

A Historical and Perceptual Study of Vowel Length in Thai

Rungpat Roengpitya

Department of Linguistics, University of California at
Berkeley, Berkeley, CA 94720

Introduction

In Standard Thai, vowel length is contrastive e.g. [cip] ‘to sip’ – [ciip] ‘to pleat,’ although, in historical Tai, Li (1977) reconstructed vowels in Proto-Tai without a length distinction. Short and long contrast of Thai vowels arose from a monophthongization, the change in vowel qualities, a vowel lengthening, and borrowings, as presented below.

Standard-Thai Vowel System

i, ii	i̯, i̯i̯	u, uu
e, ee	ɤ, ɤɤ	o, oo
ɛ, ɛɛ	a, aa	ɔ, ɔɔ

Proto-Tai Vowels

Standard-Thai Vowels

*i	>	i
*i, *iɤ, *ei, *ui	>	ii
*e, *ie	>	e
borrowings	>	ee (Potibal)
no source	>	ɛ
*ɛ, *iɛ	>	ɛɛ

(Brown 1979: from ea)

*i̯	>	*i̯
*i̯, *i̯ɤ, *i̯u	>	*i̯i̯
no source	>	ɤ
no source	>	ɤɤ (schwa)
*ɤ, *uɤ	>	a
*a, *i̯a, *ua	>	aa
*u, *io	>	u
*u, *uɤ, *uo, *i̯u, *eu	>	uu
*o, *uo, *ui̯	>	o

Proto-Tai Vowels

Standard-Thai Vowels

borrowings	>	oo
borrowings	>	ɔ
		(Brown 1979)
*ɔɔ, *i•ɔ, *uɔ, *i•ɔ	>	ɔɔ
		(Brown 1979: from oa)

From above, it can be seen that the distinctive vowel length in Thai came from the change in both vowel quantity and vowel quality. Since vowels in Proto-Tai used to have distinct vowel quality, this paper is aimed to study the relationship between vowel quality and vowel quantity in Thai.

In Standard Thai, Abramson (1962) said that vowel duration is the main cue to distinguish short and long vowels in Thai. In Abramson and Ren (1990), they found that the audible secondary cue for vowel length in Thai is vowel quality. The previous experiment of Roengpitya (1999) confirmed that other perceptual cues besides vowel duration could be vowel quality and final nasal duration. It is found that short vowels are more centralized than long vowels. Moreover, short vowels are followed by longer final nasals and long vowels are followed by shorter final nasals, as also found by Abramson (1962), by Onsuwan and Beddor (1998), and by Roengpitya (1999).

A perceptual experiment was conducted to see whether the cues to distinguish vowel length in Thai are only vowel duration or other cues such as vowel quality and final nasal duration.

Procedures

Eighteen pairs of Thai meaningful and nonsense words were chosen for this experiment, as shown in Table 1.

Table 1 Thai Words and Meanings

Pairs	Meaning
1. p̌ik/ p̌iik	- / wings
2. p̌in/ p̌iin	a pin / -
3. p̌ek/ p̌eek	- / -
4. p̌en/ p̌een	-/ -
5. p̌ak/ p̌aak	to stick in/ a mouth
6. p̌an/ p̌aan	to spin/ ramie
7. p̌uk/ p̌uuk	downy/ -
8. p̌un/ p̌uun	-/-
9. p̌ok/ p̌ook	a cover/ -
10. p̌on/ p̌oon	to grind/ -
11. p̌rk/ p̌r̄rk	-/ -
12. p̌rn/ p̌r̄rn	-/ -
13. p̌ek/ p̌eek	-/ -
14. p̌en/ p̌een	-/ -
15. p̌ok/ p̌oək	-/ to peel
16. p̌on/ p̌oən	-/ -
17. p̌i'k/ p̌i'̄i'k	a pile/ -
18. p̌i'n/ p̌i'̄i'n	-/ -

Each pair contained a word with a short vowel and the other with a long vowel. Each word had an initial voiceless unaspirated labial stop /p/, its vowel, a final velar stop /k/ or a final alveolar nasal /n/, and a low tone. A native-Thai male speaker said the word in the frame sentence “faŋ kham waa _____ sɔɔŋ khaŋ.” ‘Listen to the word _____ twice.’ All the tokens were recorded on an analog tape and were digitized at a sample rate of 16 KHz. All the tokens were measured for vowel duration and final nasal duration. The results were in the Table 2.

Table 2 Vowel and Nasal Duration

Pairs	Vowel Duration	Nasal Duration
1. pik/ piik	143.06/ 309.94	-/ -
2. pin/ piin	153.94/ 319.94	256.63/ 228.25
3. pèk/ pèek	157.31/ 323.81	-/ -
4. pèn/ pèen	156.81/ 308.25	306.06/ 219.88
5. pàk/ pàak	168.75/ 323.75	-/ -
6. pàn/ pàan	155.13/ 326.88	241.13/ 189.69
7. pùk/ pùuk	150.50/ 285.75	-/ -
8. pùn/ pùun	137.56/ 326.81	275.00/ 212.69
9. pòk/ pòok	167.25/ 291.75	-/ -
10. pòn/ pòon	147.63/ 303.88	270.94/ 211.13
11. pǎk/ pǎǎk	153.50/ 345.31	-/ -
12. pǎn/ pǎǎn	151.06/ 298.63	284.38/ 207.44
13. pèk/ pèek	181.81/ 349.88	-/ -
14. pèn/ pèen	176.81/ 316.13	261.56/ 176.81
15. pòk/ pòok	171.13/ 304.31	-/ -
16. pòn/ pòon	186.13/ 319.50	275.50/ 219.75
17. pi'k/ pi'i'k	140.75/ 317.06	-/ -
18. pi'n/ pi'i'n	143.00/ 310.25	273.44/ 248.81

In each pair, a short vowel was lengthened at 10-20 ms steps until it had the same duration as the long vowel of its pair, and a long vowel was shortened at 10-20 ms steps until it had the same duration as the short vowel of its pair. In pairs 2, 4, 6, 8, 10 which had an alveolar nasal as a final, the long nasal after a short vowel was shortened at 10ms step until it had the same duration as the short nasal after a long vowel, and vice versa. All the tokens were resynthesized in the LPC analysis and resynthesis program. All the tokens were randomized. There were 9 sections of this experiment, which contained a total of 1,150 tokens. Fifty-six native-Thai listeners (25 males and 31 females with the age ranging from 18-25 and with the mean age of 20) listened to these tokens and judged whether each token had a short or a long vowel.