2aSC35. Lexical stress without postlexical head-marking: Evidence from Tagalog

Victoria Anderson, Dept of Linguistics and LAE Labs, University of Hawai‘i at Manoa
vanderso@hawaii.edu

Introduction & Background

•Jun (2005) compares prosodic prominence in 21 languages

- Families represented: Australian, Basque, Bengali, Chinese, Persian, Germanic, Greek, Japanese, Kinande, Korean, Muskogean, Romance, Semitic, Slavic
- Among families not represented: Austronesian (the world's largest, numerically and geographically)
- Jun finds an implicational relationship between prominence types at lexical and post-lexical levels
  - Lexical prominence types include: tone, stress, pitch accent
  - Post-lexical prominence types include: head-marking, edge-marking
  - 14 of 21 languages in the sample mark lexical prominence with stress
  - All 14 use post-lexical head-marking
  - 4 additionally mark a phrase's edge(s)
  - No stress language employs postlexical edge-marking alone

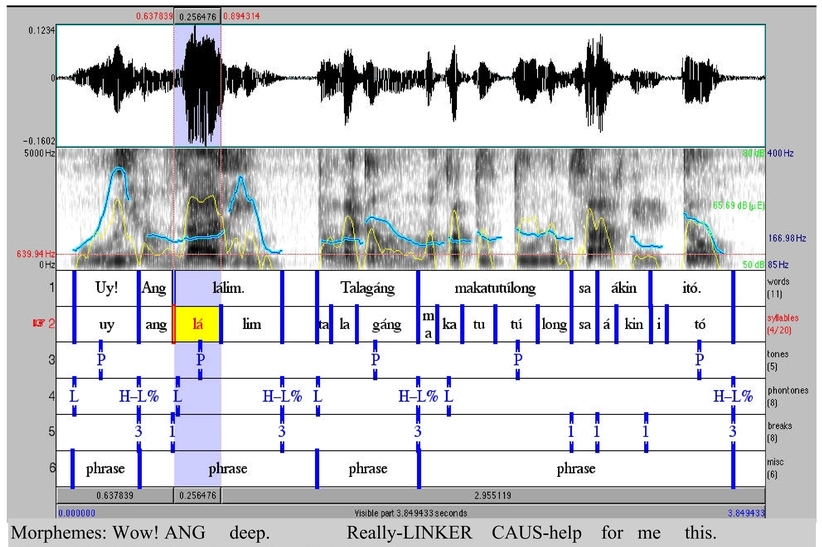
•Jun's generalization: Stress lgs. indicate phrasal prominence by placing post-lexical pitch accent on the phrase's headword.

•Does this hold for Tagalog (Austronesian, Central Philippine)?

- Lexical prominence type: stress

láyas *'leave'*	bálot *'package'*	búkas *'tomorrow'*	gáling *'from'*
layás *'carefree'*	balót *'fertilized egg'*	bukás *'open'*	galíng *'power'*

- Post-lexical prominence type: Pilot data suggest absence of head-marking.
  - Low pitch appears on the first syllable in a phrase, while high pitch appears on the last, suggesting postlexical edge-marking.



Morphemes: Wow! ANG deep. Really-LINKER CAUS-help for me this.
Gloss: 'Wow! How deep. This will really help me.'

Questions & Hypotheses

•Does Tagalog show typical acoustic hallmarks of post-lexical head-marking? If not, is it typologically novel?

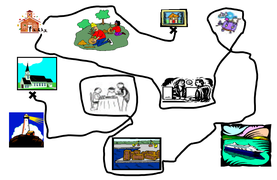
•Null hypothesis: Like other lexical stress languages, Tagalog robustly employs all of the following to mark phrasal heads:

- increased duration
- increased amplitude
- increased pitch prominence (greater pitch range or deviation from mean)

Speech Materials

•UH Tagalog corpus

- 6 female, 6 male native speakers of Manila Tagalog, age range 16-75.
- 5 speech tasks ranging from careful speech to casual speech:
  - Conversation: Loaded question
  - Map task
  - Story reading: *'Ibon at Tangkad'*
  - Story retelling from memory: *'Ibon at Tangkad'*. Pictures: Mayer, M. (1974).
  - Phonetically-controlled sentences largely composed of voiced segments. E.g.:
    Maganda ang nanay niya. *'Her/his mom is pretty.'*
  - Declaratives, wh-questions, y/n questions, etc.



•Data subset for current study: spkr F1 (age 56)

- Phonetically controlled declaratives
- Declaratives from story retelling
- 420 syllables in approximately 70 prosodic phrases

Labeling & Measurements

•Praat 4.5:

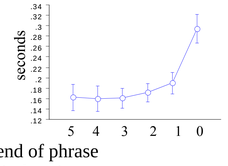
- Waveform, spectrogram, pitch track and intensity track displayed for each utterance
- Utterance annotated for:
  - word boundaries
  - syllable boundaries
  - lexical stress
  - phrasal prominence (as judged by native speaker)
  - for each syllable, its position in the phrase
    i.e.: final *(position 'zero')*, penult *(position 'one')*, antepenult *(position 'two')*, etc.

•For each syllable, duration, pitch range, and rms amplitude were measured.

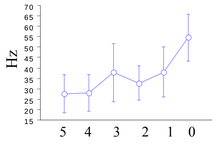
Results: position in phrase

•A syllable's position in a phrase strongly determines its duration, pitch range, and mean intensity.

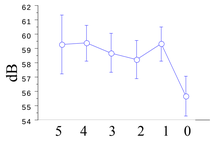
- Duration:
  - 1-way ANOVA*, effect of syllable position on duration: ***F*(5, 353)=41.548, p<.0001.**
  - Posthoc analysis**:
    - phrase-final syllables (position 'zero') are significantly longer in duration than syllables in positions 1, 2, 3, 4 and 5 away from end of phrase
    - Syllables in positions 1, 2, 3, 4, 5 do not differ significantly in their durations



- Pitch range:
  - 1-way ANOVA, effect of syllable position on pitch range: ***F*(5, 349)=6.057, p<.0001.**
  - Posthoc analysis: phrase-final syllable has significantly wider pitch range than syllables in positions 5, 4, 2



- Mean intensity:
  - 1-way ANOVA, effect of syllable position on mean intensity: ***F*(5, 353)=8.371, p<.0001.**
  - Posthoc analysis: syllables in positions 5, 4, 3 and 1 have greater intensity than phrase-final syllables

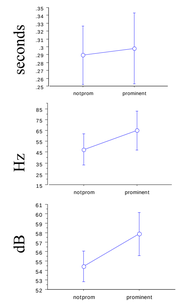


*Factorial analysis of variance, significance level: p≤ .01
**(Scheffé's *F* at 99% confidence interval)

Results: prominence vs. non-prominence

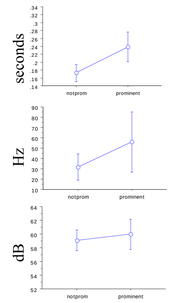
•For phrase-final syllables:

- Duration: No significant difference
  - 1-way ANOVA, effect of prominence on duration: ***F*(1, 77)=0.154, p=.6955.**
- Pitch range: Only marginal difference
  - 1-way ANOVA, effect of prominence on pitch range: ***F*(1, 77)=4.109, p=.0461**
- Mean intensity: significant difference
  - 1-way ANOVA, effect of prominence on intensity: ***F*(1, 77)=11.372, p=.0012**



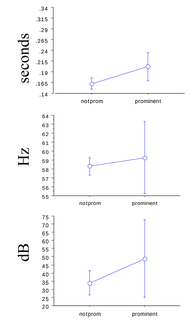
•For penultimate syllables:

- Duration: Significant difference
  - 1-way ANOVA, effect of prominence on duration: ***F*(1, 72)=17.131, p<.0001**
- Pitch range: Only marginal difference
  - 1-way ANOVA, effect of prominence on pitch range: ***F*(1, 71)=5.728, p=.0193**
- Mean intensity: No significant difference
  - 1-way ANOVA, effect of prominence on intensity: ***F*(1, 72)=0.716, p=.4003**



•For ante- and preantepenultimate syllables:

- Duration: Significant difference
  - 1-way ANOVA, effect of prominence on duration: ***F*(1, 130)=7061, p=.0089**
- Pitch range: Only marginal difference
  - 1-way ANOVA, effect of prominence on pitch range: ***F*(1, 127)=3.199, p=.0761**
- Mean intensity: No significant difference
  - 1-way ANOVA, effect of prominence on intensity: ***F*(1, 130)=0.740, p=.3913**



Discussion & Conclusion

•Robust prosodic effects of phrase-final position:

- Phrase-final lengthening
- Lower mean intensity
- Wider pitch range, suggesting presence of a phrasal tone associated with this position.

- Substantially weaker/more variable effects of 'prominence':
  - For phrase-final syllables
    - Presence of 'phrasal prominence' does not reliably affect duration or pitch range.
    - Probable reason: phrase-final lengthening and phrasal tones on these syllables override prominence effects
    - Mean intensity is significantly increased by prominence
  - For syllables in pre-final positions in the phrase:
    - Presence of 'phrasal prominence' significantly increases a syllable's duration, but does not reliably affect intensity or pitch range.
- Unlike 'typical' stress languages, Tagalog may not robustly mark phrasal heads.
- Further questions (currently under investigation):
  - How do listeners/acquirers retrieve lexical stress from the signal?
  - How active is lexical stress in Tagalog?
  - What constitutes phrasal 'prominence'?
  - Is this speaker representative of the behavior of other speakers, in other contexts?