The following full text is a publisher's version.

For additional information about this publication click this link.
http://hdl.handle.net/2066/56977

Please be advised that this information was generated on 2019-02-08 and may be subject to change.
A Cross-Language Comparison of the Use of Stress in Word Segmentation

Michael D. Tyler
MARCS Auditory Laboratories
University of Western Sydney, Australia

Pierre Perruchet
LEAD-CNRS UMR 5022
Université de Bourgogne, Dijon, France

Anne Cutler
Max Planck Institute for Psycholinguistics
Nijmegen, The Netherlands

Background

Word boundaries in continuous speech are hardly acoustically marked. However, listeners use language-specific cues (e.g., lexical stress placement) to segment speech into words (for an overview, see Cutler, 2001).

How are listeners influenced by this native-language segmentation experience when confronted with an unknown foreign language? French has final accent, and French listeners benefit from vowel lengthening and/or a pitch change on the final syllable of each word in an artificial language (Bagou et al., 2002). Dutch has main initial stress, and Dutch listeners benefit from a pitch rise on the first syllable of each word in an artificial language (Vroomen et al., 1998).

But: Can listeners benefit from regularities that are not familiar from their native language?

The Current Study

An artificial language of 9 randomly concatenated words was presented to French and Dutch adult listeners in 3 versions: with no stress vs. those with initial- or final-syllable stress (pitch excursion) on each word. An additional experiment tested listeners in 3 versions: with no stress vs. those with initial- or final-syllable stress (pitch excursion) on each word.

Method

French vs. Dutch Experiment

72 French Listeners (Dijon, France)
72 Dutch Listeners (Nijmegen, The Netherlands)

9-word artificial language

A pool of 30 diphone-synthesized (MBROLA) syllables from: 6 consonants (/p,b,m,f,s,k/) & 5 vowels (/a,e,i,o,u/), chosen to be as phonetically similar as possible between French and Dutch, were randomly allocated to words to create 24 unique languages, each of 10 minutes duration.

To test for the influence of phonetic differences, half of the participants heard a language synthesized using male Dutch diphones and half a language using male French diphones.

No stress condition: Monotone 120 Hz.

Stress conditions: A parabolic pitch rise-fall from 120 Hz to 170 Hz over the 1st or last syllable of each word (from Thiessen & Saffran, 2003).

Test items: 27 pairs of words and partwords (e.g., last syllable of one word and the first two syllables of another word). Participants were asked to indicate which member of each pair was a word of the language.

French vs. Dutch Experiment Results and Discussion

Participants performed the task very well – all mean scores were above chance (50%, many significantly so).

Data were analysed using planned contrasts:

Stress (initial + final) > No Stress

Initial stress > final stress, regardless of talker accent. Dutch listeners unexpectedly benefited from final stress, regardless of the talker, and only benefited from initial stress when the talker's accent was Dutch.

Most of the Dutch participants had been exposed to French at school or on vacation, and many volunteered that the language "sounded French".

Australian Experiment Results

Stress (initial + final) > No Stress:

Initial stress > final stress:

No interactions.

Australian Experiment Results

Most of the Dutch participants had been exposed to French at school or on vacation, and many volunteered that the language "sounded French".

Most of the Dutch participants had been exposed to French at school or on vacation, and many volunteered that the language "sounded French".

Australian listeners benefited from initial stress only, regardless of talker accent.

General Discussion

Monolingual French and Australian learners learn words more successfully in an artificial language when prosodic word boundary cues match those of their native language.

Multilingual Dutch listeners appear to have expanded their repertoire of segmentation cues when learning French, so were able to vary their strategy to suit.

Therefore, for second-language (L2) learners: Segmentation is easier when L1 and L2 word boundary characteristics are shared.

Initial insensitivity to L2 characteristics that are not present in the L1 can (sometimes) be overcome with L2 experience.

References


