Southern Vietnamese & Cantonese Tone Changes and Reduplication
Alvin Vuong

Abstract

This paper discusses several rules for the tone changes and reduplications of Cantonese, a Sino-Tibetan language spoken in the Guangdong Province of Southern China, and Southern Vietnamese, an Austro-Asiatic language spoken in South Vietnam. Recording data was elicited by a native speaker of both languages. This data slightly revises the findings of Hashimoto, and partially supports the analysis of Nguyen (2007).

Hoàng (1965) was used mainly to document a Vietnamese phonemic inventory for my speaker. Hashimoto (1972) documents various Cantonese tone change and reduplication rules, including contextual tone change and tone sandhi. Where contextual tone changes are optional, tone sandhi is not. Nguyen's paper (2007) on stress and tone sandhi in Vietnamese describes a phenomenon called within-register tonal harmony where tone sandhi is applied in order to achieve a more natural pitch sequence. This paper also describes another phenomenon where first final stops are replaced with nasals in reduplicated contexts.

On the Cantonese, my speaker exhibited completely optional contextual tone change, but definite tone sandhi as described by Hashimoto. On the Vietnamese, my speaker exhibited within-register tonal harmony but not first final stop nasal replacement, partially backing Nguyen's conclusions.

This analysis largely backs Hashimoto's optional contextual tone changes and tone sandhi rule. It also provides data counter to one of the rules that Nguyen (2007) proposes – first final stop nasal replacement, but it supports within-register tonal harmony. It also

extends the tone change and reduplication rules discussed by Nguyen, by also examining phrase boundary interactions.

1. Introduction

Cantonese (referred to as Yue) is a Sino-Tibetan, Chinese language from the Guangdong Province of Southern China; it is spoken by almost 63 million people around the world. Vietnamese is an Austro-Asiatic language, of the Viet-Muong subgroup, with origins from the country of Vietnam in Southeast Asia (Ethnologue 2005). Currently, there are over 75 million speakers in all countries throughout the world. The writing system of Vietnamese began as an adjusted Chinese character system, but today uses the Latin alphabet with various diacritics to indicate tones, as well as special characters. There are three main dialects of spoken Vietnamese: Northern (Hanoi), Central (Hue), and Southern.

I aim to document and analyze the influences of tone changes in and out of reduplications in Southern Vietnamese on the tone changes in and out of reduplications in Cantonese, based on data and evidence elicited from a native speaker of both languages.

My consultant for this project, Tony Vuong, is a native speaker of both Cantonese and Southern Vietnamese. He grew up in various parts of South Vietnam and other parts of Southeast Asia (many refugee camp relocations due to the Vietnam War). He speaks both Cantonese and Vietnamese at home as well as with relatives and at various times for social use as the opportunity arises, such as eating at a Chinese restaurant. Since coming to the United States, he has also learned American English, though not fluently. He can read Chinese orthography in various forms, but rarely ever has the need to write.

This project will begin with an analysis of Cantonese phonology as given in Hashimoto 1972 and an analysis of Vietnamese phonology as given in Hoàng 1965. Both books survey the

phonology of each language and include information about suprasegmental features (like tone) within each language. Hashimoto (1972) also provides rules for tone sandhi in Cantonese, as well as various contexts in which tone becomes altered in contextual speech. In order to look at tone change in reduplicated contexts for Vietnamese, I will have to reference Nguyen's 2007 paper, which discusses tonal harmony and reduplication.

2. Hoàng (1965), Hashimoto (1972), and Nguyen (2007)

The phonemic inventory of Southern Vietnamese, according to Hoàng (1965), is as follows:

(1) Vietnamese Consonants

	Bilabial	Labiodental	Alveolar	Retroflex	Palatal	Velar	Glottal
Plosive	p b		t tʰ d	ʈ	c	k g	
Nasal	m		n		ɲ	ŋ	
Fricative		f v	s	ʐ	ç	x	h
Approximant					j	w	
Lateral Approximant			l				

(2) Vietnamese Vowels

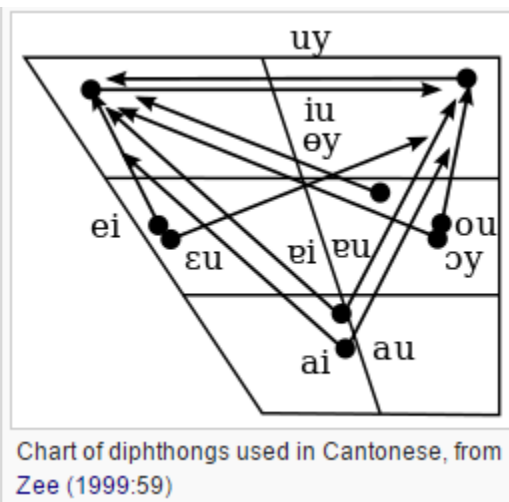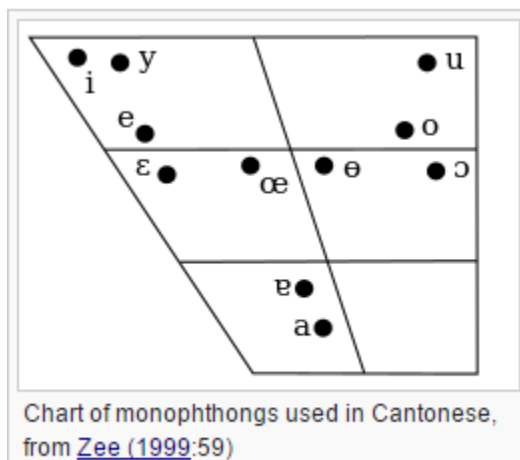|	Front	Central	Back
High	i	ɨ	u
Mid-High	e	ə	o
Mid-Low	ɛ		ʌ, ɔ
Low		a	s

The phonemic inventory of Cantonese, according to Hashimoto (1972), is as follows:

(3) Cantonese Consonants

	Bilabial	Labiodental	Alveolar	Postalveolar	Palatal	Velar	Glottal
Plosive	p pʰ		t tʰ			k kʰ kʷ kʷʰ	(ʔ)
Nasal	m		n			ŋ	
Fricative		f	s	ʃ			h
Affricate			t͡s t͡sʰ	t͡ʃ t͡ʃʰ			

Approximant					j	w	
Lateral Approximant			l				

(4) <u>Cantonese Vowels</u>

Chart of monophthongs used in Cantonese, from <u>Zee (1999</u>:59)

Chart of diphthongs used in Cantonese, from Zee (1999:59)

(5) <u>Vietnamese Tones</u>

According to Hoàng (1965), Vietnamese has a total of six tones (however, the Southern dialect uses only five; Southern speakers group two of the tones as the same tone). These are the level tone (*ngang*), the hanging tone (*huyền*), the sharp tone (*sắc*), the asking tone (*hỏi*), the heavy tone (*nặng*), and the tumbling tone (*ngã*). Many Southern speakers replace the tumbling tone with the asking tone.

Level	*ngang*	˧	(33)
Hanging	*huyền*	˩	(21)
Sharp	*sắc*	˦	(35)
Asking	*hỏi*	˨	(313)
Heavy	*nặng*	˧ʔ˩ʔ	(3ʔ1ʔ)
Tumbling	*ngã*	˧ʔ˥	(3ʔ5)

Both the heavy and tumbling tones have glottalisation, as noted above. The *ngã* tone is replaced by the *hỏi* tone by most Southern speakers, including my consultant.

(6) <u>Cantonese Tones</u>

According to Hashimoto (1972), there are traditionally nine tones in Cantonese. These tones can be classified as follows:

	Ping (Even)	Shang (Rising)	Qu (Going)	Ru (Entering) - High	Ru (Entering) - Middle
Yin (Upper)	˥ or ˥˥ (53) or (55)	˧˥ (35)	˦˦ (44)	˥ (5)	˦ (4)
Yang (Lower)	˨˩ or ˨˨ (21) or (22)	˨˦ (24)	˧˧ (33)	˧ or ˧˧ (3) or (33)	

The Ping, Shang, and Qu tones occur on open syllables, while the Ru tones occur on checked syllables. Open syllables are syllables which do not end in a stop consonant, while checked syllables do. Yin tones are upper range tones, and Yang tones are lower range tones. Ping tones are either falling or level, Shang tones are rising, and Qu tones are level. Ru tones are all level.

(7) <u>Tone Change in Cantonese</u>

Hashimoto (1972) states that there are various ways that tone can be modified in Cantonese. Tone can change for phonetic, semantic, and grammatical reasons (i.e. morphology). 'Sugar' or 糖 is /tʰɔːŋ˨˩/ or /tʰɔːŋ˨˨/. But 'candy' (also 糖) is /tʰɔːŋ˧˥/. The low falling tone changes into a mid-rising tone. This is contextual. Using tone change to indicate associated meanings, like unimportance or contemptuousness, can also be done.

For example, 'person' or 人 is pronounced as /jɐn˧˥/ with a mid-rising tone, while in the phrase, 'that guy' 個個人, 'guy' or 人 is pronounced as /jɐn˨˩/ with a low falling tone in order to indicate neutral emotion towards that person.

(8) <u>Reduplication & Tone Sandhi in Cantonese</u>

According to Hashimoto (1972), Cantonese is poor in tone sandhi. Nonetheless, the following rule is noted:

"Tone sandhi occurs with the Ping-tones or falling tones when followed by certain tones. A falling tone loses its falling contour and becomes a level tone if it is followed by another falling tone of the same pitch register. Thus, a high falling tone becomes a high level tone if followed by another low falling tone; and a low falling tone becomes a low level tone if followed by another low falling tone. In addition, the products of this tone sandhi have the same effect on the preceding falling tones." (p. 112)

This is shown in rule form:
        35 → 55   /__53/55/5
        21 → 22   /__21/22

One of the listed examples:
        時時來   si:˨ si:˨ lɐj˨   →   si:˩ si:˩ lɐj˨   'often come'

Hashimoto acknowledges that the Yang-Ping tone sandhi is rarely noticed due to the pitch level of the tone is so low that the distinction between a level and a falling tone is hard to hear.

It is currently debated as to whether or not tone sandhi exists in Cantonese. However, there is evidence of tone change (even if not specifically sandhi) especially with respect to reduplication.

(9) <u>Tone Change & Reduplication in Vietnamese</u>

Tone change in Vietnamese occurs similarly to Cantonese, in the sense that phonetic, semantic, and grammatical influences change the tone of a word.

But in addition to this, there are examples of reduplication tone alterations that occur as well. For example, *nhẹ* 'gently' changes to *nhè nhẹ* 'as gently as possible.'

In a paper that explores tone sandhi in reduplication for Vietnamese, Nguyen gives rules for what's called 'within-register tonal harmony.'

High register: Rising/Curve → Level

      Rising-Rising → Level-Rising   35 35 → 33 35

      Curve-Curve   → Level-Curve   214 214 → 33 214

Low register: Drop/Broken → Falling

      Drop-Drop   → Falling-Dropping   212 212 → 21 212

      Broken-Broken → Falling-Broken   214 214 → 21 214

According to Nguyen (2007), the tone sandhi reduplication only applies to dynamic tone contour sounds, such as rising-rising, dropping-dropping, etc. and not to even tones like level-level.

An example of Rising-Rising → Level-Rising tonal harmony is:

      ʂaŋ˦˥ ʂaŋ˦˥ → ʂaŋ˦ ʂaŋ˦˥   'rather bright'

Also according to Nguyen (2007), first final stops become replaced by nasals. This is explained to be due to the naturalness of the final voiced nasal in a word within reduplication.

This rule is not notated in Nguyen (2007) but would be notated as such:

      $[-continuant] \rightarrow [+sonorant] \: / \: \_\:]_{word}$ Bounding Domain: Phrase

For example, he lists:

p → m:

đẹp đẹp   pretty pretty   'rather pretty'   [ɗɛp˥ʔ˩ʔ ɗɛp˥ʔ˩ʔ] → [ɗɛm˨ ɗɛp˥ʔ˩ʔ]
→ đèm đẹp

t → n:
tốt tốt   good good   'rather good'   [tot˦ tot˦] → [ton˧ tot˦]
→ tôn tốt

c → ɲ:
sạch sạch   clean clean   'rather clean'   [ʂɐc˥ʔ˩ʔ ʂɐc˥ʔ˩ʔ] → [ʂɐɲ˨ ʂɐc˥ʔ˩ʔ]
→ sành sạch

k → ŋ:
khác khác   different different   'rather different'   [xak˦ xak˦] → [xaŋ˧ xak˦]
→ khang khác

3. Vietnamese Tone Change and Reduplication in the Speech of Tony Vuong

Differences in Vietnamese Sound Inventory (for this speaker)

Because I have already done a study of my speaker's Vietnamese for Ling 103, I already have a

phoneme chart for him that differs from Hoàng's. This is shown as follows:

	Bilabial	Labiodental	Alveolar	Retroflex	Palatal	Velar	Glottal
Plosive	p b		t tʰ d	ʈ	c	k kʰ g	
Nasal	m		n		ɲ	ŋ	
Fricative		f v	s				h
Approximant			ɹ		j	w	
Lateral Approximant			l				

Doesn't distinguish between /ç/ and /s/. Pronounces /ç/ as /s/. Uses [tç] rather than /c/. Uses /ɹ/

instead of /ʐ/. Uses /kʰ/ instead of /x/. Distinguishes between /k/ and /kʰ/. Pronounces

orthographic spelling 'v' as both /v/ and /w/.

Vowels were pronounced as described in Hoàng (1965).

Vietnamese Tones

Initially, I elicited Tony's Vietnamese tones. This was using the minimal set of the various tonal

productions of /ma/, items #1 through #5 on the word list. Notably, Tony's production of these

tones was exactly as expected, although for the heavy tone (*nặng*), instead of explicit

glottalisation, he produces a low creaky sound.

Vietnamese Tonal Harmony:

As described in (9), there exists a phenomenon called within-register tonal harmony. My speaker

followed these rules and matched what Nguyen (2007) found. Below are pictures of the
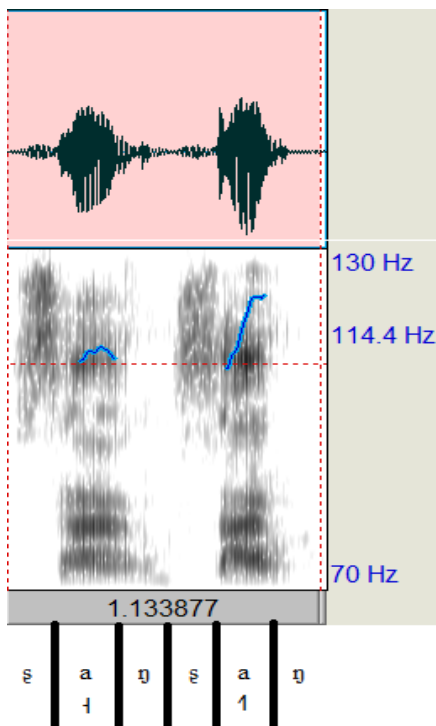
spectrograms with the pitch curves drawn on them.

Within-Register Tonal Harmony Rules:
High Register: Rising/Curve → Level:
Rising-Rising → Level-Rising:
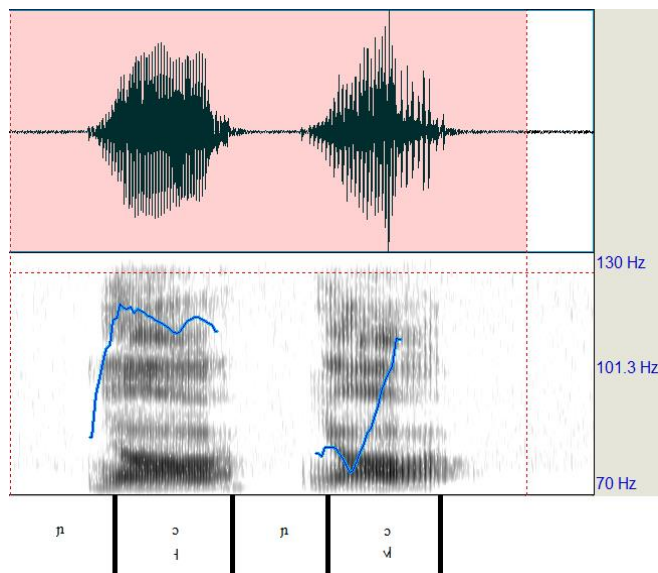   35 35 → 33 35 (Nguyen 2007)

      sáng sáng   bright bright   'rather bright'   [ʂaŋ˧˥ ʂaŋ˧˥] → [ʂaŋ˧ ʂaŋ˧˥]
      → sang sáng

Curve-Curve → Level-Curve:

    214 214 → 33 214 (Nguyen 2007) or 313 313 → 33 313 (Hoang 1965)

    nhỏ nhỏ   small small   'rather small'   [ɲɔˇ ɲɔˇ] → [ɲɔ˧ ɲɔˇ]
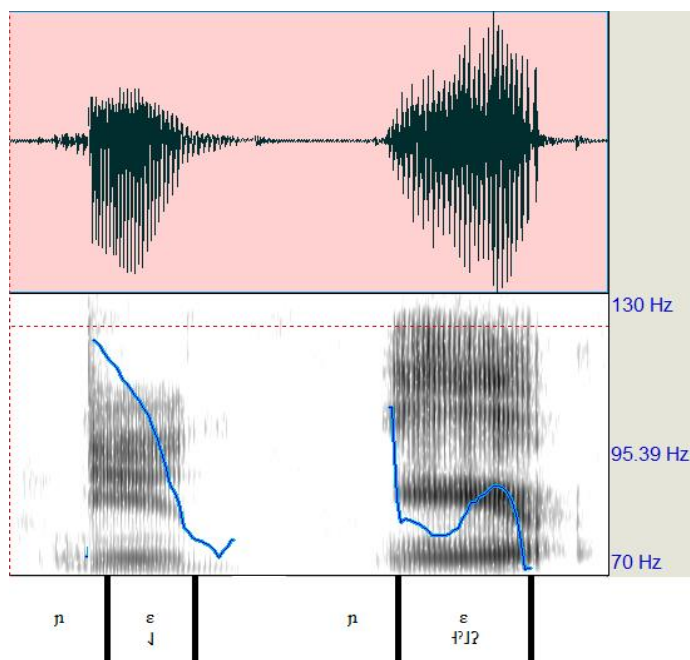   → nho nhỏ

Low Register: Drop/Broken → Falling:

Drop-Drop → Falling-Dropping:

    212 212 → 21 212 (Nguyen 2007) or 3ˀ1ˀ 3ˀ1ˀ → 21 3ˀ1ˀ (Hoang 1965)

    nhẹ nhẹ   light light   'rather light/gently'   [ɲɛ˦ˀ˩ˀ ɲɛ˦ˀ˩ˀ] → [ɲɛ˩ ɲɛ˦ˀ˩ˀ]
    → nhè nhẹ

Broken-Broken → Falling-Broken:

      214 214 → 21 214 (Nguyen 2007)

      Not including this reduplication because the broken tone (*ngã*) isn't used by the

Southern Vietnamese dialect. My speaker does not use this tone.

      Now I include examples of cases where tonal harmonic changes are not needed. My

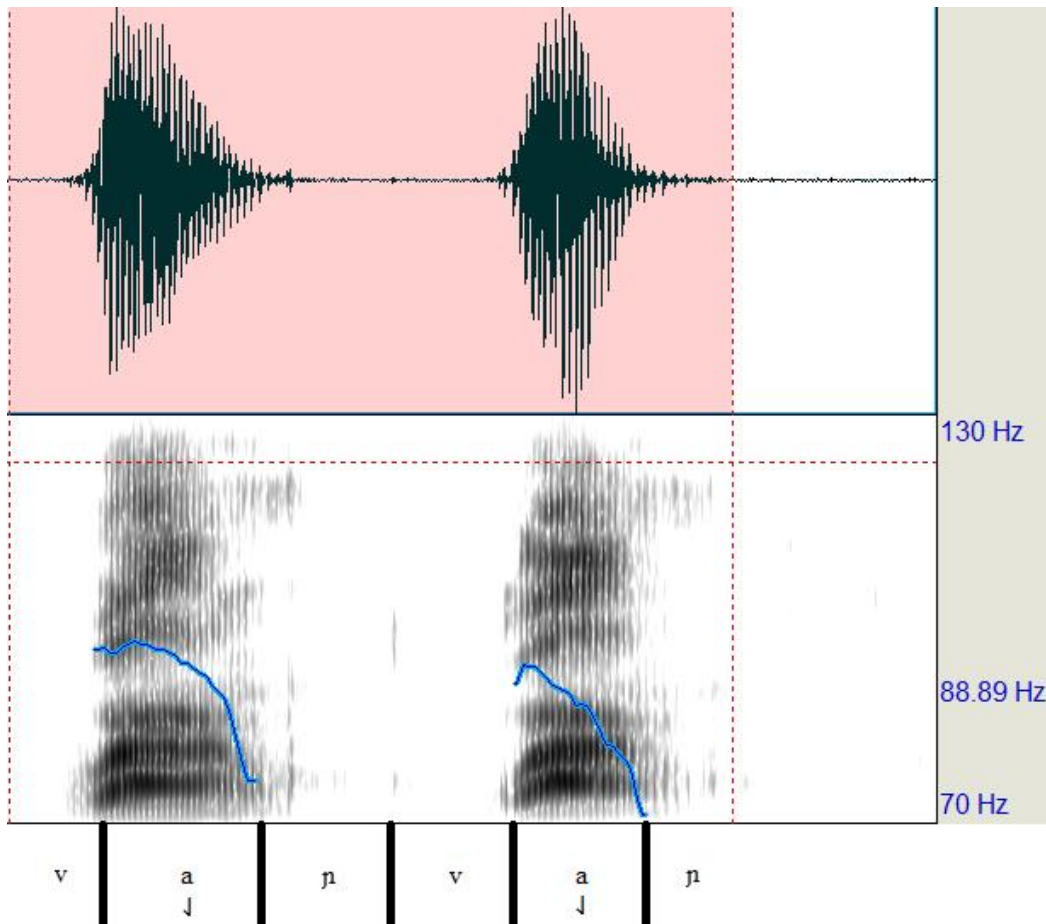speaker followed these as well (only one spectrogram included, due to simplicity).

Non-Tone Sandhi Reduplication:
Even-Tone: Level-Level:

    xanh xanh   blue blue   'bluish'   [sɐɲ˦ sɐɲ˦]

Even-Tone: Falling-Falling:

    vàng vàng   yellow yellow   'yellowish'   [vaŋ˨˩ vaŋ˨˩]

First Final Stop Nasal Replacement:

According to (9) and Nguyen's 2007 analysis, first final stops become replaced by nasals. This

was not the case for my speaker.

p → m:
    đẹp đẹp   pretty pretty   'rather pretty'   [dɛp˦ˀɹʔ dɛp˦ˀɹʔ]
t → n:
    tốt tốt   good good   'rather good'   [tot˦ tot˦]
c → ɲ:
    sạch sạch   clean clean   'rather clean'   [ʂɐc˦ˀɹʔ ʂɐc˦ˀɹʔ]
k → ŋ:
    khác khác   different different   'rather different'   [xak˦ xak˦]

4. Cantonese Tone Change and Reduplication in the Speech of Tony Vuong

Differences in Cantonese Sound Inventory (for this speaker):

First, I tested Tony's sound inventory for Cantonese (this was done without recording, just to see

if his matched with the source's). His phoneme inventory is the same as that of Hashimoto
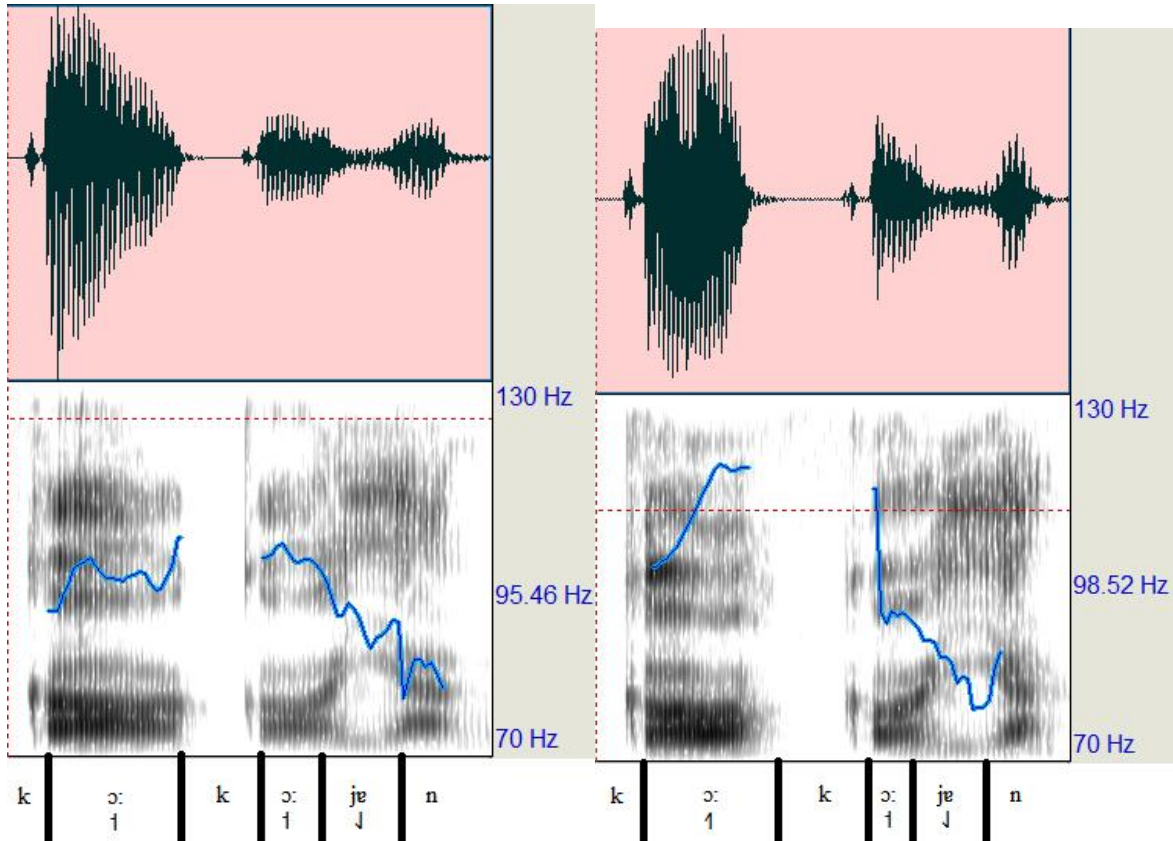
(1972).

Cantonese Tones:

After this, I elicited his Cantonese tones, items #6 through #14 on the word list. Similar to

Vietnamese, this was using a minimal set of the various tonal productions of /si/ and /sik/ or

/sek/. Tony's tonal production was exactly as expected.

Irregular Contextual Tone Change in Reduplication:

Next, a couple of irregular tone changes due to context were elicited to illustrate how context

affects tone and, therefore, meaning. (Only two spectrograms here, in order to show contrast for

one example pair.)

| 個個人 | all people | 'everybody' | [kɔ:˩ kɔ:˩ jɐn˩] |
| 個個人 | that one person | 'that one person' | [kɔ:˥ kɔ:˩ jɐn˩] |

As you can see the first tone on the first syllable changes the phrase to mean something slightly different. This occurs in the other examples as well.

Regular Contextual Tone Change in Reduplication:

As described in (7) by Hashimoto (1972), reduplication is a way of changing the context of an adjective, now we elicit reduplications that affect the meaning in certain ways:

Reduplication to mean 'very/extremely':

> This contextual tone change applies for my speaker sometimes. My speculation is that
>
> sometimes without the emotion behind the phrase, there is no tone change, making this

tone change completely optional. Reduplication changes the meaning; tone change

exaggerates and emphasizes it.

For example, it applied here:

好好   good good   'very good/well'   hou˨ hou˨ → hou˧˥ hou˨

But not here:

怕怕   afraid afraid   'very afraid'   pa:˨ pa:˨
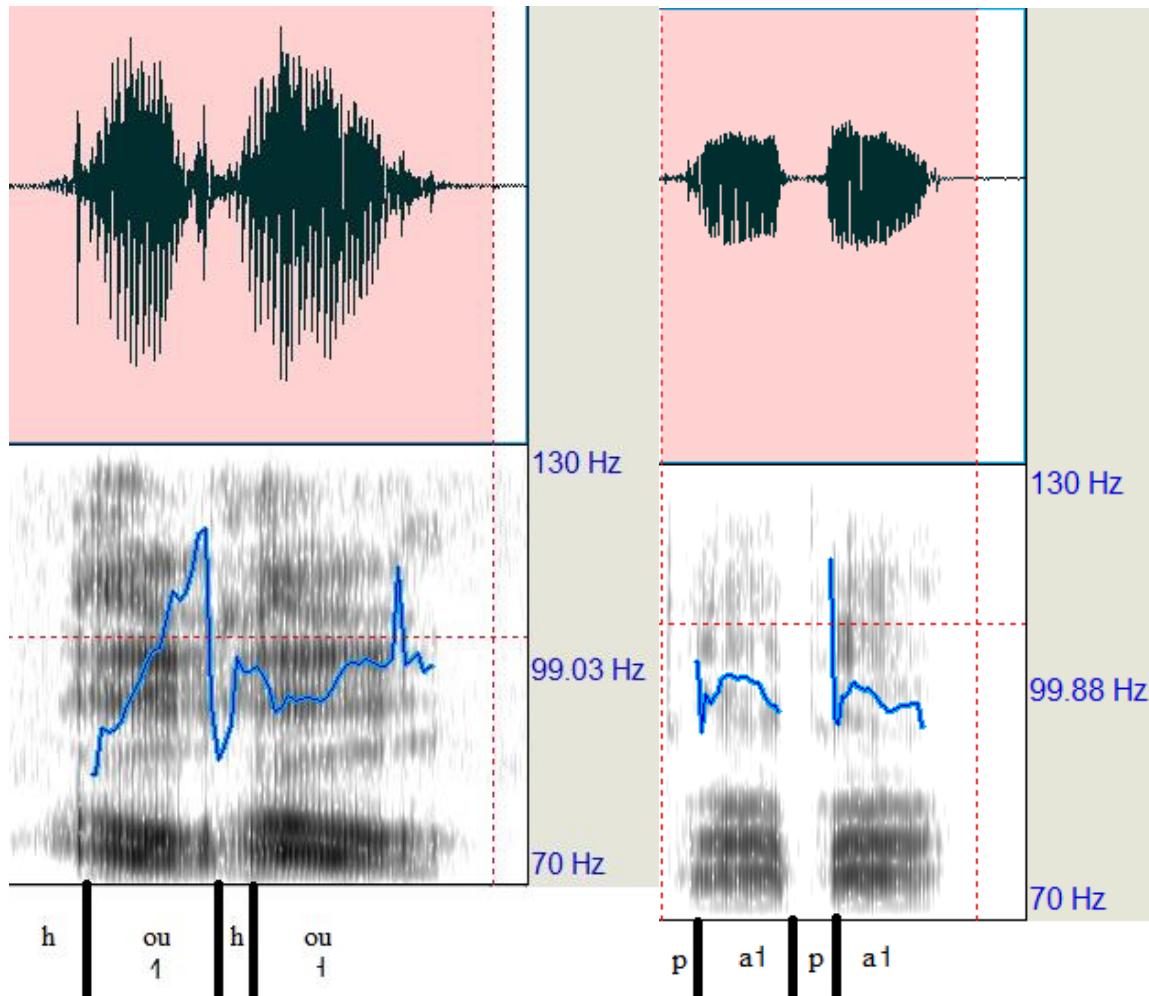
Reduplication to mean 'a little' (optional tone change):

My speaker does not apply this optional change. He just reduplicates it with the original tone

sequence.

For example, in:

亮亮哋   pretty pretty little   'a little pretty' [lɛ:ŋ˦ lɛ:ŋ˦ tej˦˥] or [lɛ:ŋ˦ lɛ:ŋ˥ tej˦˥]

He produces the former: [lɛ:ŋ˦ lɛ:ŋ˦ tej˦˥] with no tone change.

Reduplication to mean 'measure by measure' (optional tone change):

My speaker does not apply this optional change. He just reduplicates it with the original tone

sequence.

For example, in:

一日日   one day day   'day by day'   [jɐt˥ jɐt˦ jɐt˦] or [jɐt˥ jɐt˥ jɐt˦]

He produces the former: [jɐt˥ jɐt˦ jɐt˦] with no tone change.

It seems like contextual tone change is largely optional depending on the emotion of the speaker.

Tone Sandhi:

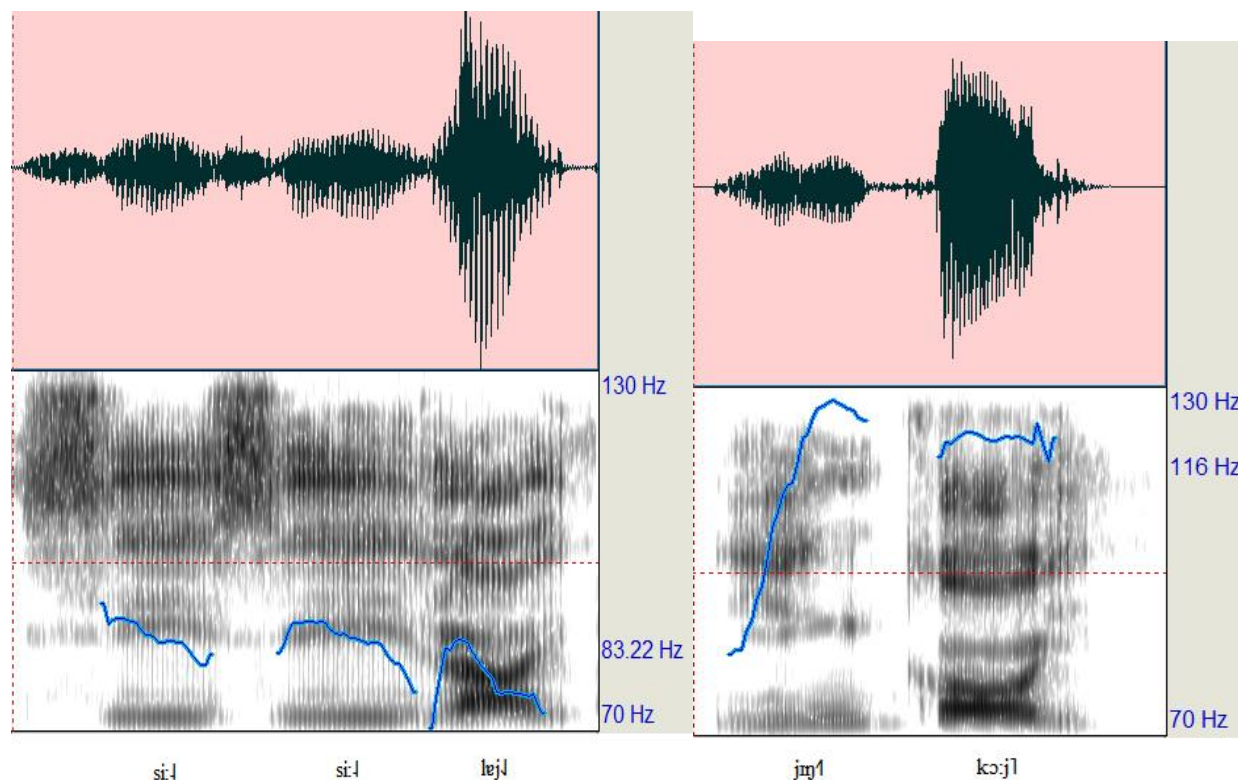Now we look at tone sandhi in Cantonese. The following are the aforementioned rules:
        35 → 55   /__53/55/5
        21 → 22   /__21/22   (Hashimoto 1972)

In both examples below, my speaker follows these rules.
時時來	time time come	'so often comes'	[si:˩ si:˩ lɐj˩] → [si:˦ si:˦ lɐj˩]
應該	should that	'should/must'	[jɪŋ˥ kɔ:j˥˧] → [jɪŋ˥ kɔ:j˥]

5. Tone Sandhi across Phrase Boundaries

Vietnamese Tonal Harmony across Phrase Boundaries:
What Nguyen (2007) did not test for was whether or not his rule was bounded by a phrase or by

an utterance.

In order to test for this, I created two phrases that might occur next to each other in typical
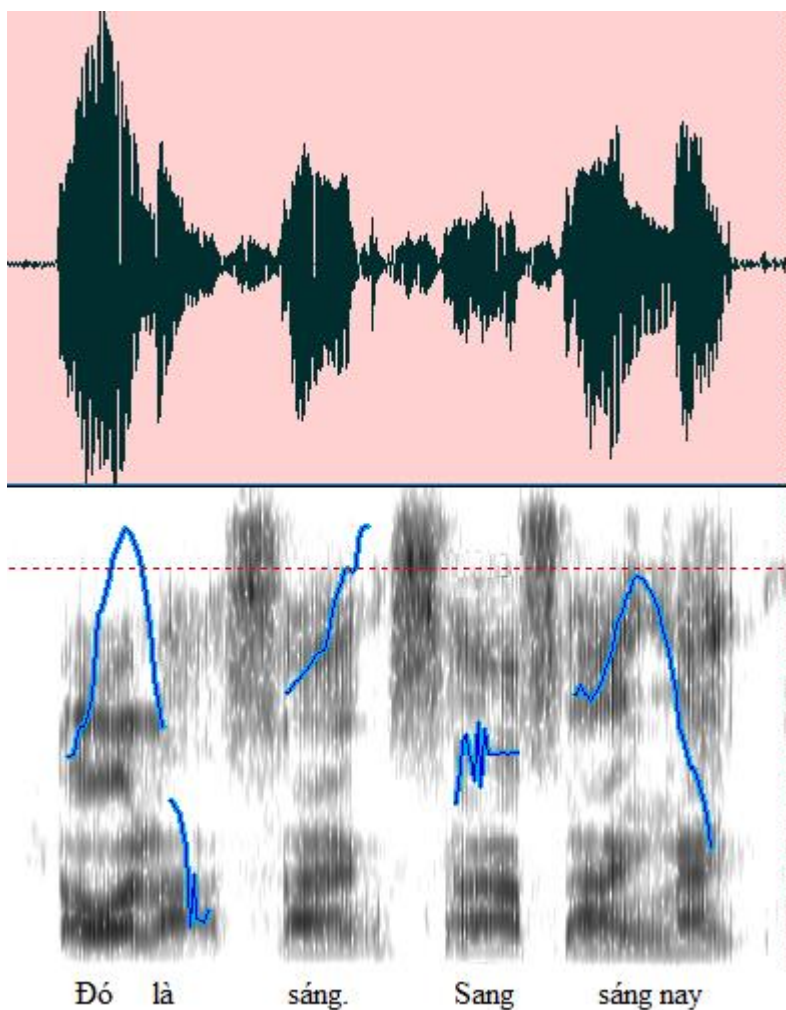
speech.

Vietnamese Tonal Harmony:

      Đó là sáng. Sáng sáng nay.   'It is bright. Rather bright today.'

          If phrase bounded: sáng. Sang sáng

          If utterance bounded: sang. Sang sáng

     This was the resulting recording spectrogram:

Đó   là   sáng.   Sang   sáng nay

Seems like the rule is phrase-bounded! This adds to Nguyen's analysis.

<u>*Cantonese Tone Sandhi across Phrase Boundaries*</u>
We try to do the same with Cantonese. However, this becomes inconclusive.
As context definitely affects this phrase.

我好。好好人。   'I'm good. Very good people.'

ɲɔ˧˥ hou˧˥. hou˧˥ hou˧˥ jɐn˩.

6. Audio Recording

In order to show the aforementioned aspects of Tony's speech, I recorded the elicitation

of the word list in the appendix. This list includes the orthography, gloss, underlying form, and

IPA transcription.

7. Conclusion

It doesn't seem like there are any special interactions between the two languages in particular for my speaker. Both languages use contextual tone changes as a means for emphasis and exaggeration. However, the rules that govern tone sandhi in both languages don't seem to interact, at least in the reduplicated and non-duplicated contexts that I chose for elicitation. But my analysis definitely adds to the analyses of Hashimoto and Nguyen to provide more evidence for these rules of tone sandhi and reduplication.

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Appendix: Elicitation List & Sound File Contents

This is the elicitation word/phrase list that I used for my speaker.

The first few items are used to illustrate each Vietnamese and Cantonese tone in its regular form.

Here is the basic elicitation script of Vietnamese tones (excluding Tumbling (*ngã*) due to the Southern dialect) (Hoang 1965):

	Phoneme	Orthography	English Meaning	Transcription
1.	/˧/ (33)	ma	'ghost'	ma˧
2.	/˨˩/ (21)	mà	'but or yet'	ma˨˩
3.	/˧˥/ (35)	má	'cheek'	ma˧˥
4.	/˧˩˧/ (313)	mả	'tomb/tombstone'	ma˧˩˧
5.	/˧ˀ˨ˀ/ (3ˀ1ˀ)	mạ	'rice seedling'	ma˧ˀ˨ˀ

Here is the basic elicitation script of all possible Cantonese tones (Hashimoto 1972):

6.	˥ or ˥˥ (53) or (55)	詩	'poetry'	si:˥
7.	˧˥ (35)	史	'history'	si:˧˥
8.	˦ (44)	試	'test'	si:˦
9.	˨˩ or ˨ (21) or (22)	時	'time'	si:˨˩
10.	˨˦ (24)	市	'city'	si:˨˦
11.	˧ (33)	是	'yes'	si:˧
12.	˥ (5)	識	'knowledge', 'know'	sek˥
13.	˦ (4)	熄	'to put out'	sik˦
14.	˧ or ˧˧ (3) or (33)	食	'to eat'	sek˧

Now we get into reduplicated sounds within Vietnamese and Cantonese:

	Orthography	Gloss	English Meaning	Transcription
15.	sáng sáng → sang sáng	bright bright	'rather bright'	ʂaŋ˧ ʂaŋ˧˥
16.	nhỏ nhỏ → nho nhỏ	small small	'rather small'	ɲɔ˧ ɲɔ˧˩˧
17.	nhẹ nhẹ → nhè nhẹ	light light	'rather light/gently'	ɲɛ˨˩ ɲɛ˧ˀ˨ˀ
18.	xanh xanh	blue blue	'bluish'	sɐɲ˧ sɐɲ˧
19.	vàng vàng	yellow yellow	'yellowish'	vaŋ˨˩ vaŋ˨˩
20.	đẹp đẹp	pretty pretty	'rather pretty'	ɗɛp˧ˀ˨ˀ ɗɛp˧ˀ˨ˀ]

21. tốt tốt   good good   'rather good'   tot˥ tot˥

22. sạch sạch   clean clean   'rather clean'   ʂɐc˥˧ʔ ʂɐc˥˧ʔ

23. khác khác   different different 'rather different'   xak˥ xak˥

24. 個個人   all people   'everybody'   kɔ:˦ kɔ:˦ jɐn˨

25. 個個人   that one person   'that one person'   kɔ:˥ kɔ:˦ jɐn˨

26. 慢慢   slow slow   'slowly'   ma:n˦ ma:n˥

27. 一個人   one person   'one person'   jɐt˥ kɔ:˦ jɐn˨

28. 一個人   one person   'alone/single'   jɐt˥ kɔ:˦ jɐn˥

29. 好好   good good   'very good/well'   hou˥ hou˦

30. 熱熱   hot hot   'very hot (temperature)' ji:t˥ ji:t˦

31. 亮亮   pretty pretty   'very pretty'   lɛ:ŋ˥ lɛ:ŋ˦

32. 怕怕   afraid afraid   'very afraid'   pa:˦ pa:˥

33. 亮亮哋   pretty pretty little 'a little pretty'   lɛ:ŋ˦ lɛ:ŋ˦ tej˥

34. 怕怕哋   afraid afraid little 'a little afraid'   pa:˦ pa:˦ tej˥

35. 一日日   one day day   'day by day'   jɐt˥ jɐt˦ jɐt˦

36. 時時來   time time come   'so often comes'   si:˦ si:˦ lɐj˨

37. 應該   should that   'should/must'   jɪŋ˥ kɔ:j˥

38. Đó là sáng. Sang sáng nay.   'It is bright. Rather bright today.'
    do˥ la˨ ʂɐŋ˥. ʂɐŋ˦ ʂɐŋ˥ nai

39. 我好。好好人。   'I'm good. Very good people.'
    ɲɔ˥ hou˥. hou˥ hou˥ jɐn˨