



TONES OF THAI SONG VARIETIES

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Abstract

This paper is a survey of synchronic phonetic and phonological variations in tone systems of Thai Song or Tai Dam (Black Tai), a language of the southwestern branch of the Tai-Kadai language spoken in Thailand. It aims to study how the tone systems are regionally and socially varied.

Key words: tones, variation, Thai Song, Lao Song, Tai Dam, Black Tai

ISO 639-3 language codes: soa, blt

1. Introduction

Thai Song people have been addressed by various names such as Thai Song, Thai Song Dam, Lao Song Dam, Lao Song, Song, Tai Song Dam, Tai Dam or Black Tai.¹ The name “Thai Song” refers to people dressed in black costumes. These people migrated from Muang Thaeng (Myang Teng or Muoi)², Sipsongchutai (Sipsong Chao Tai) in the northern part of Laos. This location used to be under the Luang Prabang government (Sribusara 1987).

The original settlement of Thai Song people in Thailand was in Phetchaburi province. Later on, Thai Song people moved to other provinces such as Kanchanaburi, Ratchaburi, Suphanburi, Nakhon Pathom, Samut Sakhon, Samut Songkhram, Nakhonsawan, and Phitsanulok. In addition to the migration to Thailand, Tai Dam people also migrated from Muang La (Son La) in Vietnam to Laos.

Thai Song belongs to the Southwestern Branch of the Tai-Kadai language family (Li 1960). Based on tonal splits and mergers, Thai Song is distinguished from the Lao language and other Lao ethnic group languages as a member of the Tai language group (Brown 1965).

This paper³ explores synchronic phonetic and phonological variations in tone systems of Thai Song. The research questions are: i) how do the tones vary at different locations, and ii) how do the tones vary according to age-group.

2. Framework

The theoretical framework of this tonal study is based on the checklist for determining tones in Tai dialects (Gedney 1972). Variation Theory is also used as a framework for this study. This theory holds that linguistic forms have variants that are alternatively used but their meanings remain the same. Variation Theory is an important part of sociolinguistics which asserts that there is no free variation. Linguistic variation is conditioned by social factors such as region, social class, educational background, or style (Snyder 1995).

¹ The term “Tai” is distinguished from “Thai” in so far as: “Conventionally, Southeast Asianists use the term “Tai” in referring to any speakers of the Tai language family, reserving the aspirated “Thai” to designate only those citizens of the Kingdom of Thailand as a Siamese Tai state” (Sams 1988:116). So Black Tai residing in Vietnam and Laos are referred to as Tai Dam in this paper.

² Muang Thaeng is presently Muang Dien Bien Phu in northwestern Vietnam. The term Tai Dam or Black Tai is used to refer to this ethnic group residing in this area.

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This study covers both social and regional variation. Age is chosen as an independent variable as it has been found in most Thai Song studies that age group is an important independent variable that conditions linguistic variation (Buranasing 1988, Liamprawat and Wattanaprasert 1996, and Saeng-ngam 2006).

3. Methodology

3.1 Data collection

The study of regional tone variation was based on previous studies of Thai Song/Tai Dam tone systems and fieldwork by the researcher at the 14 locations listed in table 1. The Tai Dam dialect compiled by the researcher was spoken in Muang La (Son La), Vietnam. The informant from Muang La was female and 66 years old. She came from Lae village to visit her relatives in Vientiane where the data were collected.

Table 1: Sources of data

Locations		No. of informants	Researchers	Methods of data processing
ML1	Muang La (Son La), Vietnam	6	Gedney (1964) and Fippinger and Fippinger (1974)	Auditory judgment
ML2	Muang La (Son La), Vietnam	1	Burusphat (Fieldwork 2010)	Auditory judgment and PRAAT program
NP1	Donyaihom sub-district, Muang district, Nakhon Pathom province	4	Panka (1979)	Auditory judgment and sound spectrograms
NP2	Dontoom sub-district, Banglen district, Nakhon Pathom province	2	Wattanaprasert and Liamprawat (1988)	Auditory judgment
SP1	Suantaeng sub-district, Muang district, Suphanburi province	2	Wattanaprasert and Liamprawat (1988)	Auditory judgment
SP2	Bandon sub-district, U-thong district, Suphanburi province	18	Buranasing (1988)	Auditory judgment
SM	Nongsonghong sub-district, Banphaew district, Samut Sakhon province	3	Wattanaprasert and Liamprawat (1988)	Auditory judgment
PB1	Khaoyoi sub-district, Khaoyoi district, Phetchaburi province	4	Unakornsawat (1993)	Auditory judgment
PB2	Nongprong sub-district, Khaoyoi district, Phetchaburi province	6	Maneewong (1987)	Auditory judgment and Visi-pitch model 6087
PB3	Nongprong sub-district, Khaoyoi district, Phetchaburi province	32	Saeng-ngam (2006)	Auditory judgment and PRAAT program
KB	Rangway sub-district, Phanomthuan district, Kanchanaburi province	3	Suesorsit (1992)	Auditory judgment
NW	Huathanon sub-district, Thatako district, Nakhonsawan province	1	Daecha (1986)	Auditory judgment and sound spectrograms
PL	Bothong sub-district, Bangrakam district, Phitsanulok province	2	Jirananthanaporn et al (2003)	Auditory judgment
L	Khawkaew sub-district, Chiangkhan district, Loei province	3	Ananthrawan (1978)	Auditory judgment and sound spectrograms

Table 1 shows that all tonal descriptions, except for Saeng-ngam's work, are based on auditory judgment. This study offers phonetic measurements of tones that were formerly described by auditory impression only. Though Saeng-ngam's study used both auditory judgment and PRAAT⁴ program, as in this study, the research sites of these two works were different. In addition, this study is a comprehensive work of tones of Tai Song varieties as it covers most locations where Thai Song people reside.

The study of social tone variation is based on the researcher's fieldwork. It is a case study of six speakers from two locations, village number 6 (Huathanon village), Donphutsa sub-district, Dontoom district

⁴ PRAAT is a speech software program for identifying the tone characteristics, that is, tone height and shape. It was created by Paul Boersma and David Weenink of the Institute of Phonetics Sciences of the University of Amsterdam in 1992 (www.praat.org).

and village number 9 (Sakaeray village), Donyayhom sub-district, Muang district, Nakhon Pathom province. These two locations were chosen for this case study because no previous acoustic studies of tones in these locations have been found and the language vitality in these locations is strong. Young generation speakers still use the Thai Song language in their villages. The gender and ages of the six informants are as follows:

Table 2: Genders and ages of the six informants

Age groups	Huathanon (HTN)		Sakaeray (SKR)	
	Age	Gender	Age	Gender
Old generation (G1)	66	Male	74	Male
Middle generation (G2)	40	Female	39	Male
Young generation (G3)	22	Female	21	Male

3.2 Instruments

3.2.1 Tone box and sets of wordlist

All studies in table 1 used Gedney's (1972) tone box or tone checklist for their tone analyses. The study of Thai Song tone system in Nakhon Pathom province also used the tone box as shown in diagram 1. This tone box is a short-cut tool for discovering tone splits, coalescences, complementary distribution and the numbers of contrastive tones.

Diagram 1: Tone box (Gedney 1972:434)

		Proto-Tai Tones				
		A	B	C	D-long	D-short
Initials at time of tone split	1. Voiceless friction sounds *s, hm, ph etc.	1	5	9	13	17
	2. Voiceless unaspirated stops, *p, t, etc.	2	6	10	14	18
	3. Glottal, *ʔ, ʔb, etc.	3	7	11	15	19
	4. Voiced, *b, m, l, z, etc.	4	8	12	16	20
		Smooth Syllables			Checked Syllables	

The tone box displays four categories of tones reconstructed in the Proto-Tai language labeled as A B C in smooth syllable and D in checked syllable. The tone splits and mergers in each category or between different categories are conditioned by four different historical classes of phonetic features of the initial consonant of each syllable, that is, aspirated, unaspirated, glottalized/implosive, and voiced. In the checked syllable, tone splits and mergers are conditioned by vowel length. Tones in checked syllables are identified as being in the same categories as those in smooth syllables.

A checklist of eighty monosyllabic words was prepared by adapting the wordlists of Gedney (1972) and Akharawatthanakun (2003)⁵ (See the appendix). The tone box displayed in diagram 1 has twenty cells for possible tone distinctions. Each cell contains four test words whose initial consonants fall into the same consonant class. In addition to the checklist of eighty test words, analogous sets of twenty monosyllabic words, adapted from Akharawatthanakun (2003), were used for an acoustic study of tones. Each monosyllabic word was tripled, resulting in sixty words. To eliminate the repetitive environments of these words, three tokens of each word were shuffled in random order.

The tone checklist and analogous sets were used to interview the Muang La informant and the six Thai Song speakers from three age groups: old generation (over 60), middle generation (35-55), and young generation (18-30) at two locations, Huathanon and Sakaeray villages. The informants pronounced the test words in citation style.

3.2.2 Software programs

The voice data were recorded on IC recorder and transferred to wave files on a computer. The acoustic study was carried out by using the speech software program PRAAT 4.5.08 and Microsoft Excel Version 2003

⁵ Akharawatthanakun's wordlist was adapted from Tingsabath's (1990) wordlist.

which was used to process the fundamental frequency (F_0) of tones in the form of line graphs. Fundamental frequency is an acoustic measurement associated with the physical reality underlying the number of complete variations in air pressure per second conducted by the opening and closing of vocal folds. On the other hand, pitch is sensed by a perception. It refers to the auditory sensation of ranging sound from high to low. Both fundamental frequency and pitch distinguish contrastive tones of a language (Canilao 2010).

3.3 Data analysis

The tone characteristics were transcribed by using auditory judgment confirmed by an acoustic analysis which displayed tone shape and height on line graphs.

The speech software program PRAAT was used to analyze the tone characteristics, that is, the fundamental frequency value of each word and duration of each tone. The 100% duration is divided into 10% of duration. The fundamental frequency at each 10% of duration was entered into a Microsoft Excel program version 2003 which converted the fundamental frequency of tones into the form of line graphs. A line-graph figure was created by drawing six horizontal lines to divide the fundamental frequency range into five sections. Using six horizontal lines, instead of five, the fundamental frequency range can be studied in details (Tingsabadh 1990). The five sections starting from the first to the fifth sections represent low pitch, mid-low pitch, mid-pitch, mid-high pitch, and high pitch respectively. To describe the pitch of each tone, two or three numerals such as [13] or [214] are used to represent the beginning point, change point, and end point of the fundamental frequency curve (Boonsawasd 2001). Figure 1 provides a description of the A1 tone of the G2 speaker of SKR using three numerals. The beginning point of the fundamental frequency curve starts at the second section. The change point is of the first section, and the ending point reaches the third section. So this tone [213] is described as lower-mid falling rising tone.

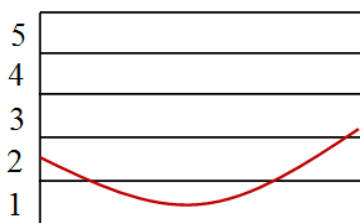


Figure 1: A description of tone characteristics by fundamental frequency curve and numerals

The analysis of tone patterns, i.e. the split, coalescence, and complementary distribution of tones, was based on Gedney's (1972) approach.

4. Findings

The regional variation of tones and the tonal variation by age group have been found as discussed below.

4.1 Regional variation of tones

The phonetic characteristics of tones and number of tones at 14 locations are summarized in table 3. The 1-5 numerals represent different levels of tone height and direction of tone movement from the lowest to the highest levels of pitch respectively, i.e. 1: low, 2: lower-mid, 3: mid, 4: higher-mid, and 5: high.

All works, except Gedney (1964), Fippinger and Fippinger (1974), Buranasing (1988), and Saengngam (2006), use these numerals. While the 1-5 numerals designate the phonetic values of tones, tone numbers (tone 1- tone 6) are assigned to contrastive tones. Thai Song at all locations, except at Loei (Ananthrawan 1978), have six tones. The tone numbers in some studies were adjusted so that their tone numbers conformed to most studies, that is, tone 1 (A123), tone 2 (A4), tone 3 (B123), tone 4 (B4), tone 5 (C123), and tone 6 (C4) as seen in Diagram 2. The Loei variety has five tones, so C123 tones were labeled as tone 4 and C4 as tone 5.

Diagram 2: Tone numbers of Thai Song/Tai Dam varieties

		Proto-Tai Tones		
		A	B	C
Initials at time of tone split	1. Voiceless friction sounds <i>*s, hm, ph, etc.</i>	Tone 1 A1	Tone 3 B1	Tone 5 C1
	2. Voiceless unaspirated stops, <i>*p, t, etc.</i>	A2	B2	C2
	3. Glottal, <i>*ʔ, ʔb etc.</i>	A3	B3	C3
	4. Voiced, <i>*b, m, l, z, etc.</i>	Tone 2 A4	Tone 4 B4	Tone 6 C4

Smooth Syllables

The tone characteristics of the Muang La 2 are displayed as tone shapes in six-level line graphs as follows:

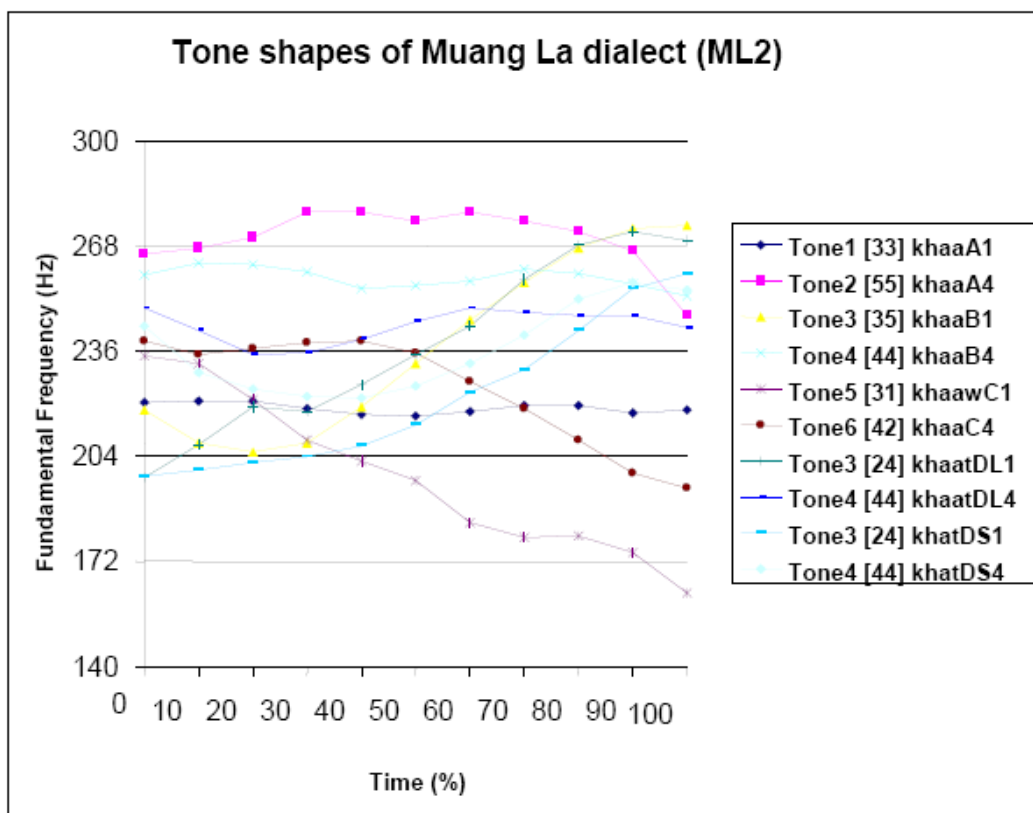


Figure 2: Tonal shapes of Muang La dialect (ML 2)

Table 3 (below) shows the different Thai Song tonal inventories at different 14 locations. The vertical columns list the 14 research sites and the phonetic realizations of four categories of tones, A, B, C, D (DL/DS) while the horizontal rows represent four tonal classes, 1, 2, 3,4.

Table 3: Thai Song/Tai Dam tones at 14 locations

	Research sites	Tonal categories				
		A	B	C	DL	DS
Tonal classes	1, ML1	1 lower-mid level	3 high rising	5 low and glottalized	3 high rising	
	2, ML2	1 mid level [33]	3 lower-mid rising [35]	5 mid falling and glottalized [31?]	3 lower-mid rising [24]	
	3, NP1	1 lower-mid rising [24]	3 mid rising [35]	5 mid level [33]	3 mid rising [35]	
	NP2	1 lower-mid rising [24]	3 mid rising [35]	5 mid level [33]	3 mid rising [35]	
	SP1	1 mid rising [34]	3 lower-mid rising [24]	5 mid falling [32]	3 lower-mid rising [24]	
	SP2	1 mid falling rising	3 lower-mid falling rising	5 lower-mid falling and glottalized	3 lower-mid falling rising	
	SM	1 mid rising [34]	3 mid rising [24]	5 mid falling [32]	3 lower-mid rising [24]	
	PB1	1 mid rising [35]	3 mid rising [24]	5 lower-mid falling [21]	3 lower-mid rising [24]	
	PB2	1 lower-mid rising [23]	3 lower-mid high rising [25]	5 mid level and glottalized [33?]	3 mid rising [35]	
	PB3	1 lower-mid rising [213]	3 lower-mid rising [25]	5 low level [22]	3 lower-mid rising	
	KB	1 mid rising [34]	3 low rising [24]	5 mid falling [32]	3 lower-mid rising [24]	
	NW	1 low rising [14]	3 mid rising [35]	5 lower-mid level and glottalized [22?]	3 mid rising [35]	
	PL	1 low rising [23]	3 mid rising [35]	5 lower-mid level [22]	3 mid rising [35]	
	L	1 lower-mid rising falling [241]	3 high rising [45]	4 lower-mid falling [21]	3 higher-mid rising [45]	3 higher-mid level [44]
Tonal classes	4, ML1	2 high level	4 higher-mid level	6 mid falling and glottalized	4 higher-mid level	
	ML2	2 high level [55]	4 higher-mid level [44]	6 higher-mid falling and glottalized [42?]	4 higher-mid level [44]	
	NP1	2 mid rising falling [354]	4 higher-mid level [44]	6 higher-mid falling [43]	4 higher-mid level [44]	
	NP2	2 mid rising falling [354]	4 higher-mid level [44]	6 higher-mid falling [43]	4 higher-mid level [44]	
	SP1	2 mid rising falling [354]	4 higher-mid level [44]	6 higher-mid rising falling [452]	4 higher-mid level [44]	
	SP2	2 mid rising falling	4 higher-mid level	6 mid falling	4 higher-mid level	
	SM	2 high rising [45]	4 mid level [33]	6 higher-mid rising falling [452]	4 higher-mid level [44]	
	PB1	2 higher-mid falling [43]	4 mid level [33]	6 higher-mid rising falling [452]	4 mid level [33]	
	PB2	2 higher-mid rising falling [453]	4 mid rising falling level [342]	6 mid falling [32]	4 mid rising falling [343]	
	PB3	2 low-mid rising falling [232]	4 mid level [33]	6 mid falling [32]	4 mid level	
	KB	2 mid rising falling [354]	4 higher-mid level [44]	6 higher-mid rising falling [452]	4 higher-mid level [44]	
	NW	2 mid rising falling [343]	4 mid level [33]	6 higher-mid falling [42]	4 mid level [33]	
	PL	2 mid rising falling [354]	4 mid level [33]	6 higher-mid falling [42]	4 mid level [33]	
	L	2 higher-mid rising falling [453]	4 lower-mid falling [21]	5 mid falling [31]	2 higher-mid falling [43]	

4.1.1 Tone splits and coalescences

As mentioned above, Thai Song and Tai Dam varieties at all locations, except Loei, have six tones. The Loei variety has five tones as it merges C123 tones with B4 tone. The tone splits of all varieties agree with the statement made by Pittayaporn (2009:243) that “Most modern varieties show a basic split, i.e., bipartition across the four tonal categories based on voicing.” That is, from the five tone categories of the parent language called A, B, C, DL, DS, two series of tones have developed in Thai Song varieties at all locations. Splits that have developed are ABCD123-4. At all locations except Loei, DL and DS have merged with each other and DLDS123 and DLDS 4 correspond to B123 and B4 respectively. Unlike in other varieties, in the Loei variety, DL123 has not merged with DS123. DL123 is a high rising tone [45] which corresponds to B123 while DS123 is a high level tone [44]. Furthermore, DS4 corresponds to A4.

Because of this binary split of tones, tones conditioned by earlier voiceless and glottalized initials are referred to as A1, B1, C1, and D1 tones and tones conditioned by earlier voiceless initials are labeled A2, B2, C2, and D2 tones (Li 1977). The discussion of tones below will follow this convention as the 1-2 system explicitly represents the binary split of tones.

4.1.2 Tone characteristics

Even though tone splits and coalescences are the same across locations, phonetic values vary from place to place. At all locations, except Muang La, Loei, Phetchaburi 2, and Samut Sakhon, original voiced consonant initials give series 2 tones, falling (A2, C2) or higher-mid level (B2) tones. In the Loei and Phetchaburi 2 varieties, the original voiced consonant initials all give falling tones (ABC2) and in the Samut Sakhon variety a rising tone (A2). In the Muang La varieties, the original voiced consonant initials give falling (C2) or high level/higher-mid level tones (A2/B2).

The other three types of consonants, voiceless friction, voiceless unaspirated stops, and preglottalized consonants, give series 1 tones, rising (A1B1) or lower-mid level/falling (C1) at all locations, except Muang La varieties, which have lower-mid level tone (A1). C1 and C2 tones are terminated with a glottal closure in Muang La varieties whereas all other varieties, except Suphanburi 2, Phetchaburi 2 and Nakhonsawan, have lost this feature. It should be noted that the phonetic values of Muang La 1 and Muang La 2 tones are not much different. For example, the B tone of Muang La 1 is high rising whereas that of Muang La 2 is lower-mid rising. The phonetic features of tones are further compared in detail below. A tone shape was chosen to represent the tone variants of each tone. The choice was based on the phonetic shapes shared by most varieties. For example, the beginning point of the fundamental frequency curve of the A1 tone in most varieties starts at the second section (lower-mid), so the starting point of this tone is described as lower-mid.

Tone 1: A1 Lower-mid rising

Tone 1 in all varieties, except ML1 and ML2, is a rising tone. The phonetic value chosen to represent most varieties is lower-mid rising [24]. The minor difference of the phonetic feature is the starting and ending points of the contour. The contour starts at low, lower-mid, or mid and rises to mid, higher-mid, or high. The Loei variety has a falling contour after the rising. In ML1 and ML2, tone 1 is lower-mid and mid level respectively. The tone 1 variation, by location, is as follows:

1. Low/lower-mid rising (NP1, NP2, PB2, PB3, NW, PL, L)
2. Mid rising (SP1, SP2, SM, PB1, KB)
3. Lower-mid/mid level (ML1, ML2)

Tone 2: A2 Mid rising falling

Tone 2 in most varieties is a humped tone. The phonetic feature representing all tone varieties is mid rising falling [354]. The contour starts at low, mid or higher-mid, then rises to higher-mid or high, and falls to low, mid, or higher-mid. SM and PB1 have rising [45] and falling [43] respectively. In ML1 and ML2, tone 2 is high level. The tone 2 variation, by location is as follows:

1. Mid rising falling (NP1, NP2, SP1, SP2, KB, NW, PL)
2. Higher-mid rising falling (PB2, L)
3. Lower-mid rising falling (PB3)
4. Higher-mid rising (SM)
5. Higher-mid falling (PB1)
6. High level (ML1, ML2)

Tone 3: B1 Mid high rising

Tone 3 in all varieties is a contour tone. The phonetic feature chosen to represent B1 varieties is mid high rising [35]. Most varieties end with high rising so mid high rising was chosen as a representative of all variants, instead of lower-mid rising. The contour starts at lower-mid, mid, or higher-mid to lower-high or high. The tone 3 variation, by location, is as follows:

1. Mid high rising (ML2, NP1, NP2, NW, PL)
2. Lower-mid rising (SP1, SP2, SM, PB1, KB)
3. Lower-mid high rising (PB2, PB3)
4. Higher-mid high rising (ML1, L)

Tone 4: B2 Higher-mid level

Tone 4 in all varieties, except PB2 and L, is a level tone. The phonetic value representing tone variants is higher-mid level [44]. PB2 and L have a contour tone, i.e. mid rising falling [342] and lower-mid falling [21] respectively. The tone 4 variation, by location, is as follows:

1. Higher-mid level (ML1, ML2, NP1, NP2, SP1, SP2, KB)
2. Mid level (SM, PB1, PB3, NW, PL)
3. Falling (PB2, L)

Tone 5: C1 Lower-mid falling

Tone 5 in most varieties is a low falling tone. The phonetic value representing C1 tone variants is lower-mid falling [21]. This contour tone starts at lower-mid or mid and ends with low or lower-mid respectively. Some varieties show lower-mid [22] or mid level [33]. Tone 5 is terminated with a glottal closure in some varieties (ML1, ML2, SP2, PB2, NW). The tone 5 variation, by location, is as follows:

1. Lower mid/mid falling (ML1, ML2, SP1, SP2, SM, PB1, KB, L)
2. Lower-mid/mid level (NP1, NP2, PB2, PB3, NW, PL)

Tone 6: C2 Higher-mid falling

Tone 6 in all varieties is a high falling tone. The phonetic value representing C2 tone variants is higher-mid falling [42]. The contour starts at mid or higher-mid and falls to lower-mid, mid or low respectively. Some varieties (SP1, SM, PB1, KB) show a humped tone [452]. The variation of tone 5 by locations is as follows:

1. Higher-mid/mid falling (ML1, ML2, NP1, NP2, SP2, PB2, PB3, NW, PL, L)
2. Higher-mid rising falling (SP1, SM, PB1, KB)

4.2 Tonal variation by age-group

This section presents the tone variation by age-group of Huathanon variety (HTN) and Sakaeray variety (SKR). The tone variation is shown in Gedney's tone boxes as seen in Diagrams 3 and 4.

Diagram 3: Tone variation by age-group at Huathanon village

	A	B	C	DL	DS
aspirated	G1 [13]	G1 [15]	G1 [22ʔ]	G1 [15]	G1 [25]
unaspirated	G2 [213]	G2 [214]	G2 [31ʔ]	G2 [213]	G2 [23]
glottalized	G3 [212]	G3 [215]	G3 [31ʔ]	G3 [214]	G3 [24]
voiced	G1 [243]	G1 [33]	G1 [31ʔ]	G1 [33]	G1 [44]
	G2 [232]	G2 [22]	G2 [31]	G2 [22]	G2 [22]
	G3 [232]	G3 [22]	G3 [31]	G3 [22]	G3 [22]

Diagram 4: Tone variation by age-group at Sakaeray village

	A	B	C	DL	DS
aspirated	G1 [13]	G1 [14]	G1 [33ʔ]	G1 [14]	G1 [24]
unaspirated	G2 [212]	G2 [214]	G2 [21ʔ]	G2 [24]	G2 [35]
glottalized	G3 [312]	G3 [315]	G3 [31ʔ]	G3 [314]	G3 [24]
voiced	G1 [242]	G1 [33]	G1 [21ʔ]	G1 [22]	G1 [22]
	G2 [232]	G2 [33]	G2 [31]	G2 [22]	G2 [22]
	G3 [232]	G3 [22]	G3 [31]	G3 [33]	G3 [33]

The tone patterns of HTN and SKR varieties are identical to that of the 14 varieties discussed in 4.1. That is, they show a binary register split giving six contrastive tones. In most cases, DL1 and DS1 correspond to B1 while DL2 and DS2 correspond to B2. The tone characteristics varying according to age-group are discussed and presented in line graphs below.

Tone 1: A1 Lower-mid rising

The phonetic feature of A1 tone by all informants is a rising tone. This rising tone has two shapes.

Tone features

Tone shape 1 13

Tone shape 2 213/212/312

Age-group and location

G1-HTN, G1-SKR

G2-HTN/G3-HTN, G2-SKR/G3-SKR

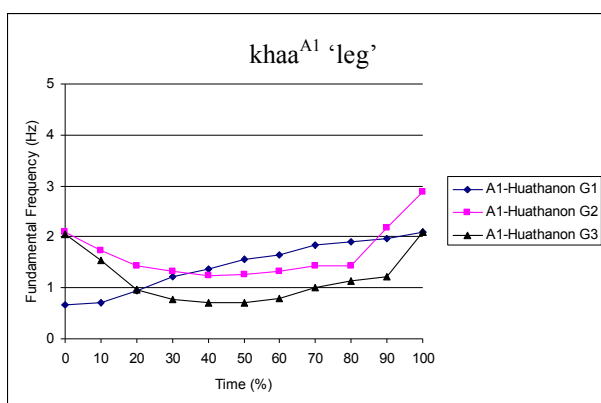


Figure 3. Tone 1: A1 Lower-mid rising (Huathanon)

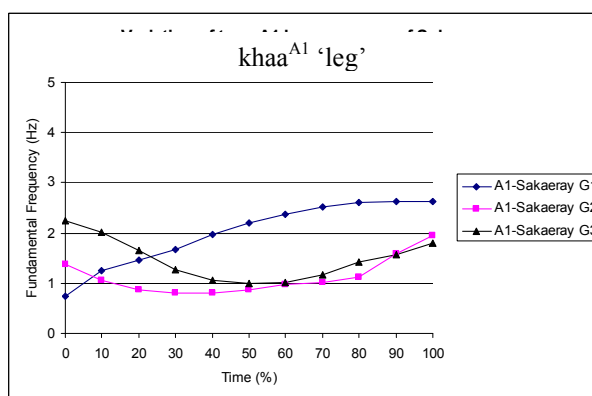


Figure 4. Tone 1: A 1 Lower-mid rising (Sakaeray)

Tone 2: A2 Lower-mid rising falling

A2 tone of all varieties is a humped tone which has two tone shapes.

Tone features

Tone shape 1 243/242

Tone shape 2 232

Age-group and location

G1-HTN/ G1-SKR

G2-HTN, G3-HTN, G2-SKR, G3-SKR

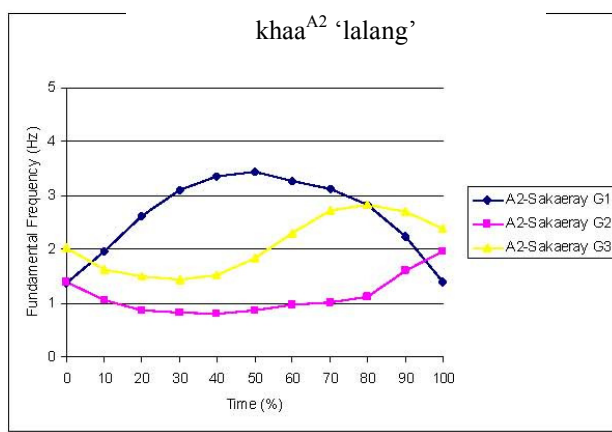
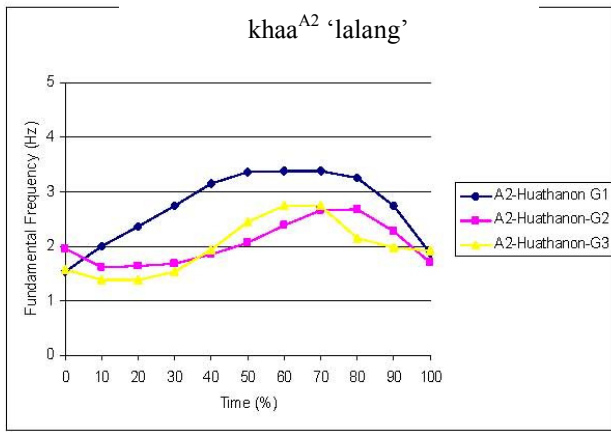


Figure 5. Tone 2: A2 Lower-mid rising falling (Huathanon)

Figure 6. Tone 2: A2 Lower-mid rising falling (Sakaeray)

Tone 3: B1 Lower-mid high-rising

B1 tone of all varieties is a rising tone. This tone is similar to tone A1 except that the ending point is higher than A1. Similar to A1, it has two tone shapes in smooth syllables.

Tone features

Tone shape 1 15/14

Tone shape 2 214/215/315

Age-group and location

G1-HTN/G1-SKR

G2-HTN, G2-SKR /G3-HTN/G3-SKR

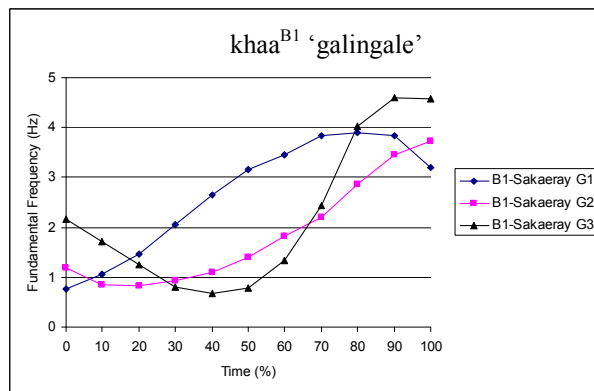
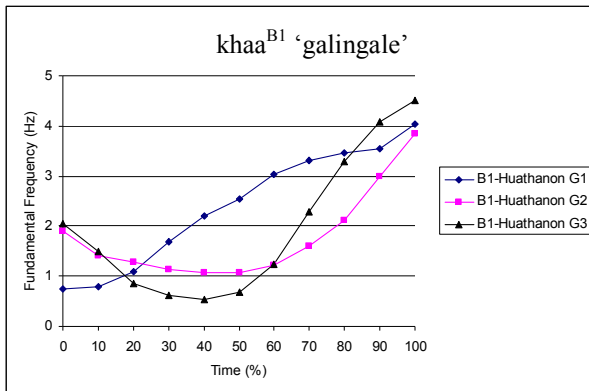


Figure 7. Tone 3: B1 Lower-mid high rising (Huathanon)

Figure 8. Tone 3: B1 Lower-mid high rising (Sakaeray)

In checked syllables (DL1 and DS1), the tone shapes of tone 3 are similar to those in smooth syllables, that is, the tone shapes having a starting point and an ending point (14/15/23/24/25/35) or a starting point, a change point, and an ending point (213/214/314) as illustrated by figures 9-12.

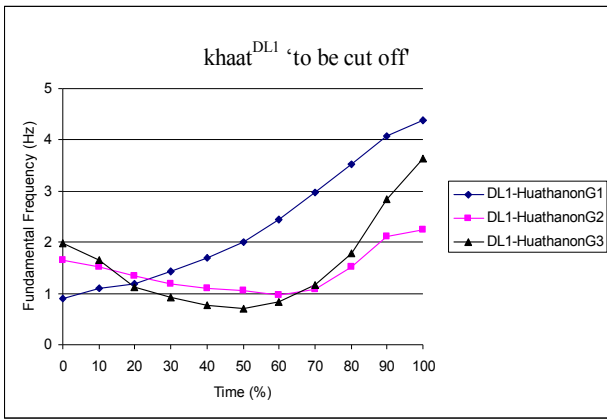


Figure 9. Tone 3: DL1 Lower-mid high rising (Huathanon)

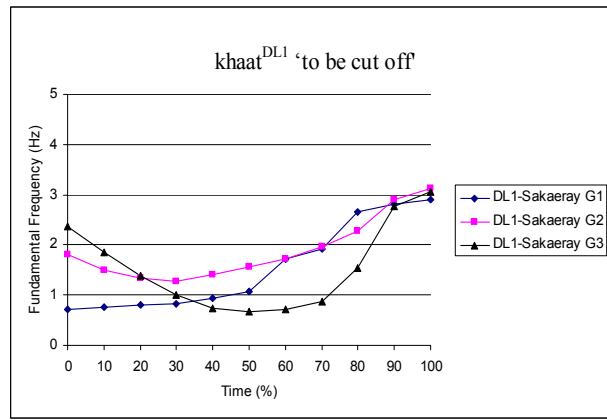


Figure 10. Tone 3: DL1 Lower-mid high rising (Sakaeray)

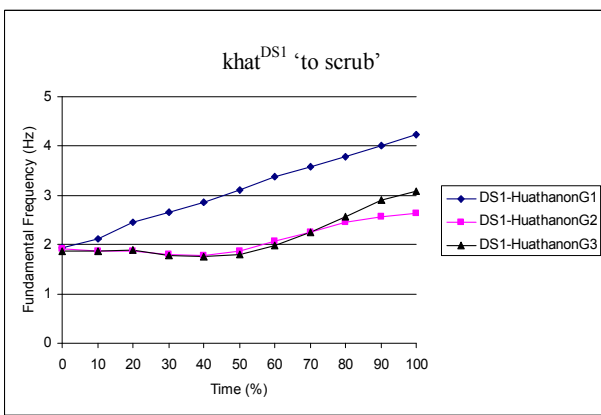


Figure 11. Tone 3: DS1 Lower-mid high rising (Huathanon)

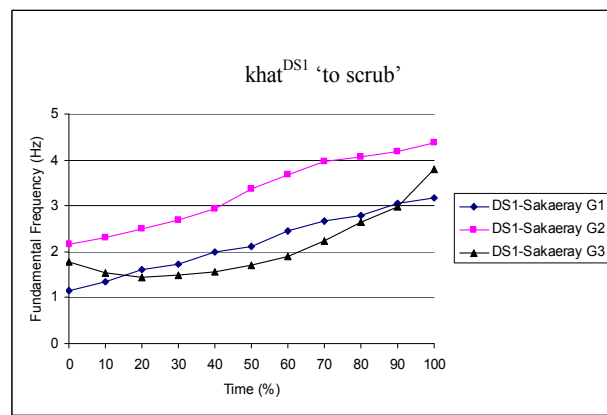


Figure 12. Tone 3: DS1 Lower-mid high rising (Sakaeray)

Tone 4: B2 Mid/lower-mid level

B2 tone of all varieties is a level tone. It has two phonetic shapes in smooth syllables.

Tone features

Tone shape 1 33

Tone shape 2 22

Age-group and location

G1-HTN, G1-SKR, G2-SKR

G2-HTN, G3-HTN, G3-SKR

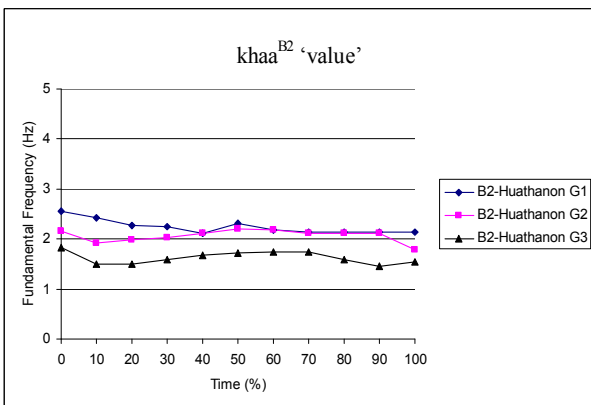


Figure 13. Tone 4: B2 Mid/lower-mid level (Huathanon)

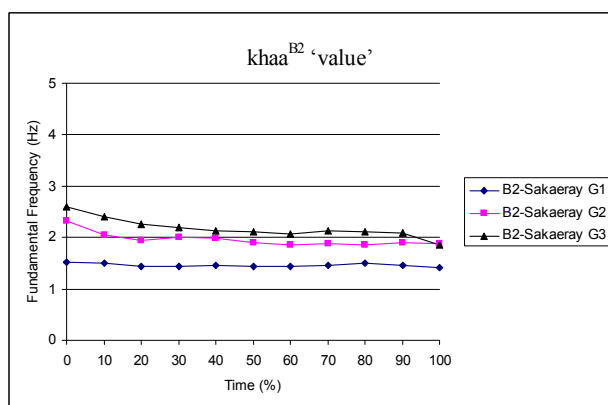


Figure 14. Tone 4: B2 Mid/lower-mid level (Sakaeray)

The phonetic values of tone 4 in checked syllables (DL2 and DS2) are similar to those in smooth syllables. Most phonetic values are either lower-mid [22] or mid level [33] tone. Only the G1 speaker (HTN) pronounces this tone as higher-mid level [44]. The phonetic shapes of tone 4 in checked syllables are shown in figures 15-18.

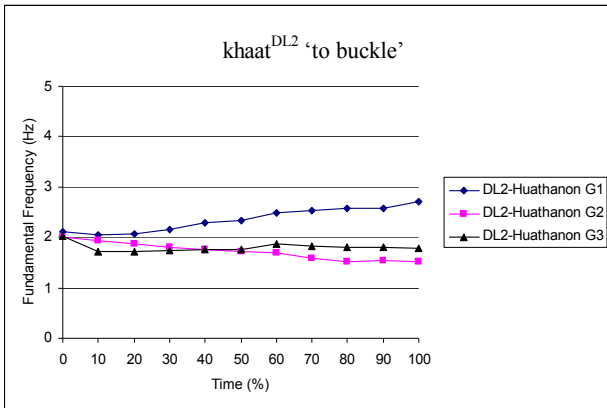


Figure 15. Tone 4: DL2 Mid/lower-mid level (Huathanon)

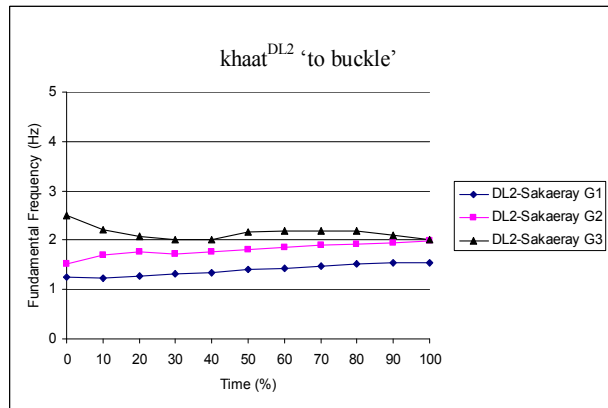


Figure 16. Tone 4: DL2 Mid/lower-mid level (Sakaeray)

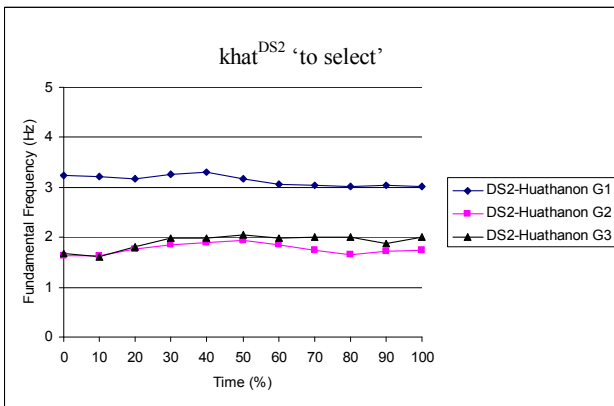


Figure 17. Tone 4: DS2 Mid/lower-mid level (Huathanon)

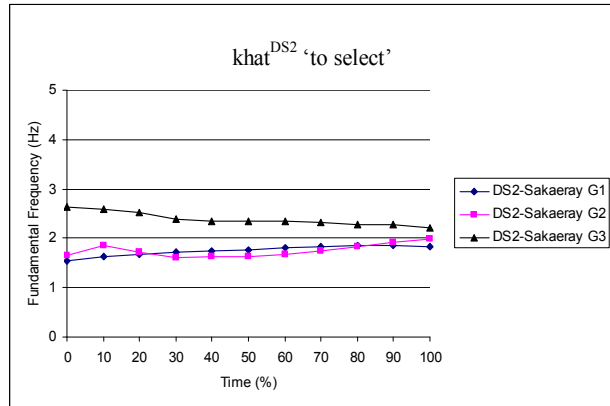


Figure 18. Tone 4: DS2 Mid/lower-mid level (Sakaeray)

Tone 5: C1 Lower-mid/mid level and lower-mid/mid falling with glottalized

The characteristics of tone 5 conform to the tone features of 14 varieties described in 4.1. That is, they are lower-mid/mid level or lower-mid/mid falling tone terminated with a glottal closure as classified into two groups below.

Tone features	Age-group and location
Tone shape 1 22̣̣̣/33̣̣̣	G1-HTN/G1-SKR
Tone shape 2 21̣̣̣/31̣̣̣	G2-SKR/G2-HTN, G3-HTN, G3-SKR

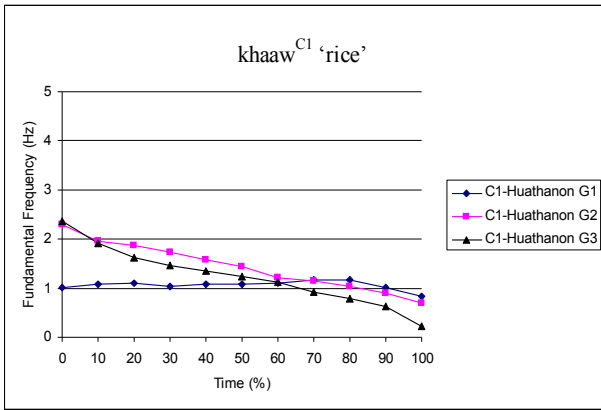


Figure 19. Tone 5: C1 Lower-mid level/lower-mid falling with glottalized (Huathanon)

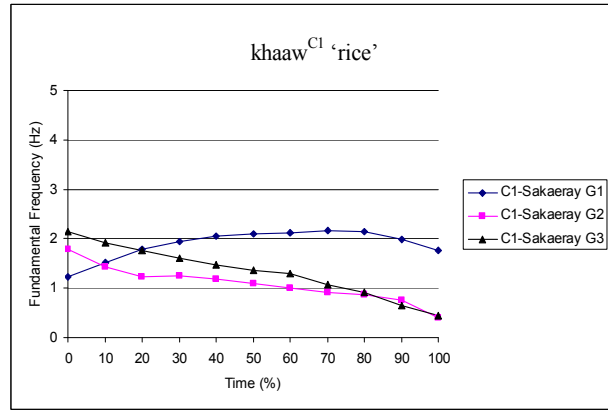


Figure 20. Tone 5: C1 Lower-mid level/lower-mid falling with glottalized (Sakaeray)

Tone 6: C2 Mid falling

Tone 6 in all varieties features falling tones. Only G1 speakers terminate this tone with a glottal closure. Based on the starting point of this contour tone, the phonetic features of this tone are classified into two groups.

Tone features

Tone shape 1 31ʔ/31

Tone shape 2 21ʔ

Age-group and location

G1-HTN/G2-HTN, G3-HTN, G2-SKR, G3-SKR

G1-SKR

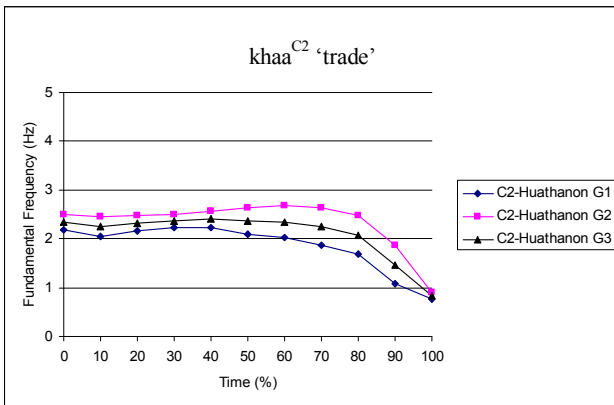


Figure 21. Tone 6: C2 Mid falling (Huathanon)

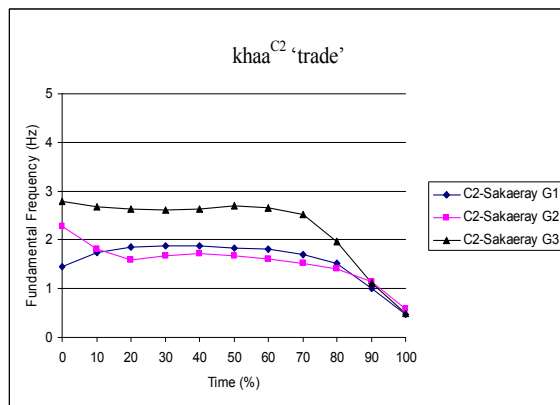


Figure 22. Tone 6: C2 Mid Falling (Sakaeray)

- The tone variation by age-group detailed above shows certain patterns of variation as follows:
- The A1 and B1 tones of the G1 speakers have two points of contours, that is, the beginning point and ending points whereas those of G2 and G3 speakers have the beginning point, the change point and the ending point.
 - The A2 tone of all speakers is a humped tone. The highest point of the contour of the A2 tone of the G1 speakers is higher than that of the G2 and G3 speakers.
 - The B2 tone is a level tone for all speakers. The variation is found at pitch level which is either lower-mid level or mid level.
 - The phonetic values of C1 and C2 tones are uniform among G2 and G3 speakers at both locations, i.e. C1 is [31ʔ/21ʔ] and C2 is [31]. On the other hand, the tone features of C1 and C2 of the G1 speakers at both locations are lower-mid/mid level with glottalization [22ʔ/33ʔ] and mid/lower-mid falling with glottalization [31ʔ/21ʔ] respectively. It should be noted that the typical glottalized feature of the C tone in Thai Song is maintained in the G1 speakers' speech. Most phonetic shapes of C1 and C2 tones in G2 and G3 speakers at both locations are similar. The glottalized feature of the C1 tone keeps C1 and C2 tones apart. If this feature is dropped in the future, as in the case of C2, it can be predicted that C1 and C2 will merge resulting in 5 tones.

5. Conclusion and discussion

This paper is a survey work of Thai Song/Tai Dam tonal inventories. It aims to study tone variation according to location and age-group. The regional variation was based on previous studies and the researcher's study of the Muang La variety. The social variation study was conducted by means of a case study of six informants at two locations, Huathanon village and Sakaeray village, Nakhon Pathom province. The Muang La and Nakhon Pathom phonetic data were analyzed by using auditory judgment and acoustic measurements. Analysis of the tone patterns was based on Gedney's (1972) approach.

A tone comparison of 14 Thai Song/Tai Dam varieties reveals that the tone patterns of most varieties are uniform. All varieties, except that of Loei, show a basic binary split, giving six tones. DS1 and DL1 correspond to B1 while DS2 and DL2 correspond to B2. These tone correspondences (B=DL) distinguish the languages of the Tai group from those of the Lao group (Chamberlain 1975). The Loei variety has five tones as C1 [21] merges with B2 [21] and D tone splits into DS1 [44] and DL1 [45], corresponding to B1 [45].

The study of tone characteristics reveals that most varieties show similar tone features. That is, A1 and B1 tones are rising tones; A2 and C2 are falling tones; C1 is a falling tone or level tone, glottalized in some varieties; and B2 is a level tone as shown in Diagram 5. Some phonetic differences lie at the starting and ending points of contours and pitch levels. Phetchaburi 2 and Loei varieties show a minor difference, namely that B2 is a falling tone. The phonetic value of the A2 tone in the Samut Sakhorn variety is distinct from other varieties in that it is a rising tone [45]. It should be noted that the Loei variety is different from other varieties in the number of tones and phonetic values of some tones. This may be due to the fact that this variety is used by those speakers who migrated directly from Laos, not from Phetchaburi, and thus distinguishing it from varieties which share a common (Phetchaburi) ancestor origin.

These Thai Song varieties are different from the ML1 and ML2 varieties spoken in Vietnam in terms of A1 and A2 tones which are lower-mid/mid level and high level respectively as shown in Diagram 6. Both C1 and C2 are glottalized falling tones in ML1 and ML2 varieties whereas C1 is a glottalized falling tone in SP2 and a glottalized level tone in PB2 and NW varieties. The glottalized feature is absent in C2 in all 12 varieties.

Diagram 5: Pattern of tonal splits and mergers in most TSD varieties

	A	B	C	DS	DL
aspirated	Rising	Rising	(Glottalized)	Rising	
unaspirated			Falling/level		
glottalized					
voiced	Falling	Level	Falling	Level	

Diagram 6: Pattern of tonal splits and mergers in ML1 and ML2

	A	B	C	DS	DL
aspirated	Level	Rising	Glottalized	Rising	
unaspirated			Falling		
glottalized					
voiced	Level	Level	Glottalized	Level	
			Falling		

Pittayaporn (2009) reconstructed pre-split Tai Dam tone system by applying internal reconstruction to Gedney's ML dialect of Black Tai, i.e. Black Tai *A as a mid level tone, *B as a rising tone⁶⁶, and *C as a glottalized falling tone. As ML1 and ML2 are the same varieties as Gedney's ML dialect, they also conform to this reconstruction. The data of ML2 variety was collected 37 years after the data collection of the ML1 variety (Fippinger and Fippinger 1974) but the tone systems of these two varieties are still the same. On the other hand, other varieties in Thailand have changed level tones to rising tone in A1 and falling tone in A2. And the glottalized feature of C tone is remained in few varieties.

The study of tone variation by age-group concludes that the typical tone pattern of Thai Song language is still preserved by three generations of speakers and has not been phonemically changed at either location. All varieties show the same tone patterns as the 14 regional varieties. This finding agrees with Saeng-ngam's

⁶⁶ B2 is considered tone B1 with a raised onset resulting from the register split so Black Tai *B is reconstructed as a rising tone (Pittayaporn 2009).

(2006) work that tone change occurs slower than lexical change. The tone characteristics are not completely conditioned by age-group as hypothesized.

The phonetic features of all tones, except C1 tone, do not vary according to age-group. That is, for all informants, the tone characteristics of A1 and B1 are a rising tone; A2 is a humped tone; B2 is a level tone; and C2 is a falling tone. Some minor phonetic differences exist but are insignificant.

In the case of C1 tone, G1 speakers at both locations use a level tone while the speakers of other generations use lower-mid falling. All informants still keep the glottal closure of C1 whereas in C2, only G1 speakers preserve it.

In overall view, the tone features of all informants mostly conform to those of the 12 varieties spoken in Thailand. That is, A1 and B1 are rising tones; A2 humped tone; B2 level tone; C1 low or mid level/falling tones; and C2 falling tone. And the glottal closure of C tone is not stable. The unstable condition of this feature suggests that it might be lost in the future. The uniform patterns of tones suggest that the speakers of all Thai Song varieties have ancestors who migrated from the same region of origin in Laos and spoke the same dialect. From differences in the features of A1 and A2 tones between the Thai Song variety and the Tai Dam variety, it can be implied that both varieties were distinct dialects or they might be the same dialect but the Thai Song variety adopted the tonal features of a Lao dialect. Akharawatthanakun (2003) has found that a number of Lao dialects such as Loei dialect and Vientiane dialect have a rising tone in A1 and a humped tone in A234 which are similar to the tone features of the Thai Song variety.

Both regional and social varieties have the tone patterns which are mostly uniform across the nation. All varieties show the regular tone split between rows 3 and 4 in all tone categories as seen in Gedney's chart. Two tones developed from each proto-tone. Li (1977) refers to these two tones as tones of series 1 and tone of series 2. The former developed from original voiceless initials and are typically high or rising in phonetic value (voiceless-high). The latter developed from original voiced initials and are typically low or falling (voiced-low). The tone patterns of most regional and social varieties show this usual pattern of tone splitting, that is, voiceless-high in A1 and B1 and voiced-low in A2 and C2. Tones C1 and B2 are level or falling.⁷ The uniform tone patterns of Thai Song suggests that, wherever the Thai Song speakers live, they are linguistically conservative, especially among the first and second generation speakers, despite the influences of neighboring Thai dialects. And as mentioned earlier, the place where Thai Song people originally settled in Thailand was Phetchaburi province. Later on they moved to nearby provinces but remain in contact with their relatives and friends. On special occasions such as the Songkran festival, most Thai Song communities will celebrate this occasion on different dates so that Thai Song people from other locations are able to join in. Thai Song people also formed the Tai Dam Association of Thailand in Nakhon Pathom province and the Tai Dam Association of the Northern Region so that these two associations can serve as centers for Thai Song speakers across the nation. This contact phenomenon might be the cause of the uniform usages of tone patterns.

The original settlement of Thai Song people in Thailand was in Phetchaburi province. The oldest and most populated Thai Song community is the village number five (Nongkhe village), Nongprong sub-district, Khaoyoi district, Phetchaburi province (Chakshuraksha 2003). Later on, Thai Song people moved to nearby provinces such as Kanchanaburi, Ratchaburi, Suphanburi, Nakhon Pathom, Samut Sakhon, and Samut Songkhram.

The change of tones A1 and A2 from level tones in Tai Dam varieties (ML1 and ML2) to contour tones in Thai Song varieties may be due to internal or external causes such as a language contact which is interesting for further research. Plungsuwan (1981) notes that the tone patterns of Thai Song at most locations in Ratchaburi province have been affected by those of Lao ethnic groups residing nearby such as Lao Ti. As the Ratchaburi variety is a mixed variety, it is not included in this study.

In conclusion, the current contributions of this study can be seen in various aspects. First, this study is a comprehensive study of Thai Song tones as it covers most locations where Thai song people reside in Thailand. It also used the speech software program PRAAT to confirm auditory judgment while most previous tonal studies of Thai Song/Tai Dam are based on auditory judgment alone. This study has determined the representative tonal contour of each tonal category, something not found in any previous studies. Finally, the selected research sites in Nakhon Pathom province and the tonal analysis of different age groups at these locations were not studied before so this study yields a new finding of tonal analysis at these locations.

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⁷ Snyder (1995) uses the term "tonal flip flop" to refer to the situation in which the tone values are opposite of that predicted.

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Appendix

Checklist of 80 test words

Adaped from Gedney (1972) and Akharawatthanakun (2003)

	A (๐)	B (ʼ)	C (๕)	D-long	D-short
1.	huu หู khaa ขา hua หัว song สอง	khai ไข่ phaa ผา khaa ข่า thua ถั่ว	khaaw ข้าว thuay ถ้วย moo หม้อ haa ห้า	khuat ขวด phuuk ผูก sook สอก saak สาก	mat หมัด phak ผัก hok หก sip สิบ
2.	puu ปี่ taa ตา kin กิน kaa กา	kai ไก่ paa ป่า taw เต่า pii ปี่	kaaw เก้า tom ต้ม kaang ก้าง tuu ตู	piik ปีก pææt แปด poot ปอด taak ดาก	kop กบ pet เป็ด tok ตก tap ตับ
3.	bin บิน dææng แดง bay ใบ daaw ดาว	baa บ่า ?im อิม baaw บาว daa ต่า	daay ต้าย ?oi อ้อย daam ต้าม ?aa อ้า	dææt แดด duuk ดูก dook ดอก ?ook ออก	bet เบ็ด dip ดิบ ?ok ออก dik ดึก
4.	mii มือ khwaay ควาย naa นา nuu งู	phoo ฟอ phii ฟี่ naŋ นัง liay เลื่อย	naa น้า maa ม้า naam น้ำ lin ลิน	mit มัด liat เลียด chiak เชือก luuk ลูก	nok นก mot มด lep เล็บ mat มัด
	Smooth syllables			Checked syllables	