

Role of prosody in L2 segmental perception of French clusters by Japanese learners

Takeki KAMIYAMA, Université Paris III, Université de Marne-la-Vallée

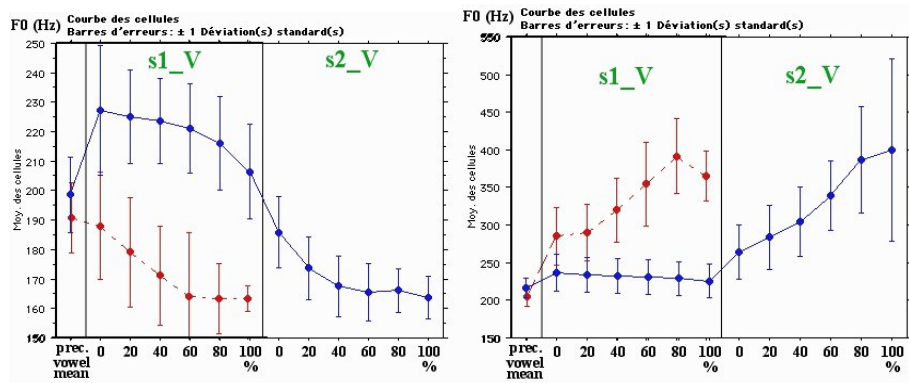
Shigeko SHINOHARA, Phonetics Laboratory, Sophia University

This paper focuses on the role of prosody in segmental perception of CCV clusters vs. CVCV sequences in French by Japanese speakers learning French.

Previous studies report a heavy reliance on prosodic patterns for word segmentation in early stages of lexical acquisition (Christoph et al. 1995 for French; Jusczyk et al. 1999 for English). In the production of young children, consonant clusters are mostly resolved through consonant deletion (Bernhardt and Stemberger 1998): the result is that prosodic patterns remain more or less intact as compared to the adult target. In contrast, recent loanword studies show that consonant clusters are overwhelmingly resolved through vowel epenthesis rather than through consonant deletion (Paradis and Béland 2002; Uffmann 2004). This pattern seems to be also reflected in adult L2 production (Shinohara 1992). A consequence of vowel epenthesis is a distortion of prosody in the target language, the number of nuclei being increased. As production patterns may reflect adult speakers' insensitivity toward prosodic information in L2, this study tests if prosodic information is still exploited in access to segmental information in L2 speakers of French.

We studied Japanese speakers' perception of minimal pair words in French differing only by the presence or absence of a vowel, such as *boulette* /bulet/ 'small ball' and *blatte* /blat/ 'beet', embedded in different intonation contours: the first syllable in CVCV words may or may not be pronounced with a higher F₀ than the second one. We exploited the possible intonation difference in French affirmative and interrogative sentences. That is, the affirmative sentences optionally have a high F₀ on the initial syllable of a sentence final lexical word (of less than three syllables) when preceded by a function word, whereas yes-no question sentences have a flat contour in this position (Vaissière 2002). As to the perception of clusters, Japanese speakers are known to perceive an illusory epenthetic vowel (e.g. /ebzo/ perceived as /ebuzo/ (Dupoux et al. 1999)). Therefore, we can suppose that they have difficulties differentiating these minimal pairs. However, this task might be facilitated by the prosodic prominence in affirmatives. We recorded 2 female native speakers of French pronouncing 28 minimal pair words embedded in two different contexts (68 sentences in total). One of the speakers produced the first syllable of CVCV words in affirmatives with a higher F₀ than the second one (see Figure 1). In subsequent experiments, these recordings and manipulated stimuli with imitated F₀ curves were used for auditory perception tests with native speakers of Japanese learning French. The learners tended to respond more correctly to the target sequence with a higher pitch. These results suggest that tonal prominence facilitates the perception of segmental sequences in L2.

Figure 1: Mean F0 of the affirmatives (left) and the interrogatives (right) with mono- (dashed lines) and disyllabic words (plain lines) pronounced by Speaker 1 (16 sentences each). The first value ("prec. vowel mean") indicates the mean F0 of the vowel preceding the target word. The time axis is normalized, i.e. 0% and 100% points correspond to the beginning and the end of the vowel. Error bar: 1 standard deviation (SD).



REFERENCES

- Bernhardt B. H. and Stemberger J.P. 1998. *Handbook of Phonological Development (From the Perspective of Constrain-Based Nonlinear Phonology)*, San Diego: Academic Press.
- Christophe, A. Dupoux, E., Bertoncini, J. and Mehler, J. 1995. Do infants perceive word boundaries? An empirical study of the bootstrapping of lexical acquisition, *Journal of the Acoustic Society of America*, 3, 1570-80.
- Dupoux, E., Kakehi, K., Hirose, Y., Pallier, C. and Mehler, J. 1999. Epenthetic vowels in Japanese: A perceptual illusion? *Journal of Experimental Psychology: Human Perception and Performance*, 25(6), 1568-1578.
- Jusczyk, P., Houston, W., Derek. M. and Newsom, M. 1999. The beginnings of word segmentation in English-learning infants, *Cognitive Psychology*, 39, 159-207.
- Paradis, C. and Béland, R. 2002. Syllabic Constraints and Constraint Conflicts in Loanword Adaptations, Aphasic Speech and Children's Errors, Jacques Durand et Bernard Laks (eds.), *Phonetics, Phonology and Cognition*. Oxford: Oxford Univ. Press, 191-225.
- Shinohara, S. 1992. *Prononciation du français par des locutrices japonaises -le cas de l'insertion de voyelles dans les groupes consonantiques avec /l/ et /R/*, DEA Diss., Univ. of Paris V.
- Uffmann, C. 2004. *Vowel Epenthesis in Loanword Phonology*. Ph. D. Diss., Univ. Marburg.
- Vaissière, J. 2002. Cross-linguistic prosodic transcription: French versus English. *Problems and methods in experimental phonetics, In honour of the 70th anniversary of Prof. L.V. Bondarko*, N. B. Volskaya, et al. St.-Petersburg, St.-Petersburg State Univ. 147-164.