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Term Paper

## **VIETNAMESE PHONOLOGY**

## **I. Introduction**

This project will analyze the phonetics of Vietnamese. Vietnamese is an Austro-Asiatic language, of the Viet-Muong subgroup, with origins from the country of Vietnam in Southeast Asia, according to Ethnologue. Currently, there are over 75 million speakers in all countries throughout the world (mainly in East & Southeast Asia, North America, Australia, and Western Europe), as of a 2007 census. Vietnamese also has the most speakers out of all the languages in the Austro-Asiatic language family, and it is the national language of Vietnam. 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. According to the UCLA Language Materials Project, Vietnamese is a tonal language, meaning that the semantics are affected by the pitch of speech. Various tones are used to indicate various meanings.

My speaker consultant is my father, Tony Vuong, who grew up in various parts of South Vietnam and other parts of Southeast Asia (many refugee camp relocations due to the Vietnam War). He is a native speaker of Southern Vietnamese, as well as Cantonese and Mandarin. He currently often speaks Vietnamese, as well as Cantonese, at home with relatives and also at various times for social use as the opportunity arises, such as eating at Vietnamese restaurants. Since coming to the United States, he has also learned American English, although not perfectly fluent. He can also read Vietnamese, but rarely ever has the need to write.

The main reference source that I will be using for Vietnamese phonology and phonetics will be *A Phonological Contrastive Study of Vietnamese and English*, by Hoàng Thi-Quỳnh-Hoa. This source is Hoa's master's thesis which was submitted to the Texas Technological College in

1965. It includes a comprehensive phonemic analysis of Vietnamese, including tones, vowels, and consonants. It even describes the prosodic features of the language. Within the analysis, Hoa's thesis provides breakdowns of the distribution of vowels and consonants with their allophones based on initial, medial, and final position of a word. There are various examples of words given throughout the paper. However, in order to generate a comprehensive word bank for example words for my speaker, I will be consulting the *Vietnamese-English Dictionary*, by Đinh Hoà Nguyễn. This way, I will be able to ensure that a thorough list of words for characterizing the phonetics of Vietnamese will be compiled and used.

## **II. Consonant Phonemes**

Vietnamese has a total of twenty-three various consonant phonemes (See the consonant phoneme charts in Appendix A), including plosives /p/, /b/, /t/, /t<sup>h</sup>/, /d/, /t̚/, /c/, /k/, /g/, fricatives /f/, /v/, /s/, /z/, /ç/, /x/, /h/, nasals /m/, /n/, /ɲ/, /ŋ/, and approximants /j/, /w/, /l/. However, my speaker only has a total of twenty-two consonant phonemes, including plosives /p/, /b/, /t/, /t<sup>h</sup>/, /d/, /t̚/, /c/, /k/, /k<sup>h</sup>/, /g/, fricatives /f/, /v/, /s/, /h/, nasals /m/, /n/, /ɲ/, /ŋ/, and approximants /ɹ/, /j/, /w/, /l/. This is due to replacements and substitutions of various phonemes, as described in the following sections.

### **IIa. Stops**

Vietnamese phonemically uses a total of nine stops (my speaker uses ten): the voiced and voiceless bilabial stops /p/ and /b/, the voiced and voiceless alveolar stops /t/ and /d/, the voiceless retroflex stop /t̚/, the voiceless palatal stop /c/, and the voiced and voiceless velar stops /k/ and /g/. Vietnamese speakers also phonemically distinguish between an unaspirated /t/ and an aspirated /t<sup>h</sup>/. Surprisingly, my speaker does not use any palatal stops /c/ but rather always replaces them with a palatal affricate [tç] whenever the orthography of 'ch' shows up in written

language. Thus, phonemically we still use /c/, but allophonically, my speaker uses [tç]. Also, my speaker uses an aspirated version of the velar stop /k<sup>h</sup>/ as a phoneme as a replacement to the velar fricative /x/. The manner in which he uses /k<sup>h</sup>/ is similar to the manner in which the aspirated alveolar stop /t<sup>h</sup>/ is used.

In Vietnamese, stops in word-final position are never released in regular speech. Due to the nature of word list prompting, there might be some releasing in this recording. However, in regular speech, no stop is released. This can be seen in Appendix A Section V #57-64. One can see the difference between the unreleased stops and the continuous nasals.

Interestingly, the phoneme /p/ is a defective phoneme in Vietnamese. It only ever occurs word-finally and never word-initially. /dɛp/ is one of the few words with final-position /p/.

## **Iib. Fricatives**

Generally, Vietnamese has seven fricative phonemes (my speaker has four): the voiced and voiceless labiodental fricatives /f/ and /v/, the voiceless alveolar fricative /s/, the voiced retroflex fricative /z/, the voiceless palatal fricative /ç/, the voiceless velar fricative /x/, and the voiceless glottal fricative /h/. My speaker only uses /f/, /v/, /s/, and /h/ phonemically. He uses an alveolar approximant /ɹ/ instead of retroflex fricative /z/, doesn't distinguish between /ç/ and /s/, and uses an aspirated version of the velar stop /k<sup>h</sup>/ as a phoneme instead of /x/.

According to sources, Southern speakers of Vietnamese often vary in replacing the retroflex fricative with various other sounds. It can be replaced with an alveolar approximant /ɹ/ (as my speaker does), a flap /ɾ/, a trill /r/, or a fricative tap or trill. Orthographically this sound is represented as the letter 'r'.

My speaker also doesn't phonemically distinguish /ç/ and /s/ (they are the same phoneme to him). Orthographically, 'x' (/ç/) and 's' (/s/) are the same phoneme. He pronounces them both as /s/.

'kh' is generally pronounced as the velar fricative /x/, but my speaker doesn't use /x/ at all. Instead he uses the aspirated voiceless velar stop as a separate phoneme.

My speaker pronounces the orthographic spelling 'v' as both the labiodental fricative /v/ and the velar glide approximant /w/.

### **Iic. Nasals**

Vietnamese phonemically has four nasals (and so does my speaker): the bilabial nasal /m/, the alveolar nasal /n/, the palatal nasal /ɲ/, and the velar nasal /ŋ/. My speaker follows the standard nasal phonemes, with no replacements or substitutions.

### **Iid. Affricates**

Vietnamese generally does not use affricate phonemes. However, my speaker consistently produces the affricate [tç] whenever the palatal stop phoneme /c/ appears. Phonemically, we still use /c/, but we note that my speaker uses the palatal affricate [tç].

### **Iie. Approximants**

Vietnamese has three main approximants (my speaker uses four): the glides /j/ and /w/ and the lateral /l/. My speaker uses /ɹ/ as a phoneme, as mentioned earlier, as a substitute for the retroflex fricative.

As mentioned before, my speaker pronounces the orthographic spelling 'v' as both the labiodental fricative /v/ and the velar glide approximant /w/. The velar glide approximant is also found within and at the end of certain vowel combinations (this will be discussed in Section III on vowels).

### **III. Vowel Phonemes**

Vietnamese has a total of eleven vowel monophthong phonemes. These are the front vowels /i/, /e/, /ɛ/, the central vowels /ɨ/, /ə/, /a/, and the back vowels /u/, /o/, /ʌ/, /ɔ/, /ɑ/. My speaker used all of these vowel phonemes. However, for many of the words' phonetic transcriptions, the vowel was very close or slightly off. Vowels in Vietnamese are often diphthongized, especially at the end of words or in vowel combinations, like in [təi]. My speaker uses all of these vowel phonemes phonetically and throughout the word list.

### **IV. Allophones**

In Vietnamese, there are various allophonic variations that are particularly noteworthy. When preceded by rounded vowels (/u/, /o/, /ɔ/), /ŋ/ becomes bilabialised. This was contrasted with the non-bilabialised /ŋ/ when preceded by a non-rounded vowel in the word list. The sound is hard to hear due to the nature of ending words, however, visually, it is very apparent. An example is [səðŋ<sup>w</sup>]. This is probably due to the rounding of the vowel; the lips are already rounded, so it is easier to just make a bilabial closure as a nasal than to make the velar nasal. This happens particularly in various speakers where sometimes /ŋ<sup>w</sup>m/ is heard. The nasal /m/ indicates bilabialisation has happened simultaneously with the velar nasal.

A similar bilabialised ending phenomenon occurs with final-position /k/ if preceded by rounded vowels as well. Note that non-rounded vowels never precede this stop consonant. In this case, the sound is very apparent, and sometimes sounds like the bilabial stop /p/ in some cases. This can even happen with some degree of glottalisation. For example, my speaker changed from saying [nɔk<sup>w</sup>] to [nɔʔ]. Indicatively, the /p/ in [ŋpɔp] and [kɔʔp] even though it's supposed to show [k<sup>w</sup>], illustrates the same concept. There is frontal lip closure nonetheless.

Unreleased stops in Vietnamese can lead to glottalisation of the ends of words.

Throughout the word list, this phenomenon occurred. One example is /cɪc/ which is pronounced as [tɕɪʔ] with a glottal stop instead of an unreleased /c/. This is a very prevalent phenomenon throughout the word list as well as Vietnamese speakers.

Another allophonic variation is the shortening of the vowel /i/ when followed by a dental /t/, bilabial /p/, or palatals /c/ and /ɲ/. This possibly occurs due to the fact that stops are unreleased by nature in Vietnamese, and thus by the deletion/glottalisation of the final stop consonant, the vowel itself becomes shortened as well. This can be seen with the shortening of /e/ when followed by certain consonants too. For example, in [dɛp̚] the /e/ is shortened to [ɛ].

Lastly, in order to illustrate vowel length when shortened by a consonant unreleased stop or nasal, we can also see that vowels are longer at the end of words. To truly see this, we prompt the word ‘y’ to get the production [i:]. This definitely shows the allophonic variation in vowel length of open syllables versus closed ones.

## **V. Suprasegmental Variation – Tone**

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. In order to look at tone in a systematically objective way, I used the pitch plots that Praat outputs on top of the spectrogram data window as a reference. When the context of the word is not clear, tone is actually not emphasized. Only when my speaker was making the /ma/ tonal minimal set was the tonal contrast very apparent. One explanation could be that, only when

context or meaning really matters (multiple similar phonetic words in the same sentence or cognitive clause), then tone will be emphasized.

## **VII. Conclusion**

Vietnamese, with all of its variations and speaker subtleties, is a very interesting language. Despite the size of the country, the dialects of Vietnamese have become rather divergent and complex. Possibly due to the unofficial division of North and South Vietnam during the Vietnam War, each region formed its own unique dialect in order to distinguish themselves from the other, maybe for the purposes of identification in battle. However, despite these differences, I enjoyed investigating the special case that is my father, as he has traveled much, much more than most throughout Southeast Asia, hopping between refugee camps, and has his own unique take on the phonetics of the Vietnamese language.



**APPENDIX A: IPA CONSONANT & VOWEL CHARTS**

**Consonant Chart (from source)**

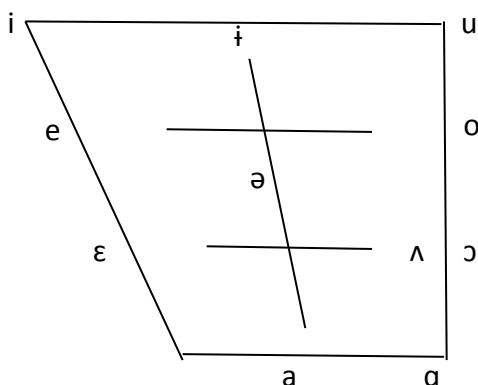
	Bilabial	Labiodental	Dental	Alveolar	Post-	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t t <sup>h</sup> d		ʈ	c	k g			
Nasal	m			n			ɲ	ŋ			
Trill											
Tap/Flap											
Affricate											
Fricative		f v		s		ʐ	ç	x			h
Lateral Fricative											
Approximant							j	w			
Lateral Approximant				l							

**Consonant Chart (for this speaker)**

	Bilabial	Labiodental	Dental	Alveolar	Post-	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t t <sup>h</sup> d		ʈ	c	k k <sup>h</sup> g			
Nasal	m			n			ɲ	ŋ			
Trill											
Tap/Flap											
Affricate											
Fricative		f v		s							h
Lateral Fricative											
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 /z/. Uses /k<sup>h</sup>/ instead of /x/. Distinguishes between /k/ and /k<sup>h</sup>/. Pronounces orthographic spelling 'v' as both /v/ and /w/.

**Vowel Chart**



**APPENDIX B: WORD LIST**

Phoneme	Orthography	English Meaning	Phonemic Transcription	Phonetic Transcription 1	Phonetic Transcription 2
<b><u>I. Consonant Phonemes</u></b>					
<b><u>Ia. Stops</u></b>					
Note: /p/ is in Section IV. It never occurs in the initial position.					
1.	/b/	ba	‘three’	/baɿ/	[ba:ɿ] “
2.	/t/	tá	‘dozen’	/taɿ/	[ta:ɿ] “
3.	/d/	đi	‘to go’	/diɿ/	[di:ɿ] “
4.	/t <sup>h</sup> /	tha	‘to acquit’	/t <sup>h</sup> aɿ/	[t <sup>h</sup> a:ɿ] “
5.	/t̚/	tri	‘to govern’	/t̚iɿ/	[t̚i:ɿ] “
6.	/c/	cha	‘father’	/caɿ/	[ja:ɿ] [t̚ɕa:ɿ]
7.	/k/	ký	‘to sign’	/kiɿ/	[ki:ɿ] “
8.	/k <sup>h</sup> /	khó	‘difficult’	/k <sup>h</sup> ɔɿ/	[k <sup>h</sup> ɔ:ɿ] “
9.	/g/	ghé	‘chair’	/geɿ/	[ge:ɿ] “
<b><u>Ib. Fricatives</u></b>					
10.	/f/	phó	‘town’	/foɿ/	[fo:ɿ] “
11.	/v/	vuong	‘Vuong’ (last name)	/vʌŋɿ/	[v̥ŋɿ] “
12.	/s/	xa	‘far’	/saɿ/	[sa:ɿ] “
13.	/ç/ as /s/	si	‘stubborn’	/siɿ/	[si:ɿ] [sii:ɿ]
14.	/h/	hĩ	‘to blow’ (one’s nose)	/hiɿ/	[he:ɿ] “

Phoneme	Orthography	English Meaning	Phonemic Transcription	Phonetic Transcription 1	Phonetic Transcription 2
<b><u>Ic. Nasals</u></b>					
15. /m/	ma	‘ghost’	/maʔ/	[ma:ʔ]	“
16. /n/	nó	‘he’	/nɔʔ/	[nɔ:ʔ]	“
17. /ɲ/	nhà	‘house’	/ɲaʔ/	[ɲa:ʔ]	“
18. /ŋ/	nga	‘Russia’	/ŋaʔ/	[ŋa:ʔ]	“
<b><u>Id. Approximants</u></b>					
19. /ɹ/	ra	‘out’	/ɹaʔ/	[ɹa:ʔ]	“
20. /l/	la	‘to shout’	/laʔ/	[la:ʔ]	“
21. /w/	và	‘and’	/waʔ/	[wa:ʔ]	“
22. /j/	da	‘skin’	/jaʔ/	[ja:ʔ]	“
<b><u>II. Vowel phonemes</u></b>					
<b><u>IIa. Front</u></b>					
23. /i/	đi	‘to go’	/diʔ/	[di:ʔ]	[dri:ʔ]
24. /e/	đê	‘dike/dam’	/deʔ/	[deɪ:ʔ]	“
25. /ɛ/	xe	‘vehicle/carriage’	/sɛʔ/	[sɛ:ʔ]	“
<b><u>IIb. Central</u></b>					
26. /ɨ/	từ	‘from’	/tiʔ/	[ti:ʔ]	[tɔi:ʔ]
27. /ə/	chờ	‘to wait’	/cəʔ/	[tɕə:ʔ]	“
28. /a/	ba	‘three’	/baʔ/	[ba:ʔ]	“
<b><u>IIc. Back</u></b>					
29. /u/	dù	‘umbrella’	/juʔ/	[ju:ʔ]	“
30. /o/	cô	‘Miss’	/koʔ/	[ko:ʔ]	“

Phoneme	Orthography	English Meaning	Phonemic Transcription	Phonetic Transcription 1	Phonetic Transcription 2
31. /ʌ/	vuong	‘Vuong’ (last name)	/vʌŋʈ/	[vʌ̃ŋʈ]	“
32. /ɔ/	nó	‘he’	/nɔʈ/	[nɔ:ʈ]	“
33. /ɑ/	ăn	‘to eat’	/ɑŋʈ/	[ɑ̃ŋʈ]	“

**III. Suprasegmentals – Tones**

**IIIa. Level (ngang)**

34. /ɪ/	ma	‘ghost’	/maʈ/	[ma:ʈ]	“
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**IIIb. Hanging (huyền)**

35. /ɪ/	mà	‘but or yet’	/maʈ/	[ma:ʈ]	“
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**IIIc. Sharp (sắc)**

36. /ɪ/	má	‘cheek’	/maʈ/	[ma:ʈ]	“
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**III d. Asking (hỏi)**

37. /ɪ/	mả	‘tomb/tombstone’	/maʈ/	[ma:ʈ]	“
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**IIIe. Heavy (nặng)**

38. /ɪ/	mạ	‘rice seedling’	/maʈ/	[ma:ʈ]	“
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**IV. Special Cases**

/p/ only ever occurs in the final position

39. /p/	đẹp	‘beautiful/pretty’	/dɛpʈ/	[dɛp̄ʈ]	[dɛpʈ]
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**V. Allophones**

Bilabialised /ŋ/ when preceded by rounded vowels: u, o, ɔ

40. [oŋ <sup>w</sup> ]	xong	‘finished/done/over’	/soŋʈ/	[sɛðŋ <sup>w</sup> ʈ]	“
41. [uŋ <sup>w</sup> ]	súng	‘gun’	/suŋʈ/	[sɛ̃ŋʈ]	“
42. [ɔŋ <sup>w</sup> ]	không	‘no’	/k <sup>h</sup> ɔŋʈ/	[k <sup>h</sup> ũðŋ <sup>w</sup> ʈ]	[k <sup>h</sup> ũŋ <sup>w</sup> ʈ]

Phoneme	Orthography	English Meaning	Phonemic Transcription	Phonetic Transcription 1	Phonetic Transcription 2
Non-bilabialised /ŋ/ when preceded by a non-rounded vowel					
43. [ɛŋ]	xèng	‘chip’ or ‘token’ (in gambling)	/sɛŋt/	[sɛ̃ŋt]	“
44. [aŋ]	xăng	‘gasoline/petroleum’	/saŋt/	[sãŋt]	“
Bilabialised ending /k/ if preceded by rounded vowels (non-rounded vowels never precede)					
45. [ok <sup>w</sup> ]	ngọc	‘pearl’	/ŋokt/	[ŋɐok <sup>w</sup> t]	[ŋɐop <sup>l</sup> t]
46. [ɔk <sup>w</sup> ]	cốc	‘glass/cup’	/kɔkt/	[kɔʔp <sup>l</sup> t]	[kɔʔt]
47. [uk <sup>w</sup> ]	nhục	‘insulted’	/ɲukt/	[ɲok <sup>w</sup> t]	[ɲoʔt]
Shorten /i/ when followed by a dental /t/, bilabial /p/, or palatals /c/ and /ɲ/					
48. [ɪt]	thịt	‘meat’	/t <sup>h</sup> ɪt/	[t <sup>h</sup> ɪ̃t]	“
49. [ɪp]	dịp	‘occasion’	/jɪpt/	[jɪ̃p̄t]	“
50. [ɪc]	chích	‘give a shot’	/cɪct/	[tɕɪʔt]	“
51. [ɪɲ]	dính	‘sticky’	/jɪɲt/	[jɪ̃ʔt]	“
/ɛ/ instead of /e/ when followed by bilabials /m/ or /p/ or final position					
52. [ɛm]	em	‘younger sister/brother’	/ɛmt/	[æ̃mt]	“
53. [ɛm]	đem	‘bring’	/dɛmt/	[dɛ̃mt]	“
54. [ɛ]	bé	‘small’	/bɛt/	[bɛ̃:t]	“
55. [ɛp]	đẹp	‘beautiful/pretty’	/dɛpt/	[dɛ̃p̄t]	“
Longer /i/ when by itself					
56. [i:]	y	‘him’	/it/	[i:t]	[i:i:t]
Final position stops are not released, while nasals are continuous at the end					
57. [k̄]	đắc	‘earth’	/dɔkt/	[dɔʔt]	“
58. [t̄]	hết	‘the end’	/hut/	[hɔʔt]	“

Phoneme	Orthography	English Meaning	Phonemic Transcription	Phonetic Transcription 1	Phonetic Transcription 2
59. [ɕ̌]	tích	'vestige/small fragment'	/təc1/	[təʔ1]	“
60. [p̄]	đẹp	'beautiful/pretty'	/dɛp1/	[dɛp̄ʔ1]	“
61. [n]	nên	'had better'	/nʌn1/	[nʌn1]	“
62. [ŋ]	bảng	'board'	/baŋv/	[baŋv]	“
63. [ɲ]	gánh	'a burden'	/gəŋ1/	[ɣəŋ1]	[ɣəŋ1]
64. [m]	mềm	'soft'	/memv/	[memv]	“

### VI. Sentence

65. - Chiều nay chị có đi đâu không? 'Will you go out this afternoon?'  
 /ciɜw1 nai1 ci1 kɔ1 di1 dɜw1 k<sup>h</sup>əŋ1/ [tɕiɜw1 nai1 tɕi1 kɔ1 di1 dow1 k<sup>h</sup>əŋ<sup>w</sup>1] “

**APPENDIX C: BIBLIOGRAPHY**

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