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Tonal variations and changes in the Southern Thai dialect in a Central-Southern transition zone

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Abstract

This study examines tonal variations and changes in the transitional area between Southern Thai and Central Thai. Tonal data were elicited using a set of 80 monosyllabic words, adapted from Gedney's (1972) checklist and collected from 128 participants across three Provinces: Prachuap Khiri Khan (Bang Saphan and Bang Saphan Noi Districts), Chumphon, and Ranong. Praat software was used for tonal analysis, while ArcGIS was used for geographic mapping. The findings reveal three distinct tonal patterns: four-tone, five-tone, and six-tone patterns, each geographically distributed within the transitional area. These tonal patterns and characteristics vary and change due to both internal and external factors. A hybrid dialect, blending Central and Southern Thai tonal features, is also present.

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Introduction

Tonal variation is a defining feature of Thai dialects, reflecting broader linguistic processes such as tone merging, splitting, and contour changes. Tonal changes in the transitional areas are shaped by both linguistic and extra-linguistic factors. In the case of Southern and Central Thai, tonal differences are one of the most salient distinguishing features. Central Thai, with its five-tone system, is relatively standardized due to its status as the language of education, media, and government. In contrast, Southern Thai is characterized by a more complex tonal inventory, typically comprising six or seven tones, with distinctive pitch contours and phonetic realizations (Diller, 1976).

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Debavalya (1983) and Kongthong (2006) examined the tonal systems in the transitional area between Central and Southern Thai, noting significant tonal diversity in the region. They identified a hybrid dialect that blends tonal features from both Central and Southern dialects. Tingsabadh (2001) characterized this mixed variety as a 'hybrid' dialect, arising in transitional areas where linguistic features from both dialects intersect. Their findings suggest that phonetic adaptation, dialect mixing, and external factors such as migration contribute to the development of hybrid tonal systems, emphasizing the dynamic nature of tonal change.

According to Trudgill (2002), hybrid dialects are typically characterized by the integration of phonological, syntactic, and lexical features from different speech communities. These varieties develop as a result of sustained and close contact between speakers of different dialects, often in geographically overlapping areas, such as in areas where Central Thai and Southern Thai converge, with speakers adopting features from both systems.

While existing studies have shed light on tonal systems and transitions, there is a lack of research focusing on the intricate phonetic and sociolinguistic dynamics of the transitional zone between Central and Southern Thai. Additionally, much of the available research on this topic was conducted more than fifteen years ago. Thus, this study investigates synchronic phonetic and phonological variations in tonal systems, focusing on tonal variations and changes in the transitional area between Central Thai and Southern Thai.

Literature Review

Tonal Studies in Southern Thai Dialects

Early tonal studies in southern Thailand focused on documenting regional tonal variations (e.g., Khwanrit, 1987; Kiwkasem, 2002; Manomaya, 1989; Somnuek, 1982; Thongkum, 1978; Thampradit, 1981). Diller (1976) provided a key study outlining the tonal systems in Southern Thai dialects, emphasizing distinctions like register and tone that differentiate it from the Central dialect. Later research broadened its scope to examine tonal variation across regions and social contexts (e.g., Kitivongprateep, 2005; Phonyarit, 2015; Wongrukhavet & Sudhinont, 2022). Studies revealed significant geographic and generational differences in tone realization, influenced by both internal linguistic evolution and external factors such as language contact.

Tonal Studies in a Central-Southern transition zone

Debavalya (1983) contributed significantly to understanding tonal systems in the transitional zone between Central and Southern Thai. Her study in Prachuap Khiri Khan focused on hybrid dialects emerging from dialect contact. The study examined tonal mergers and distinctions using a wordlist of 84 test words and revealed two distinct patterns: in the first, no tonal merger was observed between A1 and B123, identifying it as Central Thai, while in the second, a tonal merger between A1 and B123 occurred, classifying it as Southern Thai.

One of Debavalya's key findings was the identification of a clear linguistic boundary between Central Thai and the hybrid dialect, particularly in Thap Sakae District. The tonal system in this area exhibited features that were neither strictly Central Thai nor Southern Thai but a blend of both, suggesting a gradual phonetic and phonological integration. Her research laid the foundation for understanding how dialectal contact influences tonal systems and set the stage for later investigations into language contact and dialectal boundaries.

Kongthong (2006) expanded on this research by analyzing the acoustic characteristics of 15 test words across three provinces—Prachuap Khiri Khan, Chumphon, and Ranong. The study identified three tonal merger patterns: B4 and C123 (Central Thai), A1 and B1 (Southern Thai), and A1 and B123 (hybrid). These findings redefined the transitional zone, previously seen as an area of interchangeable Central and Southern Thai, as a region where either Central Thai or Southern Thai coexists with a hybrid variety.

Based on these findings, Kongthong (2006) proposed three linguistic boundaries: (1) the boundary between Central Thai and the hybrid variety in Prachuap Khiri Khan (Thap Sakae and Bang Saphan districts), (2) the boundary between Eastern Southern Thai and the hybrid variety in Chumphon (Mueang and Sawi districts), and (3) the boundary between Western Southern Thai and the hybrid variety in Ranong (Mueang and Kapoe districts). Kongthong also observed that phonetic adaptation, language mixing, and external factors such as migration and social integration contributed to the emergence of hybrid tonal systems in these areas.

Internal and External Factors in Tonal Change

In the context of dialectology, Chambers and Trudgill (1988) provide a framework for understanding dialect variation and change, highlighting the role of both internal and external factors, with an emphasis on social influences. They argue that phonological shifts can spread between dialect regions due to social factors, driving dialect change.

Tonal change, like other types of sound change, can be influenced by both internal and external factors. Internally, tonal changes often result from the natural tendency of speakers to simplify tonal distinctions, reduce effort in articulation, or create clearer distinctions in speech. Yang and Xu (2019) provided a comprehensive analysis of tone change across East and Southeast Asian languages, aiming to identify cross-linguistic patterns and underlying phonetic mechanisms. The research was significant in that it synthesized disparate studies to form a broader diachronic typology of tone change, revealing strong trends rather than random variation. One of the study's most important contributions was its confirmation of the clockwise tone shift cycle, a pattern first observed in Bangkok Thai (Pittayaporn 2007, 2018). The review demonstrated that this cycle, in which tones shifted in a predictable direction, was widely attested. The key tonal changes observed included shifts from mid falling to high falling, from high falling to mid rising, and from mid rising to a low falling-rising tone with truncated variants. Additionally, a low-level tone had transformed into a low falling tone. In addition to confirming the clockwise pattern, the study identified two other major tone change tendencies: leveling and regress-to-mid (Hyman, 2017). Leveling involved the simplification of contour tones, while regress-to-mid described a process in which high and low tones drifted toward mid-level realizations due to phonetic undershoot.

External factors, such as language contact, can also play a significant role in tonal change. When speakers of different languages or dialects come into frequent contact, their linguistic systems may gradually merge or adapt to accommodate elements from each other. Trudgill's (1986) framework of dialect contact emphasizes key processes like accommodation, leveling, and koineization, all of which occur when speakers of different dialects come into close and prolonged contact. These processes help shape the phonetic and phonological outcomes of dialect interaction, including tonal systems.

Thus, understanding tonal change requires a nuanced exploration of both the internal phonological pressures and the external social and linguistic influences. This study aims to understand how linguistic and social factors shape tonal patterns in the transitional area between Central Thai and Southern Thai. Specifically, the research seeks to answer the following questions: (1) How do tones vary in the transitional area between these two dialects? and (2) What factors drive tonal changes and variations in this region? By addressing these questions, the study contributes to a deeper understanding of tonal adaptation in dialect contact zones and the broader mechanisms of linguistic change in Thai.

Framework

This study adopts the dialectology approach by Chambers and Trudgill (1988) to analyze regional linguistic variation, focusing on how language features differ across geographical areas and the social and historical factors influencing these variations. The framework is used to examine linguistic distributions among speech communities, as well as the impact of external influences on language change. Dialectology principles also guide speaker selection, data organization, and visualization on maps.

Methodology

Site Selection

This study collected data from 128 participants across three Provinces in the transitional area between Central Thai and Southern Thai: Prachuap Khiri Khan (Bang Saphan and Bang Saphan Noi Districts), Chumphon, and Ranong. A geometric grid method was used to select study sites, with grids overlaid on a 1:400,000 scale map (1 cm = 4 km) using QGIS and Google Earth Pro. Following Heeringa's (2004) approach, each grid measured 10 km by 10 km, excluding sea areas. A village was selected from the center of each grid. If the center point fell in an uninhabited area, data were collected from the nearest village. A total of 128 villages were included, with one participant from each village. The data collection areas and the number of participants are presented in Table 1 below.

Table 1 The data collection areas and the number of participants

Provinces	Number of Participants	Areas (Districts)
Prachuap Khiri Khan	14	Bang Saphan, Bang Saphan Noi
Chumphon	78	Mueang Chumphon, Tha Sae, Pathio, Lang Suan, Phato, Thung Tako, Sawi, Lamae
Ranong	36	Mueang Ranong, Kapoe, Kra Buri La-un, Suk Samran

Participant Selection

Participant selection follows the NORMs framework (Chambers & Trudgill, 1998), commonly used in dialect research. All participants are native speakers of Southern Thai, born and raised in the selected areas. They are over fifty years old, representing older, traditional speech patterns. The participants reside in rural areas and hold traditional occupations, ensuring minimal exposure to other dialects. The highest education level is up to the fourth grade of primary school, with limited experience in standard Thai. Though the NORMs framework typically requires male informants, previous studies (Akharawatthanakun, 2012; Phonyarit, 2015) showed no significant tonal differences between genders, so both male (32%) and female (68%) informants were included.

Research Instruments

Tone box and Gedney's checklist

Gedney's tone checklist is a tool used to study how the sounds at the beginning of a word, known as the 'initial consonants,' influence the tone, or pitch pattern, of the word in Tai languages. In these languages, the tone of a word can change or merge in specific ways depending on the characteristics of the consonants at the start of the word. Historically, linguists have reconstructed a set of basic tones for smooth-sounding syllables and a separate set for syllables that end with a consonant, known as 'checked syllables.' For smooth syllables, there are three main tones (A, B, and C), while checked syllables have a fourth tone (D). The way tones change or combine is influenced by four main features of the initial consonant. First, aspirated consonants, which are sounds that include a burst of air following the consonant, play a role. Second, unaspirated consonants, which lack that burst of air, also affect the tone. Third, glottalized or impulsive consonants, which involve a brief closure of the vocal cords, influence the tonal changes. Lastly, voiced consonants, which involve the vibration of the vocal cords, can also affect how tones behave. For syllables that end with a consonant, or checked syllables, the tone can either split into different types or merge together, and this process can be further affected by the length of the vowel in the syllable.

In 1972, William J. Gedney provided a clear framework for understanding how tones split and merge, based on the different features of the initial consonant, allowing linguists to better map out the complex tonal systems of Tai languages. The tone box is shown in Table 2.

A set of eighty monosyllabic words, adapted from Gedney's (1972) checklist, was used to collect tonal data for this study. These words were selected to examine patterns of tone splits and coalescences, as well as to identify the acoustic characteristics of Southern Thai dialects. The checklist of 80 monosyllabic words, as presented in Gedney's tone box, is shown in Table 3 below.

To collect the data, the author used a structured elicitation method involving visual stimuli and targeted questioning. The author showed the informant a series of pictures and posed specific questions designed to encourage the participant to pronounce words that corresponded to a predefined tone checklist. The participant was asked to pronounce a set of eighty monosyllabic words, each word being pronounced three times. The words were presented one at a time to ensure clarity and accuracy in their production. All pronunciations were carefully recorded using a recording device for later analysis. This method ensured that the tonal variations in the words could be captured and studied in detail.

Praat: Speech software program

Praat, developed by Paul Boersma and David Weenink in 1992 at the University of Amsterdam, is a speech analysis software compatible with most operating systems. It provides visual representations of sound, including waveforms, spectrograms, pitch contours, and formant contours. Widely used in speech research, it analyzes pitch (vocal fold vibration) and formants (vocal tract resonances). This study used Praat version 6.0.40 to examine tone height and shape, with tone line graphs created in Microsoft Excel.

Table 2 Gedney's Tone Box (adapted from Gedney, 1972, p.434)

Initials at time of tone splits	Proto-Tai Tones				
	Smooth Syllables			Checked Syllables	
	*A	*B	*C	*DL	*DS
1. Voiceless frictions/ aspirated	A1	B1	C1	DL1	DS1
2. Voiceless unaspirated	A2	B2	C2	DL2	DS2
3. Voiceless glottalized/ implosive	A3	B3	C3	DL3	DS3
4. Voiced	A4	B4	C4	DL4	DS4

Table 3 A set of eighty monosyllabic words adapted from Gedney's (1972) checklist

	Smooth Syllables			Checked Syllables	
	A	B	C	DL	DS
1	huː 'ear'	kʰai 'egg'	kʰaaw 'rice'	kʰuat 'bottle'	mat 'flea'
	kʰaː 'leg'	pʰaː 'to split'	sɯa 'shirt'	muak 'hat'	pʰak 'vegetable'
	hua 'head'	kʰaː 'galangal'	mɔː 'pot'	sɔːk 'elbow'	hok 'six'
	sɔŋ 'two'	tʰua 'bean'	haː 'five'	saːk 'pestle'	sip 'ten'
2	puː 'crab'	kai 'chicken'	kaːw 'nine'	piːk 'wing'	kop 'frog'
	taː 'eye'	paː 'forest'	pɔːn 'to feed'	kɔːt 'to embrace'	cet 'seven'
	kin 'to eat'	taw 'turtle'	kaːŋ 'fish bone'	tɔːk 'to pound'	teʔ 'to kick'
	kaː 'crow'	piː 'woodwind'	tuː 'cupboard'	paːk 'mouth'	cap 'to catch'
3	bin 'fly'	baː 'shoulder'	daːj 'cotton'	dæːt 'sunshine'	bet 'fishing rod'
	dæːŋ 'red'	ʔɯŋ 'toad'	ʔɔi 'sugar cane'	biːp 'to grasp'	dip 'raw'
	baːn 'to bloom'	baːw 'man'	daːm 'classifier'	bɔːt 'blind'	ʔok 'chest'
	daːw 'star'	daː 'to scold'	ʔaː 'to open'	diːt 'to palm'	det 'to pinch off'
4	mɯː 'hand'	pʰɔː 'father'	naː 'aunt'	miːt 'knife'	nok 'bird'
	kʰwaːj 'buffalo'	waːw 'kite'	kʰiu 'eyebrow'	lɯat 'blood'	mot 'ant'
	ŋaː 'rice field'	lɯaj 'wood cutter'	nam 'water'	cʰɯak 'rope'	kʰrok 'mortar'
	ŋuː 'snake'	maːj 'widow'	lin 'tongue'	mɔːt 'rice bug'	lep 'nail'

ArcGIS online: GIS mapping software

ArcGIS Online, developed by Esri, is a web-based GIS platform for mapping, data analysis, and app development. It enables users to create, share, and integrate maps while managing geographic data. In this study, ArcGIS was used to visualize the spatial distribution of tonal variations by incorporating geographic and linguistic variables. For a detailed guide on linguistic mapping with ArcGIS, see Fukuzawa (2017).

Data Analysis

The tonal patterns, namely, tone split, coalescences, and complementary distribution, were analyzed by using Gedney's Tone Box, where the number of tones was counted under investigation by considering only the twelve slots of the smooth syllables. The tones that occur in checked syllables are each analyzed as an allotone of one of the tones in smooth syllables based on phonetic similarity.

The tonal characteristics, including tone height and shape, were initially transcribed through auditory judgment. To verify and refine these transcriptions, acoustic analysis was conducted using PRAAT version 6.0.40. Specifically, the average fundamental frequency for each tone was calculated, and the fundamental frequency of each word was normalized across 11 points, spanning from 0 percent to 100 percent of the tone's duration. This normalization process allowed for a more accurate representation of the tone's pitch contour. The normalized average frequencies were then converted into semitone values to account for gender-related pitch variations, a necessary step to mitigate fundamental frequency differences that may arise from varying speaker characteristics, as highlighted by Jitwiriyanont (2012). These semitone values were plotted on tone graphs using Microsoft Excel, with particular attention given to the peak points and the movement of the tone contours. By consistently employing acoustic analysis in this manner, the study ensured a more reliable and precise determination of tone height and shape, significantly improving the accuracy of the transcription process.

Tone characteristics are represented by numerals 1 to 5, indicating pitch height and movement from lowest to highest. These correspond to: 1 (low), 2 (lower-mid), 3 (mid), 4 (higher-mid), and 5 (high). This system, widely used in tone studies (e.g., Osatananda, 2015; Burusphat, 2012), assigns values to a tone's start, middle, and/or end. For example, '[452]' represents a higher-mid rising-falling tone, where '4' is the starting pitch, '5' marks the rise, and '2' indicates the fall.

Results

Variations and Changes in Patterns of Tone Mergers and Splits

The study identifies three distinct patterns of tonal mergers and splits in the transitional zone between Central Thai and Southern Thai: four-tone, five-tone, and six-tone patterns.

Four-tone pattern: Found in Bang Saphan and Bang Saphan Noi Districts of Prachuap Khiri Khan, as well as parts of Tha Sae District in Chumphon.

Five-tone pattern: Found in the northern areas of Ranong (La-un, Kra Buri) and Chumphon (Mueang Chumphon, Tha Sae, Pathio, Sawi).

Six-tone pattern: Found in the southern areas of Ranong (Mueang Ranong, Kapoe, Suk Samran) and Chumphon (Lang Suan, Phato, Thung Tako, Lamae).

The number of speakers along with the percentage for each pattern are detailed in Table 4, and the variations in patterns of tonal splits and mergers within the transitional area are displayed in Figure 1.

Table 4 shows that the five-tone pattern is the most prevalent, with 58 speakers accounting for 45.31 percent of the total. This is closely followed by the six-tone pattern, used by 53 speakers, representing 41.41 percent. In contrast, the four-tone pattern is the least common, with only 17 speakers, making up 13.28 percent of the speakers.

Table 4 Number of speakers and the percentage for each pattern

Tone Patterns	Number of Speakers	Percentage
Four-tone pattern	17	13.28
Five-tone pattern	58	45.31
Six-tone pattern	53	41.41

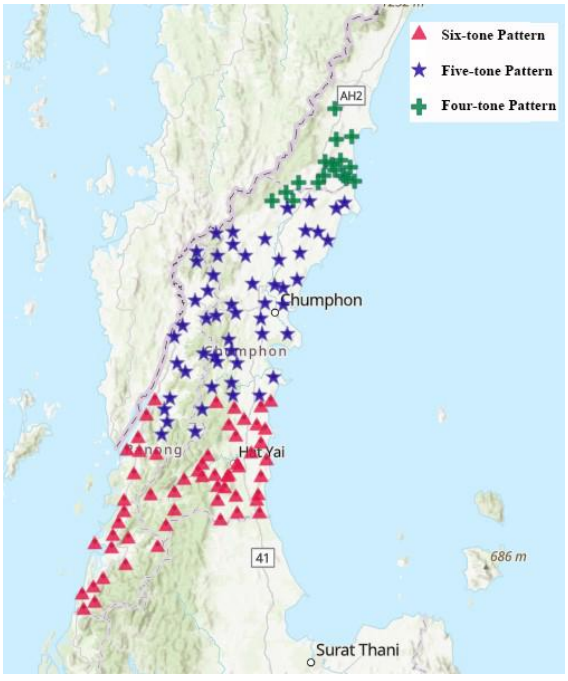


Figure 1 Variations in patterns of tonal splits and mergers in the transitional area

Figure 1 shows the variations of the three patterns of tonal splits and mergers in the Central-Southern transition area. The map clearly shows the distribution of all three patterns across different areas. As shown in the map, the six-tone pattern, represented by a triangle symbol, is distributed in the southern part of the area, while the four-tone pattern, represented by a cross symbol, is distributed in the northern part. Meanwhile, the five-tone pattern, which is the most widely spoken pattern in this transitional area, is distributed in the central part, represented by a star symbol.

This study identifies three tonal patterns from the Central-Southern transition area, reflecting characteristics of both Southern Thai and Central Thai tones. Figure 2 displays the tone boxes for the tonal patterns of Central Thai and Southern Thai, while Figure 3 illustrates the tone boxes for the three patterns observed in this study.

Figure 3 indicates that variations are found in the splits of Tones A and B. The split of Tone A in both the four-tone and five-tone patterns shows a two-way split (A1-234), conditioned by the aspiration of the initial consonant. In contrast, the six-tone pattern shows a three-way split, conditioned by both aspiration and voicing of the initial consonant. For Tone B, the five-tone and six-tone patterns show a three-way split (B1-23-4). Conversely, in the four-tone pattern, Tone B undergoes a two-way split, conditioned solely by the voicing of the initial consonant (B123-4).

As for the mergers, variations also occurred among the three tonal patterns. A23 and B23 have merged in the six-tone pattern, but in the four-tone and five-tone patterns, they have not. In the four-tone pattern, B4 and C4 have merged, whereas they remain distinct in the five-tone and six-tone patterns. The merger between B4 and C123 occurred in only the five-tone pattern.

For checked syllables, in the four-tone pattern, DL and DS have merged, resulting in DLDS1, DLDS23, and DLDS4 corresponding to C123, A234, and BC4, respectively. In the five-tone and six-tone patterns, DL123 and DS123 have merged, but DL4 and DS4 remain distinct. DLDS1 and DS4 correspond to C123 and C4, respectively.

When examining the tonal patterns in Figure 2 and Figure 3, it can be observed that the six-tone pattern is similar to the tonal pattern of Southern Thai in Surat Thani. In contrast, the four-tone pattern more closely resembles that of Central Thai, while the five-tone pattern shares similarities with both Central Thai and Southern Thai.

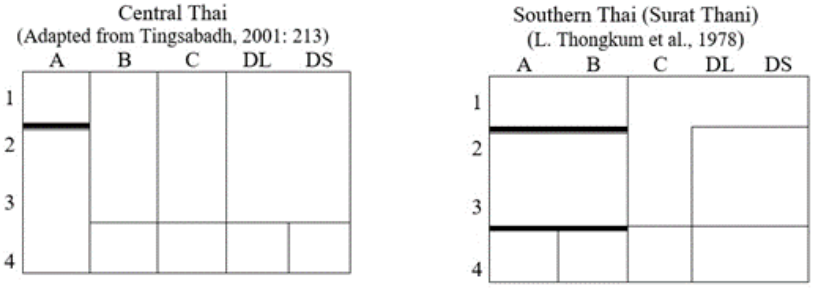


Figure 2 The tonal patterns of Central Thai and Southern Thai

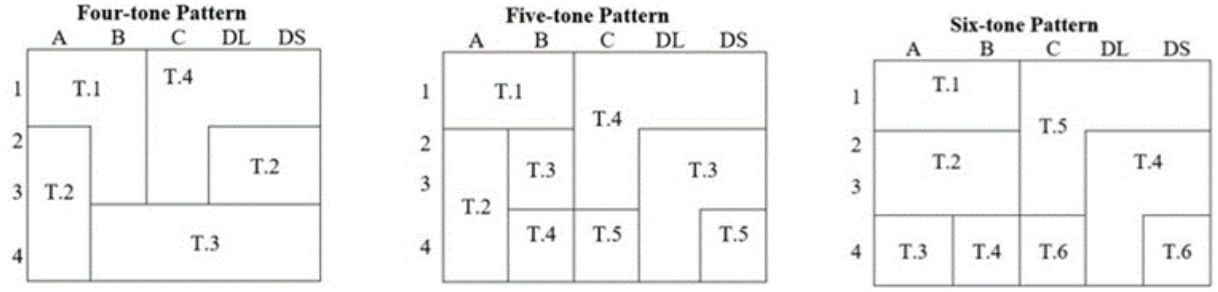


Figure 3 The four-tone, five-tone, and six-tone patterns of the Southern Thai in the transitional area

The six-tone pattern found in this study is similar to the tonal patterns described by Diller (1976), Debavalya (1983), and Kongthong (2006), while the four-tone and five-tone patterns are not. This indicates that the four-tone and five-tone patterns undergo a change. The A23 = B23 pattern changes to the A23 ≠ B23 pattern, which aligns with Diller's (1976) prediction that A23 tends to split with B23 because speakers use different tonal characteristics. It is also found that the B4 ≠ C123 pattern changes to the B4 = C123 pattern, which Kongthong (2006) observed, noting that some younger speakers use tonal characteristics of Tone B4 and C123 that are very similar. Additionally, this study also finds a change in the merger between Tone B4 and C4, with the B4 ≠ C4 pattern changing to the B4 = C4 pattern. This change in the B4 ≠ C4 pattern seems to be driven by internal factors. That is, Tone B4, which is expected to be a lower-mid rising tone [23], has instead changed to a lower-mid level tone [22]. This suggests that the contour tones may have been simplified into level tones. In contrast, the changes in the A23 = B23 and B4 ≠ C123 patterns may be influenced by external factors, language contact between Central Thai and Southern Thai.

Tonal Variations and Changes: Tonal Characteristics

Variations in the tonal characteristics of Southern Thai spoken in the Central-Southern transitional area have been identified. The tonal variants of each tone are summarized in Table 5.

Table 5 shows that the variations in tonal characteristics are found in all tones, except for Tone 6 (C4). These variations are discussed below.

Tone 1: high falling tone (AB1)

Tone 1 in most areas is a high falling tone [52], which is characterized by a sharp drop in pitch from high to low. However, there are regional variations in the realization of this tone. A higher-mid rising falling [452] tone is found in specific areas such as Lamae (Chumphon) and Suk Samran (Ranong), where the tone starts at a higher-mid level, rises slightly, and then falls. In contrast, a high falling-rising [523] tone is found in Bang Saphan and Bang Saphan Noi (Prachuap Khiri Khan), La-un (Ranong), and Tha Sae (Chumphon), where the tone initially falls and then rises again, producing a distinct tonal contour. The shapes of the high falling [52], higher-mid rising falling [452], and high falling-rising [523] tones are shown in Figure 4.

The major tonal characteristic [52] found in this study is consistent with the research of Diller (1976), Debavalya (1983), and Kongthong (2006). However, in the works of Diller (1976) and Debavalya (1983), the high falling-rising [523] tone was not observed, though it was found in Kongthong (2006), who noted that this tone is used by younger speakers. Therefore, it can be concluded that the tonal characteristics of Tone AB1 have changed, with a high falling tone [52] changing to a higher-mid rising-falling [452] and a high falling-rising [523] tone. Therefore, it can be concluded that the tonal characteristics of Tone AB1 have changed, with a high falling tone [52] changing to a high falling-rising [523] tone. This change may be due to both internal and external factors, which will be discussed in the Discussion section.

Tone 2: lower-mid rising falling tone (A23/B23)

Tone 2 is predominantly a lower-mid rising-falling tone [232] across most areas, characterized by a pitch that rises slightly from a lower-mid level before falling again. However, there are notable regional variations in this tonal pattern. A mid level tone [33] is found in specific locations such as Bang Saphan and Bang Saphan Noi in Prachuap Khiri Khan, Kra Buri and La-un in Ranong, and Tha Sae and Pathio in Chumphon. The shapes of the lower-mid rising-falling [232] and mid level [33] tones are shown in Figure 5.

Tone A23/B23 in Diller's (1976) study was found to have

Table 5 Tonal variations in Southern Thai spoken in the Central-Southern transitional area

Tone	Tonal Mergers	Tonal Variants	
		Major characteristics[1]	Minor characteristics
Tone 1: High Falling	AB1	[52]	[452] / [523]
Tone 2: Lower-Mid Rising Falling	A23/B23	[232]	[33]
Tone 3: Mid Falling	A4	[31]	[232]
Tone 4: Lower-Mid Rising	B4	[23]	[22]
Tone 5: Higher-Mid Level	C123	[44]	[22]
Tone 6: Lower-Mid Falling	C4	[21]	-

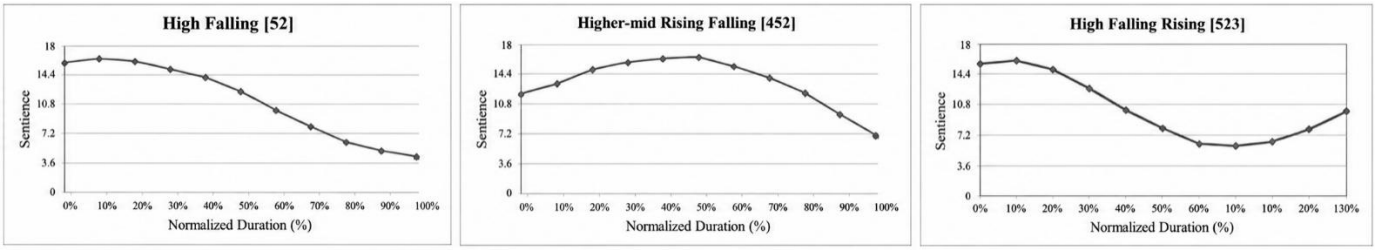


Figure 4 The shapes of the high falling [52], higher-mid rising falling [452], and high falling-rising [523] tones

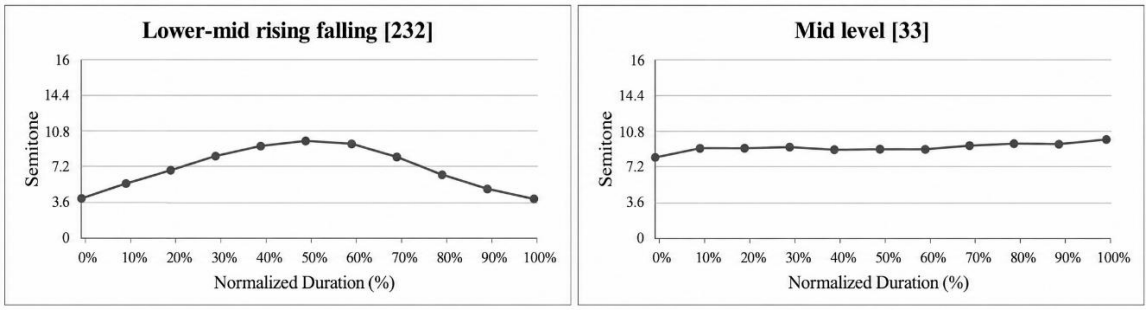


Figure 5 The shapes of the lower-mid rising-falling [232] and mid level [33]

[1] The major tone characteristics are the variants that occur most frequently, while the minor characteristics refer to the other tone variants.

two variants: a mid rising falling tone [342] and a lower-mid rising falling tone [232], with the latter observed in only a small number of speakers. In contrast, Debavalya (1983) reported only the mid rising-falling tone [342]. Kongthong (2006) identified not only the mid rising-falling tone [342] but also a lower-mid level tone [22] in some speakers. It can therefore be concluded that Tone A23/B23 has undergone a change, transitioning from a mid rising-falling tone [342] to a lower-mid rising-falling tone [232] and is now changing into a mid-level tone [33].

Tone 3: mid falling tone (A4)

Tone 3, which is commonly found in most areas, is a mid falling tone [31], characterized by a gradual drop in pitch from a mid-level to a lower tone. This tone is prevalent in many regions. However, in certain locations, there are variations in the realization of Tone 3. A lower-mid rising falling tone [232] is observed in specific areas such as Bang Saphan and Bang Saphan Noi in Prachuap Khiri Khan, Kra Buri and La-un in Ranong, and Tha Sae and Pathio in Chumphon. In these regions, the tone begins at a lower-mid pitch, rises slightly, and then falls, offering a more complex tonal contour compared to the standard mid falling tone. The shapes of the mid falling [31] and lower-mid rising falling [232] tones are shown in Figure 6.

The lower-mid rising-falling tone [232] of Tone A4 found in this study aligns with the findings of Diller (1976), Debavalya (1983), and Kongthong (2006), whereas the mid falling tone [31] was not observed. It can be inferred that Tone A4 was originally a lower-mid rising-falling tone [232], but over time, it underwent a change to become a mid falling tone [31]. This transformation may have been driven by internal factors.

Tone 4: lower-mid rising tone (B4)

Tone 4 is primarily realized as a lower-mid rising tone [23] in most areas, marked by a gradual pitch increase starting at a lower-mid level. However, significant regional variations have been observed. In Bang Saphan and Bang Saphan Noi Districts of Prachuap Khiri Khan, as well as parts of Tha Sae District in Chumphon, Tone 4 is realized as a lower-mid level tone [22], with a steady and unchanging pitch. The shapes of the lower-mid rising [23] and lower-mid level [22] tones are shown in Figure 7.

The lower-mid rising tone [23] of Tone A4 is similar to what was found in the studies by Diller (1976), Debavalya (1983), and Kongthong (2006). In contrast, the lower-mid level tone [22] was only found in Kongthong's (2006) study. Kongthong noted that this variant was used by younger speakers. It can therefore be suggested that the lower-mid rising tone [23] is in the process of changing to a lower-mid level tone [22], possibly due to internal factors.

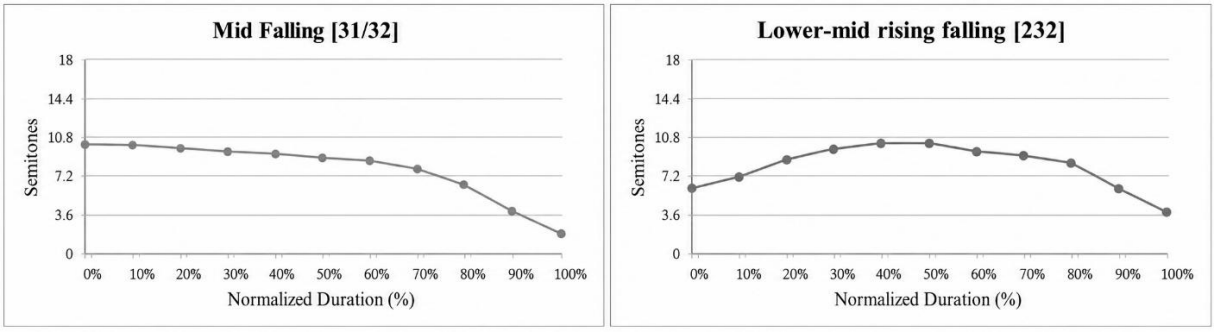


Figure 6 The shapes of the mid falling [31] and lower-mid rising falling [232] tones

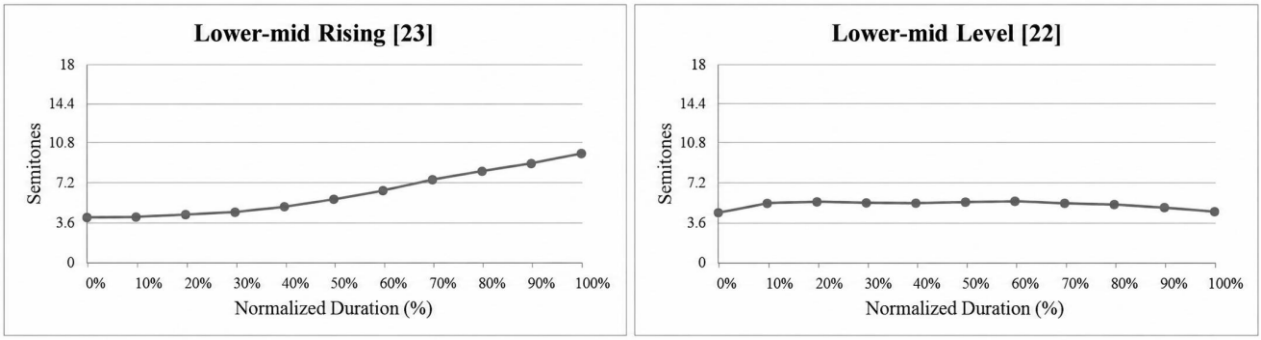


Figure 7 The shapes of the lower-mid rising [23] and lower-mid level [22] tones

Tone 5: higher-mid level tone (C123)

Tone 5 is typically a higher-mid level tone [44] in most locations, characterized by a steady pitch at a higher-mid level. This tone is a common feature across a wide range of areas, contributing to the tonal uniformity in many regions. However, regional variations are noticeable. In specific Districts such as Bang Saphan and Bang Saphan Noi in Prachuap Khiri Khan, as well as Tha Sae District in Chumphon, Tone 5 is realized as a lower-mid level tone [22], marked by a lower pitch that remains consistent across its duration. The shapes of the higher-mid level [44] and lower-mid level [22] tones are shown in Figure 8.

Diller (1976) found that Tone C123 is realized as a higher-mid level tone [44], a finding that aligns with the results of this study. However, Debavalya (1983) and Kongthong (2006) also identified a variation in which Tone C123 is realized as a lower-mid level tone [22], a result that is similarly consistent with the findings in this study. The change from a higher-mid level tone [44] to a lower-mid level tone [22] observed in some regions may reflect a tonal merger between Tone A4 and C123. This change could be indicative of ongoing phonological changes driven by internal factors.

Tone 6: lower-mid falling tone (C4)

Tone 6 in all areas is consistently realized as a lower-mid falling tone [21], characterized by a gradual decrease in pitch from a lower-mid level to a final low pitch. This tonal feature remains stable and uniform in its realization, with no observed variation across different regions. Unlike other tones, which show regional differences, Tone 6 maintains a consistent phonetic form, suggesting a strong degree of phonological stability. The lack of variation in Tone 6 may be indicative of its role as a distinct and easily recognizable tonal category within the language, unaffected by the dynamic changes seen in other tones. The shapes of the lower-mid falling tone [21] tone is shown in Figure 9.

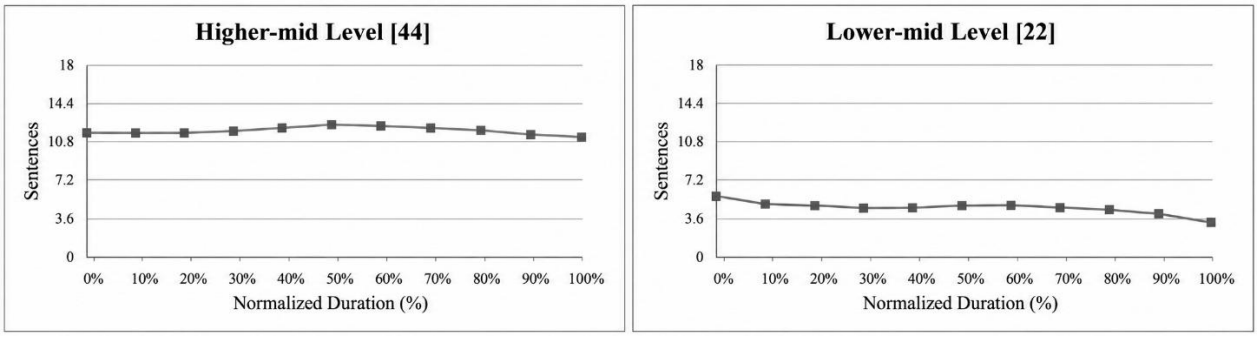


Figure 8 The shapes of the higher-mid level [44] and lower-mid level [22] tones

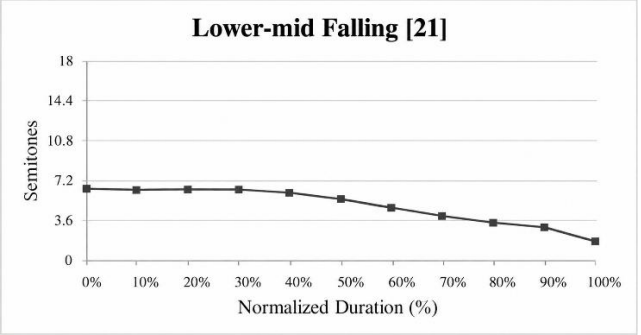


Figure 9 The shapes of the lower-mid falling tone [21] tone

Discussion

This study examines tonal variations in the Southern Thai dialect within a Central-Southern transition zone, identifying three distinct tonal patterns. These patterns are geographically distributed, with each occurring in specific regions. When compared with the findings of previous studies (Diller, 1976; Debavalya, 1983; and Kongthong, 2006), it is evident that both tonal patterns and tonal characteristics are undergoing change.

Variations and Changes in Patterns of Tonal Splits and Mergers

The findings of this study reveal significant changes in the tonal patterns of the Southern Thai dialects in the transitional zone, particularly with the four-tone and five-tone patterns. The six-tone pattern identified in this study aligns closely with the tonal patterns described by Diller (1976), Debavalya (1983), and Kongthong (2006), indicating continuity in the tonal structure of these dialects. However, the four-tone and five-tone patterns deviate from these earlier descriptions, suggesting a process of tonal change.

One of the key changes observed in this study is the change from the A23 = B23 pattern to the A23 ≠ B23 pattern. This change is consistent with Diller's (1976) prediction that A23 tends to split with B23, as speakers use different tonal characteristics for these tones. The distinction between A23 and B23 in this study indicates a divergence from previous patterns and suggests an ongoing change in the tonal system, possibly driven by internal phonological factors such as the simplification of tonal distinctions.

Another significant change is the alteration of the B4 ≠ C123 pattern, which changes to B4 = C123. This pattern change aligns with Kongthong's (2006) observations, where younger speakers tend to use tonal characteristics for Tone B4 and C123 that are increasingly similar. This finding supports Kongthong's claim that language evolution can lead to tonal mergers, particularly in younger generations, suggesting a gradual phonetic assimilation of these tones.

Additionally, this study identifies a change in the merger between Tone B4 and C4, where the B4 ≠ C4 pattern transitions to the B4 = C4 pattern. This change seems to be influenced by internal factors, specifically a change in the phonetic realization of Tone B4. Originally expected to be a lower-mid rising tone [23], Tone B4 has changed to a lower-mid level tone [22]. This change suggests a broader trend of simplification within the tonal system, where contour tones are increasingly becoming level tones. This simplification may be part of a natural phonological process aimed at reducing tonal complexity, especially in a transitional dialect area.

Tonal Hybridization

The four-tone and five-tone patterns spoken in the Bang Saphan and Bang Saphan Noi Districts (Prachuap Khiri Khan), Tha Sae, Mueang Chumphon, Pathio, and Sawi Districts (Chumphon), and La-un and Kra Buri Districts (Ranong) appear to represent a mixed or hybrid dialect of Central Thai and Southern Thai. These tonal patterns, noted in Debavalya's (1983) and Kongthong's (2006) studies, are also supported by the findings of this study. Debavalya classified these tonal patterns as part of the Southern Thai dialect due to mergers between tones A1 and B1. Specifically, there is no split between tones B1 and B2, indicating a clear mixture of Central Thai and Southern Thai, likely forming a hybrid of the two dialects.

Furthermore, Debavalya identified the linguistic boundary between Central Thai and Southern Thai as being in Thap

Sakae District, Prachuap Khiri Khan Province, while Kongthong placed the boundary in Bang Saphan District, Prachuap Khiri Khan Province. However, this study found the boundary to be in Tha Sae District, Chumphon Province, indicating that the boundary has gradually changed further south over time. The boundary is displayed in Figure 10.



Figure 10 The linguistic boundary between Central Thai and Southern Thai, as discussed by Debavalya (1983), Kongthong (2006), and this study.

This study indicates that the hybrid dialect of Central Thai and Southern Thai may have extended into Chumphon and Ranong Provinces, where these mixed tonal patterns are observed. The presence of such a hybrid dialect in this region suggests that these areas have been a point of linguistic contact and interaction for an extended period, contributing to the ongoing blending of tonal systems. Kongthong and Tingsabadh (2009) observed that the Ranong dialect is transitioning into a hybrid dialect, and the results of this study support that view.The ongoing change in the Ranong dialect reflects broader trends of linguistic change in the region, as dialects of Central Thai and Southern Thai continue to influence one another in areas of contact.

The six-tone pattern, which retains characteristics of Southern Thai, is predominantly concentrated in the lower part of the transitional zone. Its splits and mergers closely resemble those of Southern Thai in Surat Thani. In contrast, the five-tone and four-tone patterns, reflecting a mix of Southern Thai and Central Thai, are primarily found in the upper part of the area. These hybrid dialects show tonal splitting and merging patterns similar to those of Central Thai, such as A1=B123, A23=A4, and B4=C123. The upper area, geographically closer to Central Thai, demonstrates a stronger Central Thai influence, highlighting the gradual blending of dialectal features in this transition zone. As Tingsabadh (1980) noted, the Thai varieties in this region are likely a mixed language, combining elements of both Southern and Central Thai.

Variations and Changes in Tonal Characteristics

The tonal variations across regions, particularly in Tones AB1, A23/B23, A4, B4, and C123, reflect an ongoing phonetic adaptation process. These changes are influenced by both external factors, such as contact with Central Thai, and internal phonological processes aimed at simplification and articulatory ease.

High Falling Tone (AB1)

The change from a high falling tone [52] of tone AB1 to a high falling-rising tone [523] in Bang Saphan and Bang Saphan Noi (Prachuap Khiri Khan), La-un (Ranong), and Tha Sae (Chumphon) may be influenced by the presence of rising tones in Central Thai. This change could be a result of phonetic adaptation, where speakers in these regions, likely due to increased contact with Central Thai, have modified their tonal system to align more closely with the rising tone patterns commonly found in Central Thai. The high falling tone [52] may have been influenced by rising tones like [324] or [24] in Central Thai, which are more frequent in Central Thai phonology. As a result, the Southern Thai dialects in these areas may have gradually changed towards a more rising-falling tone, adopting features from Central Thai for greater phonetic coherence and ease of communication.

Lower-mid rising falling tone (A23/B23)

The change of Tone A23/B23 from a mid-rising-falling tone [342] to a mid-level tone [33] in Bang Saphan and Bang Saphan Noi in Prachuap Khiri Khan, Kra Buri and La-un in Ranong, and Tha Sae and Pathio in Chumphon may have resulted from a phonetic adaptation likely driven by language contact with Central Thai. The mid-level tone [33] may have been influenced by Central Thai, where Tone A23 in Central Thai is also realized as the mid-level tone [33]. However, this change may also be driven by internal factors. It reflects a process of simplification, where the dynamic rising-falling contour [342] is replaced by a more stable and neutral mid-level tone [33], which is easier to articulate and perceive. This change corresponds to the leveling pattern proposed by Hyman

(2017), where contour tones gradually flatten over time. The shift from a rising-falling contour to a mid-level tone represents a process of contour reduction, a core mechanism of the leveling pattern that eliminates dynamic pitch movements in favor of simpler, more stable forms.

Mid falling tone (A4)

The change from a lower-mid rising-falling tone [232] to a mid falling tone [31] in Tone A4 seems to be part of a phonetic simplification process, which could have been driven by internal linguistic factors as ease of articulation and phonological simplification. Tone A4 changes to become a mid falling tone [31]. This means that instead of starting at a lower-mid pitch, the tone now begins at a mid-level pitch and then falls to a lower pitch. The contour has simplified from a rising-falling pattern to a falling pattern, and the tone now has a more uniform falling pitch rather than the previous rising and falling movement. This transformation supports Pittayaporn's (2018) contour reduction mechanism. The replacement of the rising-falling trajectory with a falling contour highlights the influence of contour reduction and articulatory ease, which are core mechanisms of the clockwise pattern.

Lower-mid rising tone (B4)

Another change influenced by the simplification process is the change from a rising tone [23] to a level tone [22] in tone B4. This reflects the process of simplification. A rising tone involves two distinct pitch movements, from a lower pitch to a higher pitch, which is more complex compared to a level tone, which maintains a consistent pitch level. This change can be explained by the clockwise tone shift cycle proposed by Pittayaporn (2007, 2018), in which rising tones gradually evolve into level tones through the process of contour reduction. According to the model, dynamic tones such as rising contours tend to simplify over time by eliminating pitch movements, eventually resulting in more stable and articulatorily efficient level tones. This progression aligns with the tendency for tonal systems to reduce complexity, reflecting the natural phonetic bias toward ease of articulation and perceptual clarity.

Higher-mid level tone (C123)

The change from the higher-mid level tone [44] to the lower-mid level tone [22] in tone C123 also reflects this simplification process. The original higher-mid level tone [44] might be perceived as more complex or harder to maintain consistently in natural speech, leading to the change towards a lower-mid level tone [22]. This change could also arise from articulatory ease, where the lower pitch range [22] is more accessible and stable for speakers. This type of pitch adjustment aligns with the regress to mid pattern proposed by Hyman (2017), where pitch targets in tonal languages tend to converge towards the speaker's average pitch range. The simplification of rising tones into level tones further illustrates how the leveling pattern promotes articulatory ease and perceptual stability in natural speech.

Conclusion

Tonal variations in the Southern Thai dialect in the Central-Southern transitional area are shaped by a complex interplay of external and internal factors. Geographical proximity plays a significant role, with areas closer to Central Thai showing stronger influence, such as the predominance of four-tone and five-tone systems. This contact with Central Thai has driven changes in tonal patterns, leading to tonal systems that resemble those of Central Thai, reflecting a hybrid dialect. In contrast, areas further south retain the six-tone pattern, reflecting stronger preservation of Southern Thai tonal features, likely due to less direct contact with Central Thai. These tonal changes, including splits and mergers, are influenced by both external factors like language contact and internal phonological processes such as simplification and articulatory ease.

Limitation and Future Research

Future research will expand on segmental changes to offer a more comprehensive analysis. This will provide a more comprehensive understanding of how both tonal and segmental features interact and contribute to these varieties.

Conflict of Interest

The authors declare that there is no conflict of interest.

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