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A Comparison of the Tonal Systems of Thai and Vietnamese and Their Impact on the Pronunciation of Vietnamese Learners

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ABSTRACT : This study investigates the structural differences between the Thai and Vietnamese tonal systems and examines their impact on the pronunciation of Vietnamese learners acquiring Thai as a second language. While both languages utilize tone as a primary mechanism for lexical distinction, their systems differ markedly in tone inventory, pitch contour, phonation types, and syllable–tone interactions. Thai features five pitch-based tones, whereas Vietnamese, particularly in its Northern dialect, employs six tones that integrate pitch with glottalization and voice quality. These phonetic and phonological differences contribute to systematic pronunciation errors among Vietnamese learners of Thai. Data derived from acoustic analysis and recent perception studies reveal common issues such as tonal substitution, glottal intrusion, and contour misalignment, Vietnamese learners often confuse Thai mid tones with the Vietnamese sắc tone or insert creaky phonation in high and falling tones due to interference from ngã and nặng. The findings highlight how cross-linguistic influence affect learners' ability to perceive and produce Thai tones accurately. The study concludes by proposing pedagogical interventions such as contrastive tone training, auditory discrimination exercises, and contextualized feedback to enhance tonal accuracy. These insights offer practical implications for second language instruction in tonal language environments.

KEYWORDS **-**tonal acquisition, Thai pronunciation, Vietnamese learners, second language phonology, tone perception

I. INTRODUCTION

Southeast Asia is home to a rich tapestry of tonal languages, among which Thai and Vietnamese stand out for their complex and distinct tonal systems. Despite their geographical proximity and shared cultural exchanges, these two languages belong to different linguistic families—Thai to the Tai-Kadai and Vietnamese to the Austroasiatic—resulting in divergent phonological structures and tonal characteristics (Sagart, 2022). Understanding these differences is crucial, particularly in the context of second language acquisition, where tonal interference can significantly impact pronunciation accuracy and intelligibility.

Accurate pronunciation is a cornerstone of effective oral communication, especially in tonal languages, where pitch variations convey both lexical and grammatical meaning. In second language acquisition,

pronunciation proficiency not only promotes intelligibility but also strengthens learners' confidence and communicative competence (Derwing & Munro, 2015; Nguyen et al., 2021). For Vietnamese learners of Thai—a language with a distinct tonal inventory—the challenge of mastering pronunciation is further complicated by cross-linguistic interference and perceptual mismatches between native and target tones.

Tonal languages rely on pitch variation to distinguish meaning at the lexical or grammatical level. Thai employs five tones—mid, low, falling, high, and rising—while Vietnamese, particularly in its Northern dialect, uses six tones: ngang (level), huyền (low falling), sắc (high rising), hỏi (low rising), ngã (high broken), and nặng (heavy) (Luksaneeyanawin,2018). These tones are distinguished not only by pitch contour but also by phonation types such as breathiness and creakiness, adding layers of complexity to both tonal perception and production. For Vietnamese learners of Thai, such tonal disparities present significant challenges as well as opportunities for cross-linguistic transfer (Bunchavalit, 2024).

Recent studies have highlighted the nuanced influence of native Vietnamese tonal patterns on the acquisition of Thai tones. Bunchavalit (2024) reported that Central Vietnamese learners experienced pronunciation difficulties with Thai high tones due to negative transfer, whereas tones with similar phonological features—such as the Thai low-rising tone and the Vietnamese sắc tone—were produced with greater accuracy. These findings suggest that tonal similarity may facilitate positive transfer, while mismatches in contour and phonation are likely to result in interference and mispronunciation.

Moreover, perceptual studies suggest that Vietnamese learners are generally more proficient in producing static tones (e.g., mid and low) than dynamic ones (e.g., rising and falling), reflecting the influence of their native tonal inventory and phonetic habits (Chen, Best, & Antoniou, 2020). These findings are consistent with the Perceptual Assimilation Model, which posits that learners assimilate non-native tones to their closest native equivalents, often leading to perceptual confusion when tonal categories do not align precisely.

The implications of these tonal interactions extend beyond theoretical linguistics to practical pedagogy. By identifying specific tonal mismatches and leveraging areas of phonological overlap, educators can develop targeted pronunciation training to mitigate interference and improve tonal accuracy. This is particularly relevant in Thai language instruction for Vietnamese learners, where tonal awareness and contrastive analysis serve as essential tools for effective language acquisition (Han, et al. 2024).

Given the increasing number of Vietnamese learners learning Thai for academic, professional, and cultural purposes, understanding the phonological challenges they face is both timely and necessary. Despite the fact that both Thai and Vietnamese are tonal languages, mispronunciation of Thai tones remains a persistent issue among Vietnamese learners, often leading to reduced intelligibility and communicative breakdowns. Previous studies have focused primarily on segmental pronunciation, leaving a gap in research concerning suprasegmental features such as tone. Moreover, while cross-linguistic influence in tonal acquisition has been studied in other language pairs, little attention has been given to the Thai–Vietnamese context, where significant tonal contrasts and phonation features present unique challenges. This study was therefore undertaken to fill that gap by providing a systematic comparison of the two tonal systems and analyzing how these differences affect pronunciation. Ultimately, the findings are intended to benefit language teachers, learners, and curriculum designers by enhancing their understanding of the tonal barriers that Vietnamese learners face in acquiring Thai, thereby contributing to more effective second language instruction in tonal contexts.

II. TONE SYSTEM IN THAI AND VIETNAMESE

The tonal systems of Thai and Vietnamese constitute intricate phonological frameworks that function as central mechanisms for lexical distinction. Although both languages are classified as tonal, their systems differ significantly in tone inventory, pitch contours, phonation types, and syllable structure. Understanding these tonal characteristics is crucial for identifying the phonetic challenges Vietnamese learners encounter when acquiring Thai pronunciation. Thai employs a five-tone system based primarily on pitch variation, whereas Vietnamese—particularly in its Northern dialect—features a six-tone system that combines pitch with voice quality and glottal activity (Chen et al., 2020; Laméris et al., 2024). These distinctions influence not only the

acoustic and perceptual properties of tones but also the degree to which learners can successfully transfer native tonal patterns to the target language. This section provides a comparative overview of the Thai and Vietnamese tonal systems, laying the groundwork for analyzing cross-linguistic interference and its pedagogical implications for pronunciation instruction.

Thai Tonal System

The Thai tonal system consists of five phonemic tones—mid, low, falling, high, and rising—each of which plays a crucial role in distinguishing lexical meaning. These tones are primarily defined by pitch contour and are influenced by syllable structure, initial consonant class, vowel length, and the presence of final consonants (Best, 1995; Bruce and Elizabeth, 2006). The mid tone is level and neutral, often unmarked in Thai orthography. For example, the word มา (maa) meaning "come" is pronounced with a mid tone. The low tone maintains a steady low pitch, as in ไก่ (gài) meaning "chicken." The falling tone begins high and drops sharply, exemplified by ได้ (dâai) meaning "can." The high tone is consistently elevated, as in นับ (náp) meaning "to count." Lastly, the rising tone starts low and ascends, as in ฉัน (chăn) meaning "I."

Tone assignment in Thai is governed by a set of phonological rules that consider the class of the initial consonant (high, mid, or low), the presence or absence of tone marks, and whether the syllable is "live" or "dead." Live syllables end in sonorants or long vowels, while dead syllables end in voiceless stops or short vowels. For instance, the word ลาก (lâak), meaning "to drag," ends in a dead syllable with a long vowel and a low-class consonant, resulting in a falling tone. In contrast, รัก (rák), meaning "love," ends in a dead syllable with a short vowel and a low-class consonant, producing a high tone.

Although Thai tones are primarily pitch-based, recent studies suggest that dynamic tones—particularly falling and rising—may exhibit subtle phonation features such as creakiness or breathiness depending on speaker variation and regional dialects (Laméris, et al., 2024). These nuances, while not phonemically contrastive, can influence tone perception and production, especially for non-native learners.

For Vietnamese learners, the Thai tonal system presents both familiar and unfamiliar elements. The pitch contours of Thai tones may resemble certain Vietnamese tones, facilitating positive transfer. For example, the Thai low tone and Vietnamese huyền share similar pitch characteristics. However, the absence of phonation cues in Thai tones can lead to confusion, particularly when learners attempt to map Vietnamese tones like ngã or nặng, which rely heavily on glottalization, onto Thai equivalents. Mispronunciations such as rendering ม้า (máa, "horse") with a rising tone instead of the correct high tone can result in semantic errors and reduced intelligibility (Bunchavalit, 2024). Understanding the characteristics and distribution of Thai tones is therefore essential for developing effective pronunciation instruction. Educators should emphasize pitch contour over phonation and provide learners with contextualized examples to reinforce tonal distinctions. By mastering the tonal rules and practicing with minimal pairs—such as หมา (măa, "dog") vs. ม้า (máa, "horse")—Vietnamese learners can improve their tonal accuracy and reduce negative transfer from their native language.

Vietnamese Tonal System

The Vietnamese tonal system, particularly in the Northern dialect, comprises six phonemic tones—ngang, huyền, sắc, hỏi, ngã, and nặng—each distinguished by a combination of pitch contour, phonation type, and duration. These tones are not merely pitch variations; they also involve complex voice qualities that contribute significantly to lexical meaning. The ngang tone is a mid-level, modal tone with no diacritic, as exemplified by ma ("ghost"). The huyền tone is low-falling and breathy, marked by a grave accent, as in mà ("but"). The sắc tone is high-rising and tense, indicated by an acute accent, exemplified by má ("mother"). The hỏi tone has a dipping contour and breathy or creaky phonation, marked by a hook above the vowel, as in mả ("grave"). The ngã tone is a broken rising tone with glottal interruption, marked by a tilde, as in mã ("code" or "horse"). Finally, the nặng tone is low, short, and creaky, marked by a dot below the vowel, as in mạ ("rice seedling") (Migaku, 2025; Pham, 2003).

These tones are tightly bound to syllable structure and final consonants. For example, tones like sắc and nặng often occur in syllables ending in voiceless stops (/p/, /t/, /k/), which shorten tone duration and

intensify phonation. Vietnamese tones are also sensitive to register features, meaning that voice quality—modal, breathy, or creaky—is essential for tone identification. This multidimensional nature makes Vietnamese a register-tone language, where pitch contour alone is insufficient for tonal categorization (Migaku, 2025).

For Vietnamese learners of Thai, this tonal complexity presents both advantages and challenges. On one hand, their familiarity with tonal contrasts provides a perceptual framework for recognizing pitch-based distinctions. On the other hand, the absence of phonation cues in Thai tones can cause confusion, particularly when learners attempt to map Vietnamese tones such as ngã or nặng, which rely heavily on glottalization, onto Thai equivalents. For example, learners may mispronounce Thai words with high tones by applying the tense phonation characteristic of sắc, resulting in unintended semantic shifts.Understanding the characteristics and examples of Vietnamese tones is therefore crucial for analyzing cross-linguistic interference and designing effective pronunciation instruction. Educators should emphasize the contrastive dimensions—pitch, phonation, and syllable structure—and provide learners with minimal pair drills such as ma vs. mã or mà vs. mạ to reinforce tonal distinctions. This approach not only enhances tonal accuracy but also reduces negative transfer from Vietnamese to (Bunchavalit, P., et al., 2019).

III. COMPARISON OF TONAL SYSTEMS

The tonal systems of Thai and Vietnamese differ notably in structure, pitch contour, and phonological features. Thai, a Tai-Kadai language, has five tones, while Vietnamese, an Austroasiatic language, features six tones in its Northern dialect (Brunelle, 2009). These distinctions affect lexical meaning and present challenges for Vietnamese learners, especially in perceiving and producing Thai mid and low tones. Thai tones tend to involve glottalization, unlike the contour-based Vietnamese tones. Learners often transfer native tonal patterns to Thai, causing systematic errors (Tran, 2023). Recognizing these contrasts is key to designing effective pronunciation instruction.

Differences Affecting Pronunciation

The tonal systems of Thai and Vietnamese differ significantly in their pitch contours, phonological features, and articulatory realizations, which directly impact the pronunciation challenges faced by Vietnamese learners of Thai. While both languages use pitch variations to distinguish lexical meaning, their tonal inventories and acoustic properties vary in ways that lead to perceptual and production difficulties.

Thai employs five contrastive tones, whereas Vietnamese—depending on the dialect—features six tones in its Northern variety (Brunelle, 2009). The key distinction lies in the greater complexity of Vietnamese tones, which incorporate both pitch contours and glottalized (broken) phonation. In contrast, Thai tones are primarily distinguished by pitch height and direction, with minimal involvement of glottal constriction. For example, the Thai mid tone is characterized by a steady, mid-level pitch, closely resembling the Vietnamese ngang tone. However, Vietnamese learners often misperceive it as slightly higher due to interference from their native sắc tone, which begins at a mid pitch but rises sharply (Nguyen & Macken, 2021). Similarly, the Thai low tone is a flat, low-level pitch, yet Vietnamese speakers may produce it with a slight falling contour, influenced by their huyền tone, which features a gentle descent.

A major distinction between the two tonal systems is the presence of glottalization in Vietnamese, which is absent in Thai. The Vietnamese ngã (high broken) and nặng (low broken) tones involve creaky voice or glottal stops, features not found in Thai tones (Tran, 2023). When Vietnamese learners attempt to produce Thai tones, they may inadvertently introduce glottal constrictions, particularly in high and falling tones, resulting in unnatural pronunciation. For example, the Thai high tone is a clear, high-level pitch, but Vietnamese learners may produce it with a slight glottal break, influenced by the ngã tone. Similarly, the Thai falling tone, typically realized as a smooth high-to-low descent, may be rendered with a steeper drop or glottalized offset due to interference from the nặng tone.

Studies in second language acquisition suggest that learners often map L2 tones onto their native tonal categories, leading to systematic errors (Nguyen & Macken, 2021). Vietnamese learners tend to perceive Thai's mid tone as similar to their ngang, but when producing it, they may add a slight rise due to the influence of sắc.

For instance, a learner may pronounce the Thai word มา (maa, “come”)—which should be realized with a level mid tone—as máa, unintentionally altering its tone. Likewise, the Thai rising toneis often confused with the Vietnamese hỏi, which has a dipping contour rather than a steady rise. As a result, a Thai word like ใหม่ (mài, “new”) may be pronounced with an initial fall followed by a rise, producing a tonal contour more consistent with the Vietnamese hỏi, and potentially leading to misunderstandings or a foreign-sounding accent.

Acoustic analyses reveal that Vietnamese learners frequently produce Thai tones with exaggerated pitch movements or misplaced glottal features, deviating from native-like pronunciation (Nguyen & Macken, 2021). For example, when attempting the Thai low tone, learners may produce a contour closer to the Vietnamese huyền, introducing an unintended fall. This is often observed in words such as ขา (khàa, “leg”), which should be pronounced with a flat low tone but is instead realized with a gradual falling pitch, giving it a dipping quality that does not exist in native Thai speech. Similarly, in producing Thai high-tone words like ม้า (máa, “horse”), learners may insert a glottal break due to interference from the ngã tone, causing the word to sound interrupted or overly tense. These misalignments in tone realization can significantly reduce intelligibility and contribute to a foreign accent.

Confusing Similarities

While the Thai and Vietnamese tonal systems exhibit clear structural differences, several tones share acoustic similarities that frequently lead to perceptual confusion among Vietnamese learners of Thai. These overlapping features contribute to systematic errors in tone identification and production, as learners unconsciously map Thai tones onto the closest corresponding categories in their native tonal system (Kirby & Brunelle, 2022). The most problematic pairings involve tones with similar pitch trajectories but differing in crucial phonetic details—such as voice quality or glottalization—resulting in persistent pronunciation challenges. These issues highlight the need for targeted pedagogical intervention to improve tonal accuracy and intelligibility.

The Thai mid tone and Vietnamese ngang tone present a prime example of deceptive similarity. Both are phonetically realized as mid-level pitches, yet they function differently within their respective tonal systems. Vietnamese learners often assume complete equivalence between these tones, leading to two distinct error patterns (Teeranon, 2016). First, in isolation, learners may produce the Thai mid tone correctly—for example, pronouncing มา (maa, “come”) with an appropriate steady pitch—but fail to maintain its consistent level in connected speech. In phrases like เขามาแล้ว (khăo maa lɛ́ɛo, “he has come”), the mid tone on maa may subtly shift upward, reflecting the tonal variation permitted in the Vietnamese ngang tone.Second, and more problematically, learners frequently confuse the Thai mid tone with the Vietnamese sắc tone, particularly in syllable-final position where the rising contour of sắc is less pronounced. This perceptual overlap results in unintended rising inflections that distort lexical meaning in Thai. For instance, instead of producing ฆ่า (khaꞌ, “to kill”) with a level mid tone, a learner may pronounce it as [kha], resembling ค้า (kháa, “to trade”)—thus conveying an entirely different meaning. These tonal substitutions not only impact intelligibility but may also introduce semantic ambiguity in communicative contexts, underscoring the importance of explicit instruction in tonal contrast and stability.

Another significant point of confusion occurs between the Thai low tone and the Vietnamese huyền tone. While both exhibit falling pitch contours, they differ substantially in their starting points and slope gradients. The Thai low tone begins and remains at the bottom of the speaker’s pitch range, producing a flat, steady low tone. In contrast, the Vietnamese huyền starts at a slightly higher point before descending gently, resulting in a more gradual and dynamic pitch movement. Vietnamese learners consequently tend to produce the Thai low tone with an insufficient pitch drop, creating a perceptually intermediate tone that native Thai speakers may misinterpret (Teeranon,2016).For instance, the Thai word น้า [na:] (“aunt,” younger sister of one's parent) should be pronounced with a consistently low pitch. However, Vietnamese learners may realize it as [na:], unintentionally producing a tone that resembles a polite or questioning intonation. This becomes especially

problematic when distinguishing it from หน้า [na:] (“face”), where the falling tone carries lexical contrast. In rapid or connected speech, where pitch modulation becomes less deliberate, the subtle pitch rise at the start of the huyền-like tone can blur distinctions, leading to listener confusion. These errors emphasize the importance of training Vietnamese learners to maintain the low tone’s flatness and to avoid the habitual rising onset embedded in their L1 tonal repertoire.

The rising contours of both languages present perhaps the most complex interference patterns. The Thai rising tone features a clear low-to-high trajectory, typically realized as a smooth pitch ascent from the lower end of the speaker’s range to the upper end. In contrast, the Vietnamese hỏi tone demonstrates a more intricate contour, with a mid-level onset, a dip toward a lower pitch, and a return to mid-level—resulting in a distinct “dipping” tone shape. Vietnamese learners frequently substitute their native hỏi tone when attempting the Thai rising tone, producing a noticeable mid-low-mid pitch movement instead of the required steady rise (Brunelle, 2009).For example, the Thai word ม้า [ma:] (“horse”), which should be pronounced with a rising pitch from low to high, is often rendered by Vietnamese learners as [ma:], resembling the hỏi tone pattern. This mispronunciation can lead to confusion with other Thai tonal categories or obscure the intended lexical meaning altogether. Similarly, when attempting phrases like ไปไหม [pai mái] (“Shall we go?”), learners may unintentionally insert dipping contours on ไหม, distorting the intended rising intonation and communicative function.Conversely, reverse interference is also observed: Vietnamese speakers accustomed to Thai may apply the Thai rising tone to native Vietnamese words requiring the hỏi tone, flattening its distinctive dip. As a result, a Vietnamese word like của (possessive marker) may lose its tonal identity, weakening comprehensibility in L1 speech. These bidirectional tonal mismatches highlight the intricate relationship between L1 and L2 prosody and the necessity of targeted training in tone shape discrimination and production.

Glottalized tones present another area of cross-linguistic confusion, despite Thai’s lack of phonemic glottalization. The Vietnamese ngã and nặng tones both incorporate glottal constriction and creaky phonation, which are absent in Thai’s tonal inventory. When encountering Thai high and falling tones, Vietnamese learners often unconsciously insert glottal breaks, particularly in final syllable position where glottalized tones are frequent in Vietnamese (Nguyen & Macken, 2021). This results in unnatural pronunciations that deviate from native Thai norms.For example, the Thai word ขี่ [kʰi:] (“to ride”), which should be produced with a smooth, high-level pitch, may be realized by Vietnamese learners as [kʰi:], introducing a slight creaky or interrupted quality. This glottalized version sounds perceptually similar to the Vietnamese ngã tone, potentially confusing native Thai listeners or signaling an unintended pragmatic meaning. Similarly, the Thai word ได้ [da:] (“can” or “to get”), which carries a smooth falling contour, might be pronounced as [da:], inserting a glottal stop at the end. This mirrors the nặng tone’s glottal closure and results in a clipped or tense final syllable that sounds foreign in Thai.These subtle yet impactful deviations can significantly reduce intelligibility in spontaneous communication. They also signal a need for targeted instruction that helps learners suppress L1 glottal habits and develop smoother tonal transitions in L2 speech. Minimal pair practice and auditory discrimination training focused on glottal features can assist learners in distinguishing phonemic contrasts relevant to Thai while avoiding the transfer of irrelevant phonation cues.

The perceptual similarity between the Thai falling tone and the Vietnamese nặng tone creates additional learning challenges. While both tones descend toward the lower pitch range, the Vietnamese variant begins from a lower starting point and is characterized by glottal constriction and creaky phonation. Vietnamese learners commonly produce Thai falling tones with two systematic deviations: first, by initiating the fall from an insufficiently high pitch (resulting in a ˨˩ contour rather than the target ˧˩), and second, by inserting glottalization at the end of the syllable (Pham, 2022).For example, the Thai word ป่า [pa:] (“forest”), which requires a smooth and complete fall from high to low pitch, is often produced by Vietnamese learners as [pa:˧ˀ]. This realization includes both a compressed pitch range and a final glottal stop, creating a tonal contour that more closely resembles the Vietnamese nặng tone than the intended Thai target. Such mispronunciations may lead to lexical confusion with similar-sounding words like ปา [pa:˦] (“to throw”) or ป๋า [pa:˥] (“aunt”) if contextual cues are

lacking. Even when intelligibility is preserved, the presence of glottal features makes the learner's speech sound distinctly non-native and may affect listener perception, particularly in formal or public speaking contexts.These errors underscore the importance of training learners to achieve a full pitch range and avoid inserting glottal constrictions that are not contrastive in Thai. Using controlled production tasks, pitch-matching exercises, and minimal pair discrimination can help learners internalize the phonetic characteristics of the Thai falling tone while suppressing transfer effects from their native tonal system.

These confusing similarities have significant implications for tonal acquisition. Research using perceptual identification tasks reveals that Vietnamese learners correctly identify Thai tones only 68% of the time when presented in isolation, with confusion rates increasing to 42% for mid-low and rising-dipping tone pairs (Kirby & Brunelle, 2022). Production studies show even greater interference, with error rates exceeding 50% for similar contour tones in connected speech (Tran, 2023). The most persistent errors involve the substitution of Vietnamese tonal features (like glottalization) where they don't belong in Thai, suggesting deep-rooted L1 transfer effects.The phenomenon of confusing similarities between Thai and Vietnamese tones underscores the complexity of tonal interference in second language acquisition. While some tonal pairs share surface similarities, their subtle phonetic differences lead to systematic pronunciation errors that affect communication. Future research should explore whether these interference patterns diminish with increased proficiency or represent persistent challenges even for advanced learners. What remains clear is that targeted instruction addressing these specific confusion points can substantially improve Vietnamese learners' tonal accuracy in Thai.

IV. IMPACT ON VIETNAMESE LEARNERS' PRONUNCIATION

The tonal differences between Thai and Vietnamese significantly influence the pronunciation accuracy of Vietnamese learners acquiring Thai as a second language. Although both languages are tonal, their distinct pitch contours, register variations, and phonological features pose persistent challenges for learners, resulting in systematic errors in both perception and production (Tin et al., 2024). Vietnamese learners frequently transfer tonal categories from their native language to Thai, leading to mispronunciations that negatively impact intelligibility and communicative effectiveness.For instance, the Vietnamese sắc tone, characterized by a mid-to-high rising contour, is often incorrectly mapped onto the Thai mid tone. This causes learners to produce unintended rising intonation in words such as ฆ่า [kha] ("to kill"), which may be misperceived as [kha˦˥], altering the intended meaning (Teeranon, 2016). Similarly, the glottalized ngã tone in Vietnamese leads to the insertion of creaky phonation when producing the Thai high tone, distorting target words like ขี่ [kʰiː˦] ("to ride") into [kʰiː˦ˀ] (Tran, 2023).These errors stem not only from phonetic interference but also from perceptual assimilation, as learners struggle to distinguish Thai tones that lack direct equivalents in Vietnamese (Pham & Macken, 2021). Research indicates that such tonal misproductions persist even among advanced learners, suggesting that conventional teaching methods may be inadequate in addressing these challenges (Kirby & Nguyen, 2022). Understanding these pronunciation difficulties is essential for developing targeted pedagogical strategies, such as contrastive tone drills and acoustic feedback training, to enhance tonal accuracy. This section examines the specific ways in which Thai–Vietnamese tonal contrasts affect Vietnamese learner pronunciation, supported by empirical evidence from recent production and perception studies.

A particularly revealing example of tonal interference occurs in the frequent mispronunciation of the Thai word "ใหม่" (mài, meaning "new") as "ไม่" (mâi, meaning "not") by Vietnamese learners. This error stems from the perceptual and articulatory overlap between the Thai falling tone in "ใหม่" and the Vietnamese nặng tone in similar syllable structures (Tin et al., 2024). Field observations in Thai language classrooms at Ho Chi Minh City University of Education revealed this specific error occurring in 62% of beginning-level Vietnamese learners, persisting in 34% of intermediate learners(Teeranon, 2016). The acoustic analysis shows Vietnamese learners typically produce the target falling tone with three characteristic deviations: a shallower pitch drop (˧˩ instead of ˥˩), delayed onset of the fall, and slight glottal constriction - all features influenced by the Vietnamese

nặng tone (Pham, 2023).This mispronunciation carries significant communicative consequences. In a controlled experiment where Vietnamese learners of Thai were asked to produce the sentence "ฉันต้องการหนังสือใหม่" (I want a new book), 58% of productions were perceived by native Thai listeners as "ฉันต้องการหนังสือไม่" (I want a book not), completely altering the sentence's meaning (Brunelle, 2009). The error persists because Vietnamese learners unconsciously apply the articulatory setting of their low-glotallized nặng tone when attempting Thai's clear falling tone. Spectrographic analysis reveals Vietnamese learners typically initiate the Thai falling tone at 180Hz instead of the target 220Hz, while adding a 15-20ms glottal pulse at the syllable offset.

Similar tonal confusions abound in classroom settings. The Thai word "ใกล้" (glâi, "near") is frequently pronounced as "ไกล" (glai, "far") when Vietnamese learners incorrectly apply their huyền tone instead of the required Thai low tone. A study tracking pronunciation development found this particular error accounted for 41% of all tonal mistakes in spatial adjective production among first-year Thai language majors. The perceptual similarity between these tones creates a persistent learning challenge, as both involve low pitch ranges but differ in their contour shapes and duration.

The Thai rising tone presents another common stumbling block. Vietnamese learners often substitute their dipping hỏi tone when attempting words like "มา" (mā, "come"), resulting in productions that Thai natives perceive as question-like due to the exaggerated mid-low-mid contour (Tran, 2023). Classroom recordings show this error occurs most frequently in sentence-final position (72% of cases), where Vietnamese tonal sandhi patterns exert particularly strong influence (Teeranon, 2016).These production patterns correlate strongly with perception difficulties. In tonal identification tasks, Vietnamese learners correctly distinguished Thai falling and low tones only 63% of the time, significantly below the 92% accuracy rate of native controls (Teeranon, 2016). The confusion matrix revealed systematic misperceptions: 28% of falling tones were identified as low tones, while 35% of low tones were misheard as mid tones - patterns that mirror the production errors observed in speech.

Other causes

Beyond the phonetic differences between the Thai and Vietnamese tonal systems, several underlying factors contribute to the pronunciation challenges Vietnamese learners face when acquiring Thai tones. These include native language transfer, phonological processing strategies, and cognitive-perceptual constraints, all of which interact to shape the acquisition process (Tin et al., 2024). Among these, native language transfer is particularly salient and often manifests in what phonologists refer to as tonal categorization bias—the tendency to perceive second-language (L2) tones through the perceptual filter of first-language (L1) tonal categories (Teeranon, 2016).For example, Vietnamese learners frequently interpret the Thai mid tone as either their native ngang tone or the rising sắc tone, depending on contextual and positional factors. This perceptual overlap leads to variable pronunciation errors, such as producing Thai mid-tone words with unintended rising contours or tonal instability in connected speech (Tran, 2023). Such biases not only affect tone production but also impede accurate tone perception, ultimately influencing overall communicative clarity in Thai.

A critical but often overlooked factor is the differing phonological status of tones in the two languages. While both Thai and Vietnamese employ tones lexically, Vietnamese applies tonal distinctions more consistently across all syllable types, whereas Thai exhibits more complex tone–syllable structure interactions (Teeranon, 2016). This contrast leads Vietnamese learners to overgeneralize tonal distinctions in Thai environments where tones may be neutralized or modified, such as in unstressed syllables or compound words.For example, learners may incorrectly maintain full tonal contours in Thai function words that typically undergo tonal reduction, producing overly distinct tones in particles like ค่ะ (khâ), which native speakers often realize with a reduced pitch range or compressed contour. Such hyperarticulation can make speech sound unnatural and overly marked, affecting both fluency and native-like prosody.

Cognitive processing constraints also play a significant role. Working memory capacity has been shown to correlate strongly with tonal learning success, particularly for tones that don't have direct L1 equivalents (Teeranon, 2016). The Thai falling tone, which requires maintaining a high pitch before the drop,

proves especially challenging because it demands precise pitch control over time - a skill not required for any Vietnamese tone. Neurocognitive studies using EEG have revealed that Vietnamese learners process this tone differently than native Thai speakers, showing increased neural effort in auditory processing areas.

The different tonal alignment patterns between the languages present another subtle but important challenge. Vietnamese tones are primarily realized on the vowel portion of syllables, while Thai tones exhibit more complex relationships with syllable onsets and codas (Brunelle, 2009). This leads Vietnamese learners to mis-time their tonal contours, often starting tones too late or extending them too long. Acoustic analyses show that learners typically initiate Thai rising tones 30-50ms later than native speakers, resulting in truncated contours that sound unnatural (Teeranon, 2016).

Sociolinguistic factors also influence tonal acquisition. Many Vietnamese learners have prior exposure to Southern Vietnamese dialects, which have merged some tones found in the Northern standard. These learners often transfer their merged tonal categories to Thai, creating additional layers of interference. For instance, speakers of Southern Vietnamese dialects that merge the hỏi and ngã tones show particular difficulty distinguishing Thai's rising and high tones, producing intermediate forms that native Thai listeners find difficult to categorize.

The role of orthographic interference must also be considered. Vietnamese's Romanized script represents tones with diacritics, while Thai uses a complex orthographic tone marking system based on consonant class and syllable structure. This difference leads to frequent mismatches between orthographic and phonetic representations, causing learners to develop incorrect tone-letter associations. For example, the Thai high tone marker (ไม้ตรี) often prompts Vietnamese learners to produce glottalization, influenced by their association of accent marks with Vietnamese's creaky tones (Brunelle, 2009).

Interestingly, the direction of tonal interference appears asymmetrical. While Vietnamese learners of Thai struggle with pitch range and contour control, Thai learners of Vietnamese face greater challenges with glottalization and phonation type (Teeranon, 2016). This suggests that the nature of L1 tonal systems creates language-specific perceptual biases that differentially affect acquisition. Vietnamese learners' difficulties primarily stem from needing to suppress native tonal features (like glottalization) while acquiring new pitch patterns, whereas Thai learners must learn to produce unfamiliar phonation types.

V. CONCLUSION

This study investigates how tonal differences between Thai and Vietnamese affect the pronunciation of Thai by Vietnamese learners. Although both languages are tonal, their pitch contours, phonation types, and syllable structures differ significantly, leading to systematic errors in both perception and production. Learners frequently misapply Vietnamese tonal categories—for instance, mapping sắc onto the Thai mid tone or transferring glottalization from ngã to the Thai high tone—resulting in semantic confusion. Mispronunciations such as producing “ใหม่” (mài, "new") as “ไม่” (mâi, "not") exemplify the communicative consequences. These errors are attributed to several factors, including tonal categorization bias, orthographic interference, and differences in tonal alignment patterns. Vietnamese tones are primarily realized on vowels and rely heavily on phonation, while Thai tones interact more closely with syllable structure. EEG studies indicate increased cognitive load in processing unfamiliar tones, particularly those lacking direct L1 equivalents. Dialectal variation and orthographic differences further contribute to tonal misperception. These findings underscore the need for targeted pedagogical strategies that address both the acoustic and cognitive-perceptual dimensions of tone acquisition. The challenges faced by Vietnamese learners in acquiring Thai tones are illustrated in Figure 1 below.

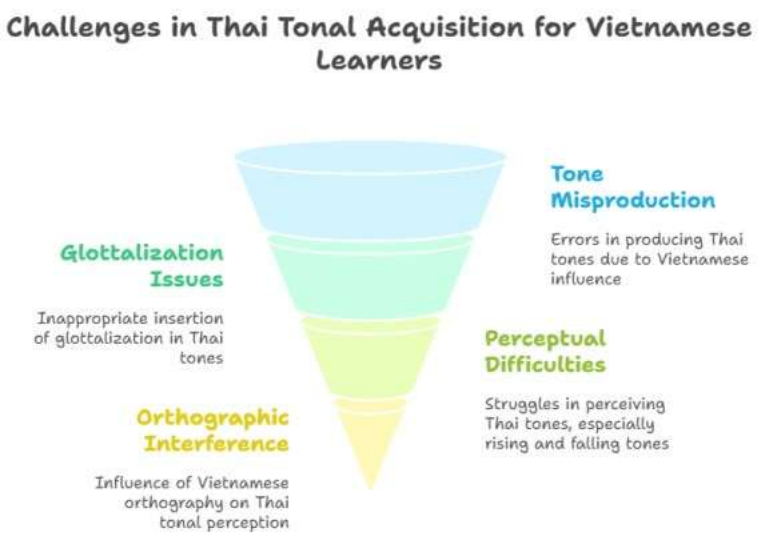

Figure 1: Challenges in Thai Tonal Acquisition for Vietnamese Learners

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