

Prominence in Tagalog

Acoustic properties of stress within multisyllabic words

About This Project

This project investigates the acoustic properties of stress within multisyllabic words and determines the vocalic cues of prosodic prominence. Across languages, speakers understand stress as a significant variance in acoustic signals of a spoken word. This research extends the concept of a functional load, a distinguishing feature of a language that informs the identity of a phoneme, by studying prominence properties and contrastive properties. For example, languages in which vowel length defines contrast between words were compared to languages in which vowel length does not distinguish words.

Methodology

- In order to distinguish the lexical stress of a word in isolation from the stress assigned when spoken in context, two types of dialogues will be presented to native speakers of the language.
- The focus condition will emphasize the target word; the non-focus condition will emphasize a word after the target word. Differences in acoustic properties between the two dialogues will determine the role of lexical and sentential stress.

Methodology

- Recordings of exemplar words will be recorded by speakers of the language. The phonemes of the target words in the utterances are then isolated so that the acoustic properties of each syllable in the target words can be analyzed.
- Speakers will be natives of Manila, Philippines and their parents must be as well. Speakers must not speak another language other than English and should be 18-35 years old.

Methodology

- Target words will have a CVCVCV pattern. Stress in each position (initial, penultimate, and final) will be examined. Within each type of stress, words with the vowels /a/, /i/, and /u/ in each position will be comprise a group. Ten words of each group will be identified to be the target words.
- In order to determine which words should be used, phonological information about the language of interest is vital.

Phonology Introduction

- Tagalog [tagá ‘native of’ + ilog ‘river’] is an Austronesian language spoken primarily in the Philippines by ~27 million people as L1 (Nationalencyklopedin, 2007).
- Influences from English, [Spanish](#), Nahuatl, Sanskrit, Tamil, Malay, Indonesian, Chinese, Japanese, Arabic, and Persian are prevalent in commonly used loan words (Baklanova, 2004). French (1988) suggests that speakers consider some Spanish borrowings more natural than indigenous Tagalog words.
- Tagalog has VOS word order and is a syllable-timed language.

Vowels

	FRONT	CENTRAL	BACK
High	i		u
Mid	e		o
Low		a	

(Llamzon, 1966; Schachter & Otones, 1983; French, 1988; Comrie, 1990)

- The vowels /e/ and /o/ are not native to Tagalog were originally allophones of /i/ and /u/, respectively, as a result of influences from borrowings (Schachter & Otones, 1983; Comrie, 1990).
- Consequently, the orthography of words with allophonic variation often allows for both written forms (ex. *ate* or *ati* for ‘older sister’).

Consonants

	LABIAL	DENTAL	VELAR	GLOTTAL
Stops	p b	t d	k g	ʔ
Spirants		s		h
Nasals	m	n	ŋ	
Lateral		l		
Flap		r		
Glides	w	j		

(Llamzon, 1966; Schachter & Otanes, 1983; French, 1988; Comrie, 1990)

- The /f, v, ʃ, z, tʃ/ sounds only occur in borrowings: *kotse* [kó:tʃe/ 'car' (Schachter & Otanes, 1983; Comrie, 1990). Even so, sounds in the table above are preferred.

TABLE 1. REALIZATIONS OF TAGALOG PHONEMES

		STOPS AND THEIR ASSOCIATES										NON-STOPS					
		LABIAL			DENTAL				VELAR								
		/m/	/b/	/p/	/u/	/n/	/d/	/t/	/i/	/ŋ/	/g/	/k/	/∅/	/l/	/r/	/s/	/h/
⊂		m	b	p	w	n	d	t	j	ŋ	g	k	?	l	r	s	h
⊙					u				i				a				
-																	
⊂		m	b	p	w	n	r	t	j	ŋ	g	k	?	l	r	s	h
⊙					u				i				a				
⊃		m	b	p	u	m/n/ŋ	d	t	i	m/n/ŋ	g	k		l	r	s	
-																	
⊂		m	b	p	w	n	d	t	j	ŋ	g	k	?	l	r	s	h
⊙					o				i/e				a				
⊃		m	b	p	o	n	d	t	j	ŋ	g	k	h	l	r	s	?

Note: Phonemes are in first row, and syllabons in leftmost column.

Potet (1995)

Syllable Structure

- The syllable structure of Tagalog is either CV or CVC (Potet, 1995).
- A few sources posit that every word-final syllable is CVC when including /ʔ/ and /h/ as consonants (French, 1988; Schacter and Otanes, 1983).
- Clusters occur when the second consonant is a glide as the result of high vowel reduction: *diyan* [dyan] ‘there’, *buwan* [bwan] ‘month’.
- Otherwise, complex C onsets and codas occur in loanwords only.

Stress

- Stress falls on the penultimate or final syllable (Baklanova, 2004).
- Vowel length is the best indicator of primary stress (Schachter & Otanes, 1983; Comrie, 1990; Baklanova, 2004).
- Unstressed vowels are not reduced, except in the case of the glides mentioned in the previous slide (Comrie, 1990).
- Stress is contrastive, and minimal pairs are not distinguished by modern orthography although a diacritic system has been utilized in older literature (Schachter & Otanes, 1983; Baklanova, 2004).

Stress Shift

- Primary stress shifts to the syllable to the right when verbal suffixes (-an, -in) are added (French, 1988):
 - tasa* [tá:sah] ‘assessment’ + *-an* →
tasahan [tasá:han] ‘assess’
- Note that these are –VC affixes and will most likely not be used for the purposes of Stress Lab.

Affixes

- Verbs can take
 - a prefix,
 - a suffix,
 - an infix,
 - a prefix and a suffix together,
 - or a prefix and an infix together (French, 1991).
- Prefixing and infixing are most common.

Infixes

- The two Tagalog infixes always occur after the initial C of the root (Wolfenson, 1906):
- -um-: infinitive or preterite marker
 - *súlat* ‘write’ → *sumúlat* ‘to write’
- -in-: preterite or present passive marker
 - *súlat* ‘write’ → *sinúlat* ‘written’
- Borrowed words are treated likewise, even with foreign phones:
 - charge → *chinarge* ‘charged’

Relevant Prefixes

- **ka- + NOMINAL ROOT:** person associated with nominal root
 - *ka-* + *kuwarto* ‘room’ → *kakwarto* ‘roommate’
 - In a few cases, the first syllable of the nominal root is reduplicated:
ka- + pRED + *bayan* ‘country’ → *kababayan* ‘compatriot’
- **pa- + VERB ROOT:** causative
 - *pa-* + *tago* ‘keep’ → *patago* ‘something caused to be kept’
- **ma- + NOMINAL/ADJ ROOT:** emphasizing particle OR adjective marking particle (from *may* ‘there is/are’)
 - *ma-* + *laki* ‘big’ → *malaki* ‘very big’
- **CV-** reduplication

Reduplication

- One of Tagalog's hallmark features is reduplication. This usually indicates emphasis or plurality (Blake, 1917).
- partial reduplication
 - plurality
mabúti 'good' → *mabubúti* 'good-PL'
 - denotes distribution
magkanó 'how much' → *magkakanó* 'how much apiece'
 - restrictive meaning
piso 'peso' → *pipiso* 'only one peso'
 - verb forms
laro 'play' → *naglalaro* 'play-PRES'

Reduplication (cont)

- full reduplication

- with nominal roots: ‘every ROOT’

áraw ‘day’ → *araw-áraw* ‘every day’

- with numerals: ‘at a time’

dalawá ‘two’ → *daladalawá* ‘two by two’ (still partial but classified as full by Blake (1917))

- diminutive

táwo ‘man’ → *tawotawóhan* ‘little man’

mabúti ‘good’ → *mabutibúti* ‘pretty good, somewhat good’

- combined

- even further restriction

píso ‘peso’ → *pipisopíso* ‘only a single piso’

Summary of Phonological Properties

- Tagalog has a simple phonological system with CVC as the maximal syllable structure for native words.
- Loanwords are well-integrated into the lexicon and are treated as native words, evidenced by affixing behaviors. These allow for more complex syllables.
- Tagalog is primarily prefixing. There are 2 infixes and 2 suffixes.
- Reduplication can be partial, full, or combined. Some roots contain reduplicated syllables while others are generated morphologically.

Sample Target Words

Orthography	IPA	Part of Speech	Gloss
pakita	pa ^h í ^h ta	n	demo, sample
pabasa	pa ^h ba ^h sa	n	reading of the Passion
kasama	ka ^h sa ^h ma	n	partner, companion
sakada	sa ^h ka ^h da	n	underpaid outsourced laborers
sagasa	sa ^h ga ^h sa	adj; n	reckless; plunge
batuta	ba ^h tu ^h ta	n	association, club
bakuna	ba ^h ku ^h na	n	vaccination
bagito	ba ^h gi ^h to	n	amateur
pasibi	pa ^h si ^h bi	n	shed joined to side of house, balcony
kabibi	ka ^h bi ^h bi	n	valve, clam shell, mussel

Carriers for Target Words

Focus Condition

Raul: Ano sinabi ni Maria sa umaga?
what was said by Maria in morning

What did Maria say in the morning?

Marites: Sinabi ni Maria "manok" sa umaga.
was said of Maria "chicken" in morning

Maria said "chicken" in the morning.

Carriers for Target Words

Non-Focus Condition

Raul: Sinabi ni Maria “manok” sa kahapon?
 was said by Maria “chicken” in afternoon

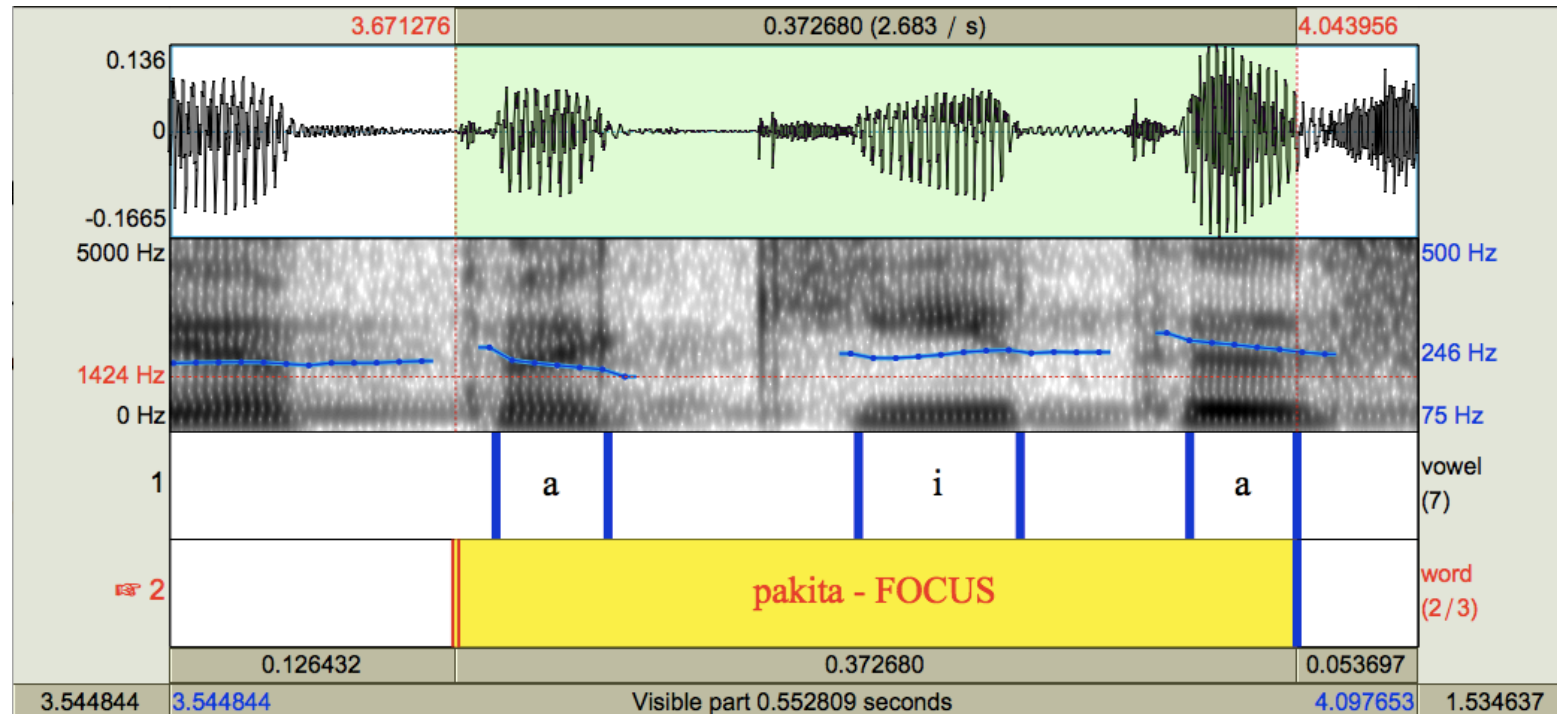
Did Maria say “chicken” in the afternoon?

Marites: Hindi, sinabi ni Maria “manok” sa umaga, hindi sa kahapon
 no was said of Maria “chicken” in morning, not in afternoon

Maria said “chicken” in the morning, not in the afternoon.

Sample Data

- Here is a spectrogram of a female speaker reading the dialogues. The target word has been isolated, and the vowels of interest have been identified.



Analysis

- Once all the dialogues have been recorded by multiple speakers, each identified vowel will be analysed for fundamental frequency, duration, intensity, phonation, and spectral properties through the programs Praat and R.
- The stress predictability of each acoustic property will then be calculated by a percentage.

Anticipated Results

- This study distinguishes between lexical stress and sentential stress.
- Because duration is often cited as the most notable indicator of stress in Tagalog, this property is expected to be the most predictive of stress in our study as well.
- I have observed Tagalog to display dynamic sentence prosody. Pitch slope is expected to be a prominent predictor of stress.