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RESEARCH ARTICLE

Tonal Variation in the Phuan Language of Northeastern Thailand as Spoken by Elderly Informants

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ABSTRACT

This study aims to analyze tonal variation and phonetic characteristics in the Phuan language as spoken in Northeastern Thailand. Data were collected from 24 primary language informants aged 55–65 across eight subdistricts in four provinces: Pak Tom Subdistrict in Loei Province; Kut Bong, Na Kha, Pho Tak, and Ban Mo Subdistricts in Nong Khai Province; Ban Phue and Ban Chiang Subdistricts in Udon Thani Province; and Wisit Subdistrict in Bueng Kan Province, with three informants from each location. The analysis follows Gedney's (1972) tonal box framework, using a 60-word list to examine the number of tonal phonemes and patterns of tonal merger and split. Additionally, a 20-word tone similarity list from Akharawatthanakun (2003) was used to analyze the phonetic features of Phuan tones through acoustic phonetic methods. Praat software was used for acoustic analysis, and Microsoft Excel 365 was employed to process and present the data in graphical representations. Fundamental frequency (F0) values of the tonal data were converted into semitone (ST) units for comparative analysis. The findings revealed that the Phuan language in northeastern Thailand features both five and six tonal phonemes. Five-tone systems were found in three subdistricts: Pak Tom, Na Kha, and Ban Mo, while six-tone systems were observed in five subdistricts: Kut Bong, Pho Tak, Ban Phue, Ban Chiang, and Wisit. Four distinct patterns of three-way tone split and merger were identified: (1) A123-4, B123-4, C1-234, DLDS123-4; (2) A1-234, B1234, C1-234, DLDS123-4; (3) A1-234, B123-4, C1-234, DLDS123-4; and (4) A123-4, B1234, C1-234, DLDS123-4. Despite some areas sharing similar tonal systems, differences were found in the phonetic characteristics of the tones. The study also underscored that the residential locations of speakers play a significant role in shaping tonal variation in the Phuan language.

INTRODUCTION

Phuan is a Tai language descended from the Chiang Saen–Yunnan branch, classified within the Southwestern Tai group (Brown, 1965). It is spoken in several regions of Thailand, including the Central, Northern, Eastern, and Northeastern regions (Tanprasert, 2003). Large-scale migration of Phuan people into Thailand occurred during the reign of King Rama V (Samlamchiak, 1994). At that time, the abolition of slavery was enacted for Thai citizens, but Phuan migrants were not permitted to return to their original homeland. As a result, many Phuan people who had settled in the Central region eventually relocated and established communities along the Mekong River in the Northeastern provinces of Loei, Udon Thani, and Nong Khai—areas geographically close to their ancestral homeland (Preeditsanit, 1996). The Phuan language spoken in various Northeastern communities exhibits distinct tonal characteristics. For instance, a study by Toophom (2017) analyzed tonal variation in Phuan as spoken in Ban Klang village, Chiang Khan District, Loei Province, based on speaker age. The research revealed clear phonetic differences in tonal production between Phuan speakers in Ban Klang and those in Buhom village, despite both villages being in the same district. Similarly, Tanprasert's (2003) study demonstrated that the phonetic characteristics and the

number of tonal phonemes in the Phuan language differ between Udon Thani and Nong Khai provinces.

The sound system of the Phuan language in Thailand has been widely studied, including its consonants, vowels, and tonal features. Various studies have reported differing phonological inventories: (1) Arromsuk (1978), Tanyong (1983), and Homduang (2016) found that Phuan has 20 initial consonant phonemes, 18 monophthongs, 6 diphthongs, and 6 tones. (2) Brown (1965), meanwhile, reported 19 initial consonants, 18 monophthongs, 6 diphthongs, and 6 tones. (3) Khanittanan (1973) identified 20 initial consonants, 18 monophthongs, 3 diphthongs, and 6 tones, while (4) Seneesrisan (1983) found a similar consonant and vowel system but noted only 5 tonal phonemes. These studies also indicate that factors such as the speaker's age and place of residence can influence variations in the Phuan phonological system.

Language variation is the initial stage before language undergoes change, and it typically arises from the social factors associated with speakers. These social factors—external influences—play a crucial role in causing individual language variation. Such factors include age, gender, place of residence, ethnicity, occupation, and level of education (Prasithrathasint, 2001). These variables are inherently linked to speakers and are closely related to language variation. Among them, place of residence is particularly complex compared to age and gender. While age and gender are relatively easy to observe and categorize, defining and delineating residential location requires careful criteria to avoid complications in research. One common issue in studying residential factors is speaker migration. If a speaker frequently relocates without settling in one place for an extended period, their language may be influenced by multiple linguistic environments, making it difficult to determine their original dialect or native language.

Previous studies have shown that the Phuan language in Thailand is undergoing rapid change, particularly in its sound system and tonal features. This shift is largely influenced by the widespread use of Standard Thai and the Isan dialect in daily communication. Such influence has led to tonal variation among speakers of different age groups, especially between the elderly and younger generations. Therefore, this study aims to investigate tonal variation in the Phuan language as spoken in northeastern Thailand, with a focus on elderly informants. The research seeks to analyze the current tonal variation patterns and explore the social factors that may contribute to these changes. The findings are expected to contribute both to language preservation efforts and to a deeper understanding of language change processes within society.

Research Objective

The objective of this study is to analyze tonal variation and the phonetic characteristics of Phuan tones as spoken by elderly informants in northeastern Thailand. As Phuan is an ethnic minority language spoken within communities where the dominant language is Isan, the findings of this research aim to reveal whether the Phuan language has undergone tonal variation based on the speakers' geographic location.

LITERATURE REVIEWS

Phuan language in Thailand

The Phuan language in Thailand is spoken across various regions, including the Central, Eastern, Northeastern, and Northern parts of the country (Tanprasert, 2003). The Phuan people originally migrated from Muang Phuan, Xieng Khouang Province in the Lao People's Democratic Republic during the years 1782 and 1789, driven by war, threats from Chinese-Ho invasions, or the pursuit of new agricultural land (Srisuwan, 1993). A significant wave of migration occurred during the reign of King Chulalongkorn (Rama V) (Saemlamchiak, 1994), particularly after the abolition of slavery, when return to their original homeland was prohibited. As a result, many Phuan people resettled along the Mekong River in the Northeastern provinces such as Loei, Udon Thani, Nong Khai, and Bueng Kan, areas geographically close to their original homeland in Laos (Preedisanit, 1996). The distribution of the Phuan people in Thailand is concentrated in provinces along the Mekong River, as their migration from Laos followed this route. Formerly referred to as "Lao Phuan," the group gradually adopted the use of the Thai language upon settling in Thailand, leading to a shift in self-identification. They began to consider themselves Thai and changed their ethnonym from "Lao Phuan" to "Thai Phuan."

Consequently, Phuan individuals who migrated from Laos to Thailand now refer to each other as "Thai Phuan" (Saemlamchiak, 1994).

From past to present, the Phuan language in Thailand has been studied from various perspectives, including phonology, vocabulary, and language attitudes. In terms of phonology, notable studies include Wattanaprasert and Liamprawat (1988) on the phonological system of Lao speakers along the Tha Chin River; Sukpiti (1989) on the phonetic features of Phuan; Sangwansap (1991) on general characteristics of the Phuan language; Chaturaphatharawong (2015) on dialect variation; Homduang (2016) on phonological systems and sound variation; and Toophom (2017) on tonal variation based on age. Lexical studies include Tanyong (1983) on vocabulary usage among three age groups; Srisuwan (1993) on linguistic features of Phuan; Boonsorn (1997) on sentence-ending particles; Aree (2003) on adverbs; Singsena (2013) on sentence-final expressions; Huanhom (2013) on terms of address; Pongpiriyawanit (2016) on personal pronouns; and Jaimaitri and Sangkhaman (2016) on vocabulary variation. Regarding language attitudes, Kanmaneelert (2016) explored the attitudes of Phuan speakers and their language choices. These studies have shown that Phuan is used in various regions across Thailand. These findings reflect the widespread settlement of Phuan communities throughout multiple parts of the country, as evidenced by the research mentioned above.

RESEARCH METHODOLOGY

This study is a linguistic investigation employing a qualitative approach. The research data focuses on Thai tonal phonemes as they appear at the word level. The lexical items used to collect tonal phoneme data were drawn from Gedney's (1972) tonal test wordlist, which consists of 60 words. These words have been widely cited by scholars studying the tonal systems of Tai languages spoken across Southeast Asia, including Thailand. Additionally, 20 words proposed by Akharawatthanakun (2003) were included for tonal analysis using the Praat software, version 6.2.03. The research was conducted in eight sub-district-level locations across four provinces—Loei, Nong Khai, Udon Thani, and Bueng Kan—where Thai Phuan ethnic communities are present. The findings will be presented in the form of tone contour graphs and tonal box diagrams.

Research Instruments

1) The primary instruments for data collection include a wordlist and the tonal box test developed by Gedney, which is designed for studying tonal systems of Tai languages. The details are as follows:

	A	B	C	DL	DS
1	หู ear ขา leg หัว head	ไข่ egg ผ่า cut เข่า knee	ข้าว rice เสื้อ shirt ผ้า cloth	ขาด torn เหงือก gum หาบ carry with a pole	หมัด flea สัก tattoo ผัก vegetable
2	ปี year ตา eye/grandfather กิน eat	ป่า forest ไก่ chicken แก่ old	ป้า aunt กล้า brave ต้ม boil	ปอด lung ปีก wing ตอก nail (v.)	กบ frog ตับ liver เจ็บ hurt
3	บิน fly (v.) แดง red ดาว star	บ่า shoulder บ่าว young man ด่า scold	บ้า crazy บ้าน house อ้า open mouth	แดด sunlight อาบ bathe ดอก flower	เบ็ด hook ดิบ raw อก chest
4	มือ hand งู snake นา rice field	พ่อ father แม่ mother ไร่ plantation	น้ำ water น้อง younger sibling ม้า horse	มีด knife ลูก child เลือด blood	นก bird มด ant ลัก steal

Figure 1: Gedney's Tonal Box Test for Tai Languages (Gedney, 1972)

Legend

Column Labels (A, B, C, DL, DS): Represent different tone categories:

A: Mid tone (Tonal Class A)

B: Low tone (Tonal Class B)

C: Falling tone (Tonal Class C)

DL: Long vowels with final consonants /b, d, g/

DS: Short vowels with final consonants /b, d, g/

Numbered Classifications (1–4): Indicate types of initial consonants:

High-class consonants or consonants with leading /h/

Mid-class voiceless consonants

Mid-class voiced consonants

Low-class consonants

2) A minimal tone set by Akharawatthanakun (2003), used for analyzing Puan tonal sounds with the Praat software.

	A	B	C	DL	DS
1	ขา leg	ข่า galangal	ข้า I/slave	ขาด lack	ขัด scrub/ obstruct
2	ปา throw	ป่า forest	ป้า aunt	ปาด slash	ปัด brush off
3	บาน bloom	บ่า shoulder	บ้า crazy	บาด cut	บัตร card
4	คา stick	ค่า value	ค้า trade	คาด expect/strap	คัด select

Figure 2: Minimal Tone Set for Acoustic Analysis by Akharawatthanakun (2003)

3) The data analysis tool used in this study is the acoustic analysis software Praat, version 6.2.03.

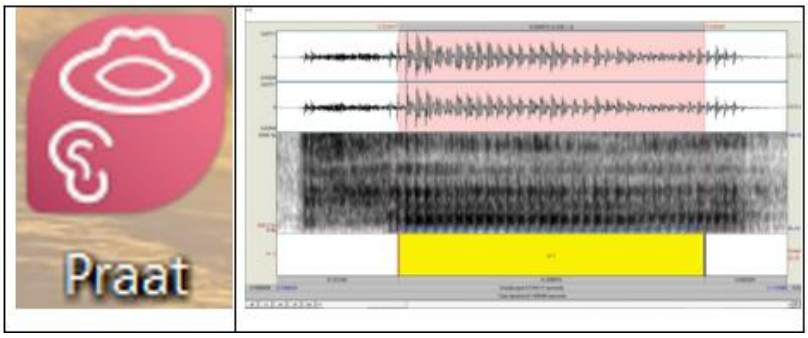


Figure 3: Praat software and examples of tonal contour spectrograms

Praat is a software program developed for analyzing acoustic differences across languages. In this study, Praat is specifically employed to analyze tonal sounds. The tonal system is a key linguistic feature of the Tai language family, used to distinguish one dialect from another.

4) Research Sites: The study was conducted in areas inhabited by the Phuan ethnic group in Northeastern Thailand. The eight selected locations are marked with the symbol

as shown in the following figure.

Phuan Language Data Collection Sites (8 Locations):

1. Pak Tom Subdistrict
2. Kut Bong Subdistrict
3. Na Kha Subdistrict
4. Pho Tak Subdistrict
5. Ban Mo Subdistrict
6. Ban Phue Subdistrict
7. Ban Chiang Subdistrict
8. Wisit Subdistrict

Figure 4: Map of Thailand by Province

https://gisgeography.com/wp-content/uploads/2017/09/Thailand-Province-Map-768x1345.jpg

RESEARCH RESULTS

1.Tonal Split and Merger in the Puan Language in Northeastern Thailand

From the analysis of the tonal system of the Puan language used in the northeastern region of Thailand, it was found that the Puan language in this region has two groups of tonal units: a 5-unit group and a 6-unit group. Each tonal unit group has two patterns of tonal split and tonal merger. For the dead syllable slots DL and DS across all areas, the tonal split pattern is the same, as summarized in Figure 5.

1) Tonal unit with 5 tonal distinctions, Pattern 1: There is tonal split and merger in a vertical pattern like A1-234, B1234, C1-234, DL123-4, and DS123-4. In the horizontal pattern, C1=DL123=DS123 and C234=DL4=DS4. This is found in one subdistrict: Pak Tom, Chiang Khan District, Loei Province.

2) Tonal unit with 5 tonal distinctions, Pattern 2: There is tonal split and merger in a vertical pattern like A123-4, B1234, C1-234, DL123-4, and DS123-4. This is found in two subdistricts: Na Kha Subdistrict, The Bo District, and Ban Mo Subdistrict, Si Chiang Mai District, Nong Khai Province. The horizontal split and merger patterns can be divided into two subpatterns as follows:

Sub pattern 2.1: C1=DL123, C234=DL4, A4=DS123, and B1234=DS4, found in Na Kha Subdistrict.

Sub pattern 2.2: C1=DL123, C234=DL4, A123=DS123, and B1234=DS4, found in Ban Mo Subdistrict.

3) Tonal unit with 6 tonal distinctions, Pattern 1: There is tonal split and merger in a vertical pattern like A1-234, B123-4, C1-234, DL123-4, and DS123-4. The horizontal split and merger patterns are B123=DL123, B4=DL4, C234=DS123, and A234=DS4. This is found in one subdistrict: Ban Phue Subdistrict, Ban Phue District, Udon Thani Province.

4) Tonal unit with 6 tonal distinctions, Pattern 2: There is tonal split and merger in a vertical pattern like A123-4, B123-4, C1-234, DL123-4, and DS123-4. This pattern is found in 5 subdistricts: Kut Bong Subdistrict, Phon Phisai District; Pho Tak Subdistrict, Pho Tak District; and Ban Mo Subdistrict, Si Chiang Mai District, Nong Khai Province; Ban Chiang Subdistrict, Nong Han District, Udon Thani Province; and Wisit Subdistrict, Mueang Bueng Kan District, Bueng Kan Province. The horizontal split and merger patterns can be divided into 5 subpatterns as follows:

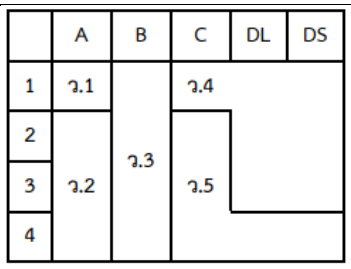
Subpattern 4.1: B123=DL123, C1=DL4, A4=DS123, and C234=DS4, found in Kut Bong Subdistrict.

Subpattern 4.2: B123=DL123, B4=DL4, C234=DS123, and C1=DS4, found in Pho Tak Subdistrict.

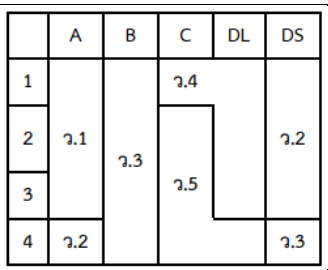
Subpattern 4.3: B123=DL123, C234=DL4, A4=DS123, and C1=DS4, found in Ban Chiang Subdistrict.

Subpattern 4.4: B123=DL123, B4=DL4, A4=DS123, and C234=DS4, found in Wisit Subdistrict.

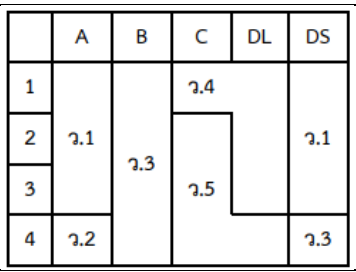
Subpattern 4.5: B4=DL123, C1=DL4, C234=DS123, and B123=DS4, found in Ban Mo Subdistrict.



Pattern 1: Pak Tom Subdistrict, Chiang Khan District, Loei Province



Subpattern 2.1: Na Kha Subdistrict, Tha Bo District, Nong Khai Province



Subpattern 2.2: Ban Mo Subdistrict,
Si Chiang Mai District, Nong Khai Province

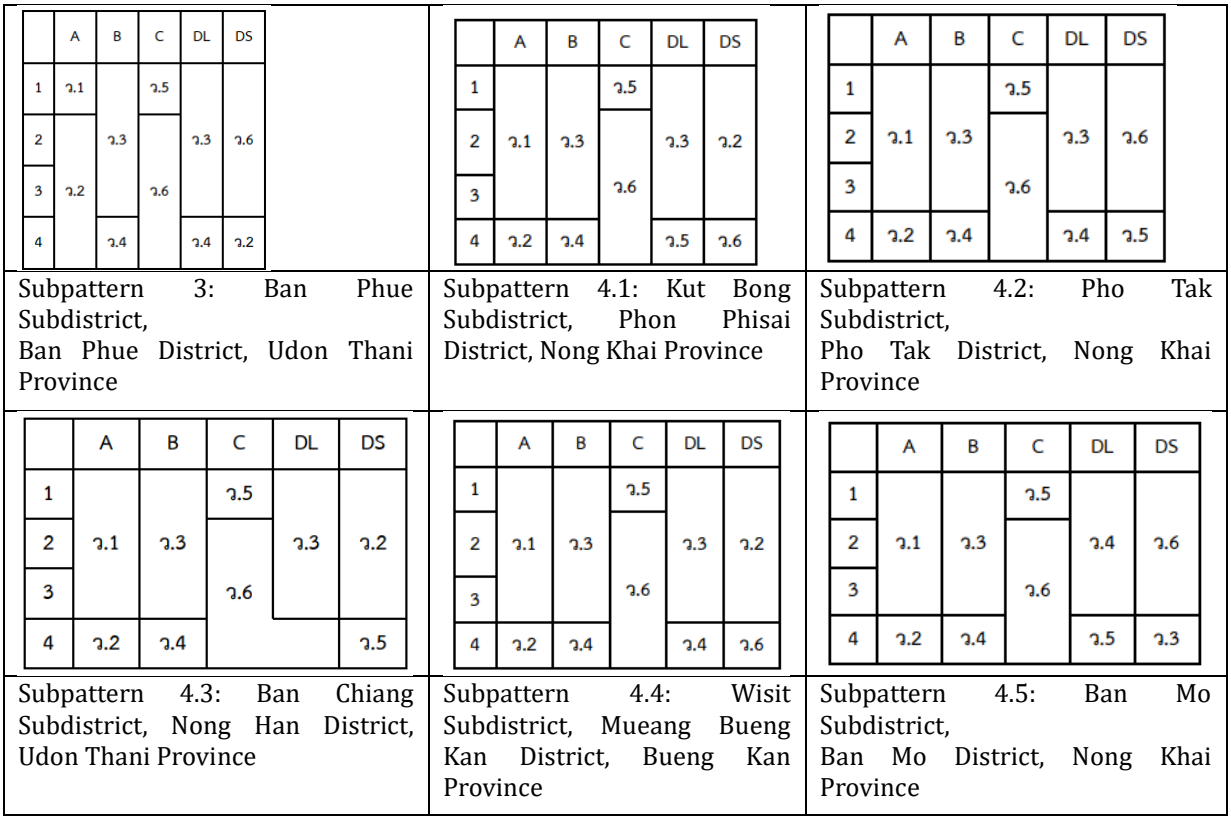


Figure 5: Tonal Split and Merger Patterns of Phuan Tonal System in Northeastern Thailand

Based on Figure 5, it is evident that the tonal split and merger patterns in Pattern 1, Pattern 2.1, and Pattern 2.2—particularly the horizontal tonal merger of live and dead syllables—show a consistent pattern of C1=DL123 and C234=DL4. This feature is a key characteristic of the Lao language group (Akharawatthanakun, 2003). In contrast, the tonal split and merger patterns observed in Pattern 3 through Pattern 4.5 display different characteristics. From Figure 5, the horizontal tonal mergers can be summarized by grouping them according to systems with five and six tone categories as follows:

1.1 Group of Tone Units with Five Tonal Categories

Tones in categories C1 and DL123 merge (C1 = DL123) in the subdistricts of Pak Tom, Na Kha, and Ban Mo.

Tones in categories C234 and DL4 merge (C234 = DL4) in the subdistricts of Pak Tom, Na Kha, and Ban Mo.

Tones in categories B123 and DS4 merge (B123 = DS4) in the subdistricts of Na Kha and Ban Mo, except in Pak Tom, where tones in categories C234 and DS4 merge instead.

Tones in DS123 show different merging patterns across the three subdistricts: in Pak Tom, they merge with category C1; in Na Kha, with category A4; and in Ban Mo, with category A123.

1.2 Group of Tone Units with Six Tonal Categories

Tones in categories B123 and DL123 merge (B123 = DL123) in the subdistricts of Ban Phue, Kut Bong, Pho Tak, Ban Chiang, and Wisit, except for one speaker in Ban Mo, where tones in categories B4 and DL123 merge instead.

Tones in categories C1 and DL4 merge (C1 = DL4) in the subdistricts of Kut Bong and Ban Mo. In Pho Tak and Wisit, tones in categories B4 and DL4 merge, and in Ban Chiang, tones in categories C234 and DL4 merge.

Tones in categories A4 and DS123 merge (A4 = DS123) in the subdistricts of Kut Bong, Ban Chiang, and Wisit, except in Pho Tak and Ban Mo, where tones in categories C234 and DS123 merge instead.

Tones in categories C234 and DS4 merge (C234 = DS4) in the subdistricts of Kut Bong and Wisit. In Pho Tak and Ban Chiang, tones in categories C1 and DS4 merge, except for one speaker in Ban Mo, where tones in categories B123 and DS4 merge instead.

2.Phonetic Characteristics of Phuan Language in Northeastern Thailand

The phonetic variations of Phuan language tones spoken in Northeastern Thailand are divided into two groups: (1) the group of tone units with five tonal categories found in three subdistricts, and (2) the group of tone units with six tonal categories found in six subdistricts, as follows:

2.1) Group of Tone Units with Five Tonal Categories

Tone 1 is divided into three patterns: 1) Low-rising-falling appears in slot A1 with the phonetic characteristic [131], found in the subdistrict of Pak Tom; 2) Low-rising appears in slot A123 with the phonetic characteristic [13], found in the subdistrict of Na Kha; 3) Mid-falling-rising appears in slots A123 and DS123 with the phonetic characteristic [314], found in the subdistrict of Ban Mo, as shown in Figure 6.

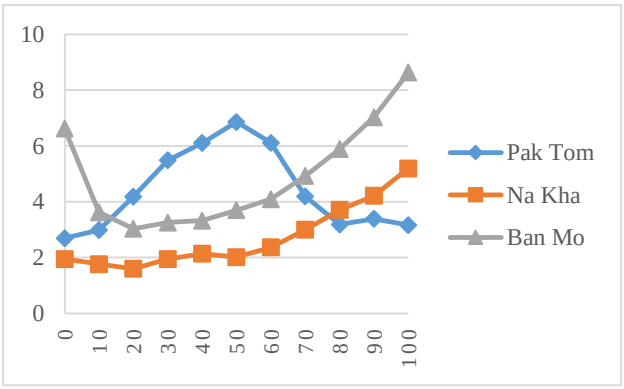


Figure 6: Phonetic characteristics of Tone 1 in the Phuan language with five tonal categories

Tone 2 is divided into two patterns: 1) Low-rising-falling appears in slot A234 with the phonetic characteristic [131] in the subdistrict of Pak Tom, and in slot A4 with the phonetic characteristic [121] in the subdistrict of Ban Mo. Although these two subdistricts are not contiguous, they exhibit the same phonetic characteristic, and 2) Low-rising appears in slots A123 and DS123 with the phonetic characteristic [12], found in the subdistrict of Na Kha, as shown in Figure 7.

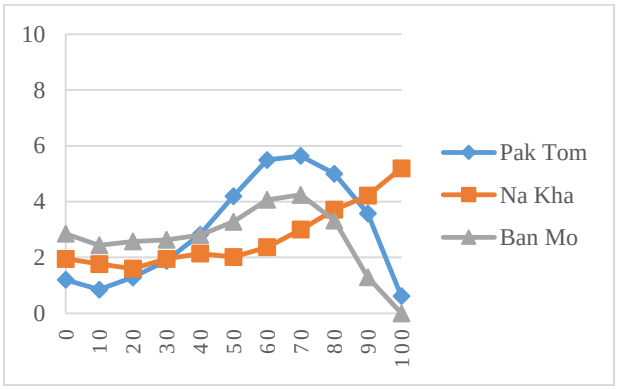


Figure 7: Phonetic characteristics of Tone 2 in the Phuan language with five tonal categories

3. Tone 3 is divided into two patterns: 1) Lower-mid falling, which appears in slots B1234 and DS4 in the subdistrict of Na Kha, with the phonetic characteristic [21]/[43], found in both Pak Tom and Na Kha subdistricts, which are not contiguous but share the same phonetic characteristics; and 2) Mid-level, which appears in slots B1234 and DS4 with the phonetic characteristic [33], found in the subdistrict of Ban Mo, as shown in Figure 8.

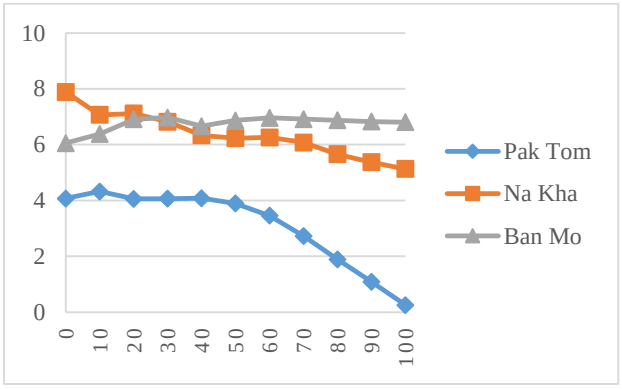


Figure 8: Phonetic characteristics of Tone 3 in the Phuan language with five tonal categories

Tone 4 is divided into three patterns: 1) Low-rising-falling appears in slots C1, DL123, and DS123 with the phonetic characteristic [132], found in the subdistrict of Pak Tom. 2) Mid-level-falling appears in slots C1 and DL123 with the phonetic characteristic [332], found in the subdistrict of Na Kha. 3) Mid-falling appears in slots C1 and DL123 with the phonetic characteristic [31], found in the subdistrict of Ban Mo, as shown in Figure 9.

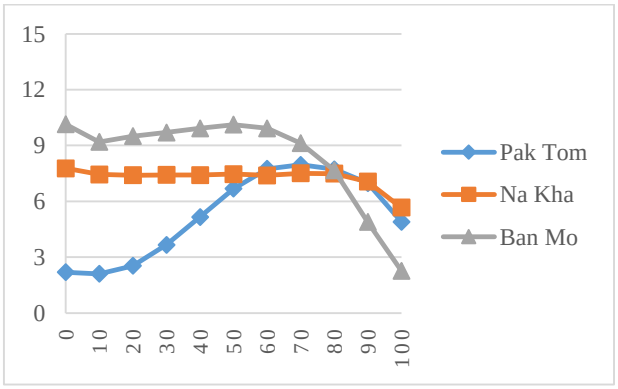


Figure 9: Phonetic characteristics of Tone 4 in the Phuan language with five tonal categories

Tone 5, Low-rising-falling at the end, appears in slots C234, DL4, and DS4 with the phonetic characteristics [121] in the subdistrict of Pak Tom, [232] in slots C234 and DL4, found in the subdistricts of Na Kha and Ban Mo. While these three subdistricts share similar phonetic characteristics, Pak Tom is the only one that is not geographically adjacent to the other two subdistricts, as shown in Figure 10.

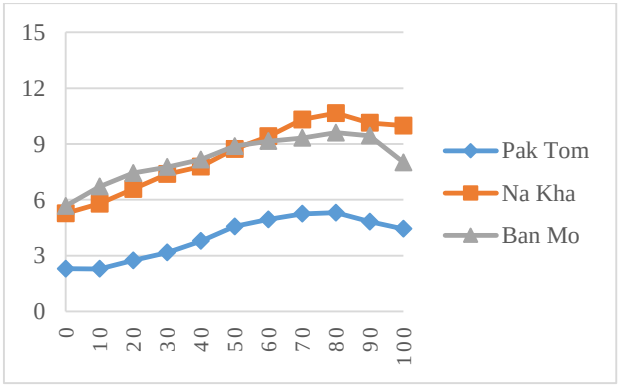


Figure 10: Phonetic characteristics of Tone 5 in the Phuan language with five tonal categories

2.2) The Group of Tone Units with Six Tonal Categories

1. Tone 1, Mid-falling-rising, appears in slot A1 with the phonetic characteristic [313], found in the subdistrict of Ban Phue; in slot A123 with [324], found in the subdistricts of Kut Bong and Ban Chiang; [214], found in the subdistrict of Pho Tak; and [213], found in the subdistricts of Wisit and Ban Mo.

It is observed that Ban Phue, Ban Chiang, Wisit, Kut Bong, Pho Tak, and Ban Mo are not adjacent subdistricts, yet they exhibit similar phonetic characteristics, as shown in Figure 11.

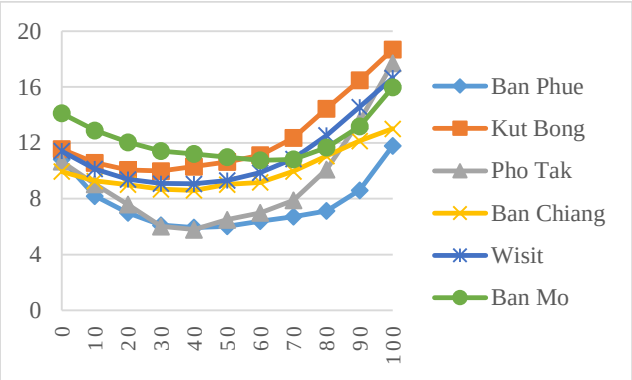


Figure 11: Phonetic characteristics of Tone 1 in the Phuan language with six tonal categories

Tone 2 is divided into three patterns: (1) Lower-mid level appears in slot A234 and DS4 with the phonetic characteristic [22], found in the subdistrict of Ban Phue. (2) Mid- rising appears in slots A4 and DS123 in the subdistricts of Kut Bong and Ban Chiang with the phonetic characteristic [34], found in Kut Bong, Pho Tak, and Ban Chiang. Notably, Ban Chiang and Kut Bong are not adjacent subdistricts but share similar phonetic characteristics. (3) Higher-mid falling rising appears in slots A4 and DS123 with the phonetic characteristic [434], found in the subdistricts of Wisit and Ban Mo, as shown in Figure 12.

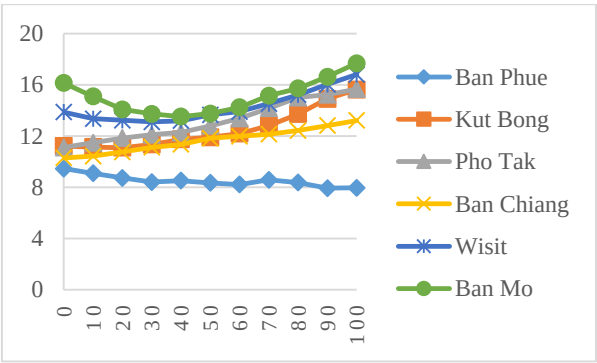


Figure 12: Phonetic characteristics of Tone 2 in the Phuan language with six tonal categories

3. Tone 3 is divided into two patterns: (1) Mid-falling appears in slots B123 and DL123 with the phonetic characteristics [31]/[32], found in the subdistricts of Ban Phue, Kut Bong, Wisit, Pho Tak, and Ban Chiang. These five subdistricts are not geographically adjacent, yet they exhibit the same phonetic characteristics. (2) Higher-mid level appears in slots B123 and DS4 with the phonetic characteristic [44], found in the subdistrict of Ban Mo, as shown in Figure 13.

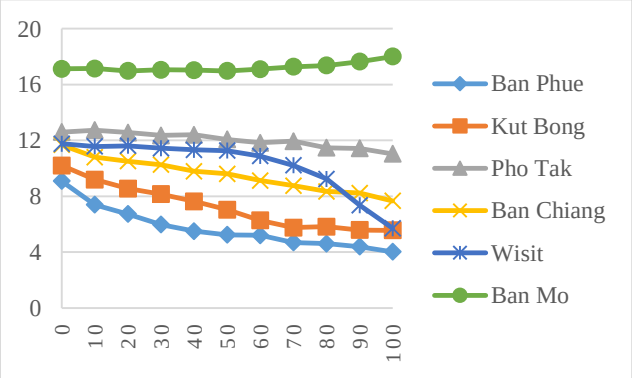


Figure 13: Phonetic characteristics of Tone 3 in the Phuan language with six tonal categories

Tone 4 is divided into two patterns: 1) Lower-mid falling, which appears in slot B4 and DL4 in the subdistricts of Ban Phu, Pho Tak, and Wisit, and in DL123 in the subdistrict of Ban Mo, with phonetic characteristics [21]/[42]/[53]. These patterns are found in Ban Phu, Kut Bong, Pho Tak, Wisit, and Ban Mo, which are not geographically adjacent but share the same phonetic characteristics. 2) Mid-level, which appears in slot B4 with the phonetic characteristic [33], found in the subdistrict of Ban Chiang, as shown in Figure 14.

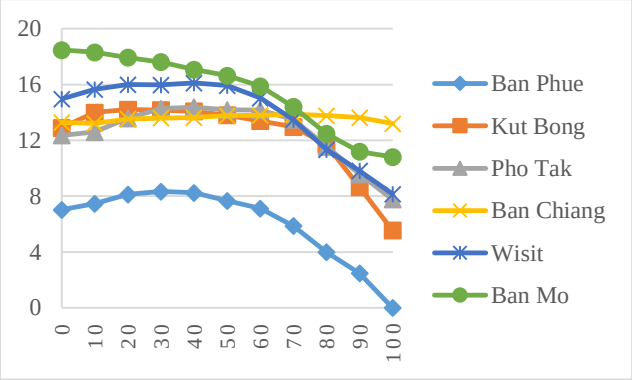


Figure 14: Phonetic characteristics of Tone 4 in the Phuan language with six tonal categories

Tone 5 is divided into three patterns: 1) Mid-level falling, which appears in slot C1 and DL4 in the subdistricts of Kut Bong and Ban Mo, and in DS4 in the subdistrict of Ban Chiang, with phonetic characteristics [332]/ [221]/ [443]. These patterns are found in the subdistricts of Ban Phu, Kut Bong, Ban Chiang, and Ban Mo, which are not geographically adjacent but share the same phonetic characteristics. 2) Mid-level, which appears in slot C1 and DS4 with the phonetic characteristic [33], found in the subdistrict of Pho Tak. 3) Higher-mid falling, which appears in slot C1 with the phonetic characteristic [43], found in the subdistrict of Wisit, as shown in Figure 15.

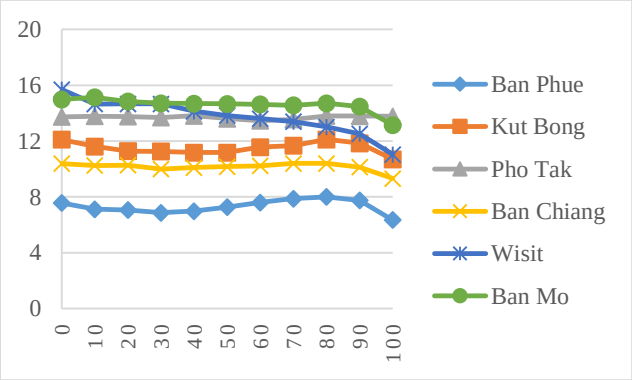


Figure 15: Phonetic characteristics of Tone 5 in the Phuan language with six tonal categories

Tone 6 is divided into five patterns: 1) Low-rising, which appears in slots C234 and DS123 with the phonetic characteristic [13], found in the subdistrict of Ban Phu. 2) Lower-mid rising falling, which appears in slots C234 and DS123 with the phonetic characteristic [232], found in the subdistrict of Ban Chiang. 3) Higher-mid rising, which appears in slots C234 and DS123 with the phonetic characteristic [434], found in the subdistrict of Ban Mo. 4) Mid falling, which appears in slots C234 and DS4 with the phonetic characteristic [32], found in the subdistrict of Kut Bong. 5) Mid-rising falling at the end, which appears in slots C234 and DS123 in the subdistrict of Pho Tak and DS4 in the subdistrict of Wisit, with phonetic characteristics [243]/[343]. These patterns are found in the subdistricts of Pho Tak and Wisit, which are not geographically adjacent but share the same phonetic characteristics, as shown in Figure 16.

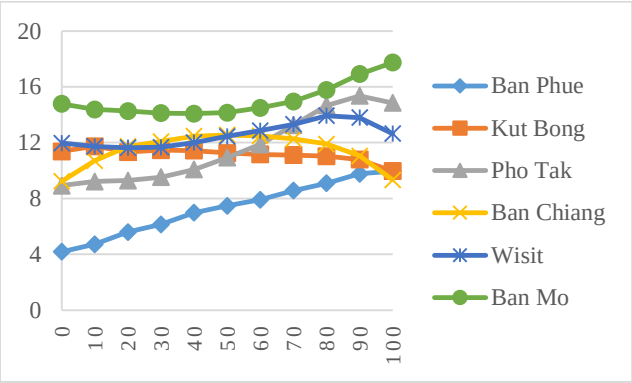


Figure 16: Phonetic characteristics of Tone 6 in the Phuan language with six tonal categories

The phonetic characteristics of tone 6 in the Phuan language, which has the largest number of sub patterns among the six tonal units, show that almost every area has its own specific form of tone 6, except for the subdistricts of Pho Tak and Wisit, where the phonetic characteristics of tone 6 are similar. However, these two areas are not geographically adjacent but still share the same phonetic characteristics.

CONCLUSION AND DISCUSSION

The objective of this study was to analyze the tonal variation and phonetic characteristics of Phuan tones spoken by elderly speakers in the northeastern region of Thailand, specifically in 4 provinces and 8 subdistricts. The findings from the auditory analysis revealed that elderly speakers in this region use two main tone systems in Phuan. These are:

The 5-tone group, which features patterns of tone split and tone merge in a vertical alignment, divided into two subcategories:

1.1) A1-234, B1234, C1-234, DL123-4, and DS123-4, found in the area of Pak Tom subdistrict.

1.2) A123-4, B1234, C1-234, DL123-4, and DS123-4, found in two areas: Na Kha and Ban Mo subdistricts.

The 6-tone group, which also features patterns of tone split and tone merge in a vertical alignment, divided into two subcategories:

2.1) A1-234, B123-4, C1-234, DL123-4, and DS123-4, found in the area of Ban Phue subdistrict.

2.2) A123-4, B123-4, C1-234, DL123-4, and DS123-4, found in five areas: Kut Bong, Pho Tak, Ban Chiang, Wisit, and Ban Mo subdistricts.

When the Phuan tonal units in northeastern Thailand are grouped into two categories, the following tonal variations were observed for each group:

5-Tone Group:

Tone 1 has 3 variations: low-rise-falling, low-rise, and mid-falling-rise.

Tone 2 has 2 variations: low-rise-falling and low-rise.

Tone 3 has 2 variations: lower-mid-falling and mid-level.

Tone 4 has 3 variations: low-rise-falling, mid-level-falling, and mid-falling.

Tone 5 has 1 variation: low-rise-falling at the end of the tone.

6-Tone Group:

Tone 1 has 1 variation: mid-low-rise.

Tone 2 has 3 variations: lower-mid-level, mid-rise, and higher-mid-falling-rise.

Tone 3 has 2 variations: mid-falling and higher-mid-level.

Tone 4 has 2 variations: lower-mid-falling and mid-level.

Tone 5 has 3 variations: mid-level-falling, mid-level, and higher-mid-falling.

Tone 6 has 5 variations: low-rise, lower-mid-rise-falling, higher-mid-rise, mid-falling, and mid-rise-falling at the end of the tone.

The most common variation was found in Tone 6, in the C234 slot of the 6-tone group, with a total of 5 variations. The tone with the fewest variations, with only 1 variation, occurred in Tone 5 in the C234 slot of the 5-tone group, as well as in Tone 1 in the A1 slot of Ban Phue and the A123 slot in the other 5 subdistricts within the 6-tone group. Acoustic analysis revealed that each variation has distinct phonetic characteristics depending on the speaker's place of residence. These phonetic characteristics of the Phuan tones in Northeast Thailand are illustrated in Figure 17.

Tonal Unit	Subdistrict			Tonal Unit	Subdistrict					
	Pak Tom	Na Kha	Ban Mo		Ban Phue	Kut Bong	Pho Tak	Ban Chiang	Wisit	Ban Mo
Tone 1	[131]	[13]	[314]	**Tone 1**	[313]	[324]	[214]	[324]	[213]	[213]
Tone 2	[131]	[12]	[121]	**Tone 2**	[22]	[34]	[34]	[34]	[434]	[434]
Tone 3	[21]	[43]	[33]	**Tone 3**	[31]	[31]	[32]	[32]	[31]	[44]
Tone 4	[132]	[332]	[31]	**Tone 4**	[21]	[42]	[42]	[33]	[42]	[53]
Tone 5	[121]	[232]	[232]	**Tone 5**	[221]	[331]	[33]	[331]	[43]	[443]
				Tone 6	[13]	[32]	[243]	[232]	[343]	[434]

Figure 17: Phonetic Characteristics of Phuan Tones in Northeast Thailand

Based on the analysis, it was found that the Phuan language group with 5 tonal units observed in 3 subdistricts, namely Pak Tom, Na Kha, and Ban Mo, shows a pattern of tonal split and merge in the horizontal axis at C1=DL123 and C234=DL4, which is characteristic of Lao tonal patterns (Akharawatthanakun, 2003). This contrasts with the Phuan language group with 6 tonal units, where the split and merge patterns in the horizontal axis do not exhibit the same specific characteristics of Lao tonal patterns, aligning with the findings of Akhrawatthanakun (2019). It was clearly concluded that the Phuan language is distinct from Lao based on linguistic characteristics that differentiate the two. In the present day, Thailand's local dialects are highly diverse, especially in the northeastern region, where Isan is spoken across all provinces. Additionally, Standard Thai serves as the primary language for daily communication and official business. Furthermore, the geographical boundaries between various linguistic regions may involve speakers of multiple dialects, resulting in multiple forms of tonal variation within the Phuan language in northeastern Thailand, as evidenced by this research. Consequently, the findings illustrate the clear tonal variation and change within the Phuan language, particularly because the speakers in this study are elderly, showing a wide range of variation that reflects their specific localities. It is therefore intriguing to consider how a study of the Phuan language among younger speakers in northeastern Thailand might reveal even clearer patterns of tonal variation and change.

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