**Tonal adaptation of English loanwords in Mandarin: The role of perception and factors of characters**

Li-Ya Mar (LYAMAR@uwm.edu)  Hanyong Park (PARK77@uwm.edu)  
Department of Linguistics, University of Wisconsin-Milwaukee

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**Background**

- The Principle of Phonological Perception (Iverson & Lee, 2006)
- Orthography factors need to be considered. (Vendelin & Peperkamp, 2005)
- Major strategies shown in corpus
  - The initial stress of a disyllabic word is frequently adapted with a high level tone. If the initial stress has a depressing onset consonant, a rising tone (L-H) is preferred. (C.Wu, 2006)
  - There is a group of characters used more frequently in adapting loans, most carrying neutral or positive meanings.
- Non-depressing & Depressing onset consonants:
  - Depressing onset consonants: sonorants, voiced stops, voicess fricatives, & voiceless affricates.
  - Non-depressing onset consonants: unaspirated stops, voiceless fricatives, & voiceless affricates. (C.Wu, 2006)

**Research Questions**

1. Are high-level tone and rising tone truly the preferred ones to adapt initial stress in disyllabic loans as shown in the corpus?
2. Based on the onset of the initial stress, how perceptually similar are the initial stress of disyllabic English loans and Mandarin tones?
3. What role do character factors play in adapting disyllabic English loans?

**Experiment 1**

- Names of 40 places, initially stressed disyllabic words (20: non-depressing onset consonants, 20: depressing onset consonants), produced by an American English speaker.

**Experiment 2: Auditory only**

- 24 tokens from Exp. 1 as the English tokens. (12 each)
- Each English token grouped with 2 Chinese tokens, the 2 most transliterated forms from Exp. 1 responses, produced by a Mandarin speaker.
- 8 native speakers of Mandarin from Taiwan
- An AXB identification test for each English target; A and B: Chinese, X: English, ISI: 1 sec.
- Ex: AXB 子孙子孙子孙 子孙子孙子孙
- Whether X sounds more A or B, on a response sheet.

**Experiment 2 Results**

![Fig. 1: The percentage of each tone used in each group](image1)

- Non-depressing onset consonants:
  - the predicted high level tone is generally the perceptually closest tone to the initial stress
  - Depressing onset consonants:
  - the predicted rising tone is not necessarily the best match to the stress in English perceptually; other tones are perceptually similar as well

**Experiment 3:**

**Auditory & Orthography**

- An identical AXB test with scripts of English orthography and Chinese characters

**Experiment 2&3 Results**

![Fig. 3: Comparison of results without and with script](image2)

- Non-depressing:
  - 27% predicted high level
  - 53% predicted rising
- Depressing:
  - 73% predicted high level
  - 44% predicted rising

- The influence of characters is significant (Chi-square, p=0.026) in initially stressed disyllabic words with non-depressing onset consonants.
- When the onset consonant is depressing, the adapted forms are more variant. The influence of characters cannot be determined.

**Discussion**

- Character factors: to avoid an infrequently-used character even if it is the preferred tone. Ex: “Hooper” adapted with a rising tone with script while it’s perceptually closer to the high level tone.
- Depressors needs to be clearly defined, specifically what makes aspiration a depressor. Ex: the aspirated /k/

**Conclusion**

1. High level tone and rising tone are favored but not necessarily the best in adapting the initial stress in English disyllabic loanwords.
2. With a non-depressing onset consonant, the initial stress is perceptually similar to high level tone whereas the initial stress with a depressing consonant is not so similar to rising tone.
3. Tonal adaptation of the stress in English: the output of the perceptual assimilation is modified by character factors.

**References**


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