

Figure 5. Histogram showing the F0 standard deviation distribution in semitones for 109 young male speakers.

4 Conclusions and future work

The preliminary statistics in this paper gives an overview on the distribution for Swedish young males' fundamental frequency mean and standard deviation. The results suggest the use of a more robust median instead of mean, since octave jumps influence the arithmetical mean. To be able to study between-speaker differences better, distributions for individual speakers should be compared and studied using different measures.

References

- Boersma, P. & D. Weenink, 2005. *Praat: doing phonetics by computer* (Version 4.3.27) [Computer program]. Retrieved October 7, 2005, from <http://www.praat.org/>.
- Braun, A., 1995. Fundamental frequency – how speaker-specific is it? In Braun & Köster (eds.), 9-23.
- Brotttsförebyggande Rådet. [www] Retrieved November 26, 2005, from <<http://www.bra.se/>>
- Jassem, W., S. Steffen-Batog & M. Czajka, 1973. Statistical characteristics short-term average F0 distributions as personal voice features. In W. Jassem (ed.), *Speech Analysis and Synthesis vol. 3*. Warsaw: Polish Academy of Science, 209-25.
- Kitzing, P., 1979. *Glottografisk frekvensindikering: En undersökningsmetod för mätning av röstläge och röstomfång samt framställning av röstfrekvensdistributionen*. Malmö: Lund University.
- Nolan, F., 1983. *The Phonetic Bases of Speaker Recognition*. Cambridge: Cambridge University Press.
- Rose, P., 1991. How effective are long term mean and standard deviation as normalisation parameters for tonal fundamental frequency? *Speech Communication* 10, 229-247.
- Rose, P., 2002. *Forensic Speaker Identification*. New York: Taylor & Francis.
- Swedia Dialect Database. [www] Retrieved during September, 2005, from <http://www.swedia.nu/>.
- Trautmüller, H., 1994. Conventional, biological, and environmental factors in speech communication: A modulation theory. *Phonetica* 51, 170-183.
- Trautmüller, H. & A. Eriksson, 1995a. The frequency range of the voice fundamental in the speech of male and female adults. *Unpublished Manuscript* (can be retrieved from <http://www.ling.su.se/staff/hartmut/aktupub.htm>).
- Trautmüller, H. & A. Eriksson, 1995b. The perceptual evaluation of F0-excursions in speech as evidenced in liveliness estimations. *J. Acoust. Soc. Am.* 97, 1905-1915.

L1 Residue in L2 Use: A Preliminary Study of Quantity and Tense-lax

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Abstract

The main question addressed in this preliminary study is what traces of L1 have been transferred to L2 use. The focus is on the durational aspects of the tense-lax and quantity contrasts in English and Japanese. The results could be interpreted as support for the hypothesis that an L1 durational pattern rather than a specific phonetic feature is the object of transfer.

1 Introduction

As a rule, adults who learn a second language are not completely successful in learning to produce and perceive L2 speech. Much of the recent research that has been done on the acquisition of second language phonology and phonetics has been concerned with the question of the source of foreign accent. A primary issue in both past and current studies of second language (L2) speech acquisition is how and to what extent the first language (L1) influences the learning of L2. The existence of common terms such as “French accent” have supported the importance of that which has become known as “L1 transfer” as a major contribution to foreign accent and numerous studies have been done to support the importance of this phenomenon.

The aim of the present study is to contribute to the understanding of the role of native language (L1) phonetic and phonological features in L2 speech acquisition. While considerable research has been done with this aim which has contributed significantly to the understanding of the nature of the phenomenon, there are still some important unanswered questions to be addressed. Central among these concerns what aspects of the perception and production of the L1 are actually transferred. One suggestion has been made by McAllister, Flege & Piske (2003). In the discussion of their results the question was raised as to whether a specific phonetic feature such as duration or an L1 durational pattern typical for the phonology of a particular L1 could be what is actually transferred. If this were the case, a durational pattern similar to that in L1 may be recognized in the use of the L2 contrast.

1.1 The pattern of durational relationships that can be found in Swedish and Japanese quantity and the abstract feature of tense-lax in English

Traditionally, the primary phonetic difference underlying phonological quantity distinctions has been attributed to durational differences in the vowels and or consonants, hence the “long-short” or “quantity” terminology. In Swedish there is a relatively complex interplay between temporal dimensions (i.e., the duration of a vowel and that of the following consonant) and spectral dimensions (i.e., formant values in the vowel). English is considered to have no quantity distinction. The tense-lax feature is considered to be a property of English phonology and is phonetically similar to some aspects of Swedish quantity. The phonetic characteristics

of the Japanese quantity distinction appear to be in some respects similar to the Swedish distinction. The contrast is based on duration and there are stable relationships between the long and short vowels and consonants in Japanese syllables.

We are not able, in this short paper, to give even a partial view of the scholarly discussion of tense-lax and its relation to quantity. For an excellent review and discussion, please see Schaeffler (2005).

In this preliminary study we have taken the liberty to focus on the obvious if somewhat unclear, relation between quantity and tense-lax. Our intent is to discover if a residue of the Swedish quantity contrast might be found in the use of an L2 by native Swedes. Our hypothesis is that evidence of patterns characteristic of Swedish quantity can be seen in native Swedes' L2 use of the tense-lax feature in English and the quantity contrast in Japanese.

2 Method

2.1 Experimental subjects

For the English part of the study, 20 native speakers of standard Swedish were recruited. These were speech pathology students at Stockholm University who were asked to read a list of English sentences containing a sentence final word with a tense or a lax vowel.

As a control group, 8 native speakers of standard American English read sentences with the same tense and lax vowels as the native speakers of Swedish

The subjects for the Japanese part of the study consisted of 11 Swedish speakers (3 females and 8 males) ranging from beginner to advanced levels of Japanese language which included 2 speakers one of whose parents was a native Japanese.

2.2 Speech material

For the English part of the study the vowels in the tense-lax pairs /i:/ - /ɪ/, /u:/ - /ʊ/, and /e:/ - /ɛ/ each occurred in three different monosyllabic words read by both the native speakers of American English and the native Swedes. All three occurrences of each vowel were placed in an identical or very similar phonetic environment (a voiceless stop).

For the Japanese part of the study the speech materials were two-syllable non-words which followed Japanese phonotactics. The stimulus words written in *Hiragana* were read 5 times. "Kinou _____ o kaimasita" (I bought _____ yesterday). The words in carrier sentences were read three times each by the same informants. In this study we present only the results for the Japanese vowels /i:/, /ɪ/, /u:/, /ʊ/, /e:/ and /ɛ/ to compare with the English part of the study.

3 Results and discussion

It should be pointed out at the outset of the discussion that the results presented here are a preliminary version of this study. There are a number of additional measures that could be relevant to the question of what aspects of the L1 are transferred in L2 use. Previous research has shown that this V/C ratio is a robust and typical aspect of the Swedish quantity contrast so we have decided to start with a presentation of this data and to present more data at Fonetik 2006 in Lund.

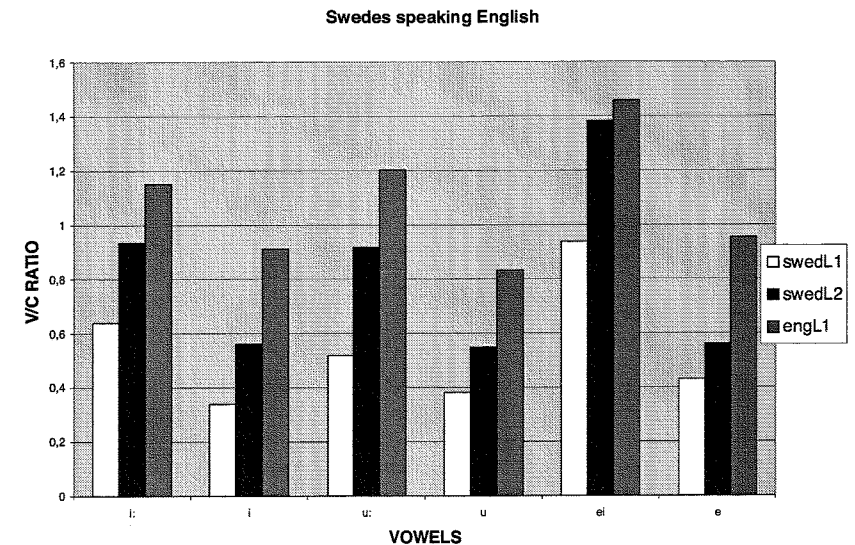


Figure 1 shows the calculated V/C duration ratios for all the tense lax vowel pairs in English. The three bars above the vowel symbols in the graph represent the V/C ratios for native Swedish (unfilled bar), Swedes speaking English (black bar) and the native English speakers.

The native Swedish data in Figure 1 is taken from Elert (1964). Although the group data may mask some of the potentially interesting individual behavior in the L2 users, it could reveal some broad tendencies that are relevant to our question as to whether or not a durational pattern is preserved in the English of the Swedish natives.

Figure 1 indicates that while the native speakers of Swedish were not able to produce the durational aspects of English authentically, they were not using the patterns familiar from their L1 according to the Swedish norm. In terms of the V/C, the L2 users as a group appear to approach the English pattern but their values are somewhere in between the Swedish and the English norms for all the vowels. This result is reminiscent of a VOT study by Flege and Eefting (1986) where the VOT values of the native Spanish speakers speaking English were between those of native English and native Spanish. Those authors interpreted this result as equivalence classification although this may imply a more strict adherence to the L1 pattern than can be seen in the results.

The L2 ratios in Figure 2 are compared to the Swedish native standard and the L2 (Japanese) native standard as in Figure 1. The Swedish L2 users' realization of the Japanese V:C syllables appears to be similar to the results for the realization of the English tense vowels in a VC sequences seen in Figure 1 although the realization of the /i:/ is better, i.e. closer to the native Japanese values, than the other long vowels /u:/ and /e:/. In these cases the L2 users have not been able to produce authentic Japanese syllables. The long /u:/ shows a result similar to those for English in figure 1. The native Swedes produce a syllable with a V/C ratio in between the standard Swedish and the standard Japanese values. The V:C sequence with /e:/, however, was produced in a way similar to the Swedish standard. An interesting aspect of Figure 2 is the realization of the short vowels in VC sequences the native Japanese syllables and the native Swedish syllables are quite similar. The native Swedes' version of a VC syllable with a short vowel is, with respect to the durational relationships, similar to the

authentic Japanese syllables. In this case it would seem that the application of the duration rules for Swedish quantity could have yielded a rather good rendering of the Japanese contrast. These results indicate that in the case of the realization of Japanese quantity, the transfer of at least some of the aspects the Swedish quantity contrast pattern is part of the Swedes' strategy in learning Japanese quantity. The durational aspects of the English tense-lax contrast present a somewhat less clear picture of the transfer phenomenon. It looks like the Swedish natives are attempting to render the contrast but could be unsuccessful because of their tendency to continue to apply the L1 pattern in their L2 use.

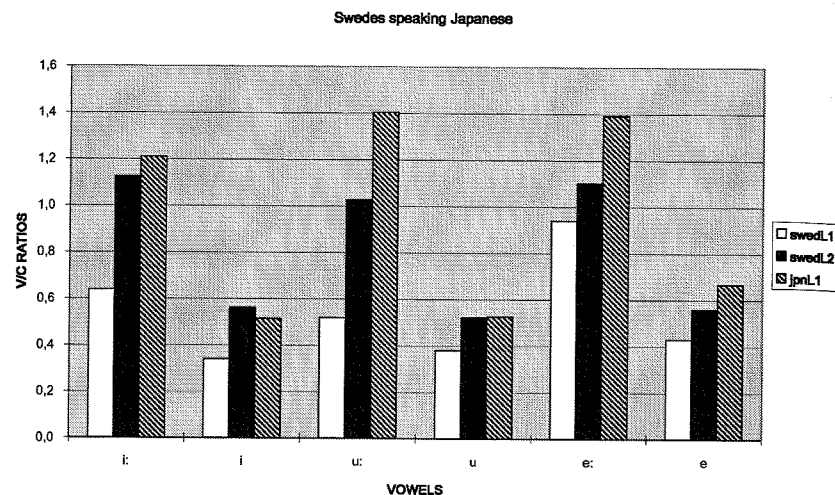


Figure 2 shows the calculated V/C duration ratios for the short-long-vowels in Japanese averaged over both isolated words and words which occurred in a sentence.

Further work on this material can give us a clearer idea of what residue from the L1 there might be in the phonetic realization of an L2 contrast.

References

- Elert, C.-C., 1964. *Phonologic Studies of Quantity in Swedish*. Uppsala: Monografier utgivna av Stockholms kommunalförvaltning 27.
- Flege, J. & W. Eefting, 1986. The production and perception of English stops by Spanish speakers of English. *Journal of Phonetics* 15, 67-83.
- McAllister, R., J.L. Flege & T. Piske, 2003. The influence of L1 on the acquisition of Swedish quantity by native speakers of Spanish, English and Estonian. *Journal of Phonetics* 30, 229-258.
- Schaeffler, F., 2005. Phonological Quantity in Swedish Dialects. *PHONUM* 10.

Cross-speaker Variations in Producing Attitudinally Varied Utterances in Japanese

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Abstract

Several acoustic phonetic parameters were analysed for six professional speakers of Japanese who produced attitudinally-varied utterances. The results showed both agreement and discrepancies among the speakers, implying that pragmatic information can be expressed in at least a few alternative ways in Japanese and that this line of research needs more attention.

1 Introduction

It is well known that pragmatic information can be combined in a set of tunes (or pitch-accents in more recent terminology) in a language like English which has been traditionally called an intonational language. How such pragmatic information is conveyed in a tone or pitch-accent language in which pitch shape is lexically determined is much less clear. For Japanese, Maekawa & Kitagawa (2002) conducted pioneering research on the production and perception of paralinguistic phenomena. We have earlier reported the F0 shape characteristics to show how speakers choose pitch shapes and phrasing to convey pragmatic meanings in Japanese (Nagano-Madsen & Ayusawa, 2005). In this paper, we will report other phonetic cues used by the same speakers. The attitudes tested are NEU(tral), DIS(appointment), SUS(picious), JOY, and Q(uestion). Three phonologically balanced short utterances were produced as a reply by six speakers – three male and three female speakers. For details on data, speakers, and procedure, see Nagano-Madsen & Ayusawa (2005).

2 F0 characteristics

2.1 Pitch range

In order to make the cross-speaker comparison more meaningful, F0 features are calculated on a semitone scale rather than in absolute Hz values. The average pitch ranges for the female and male speakers were 13.9 and 14.3 semitones respectively. Table 1 shows the average pitch range in semitones for the six speakers for the five attitude types, which shows that the overall average pitch range increases in ascending order, DIS<NEU<SUS<Q<JOY. Speakers were uniform in using their narrowest pitch range, on average 10.9 semitones, in expressing attitude DIS. The fact that attitude DIS had the narrowest pitch range agrees with the findings reported in Maekawa & Kitagawa (2002), though the exact magnitude of range cannot be compared with their data. The widest pitch range was used for JOY, with an average of 16.3 semitones. Considerable cross-speaker variation is found in the use of overall pitch range indicating that the overall pitch range alone cannot be regarded as a reliable acoustic phonetic cue for attitude types. The male speakers manifest pitch range for NEU and JOY more closely