Information-Stress Principle in Cantonese

LAU, Chaak Ming
The University of Hong Kong /
Kyushu University

Background

- It is known that
  - Cantonese syllables are perceptually isochronal
- However
  - Some syllables are indeed far shorter than others

Problem

- Question
  - What?
  - How much?
  - Why?
- Solution
  - Information-stress Principle (Duanmu 2007)

Outline

- Cantonese stress
  - Shorter syllables
  - Quantity Sensitivity (Lai 2002)
- Methodology
  - Cantonese speech → duration measurement
- Results
- Information Stress Principle (Duanmu 2007)
  - Info ↑ stress ↑

Cantonese Stress

- Lack of clear word stress
  - No ‘light words’
    (cf. Mandarin, Taiwanese, etc.)
- Perceptual Isochrony
  - Every syllable sounds equally long

Syllables with shorter duration

- Shortened syllables
  - 阿 (aa3, hypocoristic marker)
  - 唔 (m4, negative morpheme)
- ½ of normal syllables

Lai (2002)

- Classifiers are also shorter
  - Explained by an iamb
- Mono-moraic syllables
  - Aspect markers
    - e.g. 咗 zo2
  - Classifiers
    - e.g. 個 go3 (my example)
      個 電話 響緊
      cl./phone/ring-PROG

Some questions

- 1. Underlyingly monomoraic?
- 2. Are they equally short?

Methodology

- Idea
  - Measure the duration of syllables
    - If ‘isochronal’, syllables should have similar lengths
- My focus
  - Durations in a 4-syllable sequence (Verb, Particle, Classifier, Noun)
  - [$_{VP}$ 睇咗 [$_{NP}$ 本書]] (tai2zo2 bun2syu1)
    read-PER CL-book
    read a book

Methodology

- 13 subjects were recruited
- Subjects were
  - given a script (with 8 dialogues)
  - Instructed to read it out as if it is a real conversation
- Recorded Sounds
  - contained 13 VPs with the above structure
  - Only the VPs were analysed

Data Analysis

- Data discarded
  - VPs with long pauses / laughs between syllables
  - VPs in which any syllables were skipped
- Data obtained
  - 147 VPs from 13 subjects
- Segmentation
  - Manually separated into syllables by Praat

Data Sample

Results

- Average
  - V+PRT (296ms) NP (518ms)
  - V (177ms) P (119ms)
  - CL (179ms) N (339ms)
- Paired t-tests
  - V+PRT vs. NP $t(145) = -21.514, p < 0.0001$
  - Verb vs. Particle $t(145) = 14.3166, p < 0.0001$
  - Classifier vs. Noun $t(145) = 18.3805, p < 0.0001$
  - Classifier vs. Verb $t(145) = -0.4318, p = 0.66670$
    - Verbs are not significant shorter than classifiers

Conclusions

- Long last syllables (Noun)
  - Phrase-final lengthening?
- Verb > Particle
- Noun > Classifier
- NP > VP
- Classifiers ~ Verb

Moraic Account?

- Verbs have similar lengths with Classifiers
  - Both are underlyingly bimoraic
- Possibility
  - Higher level stress?
    - E.g. phrasal stress?

Phrasal Stress

- Phrasal stress assignment
  - NPs are stressed
- English
  - JOHN loves MARY
  - Subjects and objects receive phrasal stress
- Cantonese
  - Object NPs are longer than the verb (shown above)

Information-stress Principle

- The Information-Stress Principle (Dunamu 2007:144)
  - A word or phrase that carries more information than its neighbour(s) should be stressed.
- Information load (Shannon 1948, in Duanmu's wordings)
  - The more predictable a form is, the less information it carries.

Information-stress Principle

- In the phrase [X YP]
  - X, the head is more predictable than YP
  - → YP has a higher Information Load
  - → YP should receive stress

Proposal

- Length is the best phonetic correlate of Cantonese stress
- Lengthening of NPs may be due to their high ‘information load’. (ISP)
- Most underlying forms are bimoraic
  - Reduced syllables: lack stress -> shorter

To be done

- Measure
  - Nouns and verbs at different lengths
  - Syllable structure of classifiers
    - Difference between CV classifiers and CVC classifiers

Future Research

- Monosyllabic noun lengthening
  - Lengthening effect due to minimal word requirement
- Linguistic truncation
  - Monosyllabic tendency in verb truncation (Luke and Lau 2008)
  - Due to its unstressed position?
- Corpus check

Selected Reference

- Bauer, R. S. and Benedict, P. K. (1997) *Modern Cantonese Phonology*. Berlin ; New York : Mouton de Gruyter.
- Cheung, K-H. (1986). *The Phonology of Present-Day Cantonese.* University College London. PhD thesis.
- Duanmu, San (1993). Rime length, stress and association domains. *Journal of East Asian Linguistics.* **2,** 1-44.
- Duanmu, San. (2007). The *Phonology of Standard Chinese (2nd Edition).* Oxford University Press.
- Lai, Esther Yuk Wah. (2002). *Prosody and Prosodic Transfer in Foreign Language Acquisition: Cantonese and Japanese.* Lincom Europa.
- Luke, Kang-kwong, & Lau, Chaak-ming. (2008). On Loanword Truncation in Cantonese. *Journal of East Asian Linguistics*, *17*, 347-362.
- Shannon, C. E. (1948). A Mathematical Theory of Communication*. Bell System Technical Journal.* **27**, 379–423, 623–656.