant for each word. For this forced choice test, two choices (short and long) were written out on the subjects’ answer sheets and the subjects had to choose one of them.

We firstly hypothesized that German subjects would be able to discriminate the length contrasts in Japanese to some extent, but continuously rather than categorically. Secondly, we hypothesized that Japanese subjects would show similar results for all consonants and all series of /ts/ since a geminate consonant in Japanese is counted as an independent mora and recognized as one sound by native speakers. Therefore, the perceptual judgement of Japanese subjects will not dramatically be affected by the types of consonants. Thirdly, regarding the perception of original stimuli, we predicted that the geminate consonants with a larger length differential between singletons and geminates would be more accurately discriminated by non-native speakers than the consonants with a smaller length differential. In our acoustic study, it had been revealed that /t/ had the largest length differential between singleton/geminate (1: 2.43) and /ts/ had the smallest (1: 1.72). Therefore, we predicted that stop geminate /t/ would be easier to discriminate for non-native speakers than the fricative geminate /s/ (1: 2.07), and /s/ would be easier to discriminate than the affricate geminate /ts/ (/t/ > /s/ > /ts/).

**Results**

**Reliability check**

A total of 10 stimuli were played twice in the test and it was counted as “correct” if the subjects gave the same answer twice. From these results it was decided to exclude the results of subjects who did not reach 50%. On the basis of this criterion one Japanese subject was excluded, whereas all of the German subjects fulfilled this criterion. So the results of 16 Japanese (4 males and 12 females) subjects and 34 German (10 males and 24 females) subjects were used for further analysis. As for the stimuli which were played twice, only the first answer was used for the analysis.

**Identification of original stimuli**

First, it was found that Japanese subjects achieved considerably better results than German subjects, but even so the German subjects still scored relatively well (see Table 2). Apart from for geminate /ts/, German subjects scored more than 90% in each case. On the other hand, Japanese subjects did not score 100% in all cases. However, this was only due
to one male subject, who gave the wrong answers for the geminates /t/ and /ts/. Therefore, we may conclude that Japanese subjects are able to identify original singletons/geminates in nonsense words almost perfectly, while German subjects are also able to identify original singletons/geminates relatively well.

Secondly, it was also found that there were some perceptual differences amongst consonants. Generally, German subjects could identify original singletons (average: ca. 95%) better than original geminates (average: ca. 90%), but this depended on the nature of the consonant. While singletons /t/ and /ts/ were identified better than geminates /t/ and /ts/ by German subjects, singleton /s/ was not identified as well as geminate /s/. The singleton /s/ seems to be difficult for German speakers to identify, whereas the geminate /s/ seems to be the easiest of the three geminates. As for affricate /ts/, the geminate was identified much less well than the singleton, as predicted. The singleton /ts/ seems to be much easier to identify for German subjects than the geminate /ts/. In summary, the geminate /s/ was the easiest for German subjects to identify and the geminate /ts/ the most difficult, which contradicts to our hypothesis.

Table 2: Perception test (summary of results)

<table>
<thead>
<tr>
<th>Original Stimuli (%)correctly identified</th>
<th>Japanese</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Singletons</td>
<td>all consonants 100%</td>
</tr>
<tr>
<td></td>
<td>Geminates</td>
<td>/s/ &gt; /t/, /ts/ 100% 98.4%</td>
</tr>
<tr>
<td>Perception Boundary (ratio: earlier &gt; later)</td>
<td>/ts/ &gt; /s/ &gt; /t/ 1.22 1.29 1.42</td>
<td>/s/ &gt; /t/ &gt; /ts/ 1.29 1.58 1.64</td>
</tr>
<tr>
<td>Affricate /ts/ (ratio: earlier &gt; later)</td>
<td>original &gt; + 40 &gt; - 40 1.22 1.27 1.33</td>
<td>+40 &gt; - 40 &gt; original 1.29 1.60 1.64</td>
</tr>
</tbody>
</table>

Perception Boundary

The data were scored by totalling the number of “geminates” responses and calculated in percent (%): 0% means that stimuli were identified as “singletons”, while 100% indicates that stimuli were identified as “geminates”. First, it was observed that the perception of geminates by the Japanese subjects was categorical, while the German subjects did not identify geminates as categorically as native speakers, i.e. rather continuously (Figure 1 and Figure 2). As we hypothesized, with regard to Japanese subjects, there is no great perceptual difference among three consonants. Calculating proportions, geminates start to be perceived when the consonant duration becomes about 1.16-1.17 times longer than the original stimuli, whereas geminates are perceived almost 100% of the time when the consonant duration becomes about 1.55-1.62 times longer than the original stimuli.

On the contrary, the results of the German subjects show different tendencies. Firstly, original stimuli, which would have been expected to be perceived as singletons, and step 12 stimuli, which would have been expected to be perceived as geminates, were never perceived 100% as either, although the German subjects did recognize geminates gradually with increasing steps. Step 1 and step 2 of /t/ were, however, perceived 100% as singletons. Geminates were perceived by 90% of the German subjects when the consonant duration...
became 1.86-1.98 times longer than original. Secondly, in contrast to Japanese data, it was observed that there were some perceptual differences between three consonants: the perception of /s/ is more stable than the other two consonants /ts/ and /t/. In the case of /s/ no perceptual confusion (indicated by zigzag lines) can be observed as was in /ts/ and /t/, which means that /s/ was the clearest consonant for most of German subjects.

**Figure 1: Perception test result <Japanese>**

![Figure 1: Perception test result <Japanese>](image1.png)

**Figure 2: Perception test result <German>**

![Figure 2: Perception test result <German>](image2.png)
As for crossover points, the Japanese subjects show a very clear perception boundary for /t/ (step 5, 197ms, ratio 1.42), while German subjects do not: the average crossover point of the German subjects occurs at step 7, which is about 220ms (ratio: 1.58). However, there is also an auxiliary touch point at step 9 (247ms). This indicates that the German subjects were uncertain when they heard stimuli between step 7 and step 9. Concerning the crossover point for /ts/, the Japanese subjects again show a very clear crossover point at around 165ms (step 3, ratio: 1.22), which is shorter than the crossover point of /t/, while German subjects have a greater degree of uncertainty in their perceptual judgement of /ts/. The first crossover point occurs at around 168ms (step 3), which is very close to the Japanese one, but there is more than one crossover point between step 3 and step 7. The last crossover point occurs at step 7 (about 222ms), which means that German subjects need a closure duration of 222ms (ratio: 1.64) on order to perceive the singleton/geminate boundary clearly. Geminate /ts/ seemed to be very confusing for the German subjects to perceive (see Table 2).

The crossover point of /s/ shows different results from the other two consonants. Firstly, the uncertainty phases, which are observed with the German subjects for both /t/ and /ts/, were not observed for /s/. Not only the Japanese subjects but also the German subjects show one clear crossover point. Secondly, the crossover point for both groups surprisingly occurs at the same point (about 198ms, step 4, ratio: 1.29). In comparison to the other two consonants /t/ and /ts/, it is surprising that the German subjects are able to perceive the fricative geminate /s/ in a similar way to native speakers.

**Affricate /ts/**

Comparing the results of these two groups (Figure 3 and Figure 4), it can firstly be observed that the German subjects do not perceive geminates /ts/ in all series as categorically as Japanese subjects do. Moreover, while Japanese subjects show comparable results in all three series, German subjects perceive the three series differently. That is, the manipulation of the fricative portion of /ts/ had more influence on the perceptual judgement of the German subjects than on that of the Japanese subjects. The Japanese subjects seem to have focused mainly on the length of closure duration and not much on the length of fricative portion.

Regarding the Japanese subjects, the original stimuli were all perceived as singletons, while step 10 to step 12 stimuli were perceived 100% as geminates in all three series. Slight differences were observed between these three series, however: the perception of geminates began already with step 1 in FR+40ms series, while it only began with step 3 in FR-40ms series. With longer frication duration, the Japanese subjects tended to perceive geminate /ts/ slightly earlier than with shorter frication duration. On the contrary, the German subjects seem to have been confused by the length of fricative. In particular, the FR+40ms series showed markedly different results. Firstly, the perception rate of singleton was very low in this series: the original stimulus was already perceived as a geminate by 26.5% of the subjects, whereas the FR original and FR-40ms series were perceived as singletons by almost all subjects. At the same time, the perceptual rate of geminates was the highest in this FR+40ms series: 100% of the German subjects perceived geminate /ts/ at step 12, which was not observed for the other two series.
For FR+40ms series, the German subjects showed again more than one crossover points (between step 1 and step 3), while the Japanese subjects showed just one clear crossover point. Concerning the FR-40ms series, the first thing to mention is that there was only one crossover point for the German subjects, which was rare among all series, and their perception of this series was generally much clearer than of the FR+40ms series and the FR
original series. Presumably, since the fricative duration was shorter, the German subjects
could better focus on the closure duration and they were thus less confused by frication.
However, the crossover point of the German subjects occurred much later than in the
FR+40ms series: it occurred just before step 7 (216ms; ratio 1.60), which was similar to the
crossover point of the FR original series (see Table 2). Concerning the Japanese results,
there were no marked differences between the FR+40ms and the FR-40ms series, although
there was a touch point at about step 5 in FR-40ms series, which may indicate the Japanese
subjects’ uncertainty. However, the perception of geminate /ts/ was earlier for the Japanese
subjects than for the German subjects in this FR-40ms series.

Discussion

The first result of our acoustic analysis was that V1 and V2 duration does not change
markedly between singletons and geminates, rather the small differences observed in these
segments apparently depend on the individual speaker. The lengthening of V1 in Japanese
geminates noted by various researchers (Fukui 1978; Han 1994; Toda 2003) was not
observed here for either all consonants or all subjects. The shortening effect of V1 in
geminates observed in other languages such as Italian (Giovanardi et al. 1998; Esposito et
al. 1999; Mattei et al. 2000; Faluschi et al. 2001), Malayalam (Local et al. 1999) and
Swedish (Hassan 2002) was not observed in our data either. Regarding V2, much previous
research has shown that V2 is shortened in geminates (Fukui 1978; Han 1994; Toda 2003),
but again, this tendency to shorten V2 was not observed for all consonants and all subjects
in our data.

A clear long/short contrast was observed in the intervocalic consonants, however. The
biggest differential was found for stops (ratio 2.43), followed by fricatives (ratio 2.07) and
affricates (ratio 1.72). The general tendency of Japanese geminates that the differential
between singleton and geminate is bigger for stops than for fricatives (Hayes 2001; Toda
2003) was also confirmed in our data. In addition, an interesting tendency was found in our
data: the consonants which are already long in singletons are not lengthened as much as the
consonants which are originally short in singletons; our data showed that the affricates,
which had the longest duration in singletons, were not lengthened as much as the stops or
the fricatives. Since affricates are a combination of two different consonants, it may be a
natural result that affricates need longer segmental durations than the others.

Concerning VOT, our data did not show any marked differences between singletons and
geminates, which contradicts the results of previous researchers (Han 1992; Homma 1981;
Toda 2003). In their results, VOTs in geminate /t/ become shorter (ratio between 0.68 and
0.84), but our results were almost unchanged (ratio 1.05 in both /t/ and /ts/). Regarding the
affricates, an interesting compensatory mechanism was observed in our data: the closure
duration was markedly lengthened (ratio 2.38) in geminates, while the fricative portion was
slightly shortened (ratio 0.91). We also measured the total word duration of singletons and
geminates and found that the ratio corresponds to the results of intervocalic consonants.
Namely, the biggest differential ratio was found in the stop (ratio 1.55) followed by the
fricative (ratio 1.50) and the affricate (ratio 1.38). Our results of stops and fricatives are
similar to the results of Homma (1981), Han (1994) and Toda (2003).

As far as the identification of original stimuli is concerned, not only Japanese subjects
but also German subjects scored high results, which means German subjects were to some
extent able to perceive contrastive segment durations in consonants which are not present in their native language. However, this may be due to the fact that the differentials between singletons and geminates of the original stimuli were larger than those of the manipulated stimuli (original stimuli: ratio between 2.07 and 2.56, manipulated stimuli: ratio between 1.94 and 2.04) and the original geminates may have been easier than the manipulated stimuli for German subjects to perceive since the length contrasts were more strongly marked in the original stimuli series. If we had presented the original stimuli solely, the identification scores for the German subjects may have been much lower.

We hypothesized that the geminate consonants with bigger length differentials would be easier than those with smaller contrasts for German subjects to perceive, but the results were at variance with this line of thought. For German subjects, the fricative geminates /s/ were easier to identify than the stop geminates /t/, although the length differential of the original fricative geminates /s/ were smaller than those of /t/. This result contradicts those of Hayes (2001) and Toda (2003), who revealed that the geminate /t/ was easier than the geminate /s/ for English speaking subjects to perceive because geminate /t/ has a bigger length contrast than geminate /s/. From our results, we can conclude that, at least for German speakers, not only the degree of the length contrast but also the type of consonant plays a role in the perception of geminates. For them, fricative geminates were easier than stop or affricate geminates to perceive.

Regarding the perceptual boundary, we found that the Japanese subjects perceived geminates categorically in all consonants and in all series of /ts/, while the German subjects perceived them rather continuously, although they were able to perceive a gradual change in duration to some extent. Moreover, the German subjects often showed a great degree of uncertainty when the stimulus was close to the categorical boundary, while Japanese subjects showed a clear perception boundary in all cases. This categorical perception of L1 speakers and continuous perception by non-L1 speakers corresponds to results from Hayes (2001) and Toda (2003). However, the type of perception depends on the type of consonant: the German subjects did not show any uncertainty in the perception of geminate /s/ and even their perceptual boundary for geminate /s/ was exactly the same as that of the Japanese subjects. Combining these results with the perceptual results of original geminate stimuli, we can conclude that the German subjects are sensitive to fricative geminates. Toda’s (2003) suggestion that fricative geminates are more marked and thus difficult for non-L1 speakers (in her case English-speaking subjects) to perceive is expressly contradicted by the results of our German data. This difference between our results and Toda’s suggestion may depend on the different native languages of the non-L1 speakers (German vs. English).

Additionally, an interesting correlation was found between the acoustic and the perceptual data of Japanese subjects. For the Japanese subjects, the perception boundary was later for /t/ than for /ts/ and this corresponds to the differential between singleton and geminate in the original stimuli (see Table 3). This may be a highly natural perceptual process in which a long duration is required for the perception of a geminate consonant which has a long segmental duration. Native speakers are apparently sensitive to this natural timing in different kinds of geminate consonants. That is to say, native speakers seem to possess not only the general category “geminates” in their mental lexicon but also a sensitivity for the various segmental durations of geminates. This native-like perceptual attitude was not observed in the German subjects’ data.
Table 3: Correlation between the acoustic and perceptual data (Japanese subjects)

<table>
<thead>
<tr>
<th></th>
<th>Intervocalic consonant (ratio: bigger &gt; smaller)</th>
<th>/t/ &gt; /s/ &gt; /ts/</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acoustic Data</strong></td>
<td></td>
<td>2.43 2.07 1.72</td>
</tr>
<tr>
<td>(Original Stimuli)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perception Data</strong></td>
<td>Perception boundary (ratio: later &gt; earlier)</td>
<td>/t/ &gt; /s/ &gt; /ts/</td>
</tr>
<tr>
<td>(Manipulated Stimuli: Japanese)</td>
<td></td>
<td>1.42 1.29 1.22</td>
</tr>
</tbody>
</table>

Our last research question focused on the affricate /ts/. Regarding the perception of original affricate stimuli, German subjects could perceive original affricate singletons very well (/ts/: 96.3%), while their perception score of original affricate geminates was low (/ts/: 83.1%). The perceptual boundary of geminate /ts/ was also the latest of all the geminates tested for the German subjects. From these results, we can conclude that affricate geminates are the most difficult geminate consonants for German subjects to perceive. Since affricates are a combination of two consonants, affricate geminates may be more complicated and challenging than stops and fricatives for non-L1 speakers to perceive.

From the results of the three manipulated series of /ts/, we found that the manipulation of the fricative portion of /ts/ did not markedly affect the perceptual attitude of the Japanese subjects. We can conclude that the Japanese subjects mostly used closure duration as a perceptual cue for geminate /ts/ and did not use the duration of frication much. However, they showed small differences between the three series and it was evident that the Japanese subjects started to perceive geminates earliest when the fricative portion was not manipulated at all and latest when the fricative portion was shortened by 40ms. Although the acoustic data showed that the fricative portion of /ts/ is slightly shortened in geminates, our perceptual data showed that the shortening of the fricative portion did not help the Japanese subjects to perceive geminates.

On the contrary, the German subjects apparently used the duration of both the closure and the fricative portion of /ts/ as a cue for the perception of geminate /ts/. The lengthening or the shortening of fricative portions strongly affected the perceptual attitude of the German subjects: they perceived geminates /ts/ much earlier (almost as early as the Japanese subjects) when the fricative portion was lengthened (FR+40ms series), whereas the perception of geminate /ts/ was delayed when the fricative portion was shortened. However, the German subjects showed a greater degree of uncertainty in their perceptual judgement of longer fricative portions than of shorter fricative portions: they could not perceive affricate singleton /ts/ correctly when the fricative portion of /ts/ was lengthened. The lengthening of frication in /ts/ helped the German subjects to perceive geminate /ts/, but not to perceive singleton /ts/. From this result, we can conclude that the Japanese fricative /s/ apparently sounded longer to the German subjects. This may depend on the different sound systems of the languages (the quantity and the quality of /s/ may be different in Japanese and German) and the different mental lexicons.
Conclusion

This cross-linguistic study on Japanese geminates reveals that the categorical perception of geminates arises from language experience, with listeners being more sensitive to the phonetic differences that play a functional role in their native language and less sensitive to such differences that do not. The Japanese subjects show typical categorical perception results: they divide the continuum consistently into two phonetic categories (singletons and geminates). In contrast, the German subjects do not discriminate the series categorically: the identification is continuous. Lack of experience with geminates results in a poorly-defined perceptual boundary separating singletons and geminates.

Combining the results of the acoustic and the perceptual analyses, it is also confirmed that the durational parameter plays a marked role in the perception of geminates. Since other parameters such as frequency- or energy-based parameters were not examined in this study, we cannot conclude that the durational parameter is the most marked cue for the perception of geminates. However, it is confirmed that the duration of intervocalic consonants (geminate consonants) is used as a cue for the perception of geminates by both Japanese and German subjects.

It can also be concluded that the perception of three different geminate consonants varies more widely for the German subjects than for the Japanese subjects. While the type of consonant does not influence the Japanese subjects’ perception of geminates strongly, it affects the German subjects much more. In addition, our results suggest that the degree of the duration contrast between singletons and geminates does not play the most marked role for the German subjects in perceiving geminates. Rather, it depends on the type of consonant: they could perceive geminate /s/ more easily than geminate /t/ or /ts/, although the differential between singletons and geminates for /s/ was smaller than that for /t/. From this result we come to the conclusion that they are more sensitive to frication than to closure with regard to the perception of geminates. However, based on the present findings, we cannot make claims as to whether the German subjects are generally sensitive to fricative geminates or only to the voiceless alveolar fricative /s/. In order to examine this, further research will be required using other fricative consonants.

In this project, only German speakers served as non-native subjects. In future research, we could envisage conducting further studies involving speakers of different languages in order to study whether the sensitivity to fricative geminates by non-native speakers can also be observed in the speakers of other languages. Another suggestion would be to use speakers of languages that have triple length contrasts in consonants like Finnish or Estonian. It would be interesting to see how speakers of such languages react to the consonants of a language which has only double length contrasts.

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**INFORMATION**

**MA Program in Phonetics & Phonology of Portuguese**

The University of Lisbon (DLGR, Faculdade de Letras) offers a Masters Program in Linguistics (Phonetics and Phonology): Sounds and Melodies of Portuguese. The aim is to improve understanding of sound structure and provide training on various applied areas where such knowledge is needed.

The Courses taught are designed to deepen the students' knowledge of Portuguese phonetics and phonology and put it into use in areas such as language teaching, language acquisition and development, speech production and perception, speech therapy, speech recognition, or forensic phonetics.

The MA is suitable both for those with some prior knowledge of the subject and for appropriately motivated beginners.

The program begins in fall semester 2006/2007. The application deadline is September, 22.

For further information, please refer to the program website
http://www.fl.ul.pt/dlgr/SonsMelodias/index.htm
or contact:
Sonia Frota
sonia.frota@mail.telepac.pt
Gerhart Lindner (born on September 20th, 1925 in Leipzig) died on May 20th, 2005, at the age of almost 80. After having consecrated his interests and talents to the demands of his professional life with great dedication, he had gained high esteem and recognition for his academic teaching and research by his numerous students, Ph.D. candidates, staff members and colleagues.

Gerhart Lindner entered the Sächsische Taubstummenanstalt (Saxon Centre for the Deaf) in Leipzig as a student in 1946 and stayed at this institution after his final examination to work as a teacher. Parallel to his teaching activities, he continued to take courses in pedagogy, psychology and philosophy at Leipzig University. In 1952, he was offered the position of an assistant professor at the Phonetics Laboratory (School of Pedagogy, Humboldt University) directed by F. Wethlo. He obtained his Ph.D. in 1955 with a thesis on “Die Tonhöhenbewegungen in der Sprechweise gehörloser Schulkinder der letzten Grundschuljahre” (The intonation patterns in the speech of deaf school children of the last forms of primary school). Six years later, he qualified for the position of full professor presenting a habilitation dissertation on “Untersuchungen über den zeitlichen Verlauf des Sprechens [der Lautsprache] und ihre Anwendung auf die Pädagogik Hörgeschädigter” (Investigations in the time pattern of running speech and its application to the pedagogy for the hard of hearing). In 1961, he became associate professor of phonetics at the Phonetics Institute of Humboldt University (Faculty of Philosophy) which in 1962 was restructured under the name of the Institute of Phonetics and Communication Sciences, under the direction of Georg F. Meier. Gerhart Lindner became full professor in 1968 and retired in 1990.

Although phonetics must be considered the dominant domain of Lindner’s professional activities, his research interests also covered pedagogy of the hard of hearing. This can easily be demonstrated by more than 40 Ph.D. dissertations and 13 habilitation dissertations which were accomplished under his supervision and in which pedagogy of the handicapped played an important role. His own publications also reflected his interest in and devotion to the pedagogy of the hard of hearing, i.e., his numerous papers and his books, which had the character of both monographs and textbooks, were published in several editions. It were these books which made him internationally known, for example “Grundlagen der audiologischen Pädagogik” (Fundamentals of the pedagogy of audiology, 1966), “Einführung in die experimentelle Phonetik” (Introduction to experimental phonetics, 1969), “Der Sprechbewegungsablauf” (Coarticulation, 1975), “Hören und Verstehen” (Perception and understanding, 1977), and “Grundlagen und Anwendungen der Phonetik” (Fundamentals and applications of phonetics, 1981). He impressed his readers by his
methodology and technique, his awareness of problems, his comprehensive knowledge of references, and his systematic thinking.

I have met Gerhart Lindner while attending meetings and conferences. He refused politics and unfairness against colleagues, he always remained objective and provided practical solutions to problems. When he spoke, his colleagues listened to what he had to say, and he was respected for his intelligence and his honourable character.

For your teaching and research which have profoundly sponsored phonetics, for your fairness as a colleague and – above all – for your humane attitude we thank you, dear Gerhart. Rest in peace!

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INFORMATION ISCA Databases

ISCA-SAC is in the process of updating ISCA databases. An important part of this process is to have an extensive list of speech labs and groups from all over the world. Right now, there are 102 labs from 24 countries. Please, check the listing, and enter your group's information at http://www.isca-students.org/new-speech-lab.php if your group is not listed.

Do you want to become a board member in ISCA Student Advisory Committee? ISCA-SAC is looking for new motivated members (PhD students early in their degrees are preferred). There are available positions on ISCA-SAC board. If you want to volunteer for ISCA and contribute to ISCA-SAC efforts (to get an idea please visit our website), get into contact with us by sending an email: public@isca-students.org. There are exciting projects that current board members and volunteering students are working on. Join us!

Murat Akbacak
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On April 9th, 2005, Walter Trenschel celebrated his 80th birthday. He has been the representative for speech communication and phonetics at Rostock University from 1954 to 1990.

Trenschel was born in Halle in 1925 and grew up in this major city in the southern part of Saxony Anhalt. From 1949 to 1954, he studied English and German philology as well as Speech Communication at Martin-Luther-University Halle-Wittenberg. In his diploma dissertation “Die Aussprache des Englischen in Amerika” (The pronunciation of English in America), he discussed different phenomena of the phonetics of English spoken in North America. Immediately after having finished his studies, he took on the position of Assistant Professor at the German Department at Rostock University and became a Reader in speech communication in 1959.

In terms of his academic teaching, Trenschel offered lectures and seminars in pedagogy of speech performance, mainly to students of German philology and future foreign language teachers. However, students from other faculties, especially from theology, took his courses. Using practical exercises, his students were trained in how to apply their theoretical knowledge to real-life situations. In addition, Trenschel taught German phonetics to foreign students, as well as general and applied phonetics to students who acted as tutors in training programs for foreign students. Starting in the 50s, Trenschel participated in the practical rehabilitation of cleft palate patients at the University Clinic of Stomatology. He systematically contributed to the theoretical and organizational concept of a complex approach to the rehabilitation of this patient group and gave lectures on general phonetics.

Despite his extensive teaching load, Trenschel was always active as a researcher. His publications (3 books, 16 papers, and 6 book reviews) extend over a period of more than 40 (1960 to 2003) years. They mainly concern the phonetics of Standard German and articulation training as well as the principles of phonetic rehabilitation in connection with cleft palate, jaw and teeth deformations, and nasality. But the real focus of Trenschel’s research interests was nasality, i.e. the different categories of nasality, the movement of the velum, naso-pharyngeal closure, the acoustics of the nasal cavities, the difference between nasality and nasalization, nasality in the pedagogy of singing and rhetoric, and the distinction between orality and nasality. His Ph.D. thesis (1968, published in 1977) “Das Phänomen der Nasalität” (The phenomenon of nasality) is a historically orientated analysis of the term and the phenomenon of nasality, taking into account phonetic and phoniatric aspects, pedagogy of singing and rhetoric. In his habilitation dissertation (1982, published in 1994) “Oralität und Nasalität in der deutschen Standardaussprache” (Orality and nasality in Standard German), he described detailed experimental approaches to clarify nasality in
German. His research on nasality led him to conclude that nasality as a means of intensifying the sound, which is often hypothesized in the pedagogy of singing, cannot be proven experimentally. He also interpreted the results of his experimental analyses of standard German speech material as evidence for the oral character of all sounds of German, except for the nasal consonants.

When Walter Trenschel retired in 1990, the tradition in phonetics and speech sciences he had been creating and cultivating over 36 years at Rostock University was discontinued. Generations of students and the phonetics community thank Walter Trenschel for his engagement and devotion to the advancement of speech communication and phonetics and wish him many happy returns.

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INFORMATION
A free new Unicode phonetic font for both Windows and Macintosh

SIL International is pleased to announce the official release of the Charis SIL Unicode fonts (http://scripts.sil.org/CharisSILfont). Charis SIL provides a single Unicode-based font family that contains near-complete coverage of all the characters defined in Unicode 4.1 for Latin and Cyrillic-based writing systems, whether used for phonetic or orthographic needs. In addition, there is provision for other characters and symbols useful to linguists. These fonts make use of state-of-the-art font technologies to support complex typographic issues, such as the need to position arbitrary combinations of base glyphs and diacritics optimally.

Charis SIL is a serif, proportionally-spaced font optimized for readability in long printed documents, and is similar in design to Bitstream Charter, one of the first fonts designed specifically for laser printers. It is highly readable and holds up well in less-than-ideal reproduction environments. It also has a full set of styles - regular, italic, bold, and bold italic. It has been released under SIL's Open Font License (http://scripts.sil.org/OFL).

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Phonetics Institutes Present Themselves

This section of *The Phonetician* is devoted to the presentation of phonetics institutes from all over the world. The purpose of this section is to give our readers an idea about what other phonetics institutes look like, what sort of equipment they have, what their main research areas are, and last, but not least, who their staff are. Ideally, this will help to increase the scientific exchange between phoneticians and their institutes.

If you would like to present your phonetics institute in *The Phonetician*, send a short description of it to the editors. In this issue, we publish a description of the history of Phonetics at the University of Berlin.

Phonetics at the University of Berlin – A History

Upon consulting comprehensive literature on the matter, one discovers that phonetics distinguished itself as an independent scientific discipline in the first half of the last century. During that time one attempted to objectify through physical and technical means the results in sound investigation which had hitherto been conveyed subjectively. Within the system of sciences, phonetics falls between the natural sciences and the humanities. In regard to content it is a social science discipline, since its subject matter, i.e., language and speech, are areas within the social sciences. For solution of its tasks, it also makes use of technical methods; thus it is in respect to its methodological foundation a natural science. In its historical origins, it becomes therefore evident that the Berlin academians dealt with problems of human language from various different academic points of view and attempted to solve them with differing methods in the natural sciences [1]. Here it is appropriate to mention the notably excellent works of Hermann von Helmholtz (1821 - 1894) in contributions to the acoustic structure of sounds, especially of vowels produced by the human voice. He determined that formants reflect intensifying partials in the speech spectrum and are inherent to describing the quality of vowels. He summarized these groundbreaking findings of the time in his book - *Lehre von der Tonempfindung* - which appeared in 1863. These findings were applied and expanded by Carl Stumpf (1848 - 1936) through interference investigations. The first investigations into the changing of speech signals were conducted by the brothers Wilhelm (1877 - 1946) and Ferdinand (1896 - 1973) Trendelenburg, who conducted qualitative measurements in language and speech on the basis of oscillographic displays.

At the University of Berlin, phonetics had two roots as an institutional orientation - speech science and medicine.

Let us next take a look at the speech science root of the institute. The *Phonographische Kommission* founded in 1915 can be viewed as a forerunner of an institution dealing with phonetics in its broadest sense [2]. This commission was subordinate to the Prussian Ministry for Science, Culture and Public Education and had the task of recording on wax cylinders and records selected speakers from citizens of foreign populations, which found themselves as captives in German prison camps during WWI. The head of this
Phonographische Kommission was the director of the Psychological Institute of the University of Berlin, the aforementioned Carl Stumpf. In 1918, Wilhelm Doegen (1877 – 1967), who was responsible for the financial aspects of the commission, recommended the founding of a department for the study of sound and a commission of sound in a document to the Prussian Ministry, this in order to gain specialists suitable for the co-processing and evaluation of sound recordings.

Permission was granted in 1920 to establish a department for sound studies at the Prussian government library, the director of which became Doegen. At the recommendation of Diedrich Westermann (1875 – 1956), who had held a professorship in African languages since 1925, the department was changed to become the Institute for Sound Research at the University of Berlin. Westermann considered himself to be a scientist. He spoke several languages and described them for the purpose of language training. His method with which he conducted all his investigations involved an auditory analysis developed by himself and which he brought to great perfection.

The work agenda of the institute encompassed the carrying out of studies in all branches of phonetics and associated disciplines, the responsibility for phonetic instruction, the offering of specialized courses for teachers and for those of other interests, the conducting of lectures on cultural history and folk music and the continuation of making scientific recordings. Since 1935, there has existed in this institute a division of linguistics, a division of music, and a division dealing with experimental-phonetic issues. The latter division was headed by Franz Wethlo (1866 – 1960) from the phonetics laboratory of the hospital for patients with voice- and language disorders at the Charité. Thereby experimental phonetics was incorporated into the teaching responsibilities of the institute. Westermann’s emphasis in phonetics was Ewe. His dictionary and grammar of the Ewe language paved the way for his scientific esteem as a significant scholar of African languages [4]. The beginning of the 30’s saw joint presentations in experimental phonetics as well as a cooperative effort between the phonetics laboratory of the hospital for voice- and speech disorders and the institute for investigation of sound, which then later ceased to be conducted.

The Institute for Sound Research remained under the direction of Westermann even after 1945 and was re-designated as the Institute for Comparative Phonetics in 1947. Westermann remained its director until his death in 1956. In 1951 the institute was renamed again as the Institute for Phonetics and fell under the leadership of the Africanist Ursula Feyer (1901 – 1989) until the fall of the Wall in 1989.

The second root of phonetics at the University of Berlin goes back to the physiologist Hermann Gutzmann (1865 – 1922), who was employed as a physician for the voice and language impaired at the University of Berlin. Gutzmann, who was responsible for elevating the field of speech correction to that suitable for the university curriculum, united the rising field of experimental phonetics which had become infused by new instrumentation and investigative apparatus. In so doing he made connections back to Hermann von Helmholtz, Etienne-Jules Marey (1830 – 1904, pneumography), Henrik Zwaardemaker (1857-1930, laryngography), Ernst-August Meyer (pitch measurement) and others who developed their own diverse apparatus. Through Gutzmann’s initiative the first phonetics laboratory in Berlin was founded, which offered possibilities for experimental studies. Thus special phonetic studies were conducted in the laboratory which dealt with voice and speech
disorders. At the same time the laboratory produced visual materials for lecture presentations in the physiology of voice and language given by Gutzmann to physicians as well as voice- and speech pedagogy instructors. Phonetic lectures were first offered in the curriculum of the university since 1917 under the title of „speech correction“ and „linguistics“ [7] [8].

The phonetics laboratory of Gutzmann was affiliated with the hospital for the voice- and language impaired of the ENT-Clinic of Charité. After a developmental phase, the further development of the phonetics laboratory fell into stagnation through WWI and the death of Gutzmann in 1922. Subsequently a separation between the laboratory and the clinic was also undertaken. The clinic housed the clinical department of voice and speech disorders and existed independently and distinct from the phonetics laboratory in regard to the faculty and research personnel. In 1926 the phonetics laboratory became a separate facility under the direction of Franz Wethlo. Wethlo received the teaching position for experimental phonetics on March 2, 1926, and succeeded in expanding the physical and operational facilities. He developed a wealth of apparatus including the “Polsterpfeife” and was able to establish a fruitful publishing and teaching record [3].

After the end of WWII the University of Berlin was reopened in 1947 and renamed on February 8, 1949 as the Humboldt-Universität zu Berlin. After the founding of the philosophical faculty and the Institute of Special Education, the phonetics laboratory along with the hospital for the voice and language impaired was placed into the Institute of Special Education, which was under the leadership of Reinhold Dahlmann (1883 – 1972). Dahlman promoted the further development of the phonetics laboratory, for which he made available both personnel and equipment. Besides Wethlo, who at first held an Assistant Professorship and later a Professorship, there were also a scientific assistant, Gerhard Lindner (1925 - 2005) and a mechanic. Besides engaging in research, Wethlo also conducted classes for teachers of hearing impaired, speech and hearing impaired, and speech pathologists. He further endeavored to support close ties to the academic circles and societal establishments dealing with phonetics.

In 1903, the University of Berlin had established a lecture position for the art of public speaking and Emil Milan (1859 – 1917) was given responsibility for conducting classes and exercises [5]. Milan brought with him his artistic experience from the podium and the stage and the necessary scientific background to function effectively as a university lecturer. During the winter term of 1910 his “Speaking Exercises“ appeared just subsequent to Gutzmann’s lecture „Health Care of the Voice“ as a practical supplement to a medical treatise. Erich Drach (1885 – 1935) became successor to Milan, who then expanded the department further, in line with the increasing significance of speech science and public speaking. Under his leadership, expansive library holdings in speaking related materials and a collection of records were acquired. After his death, Wilhelm Leyhausen (1887 – 1953) was selected for the leadership of the newly founded Institute for Rhetoric in 1936, a position he held until 1950. Thereafter, Herta Reclam (1887 – 1953) assumed leadership of the institute.

1962 saw the unification of the Institute of Phonetics and the Institute for Rhetoric and the founding of the Institute of Phonetics and Communication Sciences under the leadership of the speech scientist Georg Friedrich Meier (1919 – 1992). The long-time assistant
Gerhart Lindner (1925 - 2005) was promoted to Professor of Phonetics, whereby the area of experimental phonetics and the phonetic laboratory were incorporated into the new institute.

With Meier as linguist and Lindner as phonetician a joint representation of both the humanities and the natural sciences within the same institute was made possible for the first time at the university. This interdisciplinary approach to phonetics was also reflected in the areas represented by the co-workers. The 15 co-workers of the institute came from the areas of communication sciences, linguistics, phonetics, psychology, acoustic science and speech science. This overlapping of disciplines made it possible to represent phonetics as disciplines in the humanities and natural sciences in research and instruction.

The founders of the institute were also concerned with this interdisciplinary aspect when they instituted a curriculum for the communication sciences. After a basic linguistics course of study, the students were able to select their course of study for the diploma from one of four areas – phonetics, general and comparative linguistics, language psychology and research in semantics. Only one student finished the diploma, as this course of study fell victim to the third reform of higher education in 1969.

The physical and technical facilities of the institute were extremely good, so that phonetic research could be carried out on a broad scope. Lindner concerned himself primarily with perception experiments with synthetic vowels and the nature and interpretation of articulatory processes in German, later also of Russian. Subsequent to this basic research, the results were also applied to the area of practical phonetics (German as a foreign language, training of the hearing impaired). Numerous instruction books, many undergoing multi-editions, testify to the extraordinary activity of Lindner, and also to the significance of the area of phonetics at this institute. Lindner combined close co-operation with the speech acoustician Dieter Mehnert (*1935), which was manifested in numerous co-authored works.

After the third reform of higher education in the GDR in 1969, the Institute of Phonetics and Communication Sciences lost its independence. From this institute and that of the Institute for Special Education the division of Rehabilitation Training and Communication Science was created at the university, in which phonetics existed as a section Phonetics/Speech Training. Dieter Mehnert headed this section.

1990 was the year of re-unification and thereby a major structural transformation at the Humboldt-Universität zu Berlin was initiated. From the section Rehabilitation Training and Communication Science there was next created the academic area rehabilitation sciences, resulting, after the establishment of a philosophical faculty IV in 1994, the founding of an Institute for Rehabilitation Sciences. Mehnert was appointed at this institute in the area of phonetics in 1990. The major emphasis of his work was in the area of experimental phonetics (intonation studies) and language analysis and synthesis in application to modern language technologies (man-machine-communication) and to the rehabilitation of the hearing and speaking impaired. Additionally, Mehnert also worked in an interdisciplinary fashion with philologists, in dealing with questions of less frequently studied languages, including African and Asian tone languages.

The curriculum offered classes in general and applied phonetics, speech acoustics, semiotic phonetics and audiology [6]. Research was oriented towards the application of
phonetics to voice and language disorders, hearing disorders, technology for voice and speech therapy, foreign language instruction and linguistics.

In 1991, as a result of the co-operation of the scientific areas of phonetics/communication science and voice disorder training, an interdisciplinary course of study was initiated “speech science with the specialization of voice and language therapy“, which finding acceptance and support resulted in the matriculation of three students.

Within the framework of the new arrangement in the scientific domain of the three Berlin universities – Humboldt-Universität, Freie Universität, Technische Universität – and the restructuring of the area of rehabilitation sciences carried out in 1991-92, further enrolment into the course of study “speech science with the specialization of voice and language therapy” was halted beginning fall semester 1993 for political reasons in higher education, thereby causing the dissolution of the area of phonetics at the end of the academic year 1996. Therewith the work within a discipline so rich in tradition at the Humbold-Universität zu Berlin, which had endured and prospered academically for more than 80 years, even in difficult times, came to an end. In all that is known about the situation in Berlin, the reasons leading to this decision, were very difficult to comprehend for many competent scientists responsible for phonetics.
Even though it was not possible to re-establish the academic area anew in the subsequent years, phonetics, however, did endure. After a hiatus of four years, Bernd Pompino-Marschall (*1950) was appointed in the summer of 2000 to the Institute for German Language and Linguistics for the area of linguistics of German, phonetics and phonology.

References:


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Archiv der Humboldt-Universität zu Berlin, Fundbuch 1920 – 1945, Inst. für Lautforschung

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INFORMATION
A freely available Unicode Phonetic Keyboard for Windows PCs

A freely available Unicode Phonetic Keyboard for Windows PCs can now be downloaded from the UCL Phonetics and Linguistics web site at: http://www.phon.ucl.ac.uk/resource/phonetics. The package allows you to switch your main keyboard between Standard and Unicode Phonetic layouts, and also contains two SIL Unicode fonts to make it easy to install and use.

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The Phonetician aims to spread information about recent congresses on different aspects of phonetics among its readers. This is why the editors would like to invite conference organizers to assist them by submitting conference reports whenever you would like to make the results more widely accessible.

The person to contact about the publication of conference reports is Dr. Tomáš Dubèda, e-mail: dubeda@ff.cuni.cz

3rd International Conference on Language Variation in Europe
June 23-25, 2005, Amsterdam, The Netherlands

ICLaVE is a biannual international conference, which invites all linguists who are interested in issues of variation in any of the languages spoken in Europe. This year's session took place in Amsterdam from the 23rd to the 25th of June. Approximately 160 participants, mostly from Europe and North America, attended the conference, which took place in the building of the Faculty of Law with the organization and support of the Meertens Institute. The conference featured three invited speakers, five workshops – comprising 23 presentations – and 93 presentations of independent papers. These talks covered a wide spectrum of topics, ranging from a discussion of vendor signs in Amsterdam to an examination of the possibility of applying the methodology of population genetics studies to language variation.

The first keynote speaker was Johan Taedelman who spoke about the spatial dimension of language change. This presentation stepped away from the more common instances of dialect transitions that occur gradually and looked into several areas in Flanders where dialect oppositions are polarized. The author's observations lead him to the conclusion that polarized oppositions are characterized by the following features: a) spatially abrupt transitions, b) maximal difference between linguistic elements that participate in the opposition, c) absence of lexical exceptions and concomitant diffusion, d) a high degree of awareness by speakers participating in the oppositions and e) loyalty to local variants. In his conclusion, Taedelman observed that these polarized dialect features have the same characteristics as primary dialectal features and are expected to be more liable to change when attitudes towards them are negative.

Shawna Poplack gave the second invited talk, in which she explored the transition period of linguistic change from a variationist perspective. The presentation focused on the changes that have taken place in the Brazilian Portuguese future system from the 16th century onward, and provided a detailed analysis of how the innovative form (-ir periphrasis) replaced the older ones in effectively all environments and types of usage. The examination of varying usage in different contexts reveals that the transition period is not abrupt but gradual, and that the development unfolds as a "series of readjustments" which leave the system itself unchanged despite the internal redistribution of constraints and functional distinctions.
The final keynote speaker was Miklos Kontra who presented the results of a large-scale survey that explores the significance of language elitism in Hungarian society. The data show that the prescriptive rules of Codified Standard Hungarian as developed and disseminated by *language cultivators* (people who have a professional or personal stake in maintaining a prestigious standard), affect 92% of Hungarian speakers. Kontra also argued that in order for *linguicism* – language-based discrimination – to be sustainable, the society must not only be characterized by prescriptivism and prestige-based correctness, it must also be the case that the prescriptive rules are complex enough that they are impossible to learn in school. In his conclusion Dr. Kontra pointed out that it is the duty of language teachers to stop practicing *subtractive teaching* (i.e. teaching the standard in order to eradicate or replace a dialect), and instead to teach the standard as an added variety (*additive teaching*) that will strengthen the students' linguistic repertoire.

The five workshop sessions were "English in Europe: from FL to L2", "Ethnolects", "Syntactic Microvariation", "Quantitative Analysis of Language Variation in Time and Space", and "Crazy Rules and Lexical Exceptions". Presentations in the first workshop explored the status of English in different European countries (Germany, France, The Netherlands, Belgium), the varying background assumptions about language and identity that affect the way English is perceived in each society, institutional attempts to resist its spread, as well as the possibility that English may become a pluricentric language with global appeal. Participants in "Ethnolects" discussed the prosodic features of Turkish-German, the emergence of Turkish and Moroccan based varieties in Amsterdam and Nijmegen, while they also re-examined the definition of the term *native speaker* in today's multiethnic and multilingual societies.

The third workshop focused on syntactic microvariation. There were presentations about the different roles that monodialectal and bidialectal speakers play in the spread of dialect features (in Veneto Italian), the nature of word order variation in Old and Middle English, the variation between null and overt subject and objects in Bislama, as well as an analysis of verbal concord in British English dialects that combined data-gathering and theoretical approaches from the generative, variationist and diachronic perspective in order to explain contrasting tendencies between different varieties.

In the fourth workshop, presentations ranged from a quantitative analysis of the linguistic factors affecting gender inflexion variation in Dutch varieties, an exploration of the non-linguistic factors affecting the diffusion of language change in Scotland, a discussion of the language-internal mechanisms that triggered the rapid rise of reflexive *zich* in 16th century Drenthe Dutch, and a dialectometric analysis of the data collected in the recent publication of the Syntactic Atlas of Netherlandic Dialects. The opening talk of the workshop was quite different from the rest but suggested an interesting new direction for quantitative studies in linguistics. Gianollo, Guardiano and Longobardi explored the use of the methods developed for population genetic studies in the classification of languages into families. In their talk they tested the success of gauging language relatedness on the basis of a set of binary parameters. The specific parameters that they used are ones that determine DP-internal syntax, and it appears to generate the correct (as determined by the comparative method) language tree. This type of research is intriguing especially as it may open up the possibility of testing more controversial cases of language relatedness.
The fifth session delved into the implications that "crazy" lexical rules hold for Optimality Theory. Participants discussed, among other things, the ramifications that the study of dialectal data has for the implicit assumptions that govern optimality theoretic grammars, the possibility that there are no markedness constraints and that these are derived from perceptual and articulatory constraints, and the way in which phenomena of phonological variation that do not meet the criterion of naturalness or exhibit a considerable degree of lexical exception can be understood within the OT framework. One presenter argued that the importance of such rules is misunderstood if they are interpreted as part of the I-language and not E-language, while another claimed that these rules emerge as the result of speakers' unsuccessful attempts to adapt to the standard pronunciation.

The independent presentations displayed a very healthy variation in research topics and covered a wide array of languages, while there were also several papers that challenged conventional theoretical wisdom. Nonetheless, there also appear to be certain trends that are worth noting. First, even though phonetic and phonological variation was still the subject for the majority of papers, there were a significant number of presentations on morphological and especially syntactic variation. Another well-represented topic was that of variation and first or second language/dialect acquisition. The most discussed languages were Dutch, English, Swedish, German and French. This perhaps is not surprising. What was somewhat surprising was that there were several talks on variation in Cypriot Greek and Ukrainian. It is encouraging to see that variationist studies are taking root in smaller linguistic communities. One topic that was notably absent was pidgins and creoles; there was only one presentation on the creole of Martinique. One is left to wonder whether there are any studies of creole speakers from former (or present) European colonies being conducted.

ICLaVE 2005 was a successful conference that brought together variationists who work in different languages and approach variation from several different theoretical perspectives for a fruitful and productive exchange of ideas. The conference demonstrated that the field of language variation and change in Europe is vigorously explored both in European and non-continental universities. We are all looking forward to ICLaVE 2007, which will be hosted by the University of Cyprus.

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conference was chaired by Isabel Trancoso from the Instituto de Engenharia de Sistemas e Computadores (INESC). INTERSPEECH 2005 covered a vast area of topics, inviting engineers, specialists in speech science, phonetics, computational linguistics, as well as representatives from the industry of spoken language processing. The main topic of the conference was "Ubiquitous speech processing". Nearly 1300 papers were submitted, with about 61 % selected for oral or poster presentation. The conference included regular and special sessions, plenary sessions, and tutorials.

The first day of the conference was dedicated to six tutorials which were organized by renowned experts in their fields. The tutorials ran in three parallel sessions and they focused on multimodal applications (presented by J. A. Larson), the principles and applications of VoIP technology (presented by G. Karam and G. di Fabbrizio), speech-based interaction systems (F. Chen and K. Jokinen), conversational machines (R. Pieraccini and M. Gilbert), speaker recognition in the area of forensic phonetics (A. Eriksson and A. Drygajlo), and basic components of and current issues in speech synthesis (A. W. Black). The main task of the tutorials was to provide a background to the given area of research, as well as information on the latest developments.

The conference included three plenary talks. The first was entitled "The Multiple-Channel Cochlear Implant: Interfacing Electronic Technology to Human Consciousness", and it was given by ISCA medallist Graeme M. Clark from the Bionic Ear Institute in Melbourne, Australia. The talk presented an extensive overview of the development of cochlear implants, from single-channel implants to a multiple-array stimulation of auditory pathways that we know today. Mr. Clark described his and his colleagues' research over the last decades, concerning not only the improvement of the implant itself, but also, for example, the most suitable age for operating the implant in children. The second plenary talk, "Linear Models for Structure Prediction" by Fernando Pereira, dealt with algorithms for predicting the structure of complex data. The last plenary talk was presented by Elizabeth Shriberg and its title was "Spontaneous Speech: How People Really Talk and Why Engineers Should Care". It focused on four inherent properties of natural, connected speech which present a problem for spoken language processing applications: recovering "implicit" punctuation which is present in spontaneous speech; dealing with dysfluencies such as pauses, slips of the tongue, or repetitions; providing for turn-taking and overlap in dialogues; and finally hearing "beyond the words" which are explicitly spoken, or in other words, understanding emotions and the state of the speaker. Ms. Shriberg also suggested directions in which future investigations into these areas could (or should) be going.

The regular sessions at INTERSPEECH 2005 covered an extremely wide range of topics. Naturally, it was impossible for anyone to hear all the talks and see all the posters. The selection of papers which will be mentioned here thus necessarily presents a very small sample and is, to some extent, biased.

Most of the papers were dedicated to various areas in speech recognition: five oral and five poster sessions, totalling well over 200 papers. Many papers focused on the robustness of speech recognition in the presence of various types of noise or other adverse conditions, using diverse techniques of combatting this problem: Pettersen et al. used Bayesian predictive classification and parallel model combination, Buera et al. a feature normalization tool, Fukuda et al. used extractors of distinctive phonetic features. Other ASR
papers dealt with the development of language models for recognition or different pronunciation models, be it multi-language or multi-accent models.

The more technical topics of the conference also included papers on signal analysis and processing, algorithms for estimating various features (f0, harmonicity, formant frequencies), speech coding, or speech enhancement to improve intelligibility and recognition in low SNR conditions. Several sessions were also dedicated to spoken dialogue systems or multimedia processing. Great attention was naturally given to different areas of speech synthesis (e.g., multilingual synthesis, articulatory synthesis, various units in concatenative synthesis, the phenomenon of naturalness of TTS, or grapheme-to-phoneme conversion). Yet another group of studies concerned speaker characterization and recognition, investigation of emotions and the state of the speaker, or automatic identification of languages or dialects.

Quite a few sessions were dedicated to topics from phonetics and phonology. To name several examples from segmental phonetics, S. Dusan dealt with spectral trajectories of coarticulated vowels based on MFCC's and suggested seven acoustic cues (spectral, dynamic, as well as temporal) in vowels which could be exploited by listeners for identification. C. Gendrot and M. Adda-Decker analyzed the relationship between duration and reduction (centralization) of French and German vowels and concluded that the triangular vocalic space shrinks with the decreasing duration of vowels, reflecting as more progressive target undershoot. Authors Al-Tamimi and Ferragne examined the relation between the number of vowels and the size of the vocalic space in a given language or dialect. Posters dealing with segmental phonetics addressed questions relating to, among others, Czech, Dutch, German, Greek, Portuguese, Vietnamese, or Waima'a.

As far as studies dealing with prosody are concerned, D. Hirst and C. Bouzon's paper investigated the effect of word stress and boundaries on the duration of British English segments; they discovered that the unit which best determines segmental duration is the Narrow Rhythm Unit and that the stressed syllable does not have any special rhythmic status. T. Ohsuga with colleagues examined the acoustic (prosodic) correlates of turn-taking in Japanese and concluded that the final mora is not crucial for turn-taking and that there must be some pre-signals concerning turn-taking before the final mora. J. Meyer analyzed the whistled form of three non-tonal languages, Greek, Turkish, and Silbo. F. Tamburini's presentation dealt with automatic identification of prominence in continuous speech in American English, Dutch, and Italian; the author measured nucleus duration, spectral emphasis, pitch movements and overall intensity, and found pitch to be most important in English and Dutch, while in Italian pitch seems to be of equal importance as duration. The presentation of T. Burrows and her colleagues compared two methods of assigning of prosodic phrase structure and pauses to written text. J. Fletcher's poster examined terminal rising pitch in statements of conversational Australian English. B. Lintfert and W. Wokurek's poster presented an analysis of voice quality in rising and falling pitch movements in German, and showed that additional modulation of muscular tension, as reflected in the open quotients, is the main correlate of pitch accent on the laryngeal level. Z. Xiong's poster analyzed downstep in Standard Chinese disyllabic words of the tonal combination H..L..H, and concluded that all the examined words are, without exception, affected by downstep. The poster of H. Kim and J. Cole analyzed the stress foot as a unit of planned timing in American English; they confirmed the fact that the mean duration of
syllables is reduced with the increasing duration of the foot, but found out in the second stage of their research that the shortening in longer feet involves only the stressed syllables. P. Wagner's poster compared perceptual prominence ratings in German syllables in native German speakers and non-native speakers, in normal and fast speech, and found the non-native speakers to rely more on acoustic cues in the signal and the native speakers to rely more on top-down processing. Several posters also dealt with the generation of f0 contours in various languages: European Portuguese (J. P. Teixeira et al.), Mandarin Chinese (K. Li et al., Q. Sun et al., or C. Chiang et al.). Other posters dealt with the recognition of prosodic phenomena, for instance D. Surendran et al. analyzed tone recognition in Mandarin Chinese, or M. Wypych presented an intonation recognizer for Polish.

Two oral and two poster sessions were dedicated to both speech perception and speech production. J. A. Alexander and colleagues' paper investigated the perception of lexical tone in American musicians and non-musicians, and discovered that identification and discrimination rate of Mandarin tones was significantly higher in musicians than non-musicians. They conclude that there is at least partial overlap in the mental processing of speech and music. J. Ma et al. investigated contextual effects on the perception of lexical tones in Cantonese and found extrinsic context to play a significant role. A. Cutler's presentation analyzed three types of lexical-level problems which L2 listeners have to face – pseudo-homophony (as a result of the inability to distinguish a given contrast), spurious activation of words embedded in the target word, and a higher rate of delayed resolution of ambiguity (again as a result of a confusable phonemic contrast in the target language). The poster of B. Schwanhäußer and D. Burnham examined the perception of lexical tone and pitch in speakers of tone and non-tone languages, and discovered the perceptual strategies depend not only on the language background, but also on musical abilities or the type of task presented. I. Falé and I. H. Faria's poster analyzed categorical perception of European Portuguese intonation; when testing a contrast between statements and questions, they found the contrast to be categorical, although reaction time measurements suggest rather a continuous perception. The poster of Terasawa et al. describes a perceptual space for timbre, compares two representations of timbre (linear frequency coefficients and MFCC’s), and concludes that MFCC parameters constitute a good perceptual representation of the timbre in static sounds. P. Jongmans and colleagues examined the intelligibility of tracheoesophageal speech. Wong et al. used fMRI to investigate neural mechanisms involved in perceiving speech in noise and found that listening in noisy environments activates areas mostly in the left brain hemisphere.

As for the papers concerning speech production, M. Airas et al. presented a software toolkit for voice inverse filtering and related analyses (time-, amplitude-, and frequency-based glottal flow parameters). A. Serrurier and P. Badin presented a three-dimensional articulatory model of the velum, based on data acquired from sagittal MRI slices. A. Cros et al. investigated the relationship between intra-oral pressure and speech sonority. M. Nakamura's poster presented the results of an EPG investigation into the articulatory and coarticulatory properties of Japanese coronal stops and interpreted the results in terms of phonological feature theory, as well as articulatory concepts. Coarticulation was also examined in the posters of V. Robert and colleagues (they analyzed the strategies of labial coarticulation based on audiovisual data) and J. Dang and colleagues (they simulate coarticulation within the framework of their "carrier model"). Several studies presented in
the poster session dealt with various problems connected with the vocal folds: P. Alku et al. propose the method of group delay function for the assessment of the quality of glottal inverse filtering; G. Fant and A. Kruckenbergs's report summarizes more studies dealing with the covariation of subglottal pressure, f0 and intensity.

Two oral sessions and one poster session dealt with both first and second language acquisition. W. Heeren analyzed the acquisition of the Dutch /a-a/ and discovered that the durational cue was exploited by all 7-year-old children, but only half of the 5-year-old children in the study, indicating that this cue is acquired usually after the age of five. C. Zmarich and S. Bonifacio compared the phonetic inventories of Italian children aged between 18 and 27 months, K. Ishizuka et al. presented the results of a longitudinal analysis of vowel spectral peaks in a Japanese girl, and K. Zajdó et al. compared acoustic vowel spaces of Hungarian and Dutch children. As for second language acquisition, W. Heeren examined the development of the Finnish contrast /t-t/ in Dutch listeners, and H. Wang and V. J. van Heuven's poster presented an analysis of mutual intelligibility of various foreign accents in English.

To write a few words about the social programme of INTERSPEECH 2005, we cannot fail to mention the welcoming reception in the Gothic Mosteiro dos Jerónimos and the banquet at the Kais restaurant, once a huge warehouse. There was also a special reception for the students present at the conference.

It remains to be mentioned that the following INTERSPEECH event will be held in Pittsburgh, Pennsylvania on September 17-21, 2006.

We will conclude this report with mentioning one of the novelties of INTERSPEECH 2005 — the Science Quiz, whose questions were assembled by a special committee organized by Gerry Bloothooft from contributors from around the world. Answers to the sixteen questions were meant to be sought during the conference. The winner was Ibon Saratxaga from Spain with twelve correct answers. Here is an example question as a bonus:

The maximum number of vowels in a language is
a. unlimited;
b. determined by the just noticeable difference of complex tones;
c. determined by the phonological structure of that language.

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16th Electronic Speech Signal Processing Conference and 15th Czech-German Workshop "Speech Processing"
Prague, September 26-28, 2005

In the last week of September 2005, Prague hosted two scientific meetings with similar focus, exceptionally joined to a single action: the 16th Electronic Speech Signal Processing Conference and the 15th Czech-German Workshop "Speech Processing".
During three days, 38 oral papers and 26 posters were presented by participants mainly from Germany and the Czech Republic, but also from several other countries. Judging by the number of papers, the best covered sections were "Speaker and speech recognition", "Speech synthesis" and "Phonetics & prosody". A lesser number of presentations were given in the "Speech enhancement" and "Dialogue" sections; in addition, there was one paper in the domain of musical acoustics. This report gives a short portrait of the two invited talks, a short notice on each of the papers in the "Phonetics & prosody" section, and only a rough thematic synopsis of the other sections.

In his talk, entitled "A phonetician's view of signal generation for speech synthesis", the first invited speaker, Eric Keller (Lausanne University), raised the question why speech synthesis, even if technically perfect, does not sound like human speech, and which variables should be controlled to obtain better naturalness. In the domain of speech rhythm, the usually exaggerated, artificial-sounding regularity may be a major obstacle. What we need is some irregularity – but the attempts to introduce mere random irregularity usually fail. Reporting on the experiments by Cummings and Port, E. Keller advances the hypothesis that some places of the utterance constitute the attractors of regular speech behaviour, and others allow for – or even call for – more variability. This hypothesis is tested on the strength of vowel onsets, known for their perceptual salience: in a French paragraph read by nine speakers, the temporal distribution of strong vowel onsets (onsets characterized by a steep intensity increase) is much more coherent across speakers than the distribution of weak vowel onsets. This finding introduces a new dimension into the question of rhythmical control in synthetic speech.

The second invited speaker, Jan Štěpánek (Academy of Performing Arts, Prague), initiated the participants into the fascinating domain of musical acoustics. His paper "Psychoacoustic experiments in the research of musical sound timbre" discussed and illustrated methodological issues in the study of musical timbre, like the question of correlation and causality between perceptual categories (e.g. dark/bright, dull/sharp, full/empty) and acoustic properties of stationary tones (e.g. levels of individual harmonics, levels in critical bands). The notion of perceptual space was discussed along with its verbal description and its acoustic interpretation, taking examples mainly from violin and organ sounds.

The "Phonetics & Prosody" section was opened by the talk "The pronunciation of anglicisms and English proper names in German: a corpus study" by J. Abresch. The author addressed the problem of segmental adaptation of loanwords (interference of German, dependence on age, idiosyncrasy). M. Dohalská and R. Škardová presented a paper entitled "Non-standard rhythmic and melodic structure of utterances and their perception", in which they tested prosodic acceptability of broadcasted Czech. In her talk "Prosodic changes in emotional speech", J. Vlčková-Mejvaldová summarized the results of a comparative study of seven different emotions in five languages. Uwe Koloska's and Diane Hirschfeld's paper "An E-learning expert system that detects pronunciation errors for non-native speech" gave an account of an interactive system for foreign-accent reduction. M. Eslami gave a talk on "Syntactic analysis and prosodic formalization in Guya, a TTS system for Persian", in which he described the way of formalizing Persian prosody analyzed by means of the Autosegmental-Metrical Phonology. In his paper "Asymmetry of Czech vowel-nasal and nasal-vowel transitions in separated oral-nasal recordings", R. Skarnitzl presented his
research on coarticulatory nasalization of Czech vowels: he concluded that nasalization spreads more easily to the left than to the right. P. Horák presented a paper on "Using neural networks to model duration in Czech text-to-speech synthesis", where he described the implementation of a stochastic model in the Epos synthesis system, providing more natural output. J. Čermák's and V. Stejskal's paper "Using fuzzy systems for prosody modelling" dealt with natural prosody approximation by means of fuzzy logic. M. Mihkla, K. Kerge and H. Pajupuu gave a talk entitled "Statistical modelling of intonation and breaks for Estonian text-to-speech synthesizer", describing the relations between text parsing and prosody prediction. Finally, B. Weiss investigated factors affecting local speaking rate in vowels, such as the semantic content of the word, word frequency, stress, vowel height, and sex, and summarized them in the paper "Variation of local speaking rate in spontaneously produced vowels".

The "Speaker and speech recognition" section included many topics, like speaker recognition in noise, audio-visual speech recognition, speech training of deaf people, automatic transcription, vocabulary issues, imitation, the Lombard effect, and automatic speech segmentation.

The papers in the "Speech synthesis" section addressed topics like spontaneous speech modelling, history of speech synthesis, quality of synthetic speech, concatenation units, and speech tools for the blind.

The papers presented in the "Speech enhancement" section were devoted to the problems of noise reduction, acoustic quality of input speech and speech activity detection.

Finally, the "Dialogue" section included papers on "ambient intelligence", efficiency of voice commands and emotions in dialogue systems.

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The English Phonetic Society of Japan's 10th National Conference (EPSJ10) and the First International Congress of Phoneticians of English (ICPE 2005)
5-6 November 2005, Kochi University, Japan

The English Phonetic Society of Japan's 10th National Conference (EPSJ10) and the First International Congress of Phoneticians of English (ICPE 2005) took place at Kochi University (on Shikoku Island) on 5-6 November 2005. EPSJ was founded by Masaki Tsuzuki, Professor of Aichi Gakuin University, in 1995. The 10th Commemorative National Conference was organized by one of its vice-presidents, Masaki Taniguchi, Professor of Kochi University and the Head of EPSJ's Kyushu-Shikoku-Okinawa Branch. The conference was supported by the Kochi Prefecture Board of Education and sponsored by Kochi Visitors and Convention Association, Discover Kyushu, Inc., Seibido, Pearson Education, and McGraw-Hill Education. We also received some donations from members of EPSJ and others.
The members of the Scientific Committee were Professor Kazuhiko Matsuno, Mr Michael Ashby, Professor Hyun Bok Lee, Professor Hoyoung Lee, Professor Ok-ran Jeong, Dr Patricia Ashby, Professor John C. Wells, Mr Shizuya Tara, as well as Professor Masaki Taniguchi, and the members of the Organizing Committee were Professor Masaki Taniguchi, Professor Mikio Kadota, Professor Takahiro Ioroi, Professor Yasuhito Ishii, Mr Shizuya Tara, Mr Masahiro Nagasaki, Mr Noriaki Yamada, Ms Yuko Inoue, Ms Asako Sawada, Ms Fumi O'Hara, Ms Erina Kishimoto.

The details of the conference are as follows: The theme was "The Role of English Phonetics in Teaching English as a Foreign Language". There were seven keynote speakers from three countries, the UK, Korea and Japan. Keynote speaker 1 was Professor Kazuhiko Matsuno (Professor Emeritus, University of Tokyo, Vice-President and Dean of the Faculty of Foreign Studies, Nagoya University of Foreign Studies). His speech, titled Making Phonetics Come Alive - Ideas for Japanese Teachers of English, emphasized the importance of making more reference to sounds of L1 and drawing more examples of phonetic facts from daily life. Keynote speaker 2 was Mr Michael Ashby (Senior Lecturer in Phonetics, Department of Phonetics and Linguistics, University College London, UK). He spoke under the title English Pronunciation in the Global Context, and presented some of the research background to the process of determining the pronunciation policy of dictionaries during a period which has seen both a growing appreciation of the emergence of English as a world language, and a questioning of the appropriateness of native-speaker norms in English, which assumes the status of a global lingua franca. Keynote speaker 3 was Professor Hyun Bok Lee (Commander of the Order of the British Empire, Permanent Council - International Conference of Spoken Language Processing, Founder and Honorary President, the Korean Society of Phonetics and Speech Sciences, Professor Distingue, Seoul Cyber University). He gave a lecture titled A Phonetic Roadmap for Japanese English. He focused on how Japanese learners can improve their English pronunciation, rhythm and intonation by comparing sounds and prosodies of English, Japanese, Korean and other languages and by singing some songs. Keynote Speaker 4 was Professor Ok-ran Joeng (Professor, Department of Speech Pathology, Daegu University, Korea, President of the Korean Association of Speech Sciences, Vice-President of the Korean Speech, Language & Hearing Association). She talked under the title Phonological Processes and Treatment Techniques, and discussed the nature of phonological processes in Koreans, Japanese and Chinese when they speak English, by which speech-language pathologists together with phoneticians could be provided with information regarding common and uncommon phonological patterns across the three Asian languages as well as the influence of native sound patterns on English. She also discussed efficient ways of treating articulation disorders for each nationality. Keynote Speaker 5 was Professor Ho-young Lee (Professor, Seoul National University, Korea). His talk was titled Teaching English Pronunciation with Speech Analysis Software. He discussed what equipments are necessary for teaching English pronunciation with speech analysis software and what can be taught with such software. Keynote Speaker 6 was Dr. Patricia Ashby (Principal Lecturer in Phonetics, University of Westminster, UK). She gave a lecture entitled Phonetics in Pedagogy: Where do we Draw the Line?, and discussed the place of phonetics in language learning, the depth of phonetic knowledge required in it, and what can be done with phonetic knowledge and skills today in language teaching/learning environments. Keynote Speaker 7 was Professor John C. Wells (Fellow of the British Academy, Professor of Phonetics, Department of Phonetics and Linguistics, University
College London, UK, President of the International Phonetic Association, President of the British Association of Academic Phonetics, Former President of the World Esperanto Association and President of the Simplified Spelling Society). He lectured under the title Using Intonation to Highlight your Message and mainly explored aspects of tonicity, giving very interesting and informative examples.

There were twenty papers and one symposium. These were: (1) Biljana Čubrović (Assistant Professor, University of Belgrade, Serbia-Montenegro) English phonetics in primary and secondary school curriculum and its impact on high-level education, (2) Larry Walker (Associate Professor, Kyoto Prefectural University) and Martin Parsons (Full-time Lecturer, Hannan University) Vowel Phonemes in Japanese and American English: Similarities and Differences, (3) Tsutomu Watanabe (Professor, Takushoku University, Japan) On Describing Degrees of Prominence in English, (4) Stephen G. Lambacher (Associate Professor, University of Aizu, Japan) Application of Speech Analysis Software in Teaching English Segmentals and Prosody to Native Japanese, (5) Takahiro Ioroi (Associate Professor, Kochi Women's University, Japan) Learners' Performance on Suffocation and Word Stress Assignment in English, (6) Mitsuhiro Nakamura (Associate Professor, Nihon University, Japan) Segments and Articulatory Gestures: a parametric approach to the characterisation of sound patterns, (7) Chikashi Tsukamoto (Graduate Student, Nagoya Gakuin University, Japan) Intonation drills, revisited, (8) Hisao Minami (Professor, Tezukayama Gakuin University, Osaka, Japan) Discrimination between falling and falling-rising tones by Japanese college students, (9) Yoiuchi Arai (Professor, Chuo University, Japan) A practical study of intonation contour analysis tools: a case study of the applicability of free software to English education in Japan, (10) Tomoko Hori (Associate Professor, Tokyo National College of Technology, Japan; Graduate Student, Kwansei Gakuin University, Japan) Difficult areas that Japanese learners of English have in shadowing, (11) Yuichi Todaka (Professor, Miyazaki Municipal University, Japan) Shadowing with practical phonetic training in helping Japanese EFL learners gain confidence in English communicative skills, (12) Takashi Shimaoka (Professor, Seitoku University, Japan) IPA and AKT (Approximate Kana Transcription), (13) Mitsuhiro Hashimoto (Professor, Seinan Jogakuin University, Japan) Oral interpretation as a form of communication, (14) Yoko Mori (Visiting researcher, Kobe Kaisei College, Japan) and Denise Wright (Lecturer, Kobe Kaisei College, Japan, and Colorado State University, US) Realization of final lengthening by English vs. Japanese speakers, (15) Martin Gore (Associate Professor, Kagoshima University, Japan) The status of monomorphemic vowel sequences in a mora-timed language, (16) Akiko Yokoyama (Associate Professor, Nihon University, Japan) and Kazuchika Manabe (Professor, Nihon University, Japan) Japanese listeners' identification processing of /f/ and word recognition models, (17) Mamoru Kinjo (Professor, Okinawa International University, Japan) Rhotacism alternation in English words, (18) Yoshiki Nagase (Professor, University of Yamanashi, Japan) How abstract/concrete is the phonology of rhotic vowels in English?- With special reference to phonetic/phonemic transcription of rhotic vowels, (19) Yoshikazu Shimizu (Professor of English, Aichi Gakuin University, Japan) Dramatic prominence of speech communication in My Fair Lady, (20) Kazuaki Ichizaki (Associate Professor, Miyazaki Women's Jr. College, Japan) What an exclamation point conveys in the middle of a sentence. There was one symposium: Coordinator: Yuji Tanabe (Professor, Senshu University, Japan); Panelists: Jeffrey Fryckman (Associate Professor, Senshu University, Japan) and Charles Browne.
Commemorating the Conference, a Workshop on English Phonetics took place at Kochi University on 4 November 2005 with the same seven keynote speakers. The details follow: First Professor Kazuhiko Matsuno gave a workshop titled *Getting the Rhythm Right*, referring to Japanese learners' weak points in English rhythm. The Japanese participants benefited a great deal from his workshop. The second workshop was conducted by Mr Michael Ashby under the title *Interactive Ear-Training*, which focussed on improving auditory aspects in learning English sounds and intonation. The third workshop was conducted by Professor Hyun Bok Lee under the title *English Vowels for Japanese Speakers - So Elusive and Ephemeral*. He gave us training in improving our English vowels, by comparing vowels of English, Japanese and other languages. The fourth workshop was conducted by Professor Ho-young Lee under the title *English Consonants for Japanese Speakers*, which focussed on improving our English consonants, citing many of the weak points of Japanese learners. The fifth workshop was conducted by Professor Ok-ran Jeong under the title *Factors Related to Phonological Disorders*. The sixth workshop was conducted by Dr Patricia Ashby under the title *Spotting the Nucleus*, which focussed on the aspect of tonicity in English intonation. The last workshop was conducted by Professor John C. Wells under the title *Choosing the Right Tone*, which focussed on the aspect of tone in English intonation. A large number of middle school teachers in addition to university teachers attended the workshops. They must have benefited a great deal from the workshops conducted by such world-renowned phoneticians.

Three parties were held with the guest speakers and the participants. The first was organized the night before the workshops at a Japanese Inn where the Imperial Family stay when they visit Kochi City. The second was held at a hot spring resort, where we enjoyed taking a variety of baths, including a sand bath, an ice-cold bath, an open-air rock bath, a Jacuzzi, etc. The third was held at a typical Japanese-style restaurant on a tatami floor. We all enjoyed the delicacies from the Pacific Ocean.

A great deal was accomplished in the three days of Workshops and Conference. Professor Ho-young Lee of Seoul National University, one of the seven keynote speakers, expressed his strong will to organize the Second International Congress of Phoneticians of English in about four years' time at his university. All the participants seemed to look forward to that occasion.

The Proceedings (book + CD-ROM) are available for 5,000 yen. For further information, please write to Masaki Taniguchi at the Faculty of Education, University of Kochi, 2-5-1 Akebono-cho, Kochi City, 780-8520, Japan or email tamasaki@cc.kochi-u.ac.jp.

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Please do not hesitate to contact me if you have any other related questions. Thank you for your cooperation.

Judith Rosenhouse
Kehrein, Wolfgang (2002)

Phonological Representation and Phonetic Phrasing. Affricates and Laryngeals
Linguistische Arbeiten 466, Niemeyer Verlag, Tübingen vi+236 pp., ISBN 3-484-30466-9

Reviewed by: Chantal Paboudjian
University of Provence, Aix-en-Provence, France

Wolfgang Kehrein is a phonologist who in 1998 co-edited with Richard Wiese the book “Phonology and Morphology of the Germanic Languages”, a collection of twelve papers treating a variety of languages and topics with a constraint-based approach and sometimes within the framework of Optimality Theory (e.g., Prince and Smolensky, 1993, Archangeli and Pulleyblank, 1987).

This 233 page volume is based on the author’s 2001 dissertation (Kehrein, 2001). It is a considerable work as indicated by its 16 pages of references, the 4-page index of the 281 languages on which this survey is based, the 146 footnotes and 263 charts and representations of phonetic classifications included within the chapters. The book is based on a thorough and detailed research, is well structured, and the arguments are well presented. Summaries are provided at the end of each section and chapter. Chapters 1 and 4 comprise the introduction and the conclusion. Chapters 2 and 3 constitute the core of this volume and present two extensive case studies about the phonetics of the phonological representation of affricates and laryngeals. Two important statements are made. The first one on the nature of affricates states that the phonological concept ‘affricate’ does not exist. Affricates are only stops phonologically and should not therefore be treated as contour segments (i.e. [stop, continuant]). The second statement on laryngeal articulation claims that the laryngeal node does not belong to the domain of single segments but is licensed directly by the sub-syllabic constituents - onset, nucleus and coda.

Chapter 2. Phonology without Affricates intends to spur conventional representations in phonology. The author claims that ‘affricate’ is not a phonological category, and does not form a natural class. Moreover, affricates and fricatives do not together form a class ([continuant]). Kehrein does not deny the existence of affricates, but treats them as a phonetically definable subset of stops. He presents his Generalized Stop Approach, a two-step approach which accounts for the special status of affricates, "being stops-only with regard to phonology, but consisting of a specific release phase phonetically" (pp. 9-10).

Other approaches are then analyzed from the perspective of the author's approach. The Strident Stop Approach (Jakobson, Fant & Halle 1951), which treats affricates as [strident, continuant], The Affricate Approach (Sagey 1986; Lombardi 1990; Hualde 1991; Weijer 1992; Schafer 1993) which makes affrication primary to Place and Manner specifications, and The Split Approach (Shaw 1991; Steriade 1994, 1995) which assumes that affricates are exclusively stops underlyingly, and should be distinguished from stops by other features.

The importance of phonetic strategies in the perception of phonological distinctions is further demonstrated. Stops may be Simple but also Manner Specified ([strident], [lateral] or [nasal]). In 27 pages the author provides evidence that "affricates are specified for a
Stricture feature [stop] and strident, lateral and nasal affricates are specified for [strident], [lateral] and [nasal] respectively. These three features are headed by a single class node of Manner (p. 57). Affricates may also be Place Driven. Place Driven affrication is the result of phonetic strategies which make phonological specifications in stops acoustically more salient. It prolongs and slows down the acoustically important release phase of the stops and this increases the perceptibility of phonological place distinctions. Place Driven affrication is thus intended to maximize the perceptibility of small differences in place of articulation.

Chapter 3. The Prosodic Phonology of Laryngeals

With its 146 pages is the longest in the volume. From a survey of 150 languages, the author discusses the phonetics and phonology of laryngeals. He accepts the traditional assumption that the laryngeal node consists of three features, i.e. [spread glottis], [constricted glottis] and [voice], but proposes what he calls "Prosodic Licensing", i.e. that the Laryngeal Node is licensed directly by sub-syllabic constituents onset, nucleus and coda rather than by individual segments. Generalizations on how languages do and do not build up laryngeal contrasts are presented and ways to extend the number of laryngeal contrasts within onsets, nuclei and codas are shown. Some apparent counter-examples are discussed. Prosodic Licensing is compared to some previous approaches which seem to fail to explain most of the empirical observations.

The important points of the volume are the claims that 'affricateness' is irrelevant for underlying representation (contrasts) and phonology proper (natural classes) which certainly revitalizes the debate on the phonetics/phonology interface, and that laryngeals are properties of the prosodic domains onset, nucleus and coda.

The book addresses three issues: (1) Provides a more adequate model of phonological representation; (2) shows that phonetics fulfills important functions with regard to phonology; (3) states universal generalizations, i.e., that non-strident affricates never contrast with stops at the same place of articulation, and laryngeals never contrast below the level of onsets, nuclei, and codas. Theoretical issues are kept to a minimum and the study does not assume any particular theoretical framework. The author focuses on the basic generalizations that underlie the phonological patterning of affricates and laryngeals. The main reason, provided by the author himself, is because his primary intent is to emphasize that linguistics and phonology are empirical sciences. The question of representation is kept distinct from the system of mapping underlying forms to surface forms. Finally some areas such as subsegmental Stricture and/or Place contours in diphthongs and autosegmental tonal contours are left for future research.

Several questions are raised in the discussion. The author particularly asks whether other apparently segmental properties should receive a prosodic treatment. Another question is the universal validity of feature hierarchy in general and of the laryngeal node in particular would constitute.

The phonological structure of segments is not an easy subject and this meticulous work can be fully appreciated with a phonological background and by a thorough reading. Specialists interested in the presentation of similarities and relationships among languages will appreciate the challenging aspect of its proposals. Furthermore, the bulk of the examples provided and the great number of the languages mentioned makes this book an indispensable tool in the area of phonological representation. For those who seek some
specific information the charts, the representations of phonological classifications, and the summaries - make it easier to digest.

**References**


*Lingua Americana, Revista de Linguistica*

(Instituto de Investigaciones Literarias y Linguisticas, Universidad del Zulia, Maracaibo, Venezuela, Year 5, No. 8 (2001), 106 pp. ISSN 1316-6689)

*Lingua Americana, Revista de Linguistica*

(Instituto de Investigaciones Literarias y Linguisticas, Universidad del Zulia, Maracaibo, Venezuela, Year 8, No. 14, (2004) 140 pp. ISSN 1316-6689)
The journal, which appears twice a year, is headed by Prof. Godsuno Chela-Flores from the Academia Venezolana de la Lengua (The Venezuelan Academy of Language) as chief editor. Although the journal has a large team of associate editors, international editors, and a counseling board, its center is found in the Faculty of Humanities and Education at the University of Zulia in Maracaibo, Venezuela. The papers included in issue 8, as well as in issues no. 14 and 15, which have reached us, are divided into three major parts: general linguistics, applied linguistics, and indigenous languages. In addition there is the editor’s introduction in the beginning of the journal and various “notes” and informative pages for subscribers and contributors at its end. Most of the papers are written in Spanish and a few appear in English; still, all the papers have abstracts in both these languages, whatever the language of the text. The English abstracts enable even readers who do not know Spanish to approach the articles in the journal. The papers are not very long, but are self contained and clearly written. Physically the journal is nicely set and printed, and is pleasant to handle and read because of the good paper quality.

As a linguistics journal, Lingua Americana is not specifically directed to phonetics or phonology. We find in it, however, a few papers on phonetic/phonological issues which we report here for our readers. Issue 8 begins with the paper “Full pauses: hesitation markers and linguistic identity” (p. 5-15) by Maria Alejandra Blondet S. and continues with “The neutralization of /r/ and /l/ in the eastern dialect of Venezuelan Spanish: beyond the system of language” by Hector Granados (p. 28-44). Further on appears “Liquid consonants in the Spanish spoken in Coro: New data on their neutralization” by Natalia Barbera de Ramirez (pp. 45-58). In issue 14 we find a paper that seems to continue the theme of the latter two papers: “On a change in the pronunciation of Havana Spanish in the last third of the 20th century and its possible causes” by Jorge M. Guitart (pp. 9-20). The paper “Is Japreria a Yukpa dialect?” by Luis Oquendo (pp. 87-98, in English) is also of interest, since it discusses dialectal genealogy on the base of morpho-phonological comparison between Japreria and Yukpa, two languages spoken in Venezuela. Issue no. 15 contains the partially related paper “Study of the early phonetical (sic.) development of the mother tongue from a discoursive (sic.) perspective” by Beatriz Valles G. (pp. 9-27).

The paper by Blondert S. describes the structure and functioning of full pauses in two dialects of Venezuelan Spanish, being part of a larger research on sound phenomena in spontaneous discourse. She has found more similarities than differences between the two dialects in the descending linear configuration of F0 and in the use of four sounds or sound sequences in the filled pauses. She even suggests that these sounds identify speakers of these dialects rather than separate them. She refers to some similar cross-language literature (American English and French) and finally suggests that the acoustic structure of F0 is a “general characteristic of languages” and its verbal manifestation a mark of identity. Another book related to this paper is “When Listeners Talk” by R. Gardner (2001) previously reviewed in this section (issue 89, 2004 (1): 80-82).
The papers by Granados (pp. 28-44) and Barbera de Ramirez (pp. 45-58) in issue 8, as well as by Guitart (pp. 9-20) in issue 14, deal with a similar topic in different dialects of Venezuela and in Cuba – the development of the liquids /l/ and /r/, namely their reduction or total disappearance. Though the processes are not the same in the different places, as revealed in the fact that these consonants may be reduced, assimilated, mixed, or deleted, under different morphological conditions, it is interesting that the same consonants (or phonological class) undergo these processes. In itself this phenomenon is not unknown in the study of historical phonology, but here we get new information about dialects which are not much researched.

The paper by Oquendo (pp. 87-98) also applies morpho-phonological considerations, but for a different goal: the comparison of two indigenous languages. The Japreria people actually speak an endangered-language since they amount to 187 speakers (37 families), and some are married to Yukpa and Hispanic spouses. The author suggests that Japreria is a language in and of itself and endeavors to prove this by comparing Yukpa and Japreria sub-morphemic units (i.e., single phonemes or syllables with semi-morphological roles) used in basic lexical items, mainly pronouns and body parts. The examples, listed in comparative tables and in a long appendix, show some similar words and word structure, but also different cognates and different morphological structures in such cognates. In the pronominal system and the kinship terms the author finds some similarities with other Caribbean languages. Since recently the role of sub-morphemic units or phonemes in roots (at least in Semitic languages) has raised renewed discussions (e.g., G. Bohas, 1997), the paper in this journal issue seems to shed additional light on the topic.

The last paper to be discussed here is by Vallez G., in issue 15 of Lingua Americana. This paper deals with mother tongue acquisition based on phonetic development and studied from a discourse perspective. The study is based on recorded mother-child play sessions, with children’s age ranging between four and twelve months. The spoken interactions are studied within their context and they show that the babies take active part in the communication act and gradually learn the phonetic/phonological elements from the mother’s utterances (by her speech rhythm, stress, repetitions, etc.). In addition, mothers talk differently to babies according to their gender, and fathers speak to them differently than mothers. Indeed, research has already shown that mothers use a special child-directed-speech or “motherese” (e.g., Elliot, 1981, Oller, 2000, Snow and Ferguson, 1977). The author also sums up the most frequent speech sounds and syllables in the babies’ and mothers’ utterances, which are the sonorous /b,y,g/, the bilabial /b,m/ and the velar /g/ and some vowels. She deduces from this inventory that voiced phonemes are easier to produce than unvoiced (and burst) sounds such as /k/ and /p/. The syllable patterns were C, V, CV, VC, and CVC. These facts are similar to findings in other languages and contribute to cross-linguistic studies since they refer to a little-researched language with a stress on the importance of the context on the child’s phonological development.

To sum up, the journal seems to be intended mainly for readers who are interested in the linguistics and languages of Central and South America, and preferably such who can read Spanish. The papers it holds do not refer solely to phonetics or phonology, but it is worth reading for those interested in this region of world languages.
References


Reviewed by: Wiktor Jassem
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Before getting on with the review, we note that this book holds a Foreword (p. vii ff.) and ten papers as follows:
- Steven Greenberg: From Here to Utility (107-132).

Since phonetics is the ‘study and science of speech,’ it may seem to an outsider, or even to a specialist mainly interested in other aspects of language, almost obvious that phonetics must be the basis, or an integral part of speech technology. H. Strik’s contribution to this volume (pp. 167-179), carries the provocative title Is phonetic knowledge any use for speech technology? a question asked publicly at the 2001 Eurospeech conference in Aalborg. Section 2 of this paper also has a stunning title: Phonetics and Speech Technology – two
different worlds. The author may perhaps be overstating his case, but he shows that, for over half a century, the divide was, if anything, widening rather than getting gradually narrower. Indeed, the most successful present-day commercial speech recognizers just brush phonetics. They tend to deal with complete words and phrases as wholes without bothering much about such ‘delicacies’ as phonemes or intonations (though, of course, a gadget for the Chinese could hardly ignore lexical tones and their modifications in connected discourse). ‘Research and education in phonetics and speech technology are conducted by different people in different faculties,’ says H. Strik (p. 169).

The beginning of speech tech can be defined very precisely: The first speech synthesizer was publicly shown at the New York World's Fair in 1939. It was called ‘Voder’ and its controls were related to vowels, consonants and intonations. These beginnings2 were quite ‘phonetic’. And in the recent two decades or so, the tendency for the split has fortunately been weakening. In a broader perspective of Human Language Processing and its applications, such as computer-aided foreign-language learning/teaching, phonetics has again been gaining ground (see, e.g., Nerbonne, 2003). A. Batliner and B. Möbius point out in “Prospodic Models, Automatic Speech Recognition and Speech Synthesis” (pp. 21-44 in this volume) the now growing recognition of the significance of prosody, especially intonation, both in Text-to-Speech Synthesis (TTS) and in Automatic Speech Recognition (ASR). J. Carson-Berndsen and M. Walsh present in their article “Phonetic Time Maps” (pp. 45-66) their innovative model of multilinear speech representation (in terms of partly overlapping phonetic features) and its application in ASR. Another model used for this purpose, consisting of two acoustic modules and one phonemic/expert module, is discussed by H. Christensen, B. Lindberg and O. Andersen in their paper “Introducing phonetically motivated heterogeneous information into Automatic Speech Recognition” (pp. 67-86).

Although in various places in the book the reciprocal relations of phonetics and speech technology are mentioned, the application of speech tech in phonetic research is treated only parenthetically. The former term does not, of course, relate to technical devices that help phonetic research, such as the spectrograph. Speech tech includes the theory and construction of instruments that simulate speech generation or speech reception, i.e., chiefly speech synthesis and automatic speech recognition/understanding. It should therefore be recalled that the earliest post-World-War-II work on speech synthesis was largely inspired by the desire of researchers to find how the various acoustic-phonetic features affect the linguistic judgment of the output signal.

As a very sweeping generalization one can venture a proposition that applied linguistics and speech technology have used structural phonology much more profitably than generative phonology. But there are areas (perhaps few) where the two schools of thought are roughly agreed, and one of these is contextual interrelations (such as sandhi). It is therefore not surprising that this particular area of interest has been found very useful in the paper “Large-Vocabulary Speech Recognition” allowing a significant reduction of the search space, as shown by G. Gravier et al. (pp. 87-106).

2 In a general sense, speech synthesis has a long history and can be traced to antiquity, see Köster (1973).
General-purpose dictionaries and some special pronunciation dictionaries give information on the pronunciation of headwords in languages such as English or French with so-called ‘deep’ spelling. M. Castor and F. Casacumberta show in “Pronunciation Modeling” (pp. 133-148) how finite-state automata can be helpful in ASR by proposing casual-speech word forms. Text-to-Speech depends on specifications of the relations between orthography and phonetic/phonological transcription. J.P.H. van Santen demonstrates in his paper “Phonetic Knowledge in Text-to-Speech Synthesis” (pp. 149-166) that rules for casual-speech are essential for the design of future TTS models.

‘The contributions in this volume can be viewed both as a reflection of existing limits to the integration of phonetic knowledge in speech technology applications and as pointers towards ways in which more [phonetic] knowledge can be of use in the future’ (Barry and van Dommelen Foreword, p. 8). The volume can be warmly recommended to those who, working in traditional, theoretical phonetics, have hitherto ignored speech technology, to engineers who still believe that to do Speech Tech requires little more than the barest rudiments of phonetics, as well as to the increasing numbers of those who, with conviction, ‘straddle the divide.’

References


Mike Davenport, S.J. Hannahs (2005)
Introducing Phonetics and Phonology

Reviewed by: Michael Ordin
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The volume under review is a textbook aimed at revealing the fascinating world of human language sound systems to absolute beginners. It is best for first year students who need to grasp the basics of phonetics and phonological analysis in a very short time. The book covers all the major areas of phonetic sciences and phonology. It is a very easy read, yet it expands on rather complicated contemporary theories, concepts, and methods.

The authors attempted to combine two different approaches to the study of the sound systems: taxonomic and generative. Thus they had to explain the essence of the generative enterprise at the very beginning of the book, along with discussing the difference between phonetics (study of actual sounds as physical phenomena) and phonology (mental representations and their transformations).

The course starts with an overview of articulatory phonetics. The book provides a description of active and passive articulators and their functions, followed by an articulatory classification and description of speech sound systems. Each class of consonants is dealt with separately, and the description of each class includes an account of the production,
distribution, and variation of speech sounds belonging to this class. The vowels are described according to the position of the tongue, while the other features like rounding and the degree of tension are treated as being of minor importance. Variations in vowels are not treated as results of accommodation and coarticulation, but rather as results of distinct vowel systems existing in different regional dialects. The authors give a good account of vowel variations distributed by accents. At the end of the chapter devoted to the description of vowels, the vowel systems of RP, General American, Lowland Scottish English and Northern-England English are summed up and depicted on vowel charts. Information concerning distribution and variation of speech sounds is particularly useful to students of phonetics and phonology whatever their future specialization, e.g., dialectology, experimental phonetics, applied phonetics, phonology, general linguistics, teaching foreign language, etc. It provides a solid ground for further phonological analysis and study of phonological processes.

When the student has grasped the major points of articulatory phonetics, the authors introduce to him fundamental notions of acoustic phonetics. The basic concepts of speech acoustics are explained: sound wave, periodicity, spectrograms, fundamental frequency, formant and formant transitions. The authors provide acoustic correlates to different articulatory features and use the acoustic correlates to describe classes of speech sounds. This chapter will not substitute a textbook on acoustic phonetics, but it serves as a decent introduction into speech acoustics and speech sciences, and provides necessary data for further phonological and phonetic studies.

The chapter on acoustic phonetics should be followed logically by a chapter on perceptual (auditory) phonetics with the account of acoustic correlates influencing speech perception and description of models of speech perception, but this textbook fails to include issues on auditory phonetics, thus leaving the whole field of phonetic sciences apart.

The phonetic part of the textbook is concluded with a small chapter on beyond-the-segment phonetic entities and phenomena: syllable, stress, tone, and intonation. The syllables are described within the framework of sonority theory. Intonation is dealt with in a very simplified manner. While teaching a course on phonetics and phonology, a supplement to cover more of prosody and intonational phonology is required.

The second part of the book is devoted to phonology. This part starts with the description of features, because they can build the bridge between phonetics and phonology. On the one hand, distinctive features are perceived by ear, correlated with acoustic parameters, and describe speech sound variation and distribution. On the other hand, features express linguistic contrast, define natural classes of segments, and formalize phonological processes. The authors prove the necessity of other distinctive features than those used to classify speech sounds by IPA. Further the authors provide an excellent, coherent, and easy-to-read description of phonological features.

Further the authors expound the notions of a phoneme, allophone, free and complimentary distribution, and explain the principles of phonological analysis aimed at defining the inventory of phonemes and their allophones in a certain language. Phonological processes are dealt with from the generative position. The authors describe the rules which govern phonological transformation from phonemic to phonetic level of representation. The students learn to establish and write formal phonological rules for different languages. An
overview of phonological operations and views given in the textbook prepares the student to digest more advanced phonological concepts and theories like feature geometry, optimality theory and phonological constrains, and to perform phonological derivational analysis. The authors then briefly introduce feature geometry and under-specification, and the basics of autosegmental phonology, metrical phonology, lexical phonology, and non-derivational phonology.

The strongest points of this textbook is a decent account of speech sound variation and distribution, the authors’ style (the book is very easy to read), complete coverage of segmental phonetics and phonology, and treatment of advanced contemporary phonological concepts and theories. Every chapter is followed by an exercise set to consolidate acquired knowledge and skills, which is a great benefit for both lecturers and students. It would be nice if the authors included more information on intonational phonology and some basics of auditory phonetics.

On the whole, this textbook fully equips the student to understand any writing on modern phonetics and phonology. The authors guide the reader on the way from the ultimate beginner to a student with solid background knowledge on phonetics and phonology, who is ready to grasp the advanced concepts and bring strong arguments in debates on different phonological issues.

David Odden (2005)

*Introducing Phonology*


Reviewed by: Michael Ordin

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*Introducing Phonology* was written as a textbook for undergraduate linguistics students who have no prior exposure to phonological theories. Another appropriate title for this writing would have been *Practical Phonology*, as it mainly focuses on problem solving and field techniques of analysis in a generative framework, rather than on phonological theories.

The aim of the book is to equip the students with the necessary skills to work with raw data rather than with theoretical knowledge of phonology. Theory is discussed on the pages, but in relation to solving certain problems or discussing a technique of analysis. Of course, this approach leaves some theoretical issues aside, but it ensures that the students will not miss the essence, the marrow and the fun of doing phonology. Moreover, theory discussion for the first six chapters is presented on the web site in more detail. Other chapter extensions are promised to come soon.

Odden’s presentation of material is drastically different from the one in other textbooks on phonology. David Odden follows a “bottom-up” method (from data to theory), while most other textbooks follow “top down” method to present material (theory is explained first and then exemplified with data).

The book is complemented with a web-site containing additional problem sets, data for exercises from the book, errata, the American Phonetic Alphabet (APA) symbol guide, phonological analysis of two more languages (Syrian Arabic and Kimatuumbi), which was intended as a separate chapter and can be used as an extension of the present seventh
chapter; and some supplementary material covering more advanced topics which were not touched upon in the textbook under review.

The organization of the material is typical of the textbooks by Cambridge Introductions to Language and Linguistics series. Each chapter is preceded by key words and an overview of the topics to be covered, and each chapter is concluded with a summary and a set of exercises.

The book contains ten chapters, Glossary, References, Index of Languages, and General Index.

The first chapter explains the difference between phonetics and phonology and briefly presents the concerns of phonology. Afterwards it expands on phonetic issues required to do phonological analysis. The author introduces the major notions of acoustic and articulatory phonetics. He does not provide the description of acoustic correlates of articulatory features or classes of sounds; nor does he plunge into speech acoustics. The author briefly explains the notions of a waveform, periodicity, amplitude, spectrum, resonance, formant, and spectrogram showing how a waveform, spectrum, and spectrograms represent the sound as a physical phenomenon. This wonderful explanation is easy to understand and does not require mathematical background to grasp on the one hand, and reflects the physical nature of the sound on the other. Further the author expands the discussion to production of sounds and organs of articulation, and demonstrates the relations between different branches of phonetics.

The second chapter is devoted to phonetic transcription. David Odden presents two major notation systems – IPA (International Phonetic Alphabet) and APA (American Phonetic Alphabet). Throughout the book the author actively uses APA transcription system, but IPA system is also well surveyed in this section for passive acquisition. Talking about transcription symbols systems the author inevitably touches upon traditional articulatory classifications of sounds. This chapter may serve as a decent concise guide into phonetic alphabets and phonetic transcription. It also helps students grasp the relations between phonetics and phonology better.

Although the first two chapters are mainly devoted to phonetics, they are not sufficient even for an introductory course on phonetics aimed at absolute beginners. Students definitely need a supplement to cover more phonetics. However, these chapters are included to demonstrate the relevance of phonetic studies to phonological analysis. The book under review is dedicated primarily to phonology, and includes the minimum phonetic material required for phonology.

The following chapters focus on phonology. The third chapter introduces the concept of phoneme and allophone, gives a brief overview of allophonic relations in some languages, instructs on formalization of phonological rules, and directs the students in their first steps in inducing phonological rules of a distinct language from raw data. As the book is intended for undergraduates who have never been exposed to phonology before, this chapter accounts each presented technique in detail, starting from the simplest and most familiar examples. By the end of the chapter the students will have acquired the concepts of phoneme, allophone, allophonic relations, complimentary and free distribution, contrast and distinctiveness.
The fourth chapter investigates the underlying representations in more details. It is primarily concerned with distinguishing underlying forms and their transformations into surface representations. It touches on variations in pronunciation between words and within the same word form depending on its position in a sentence. The most valuable gem of this chapter is the part devoted to problem solving. The students are asked to apply what they have learnt to some raw data sets to hone their analysis skills.

The fifth chapter introduces more complex concepts. Sometimes several rules are applied to the underlying representation in order to transform it into a surface representation. Here, rule sequence does matter. In this chapter the author exemplifies rule ordering and rule interaction during transformation of mental representations.

The following chapter introduces the feature theory to the students after discussing some phonetic preliminaries. Distinctive features are presented as phonetically-based properties used by phonological analysis. The presented system of distinctive features is similar to the one suggested by Halle and Clements (1983), a modified system of the one proposed in Halle and Chomsky (1968), which is a binary system of universal phonetic properties. At first David Odden provides a thorough discussion of features (very detailed and rather advanced for undergraduates), then explains how features are used to define phonemes, formalize phonological rules, and specify classes of segments. Further phonological alterations and formal rules are described in terms of distinctive features.

The seventh chapter provides a perfect practice in analyzing phonological alterations in different languages. It teaches students hypothesis formation, testing, and revision. The chapter starts with very easy tasks of analysis. Experienced philologists perform such operations without even giving it a thought, but it sometimes takes a very long time to gain the necessary experience. This chapter arms the students with some powerful techniques, explained at the elementary level. Problem solving is the most painless way to equip students with adequate analysis skills. The seventh chapter provides raw data from the Yawelmani, Kihehe, Icelandic, Hebrew, and Japanese languages to help the students gain necessary experience in practical analysis of unknown languages. Analysis of two more languages is accessible on the web site.

The eighth chapter is devoted to phonological typology and cross-linguistic comparison, revealing the notion of markedness and the distinction between common vs. uncommon patterns in world languages. The theme of the chapter is not the languages but some phonological alterations, rules, and patterns that can be widespread among languages, rather rare, or impossible. The author tries to examine what is common and what is not and why. Through a discussion of segmental and prosodic processes, students learn to distinguish between improbable phonological patterns and patterns which linguists are not aware of.

The next chapter concentrates on possible deviations of surface representations from underlying representations, and on the problematic issue of abstractness in phonology. This chapter is rather theoretical, it touches upon constraints and limiting abstractness, and validity of evidence for phonological analysis.

The last chapter introduces nonlinear theories and an alternative way of representing speech sounds. The author expounds on nonlinear theories in historical perspective. It gives the students an idea why theories are modified and changed. David Odden looks back to explain the reasons for the advent of autosegmental phonology and feature geometry, and
guides the students into the domain of recent phonological research within the generative approach.

The textbook is a treasure for lecturers thanks to loads of raw phonological data, examples, solved problems, and exercises. It is a must have for teachers and for ambitious students. Although it is intended for beginners in phonology, the book reaches a high level of knowledge of its subject. It does leave aside many topics and issues of contemporary phonology (some influential theoretical concepts such as Optimality theory, Lexical phonology, Intonational phonology, technical details about phonotactic constrains and syllabification, etc., are not even mentioned in it), but the covered topics are explained thoroughly, in detail, and from the standpoint of a practitioner. Students have an opportunity to consolidate acquired knowledge and skills doing exercises at the end of each chapter. Although the students will most probably need another textbook besides this one, Introducing Phonology is worth reading and working through. It is more a practical phonology book than a theoretical discussion. The book provides an excellent introduction into phonological analysis.

References

John Coleman (2005)
Introducing Speech and Language Processing
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“Introducing Speech and Language Processing” does not go beyond its promise – it is a mere introduction into the field of speech and language digital processing and technologies on the elementary level. In a single volume the author combines topics, which are usually covered separately in the courses on digital signal processing and computational linguistics. Usually these courses are designed for the students pursuing the degree in electronic engineering and computer science; consequently the prospective students are supposed to have a solid background in mathematics and programming. Linguistics students are (often) almost unable to figure out any sense behind the technical terms, formulas, and layouts of electronic circuits. On the other hand, they frequently need this knowledge badly. John Coleman filled the gap and made technological concepts understandable to linguistics students, who use speech technology in their research on a daily basis. The book is primarily intended for undergraduate students of linguistic departments with no prior knowledge of mathematics or programming skills. It is most useful to those specializing in experimental phonetics and phonology, acoustic phonetics, syntax, language understanding and acquisition. It may also be an invaluable source of exercises and reference materials for
lecturers who need to teach speech processing or the basics of computational linguistics to philologists.

As it follows from the title, the book primarily deals with two areas: oral speech processing and written language processing. Every concept is thoroughly explained in theory, implemented as a fragment of computer program, and further consolidated in exercises. Each line of the computer code is commented in detail. Exercises are supplied with the answers (on the author’s web site, which is still under construction at the time these lines are written, so some answers are not available yet). John Coleman does not spare words to make the ideas explicit for the students’ great benefit. He does not leave the inexperienced reader to decipher the formulas but instead wades through the explanation together with the reader, clearing the way for him from all the obscurities; he untangles every complicated concept to the minutest chunks, which can be easily swallowed and digested by the unschooled reader. The only requirements to the prospective readers are computer literacy, elementary knowledge of linguistics, and a desire to learn about the interaction of computer science, speech technologies, and linguistics.

It should be kept in mind that Introducing Speech and Language Processing by John Coleman is a textbook. The genre determined the selection of the material and the way to present it. The book lacks detailed and thorough discussions on advantages and disadvantages of every minutest change in the algorithms. As the book under review was intended for a short course, some topics are not covered at all - for example, neural networks in natural language processing, more advanced parsing algorithms, semantic processing and automatic discourse analysis, machine translation, and machine learning.

It is an introductory course, so the author provides a set of techniques used in speech and natural language processing without sticking to a certain linguistic theory or plunging deep into algorithms and maths. It enables the inquisitive student to experiment within distinct approaches and later to take more advanced books on the subject (e.g., Jurafsky and Martin, 2000, Rabiner and Juang, 2003, Huang, Acero, and Hon, 2001). When the student has acquired knowledge and skills after reading Coleman’s book, he can read and understand more technical writings.

The book consists of nine chapters, Appendix, Glossary, References, and Index. It is also accompanied by a CD-ROM and is supported by a special web site.

The first chapter is an overture. The author informs the reader on the content of the book, what to expect from the course, how the material is organized, and what kind of computer set-up is required before joining the course.

The author claims that this writing is intended to be the textbook for a short 8-class course on the subject of speech and language processing. Thus each of the rest eight chapters is centred on a distinct set of interrelated problems. Each chapter is preceded by keywords (which are further explained in the text) and a review to set the questions and determine the problems that are tackled further on. Each chapter is followed by a summary, a list of printed references for further reading, and some chapters are followed by an exercise set. The author explicates the idea, and then provides a listing of a computer code in C programming language to demonstrate how the idea can be implemented into practice. The listings are thoroughly commented, not to leave any blanks or white spots for students who read computer program listings for the first time. Afterwards a more complicated
concept from the same field is presented to the student, and a new listing is analyzed. It is possible to read the chapters selectively, but it is definitely much better to cover all the material in strict order according to the author’s layout.

The second chapter is devoted to digital representation of sound waves, sampling, quantization, and structure of C programs, C data types and basic C functions. By the end of the chapter students are supposed to be able to read basic C programs with loops, logic structures, and arrays, understand the program which generates a signal with a certain frequency and quantization level, and modify this program to change tone frequency, duration, and sampling rate of the output signal.

The third chapter focuses on filtering. It explains how to calculate RMS to determine intensity and how to build Impulse Response Filters to cut off certain frequencies from the signal. By the end of the chapter students have to understand the concept of frequency filtering and be able to modify the basic software frequency bandpass filter in C language.

The fourth chapter is concentrated on frequency analysis and linear predictive coding. It explains the concepts of spectrum, cepstrum, windowing, and linear predicting coding, as well as the ways to calculate them (without plunging deep into the maths, Fourier transform and computational grounds under the FFT algorithm. The author provides a library of pre-defined math functions to calculate spectrum without putting too much load on linguistic students). The chapter also explains how to extract acoustic parameters from speech signal including pitch and voicing detection (using autocorrelation and cepstral analysis), as well as formant peaks estimations.

The fifth chapter reveals the mysteries of finite state machines and transducers in natural language processing. It is the first chapter to deal with written language processing, and it is the first time when PROLOG programming language and logical programming are introduced. Coleman demonstrates a variety of ways Finite State Automata can be used in natural language processing, from building a model of English-like monosyllables, through computing grapheme-phoneme relations in English monosyllables, up to relating speech to phonemes using vectors of LPC coefficients and syntactic processing.

The sixth chapter serves as an introduction to speech recognition techniques. The author gives a brief overview of two major approaches to the task of automatic speech recognition: pattern matching and acoustic-phonetic mapping. This chapter contains no listings, but instead provides an overview of algorithms including decision trees building, combining decisions, using finite-state automata to compute phonotactic information, feature detection, dynamic time warping, and vector quantization.

The seventh chapter draws together acoustic analysis and finite-state machines to build probabilistic models which are used both in speech processing (acoustic modelling) and language processing (part-of-speech tagging). Complicated concepts of probability, n-gram (2-and 3-gram) models, Markov models and Hidden Markov Models are introduced and explicated. Although this chapter does not contain any code listings, the author equips the reader with necessary information to read, understand, and modify programs that implement probabilistic finite-state models. The chapter also features some Chomskian objections to language modelling using Markov models.

The eighth chapter is devoted to the phrase structure computation using PROLOG. The major schemes are given as to how parsing algorithms work and how they are extended
from syntactic analysis to phonological analysis. The book emphasizes mostly top-down recursive and deterministic parsing techniques; all the other methods for computing syntactic structures are merely mentioned.

The final chapter deals with probabilistic grammars, which were developed in the field of computational linguistics for natural language processing: context-free grammar, Tree Adjoining Grammar, and Data Oriented Grammar.

Glossary, index, and references make this textbook even easier to use in studies. The book is accompanied with a web site and a CD ROM companion, and that is where a drop of poison is let in. The CD contains a free PROLOG interpreter and C compiler, program listings, and a sound editor. Unfortunately, the sound editor is a shareware with a 30-day trial. It would be nice to have a freeware editor or, preferably, a speech analysis tool with some editing and format conversion functions. In the Introduction the author promises to provide revised versions of software or links to alternative resources on the supported web site, together with answers to the exercises, lecture notes, and handouts. Unfortunately, at the time of reviewing, that site was still under construction. The web site contained some useful resources like pictures and diagrammes for the teacher to hand out in class, and some answers. Navigation on the site was inconvenient, and the content did not meet the expectations after enjoying the wonderful and masterly-written book.

I have twice been able to partly use this book for practical teaching. Although the author intended the textbook for a short 8-time 16-hour course, it took my groups twice as long. The book turned out invaluable both for teaching and for learning parts of it. It is the best introduction into speech and language processing I have seen and tried, specially designed for linguistic students without mathematical and programming skills. And the results were amazing. Linguistic students who felt aversion to maths and the idea of programming enjoyed the course, acquired the materials, joyfully played with programs, and decided to take more advanced references on computational linguistics. I wish I had such textbook on speech processing at the first years of my struggles in the field of speech technologies. I would not be surprised if this textbook becomes a compulsory book in a standard introductory course on speech and language processing - it will be well-deserved.

References


Addenda

I have reviewed here three “Introductions.” Introducing Phonetics and Phonology by Davenport and. Hannahs, Introducing Phonology by Odden, and Introducing Speech and Language Processing by Coleman. Odden’s and Colemsan’s “Introductions” are from the series Cambridge Introductions to Language and Linguistics, whereas Davenport and Hannahs’ book was published by Arnold Publishers.
The textbooks from Cambridge University Press are more practical; they are aimed to be used by future practitioners, future specialists in related fields. The “Introducing” by Davenport and Hannahs from Arnold Publishers is an introduction into theory. It equips the students with knowledge, while the two textbooks from Cambridge University Press equip the students with knowledge and skills (and that is why they are much better – according to my very subjective, personal opinion). After reading the book by Davenport and Hannahs students will grasp the main concepts and get acquainted with the discipline. They will find out what phonetics and phonology are. After working through Coleman’s or Odden’s book students will not only have gotten acquainted with the field, they will also have tried out different techniques and methods described in the books and applied theory to practical analysis.

Arthur Hughes, Peter Trudgill, Dominic Watt (2005)

*English Accents And Dialects: An Introduction To Social And Regional Varieties Of English In The British Isles*

(Abingdon: Hodder Arnold Headlines; 159 pp., ISBN: 0340887184, £24.99)

Reviewed by: Michael Ordin

Moscow Institute of Linguistics and Economics, Russia

The book under review is the fourth edition of the introductory work on British dialects and accents aimed at the most versatile audience. It contains five chapters, the IPA chart, suggestions for further reading, and a good index.

In this expanded and updated volume he authors have added descriptions of Aberdeen, Galway and Leicester dialects. An audio CD recording is supplemented, which is much more convenient and popular now than an audio cassette.

Reading the first chapter evokes the feeling of reading a textbook on sociolinguistics. It is devoted to the variability of the English language. It elaborates separately on variations in pronunciation and on variations in grammar and vocabulary. This chapter defines the terms of Dialect and Accent, and explains the factors which cause variation and determine selection of linguistic means. Stylistic, regional, and unconditioned variations in vocabulary, grammar, and pronunciation are briefly described and illustrated with some examples. The reader will see the famous scheme of the triangle model of relations between status and accent (interconnection between social and regional variations).

The second chapter focuses on dialect variations. Although the authors do not state explicitly that dialects can refer to social as well as regional varieties (social and regional dialects), this idea is clearly conveyed throughout the first three chapters of the book. The second chapter starts by exemplifying regional variation within Standard English and then demonstrates dialectal deviations from standard grammar in negation, forms of irregular verbs, system of pronouns, degrees of comparison in adjectives, and unmarked plurality. At the end the authors briefly explain the distinction between traditional and urban modern dialects.

The third chapter is a detailed description of RP sound system. This chapter features an elaborate framework of vowels and consonants and gives a full account of RP sounds within the framework. The framework will be used as a scheme to catch and depict the difference
between RP and certain regional accents. Further the authors briefly touched upon variability within the RP. Three recordings on the accompanying CD demonstrate within-standard phonetic variations in speech.

The fourth chapter presents a schematic outline of major deviations from the standard British pronunciation on segmental level and suggests classification of regional accents based on key phonological characteristics. The phonological features were singled out after aligning distribution of the above-mentioned deviations from RP and geographical zones.

The final chapter is devoted to depicting sixteen regional dialects and their most typical segmental features. Each dialect is described and illustrated with an audio recording. The recordings are transcribed and fully annotated. The authors include the accents of the following locations: London, Norwich, Bristol, South Wales, West Midlands, Bradford, Liverpool, Edinburgh, Belfast, Dublin, Devon, Northumberland, and Lowland Scots.

The book is accompanied with teacher’s / learner’s notes and a brief set of exercises to use during the course. The companion CD is a must-have supplement to the book. It contains the recordings exemplifying the RP variety of pronunciation and the described accents. It also features test audio passages. The book also includes a thoroughly composed index and an up-to-date references list for further reading.

It is hard to imagine how this book can be used as a major source on a full-swing dialectology course due to sketchy and schematic information which is rather like a set of notes on theoretical issues for lecturers (compared to e.g. the book on English Accents by Wells, 1982). On the other hand, it is a superb introduction into the field, an invaluable source for anyone who wants to get acquainted with regional accents, and a perfect guide to improve listening comprehension skills for advanced students. Students of English as a foreign language frequently cannot understand natural spontaneous utterances of native speakers, and grow to fear from “unintelligible” authentic speech. Besides introducing local dialects, the reviewed book and the CD will help the students to overcome this fear of authentic speech and to understand natural British English.

The recordings reflect spontaneous speech, and are thus good representatives of the accents discussed in the book. Each recording is preceded by a list of key words. These words are listed to grasp the major distinctive characteristic of the accent.

The organization of material is a great advantage of the book. It can be used by students of linguistics, enthusiasts interested in regional variations (the book does not require much phonetic and phonological knowledge), and learners of English as a foreign language.

To sum up everything in a nutshell, it is a good introductory volume to regional British varieties of the English language, accompanied by a decent audio supplement on CD. It covers mostly phonetic segmental distinctions between local varieties, with just a few words on grammar, vocabulary, intonational, or stylistic variants and very little information on theoretical issues, historical background, and cultural context of the discussed variants.

For students or teachers of English as a Foreign Language on an advanced level this book is a real find. The book demonstrates how different English varieties can be and contributes to prevent the shock and possible distress of learners when faced with authentic casual speech. It is a nice preface to a dialectology course if used to enable the more advanced students of linguistics to catch the deviations from the standard and to explain
them properly in linguistic terms, but it can hardly be used as a major textbook on dialectology.

**References**


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**New Publications**


Alvord, Scott Mark (2006) *Spanish Intonation in Contact: The case of Miami Cuban bilinguals*, PhD Dissertation University of Minnesota, Department of Spanish and Portuguese


Poliquin, Gabriel (2006) Canadian French Vowel Harmony, PhD Dissertation Harvard University, Department of Linguistics


Vaissière, Jacqueline (2006), La Phonetique (Series: Que Sais-Je ? n° 637) Presses Universitaires de France


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