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The Interplay of Perception and Production: Southern Thai EFL Learners' Native Language and Dialect Contact Influence on English Pronunciation

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ABSTRACT

This study investigates variations in English short vowel sounds and their correspondences within the context of Southern Thailand, focusing on how these variations may affect intelligibility and comprehensibility in spoken English. It also examines the interplay between speech perception and production, focusing on the impact of mother tongue interference (MTI) and language contact (LC). A group of 88 tertiary students whose native language is either the Southern Thai dialect or the Standard Thai language was examined. A questionnaire and tests were employed to explore the correspondence and to assess speech perception and production. The descriptive statistics and post hoc test for one-way ANOVA results indicated that MTI and LC affect the pronunciation of English words, especially the vowel /e/. Furthermore, a new vowel sound correspondence was observed. Cross-tabulation analyses revealed comparable effects of MTI and LC on perception and production abilities. Specifically, speech production tended to mirror perceived sounds, and this effect resulted from MTI and LC. The study highlights the impact of MTI, LC, and vowel variation on English pronunciation among Southern Thai students.

Keywords: mother tongue interference; language contact; short vowel correspondence; Southern Thai dialect; speech perception and production

Introduction

Interference from a learner's first language (L1), known as mother tongue interference (MTI), often leads to linguistic divergence, as noted by Prasithrathsint (2012) and systematic differences in how second language (L2) sounds are perceived and produced (Flege, 1995). In addition to MTI, language contact (LC) also triggers linguistic changes in various sociocultural contexts across Thailand. Convergence occurs when Thai interacts with other languages or among different dialects within the same region. As Prasithrathsint (2012, p.139) states, "Language convergence results in linguistic similarities in neighboring or overlapping areas." To understand this further, a key phonological concept differentiates phonemic contrasts, which change word meaning when sounds are swapped, from free variation, where sound changes do not affect meaning (Crystal, 2008). For example, in English, the vowel sounds /æ/ (as in pan) and /e/ (as in pen) form a phonemic contrast because exchanging them changes the meaning of a word. However, this contrast is affected by dialectal vowel correspondence in the learners' L1, as /e/ in Standard Thai is typically pronounced as /ɛ/[1] in the Southern Thai dialect, leading to potential confusion when pronouncing English vowels /e/ (as in "pen") and /æ/[2] (as in "pan"). This predictable L1 transfer affects learners' perception and production of English short vowels, which can have implications for intelligibility and comprehensibility in L2 communication (Munro & Derwing, 1995, 2006).

The nature and direction of the perception–production relationship remain contested in L2 acquisition research. While misperceptions may lead to mispronunciations, this link is not necessarily unidirectional. Instead, Flege (1995) and Best and Tyler (2007) propose a dynamic and bidirectional interplay between the two systems. Understanding this interplay is key to identifying how learners acquire and stabilize L2 phonemes. However, limited research has examined the nature of this interplay among Thai learners, particularly in linguistically diverse areas such as Southern Thailand.

Based on the researcher's class observation, Southern Thai learners' misperceptions often mirror their mispronunciations during listening and

[1] Transcriptions of Thai vowels follow Ronnakiat & Jitwiriyanont (2012).

[2] Transcriptions of English vowels follow the International Phonetic Association (IPA, 1999).

speaking tasks. For example, confusion between "slept" /slept/ and "slapped" /slæpt/, which differ in vowel quality, specifically tongue height between /e/ and /æ/, can alter the intended meaning and affect the intelligibility and comprehensibility of learners' speech, potentially leading to misunderstandings. Such issues may undermine learners' confidence, reduce classroom participation, and hinder the development of communicative competence in both academic and professional contexts.

Based on prior research and classroom observations, this study proposes that English pronunciation errors among Southern Thai students are influenced by patterns of short vowel variations and short vowel sound correspondences, shaped by either MTI or LC. For some locals whose L1 is the Southern Thai Dialect, Standard Thai is acquired as an L2, making English their third language (L3). For others who acquire Standard Thai as their L1, English functions as their L2. This triadic linguistic background introduces different sources of interference: MTI in Southern Thai Dialect speakers, and LC effects in Standard Thai speakers exposed to the dominant dialect of the southern region.

Focusing on these two EFL learner groups with different linguistic backgrounds, the study explores short vowel variation patterns and correspondences to identify the most challenging English short vowels in perception and production. Central to this investigation is the interplay between perception and production, particularly whether misperception leads to mispronunciation or whether the two processes influence each other reciprocally within a linguistically diverse context. This study, therefore, focuses on the alignment between perception and production as a means of examining how internal phonological consistency is shaped by L1 influence.

This study is guided by the following research questions:

1. Which short vowel sound is the most challenging for Southern Thai EFL learners, whose L1 is either Southern Thai Dialect or Standard Thai, to produce at the word level? Additionally, do any new vowel correspondences appear beyond those tested?

2. What is the interplay between speech perception and production accuracy of English short vowels among Southern Thai EFL learners, and how is it shaped by MTI and LC across both groups of learners?

Literature Review

Sound Correspondence

Sound correspondence refers to the systematic variation in speech sounds within a language (Prasithrathsint, 2012). These variations can occur in the consonant system, vowel system, or tonal system of a single language.

Additionally, sound correspondence may exhibit similarities or systematic patterns across different languages. These variations may appear as similar or different sound characteristics in words that have the same meaning in both languages (Phuphan, 2017). Despite these variations, listeners can still identify words spoken in the same language, likely because they result from diverse pronunciations of the same word (Prasithrathsint, 2012). Even if a word is pronounced differently, its essential meaning does not change. In this case, speakers may not be aware of their diverse pronunciations, while listeners are attuned to these variations. However, miscommunication can occur among those who are not aware of these variations, potentially leading to breakdowns in understanding.

Short Vowel Sound Correspondences in the Southern Thai Dialect

Standard Thai and Southern Thai Dialect have nine short vowel sounds each, with no significant differences in monophthongs or diphthongs. The phonetic characteristics of these vowel sounds in the Southern Thai Dialect align with those in Standard (Kingkham, 2004; Siriaksornsart, 2011).

However, a notable divergence is observed in the Southern Thai Dialect, where phonetic variations or sound correspondences show a pattern that significantly differs from Standard Thai. The Southern Thai Dialect exhibits differences in phonetic units for consonants, vowels, and tone marks compared to Standard Thai (Siriaksornsart, 2011). Focusing on vowel sounds, certain short vowel phonemes in the Southern Thai Dialect contrast with those in Standard Thai. Examples of short vowel sound correspondence patterns illustrate the phonetic differences between Standard Thai and the Southern Thai dialect (Thongchuay, 1991), as shown in Table 1. The use of the Thai phonetic alphabet, as outlined by Ronnakiat and Jitwiriyanont (2012), provides a precise representation of these sounds, which often lack direct equivalents in the English language. This enhances clarity when illustrating vowel deviations.

Table 1

Short Vowel Sound Correspondences in Standard Thai and Southern Thai Dialect

Short Vowel Sound Correspondence			**Example Word**	
Standard Thai		**Southern Thai Dialect**	**Standard Thai**	**Southern Thai Dialect**
/i/	→	/a/	จิ้งหรีด	จังหรีด
/i/	→	/ɯ/	ลิง	ลึง
/ɪ/	→	/e/	ติ	เตะ

Short Vowel Sound Correspondence			Example Word	
Standard Thai		Southern Thai Dialect	Standard Thai	Southern Thai Dialect
/e/	→	/i/	เหม็น	หมิน
/e/	→	/ɛ/	เก่ง	แก่ง
/a/	→	/i/	ขมิ้น	ขี้มิน
/a/	→	/ɛ/	ควัก	แควัก
/o/	→	/ɛ/	หมด	แหม็ด
/o/	→	/u/	มะยม	ลูกยุม
/o/	→	/ɔ/	นก	น็อก
/u/	→	/ɯ/	หยุด	หยืด
/u/	→	/o/	พลุ	โพละ
/ɯ/	→	/i/	สึก	สิก

Correspondence often involves similar tongue placements but differs in height. The shift from /e/ in Standard Thai to /ɛ/ in the Southern Thai Dialect represents a particularly significant vowel correspondence (Chanavong, 1997; Tichinpong, 2006). Other correspondences, such as the vowel shift from /i/ to /e/, from /a/ to /ɔ/, and from /e/ to /i/, may not be as consistent across all words, indicating that some phonetic changes are more sporadic or context-dependent in the Southern Thai Dialect. These systematic vowel correspondences are based on Kingkham (2004), Tichinpong (2006), and Thongchuay (1991). Furthermore, Chanavong (1997) also notes that in the Southern Thai Dialect, short vowels are often lengthened, especially in single-syllable words and during the pronunciation of long monophthongs. This is most noticeable with the vowel sound /e/. When /e/ is in a closed syllable structure and followed by a voiceless stop coda—such as /p/, /t/, or /k/—it shifts to /ɛ/. However, /e/ followed by nasals can manifest as either /e/ or /ɛ/. In summary, although short vowel phonemes in Standard Thai and the Southern Thai Dialect share the same phonemic identity, their pronunciation can differ within words that contain these phonemes.

Mother Tongue Interference (MTI) and Language Contact (LC)

MTI and LC are crucial in linguistics, especially in L2 learning. MTI, introduced by Lenneberg (1967), refers to the unintended application of features from one's L1 that cause inaccuracies in L2. This concept, rooted in sociolinguistics and language education, involves the adverse transfer of linguistic components from L1 to L2, as noted by Ellis (1997) and Yule (2010).

Lott (1983) defines interference as errors in a speaker's non-native language that reflect their L1. These errors show linguistic divergence and sound correspondence from L1. The degree of interference can be positive or negative, depending on the similarity between L1 and L2. Greater structural differences between L1 and L2 make learning L2 more challenging.

Weinreich (1968) highlights the difficulties learners face in pronouncing unfamiliar sounds, which can lead to phonological interference from their L1. Derakhshan & Karim (2015) reported that L1 structures affect L2 pronunciation, as exemplified by Paramal's (2019) finding that EFL students in Pattani, Thailand, struggle with English vowel pronunciation due to their L1, Pattani Malay. Chaira (2015) noted that Indonesian speakers change /iː/ to /ɪ/ and /æ/ to /e/ in English. Tawary et al. (2020) also reported similar issues that the Ciacianese Buton dialect lacks certain vowel sounds in its phonetic repertoire, leading to negative transfer effects on both vowel and consonant pronunciation in English. Moreover, Hu and Lu (2022) found that the negative transfer in English learning across various Chinese dialect regions is strongly embedded, with dialectal speech patterns being a major contributor to inaccuracies in learners' English pronunciation.

LC occurs when languages interact, often due to individuals moving to new regions (Trudgill, 1986). Individuals need to adapt their language use to communicate effectively within diverse linguistic communities. Prasithrathsint (2012) notes that LC dynamics are influenced by the dominance of one language, leading to the transfer of L1 phonological patterns to L2, with positive and negative outcomes for learners. This adaptation process, known as dialect contact, leads to gradual changes in the language over time. LC can also lead to language convergence, where languages become more similar due to prolonged contact. This convergence affects phonetic and phonological aspects, influencing L2 pronunciation patterns. Siregar (2017), who studied Indonesian EFL learners, emphasized that dialect influences language use and teaching. Variations in dialect can create difficulties for learners, often hindering their progress in acquiring a new language. Hayeesa-i (2023) found that dialectal variations in L1 can complicate achieving native-like pronunciation in L2. For example, Patani Malay and Thai phonetic patterns impact English pronunciation, particularly vowels, stress, and intonation among Patani Malay speakers. She also explored these influences using LC and interference theories. These examples collectively demonstrate how L1 phonological patterns can transfer to L2, illustrating the process of language convergence in contact settings.

The Thongdaeng Accent

When speakers from different linguistic backgrounds interact, their languages or dialects tend to converge, adopting each other's linguistic elements (Ploog, 2017). This natural process leads to word blending, phrases, grammatical structures, and pronunciation patterns.

In Southern Thailand, Tichinpong (2006) describes the Thongdaeng as a blend of Standard Thai and the Southern Thai dialect, characterized by a Southern Thai accent. According to Phongphaiboon (1987), Thongdaeng exemplifies language convergence. When Standard Thai is not used daily, it blends with the Southern Thai Dialect, leading to deviations from the standard accent due to unique sound and grammar structures (Tichinpong, 1980). In southern Thailand, individuals who do not use Standard Thai as their L1 often speak Thongdaeng, adopting a Southern Thai accent or using Southern lexemes. Moreover, native speakers of the Southern Thai Dialect frequently infuse local features into their Standard Thai speech, resulting in the 'Thongdaeng' accent.

Thongdaeng's vowel sound system closely resembles that of the Southern Thai Dialect, as shown in Table 1. This similarity is partly due to the tendency of Southern Thai speakers to lower their tongue height when pronouncing certain dialectal vowels, which is often carried over into the Thongdaeng accent. This reflects the natural convergence that occurs when diverse linguistic backgrounds interact. The widespread adoption of the Thongdaeng accent in Southern Thailand highlights the dynamic interplay between language varieties.

In summary, MTI and LC contribute to phonological variation, affecting both speech perception and production. MTI refers to how a person's L1 influences their acquisition of a new language, while LC involves mutual influence and change within a multilingual environment, resulting in shared phonological features. The Thongdaeng language, in this case, may have developed through LC or dialect contact, sharing major features with the Southern Thai Dialect.

Phonological Permeability Hypothesis

Amaro and Rothman (2010) examine L3 acquisition by proposing the Phonological Permeability Hypothesis with an explanation that "pre- and post-pubescent phonological acquisition is fundamentally different, and this difference is maturationally conditioned in the sense of a critical period. Evidence for this should be found in differences in cross-linguistic permeability (regressive interference) between native and non-native phonological systems when an L3/Ln is acquired" (p. 280). Amaro and Rothman's study highlights the intricate relationship between phonological systems across languages, suggesting that L3 learners may positively transfer

phonological features from their L1 and L2. This could benefit learners, as they can leverage the phonological similarities between L3 and L2, even when learning occurs beyond the critical period for language acquisition.

Speech Perception and Production

For the process of perception and production in L2 speech learning, the assumptions from both the Speech Learning Model (Flege, 1995) and the Perceptual Assimilation Model (Best & Tyler, 2007) emphasized the importance of auditory perception and oral production. The ability to produce sounds like those of the target language depends on the learner's ability to distinguish between sounds in their L1 and those in the target language. Nushi & Makiabadi (2018) reported that speech perception is strongly influenced by the phonetic features of EFL Iranian learners due to early exposure and auditory experience. However, it is important to acknowledge that individual experiences and language learning contexts can vary, so there may be exceptions to this general pattern. If learners have poor auditory perception, they may not be able to differentiate between different sounds, which directly affects their speech production. Regarding vowel perception and production, Flege (1995) states that if learners notice that there are fewer vowels in L2 compared to their L1, they may create new categories for the vowels of the target language. Similarly, Escudero (2005) maintains that perception plays a foundational role in shaping L2 learners' ability to produce accurate phonological forms. These models suggest that misperceptions often lead to mispronunciations.

The challenges of phonetic interference or negative transfer from one's L1 to an L2 relate to speech processing. This mechanism involves the intake of auditory or visual information, leading to the perception and production of speech in the L2 (Garman, 1994). These mechanisms are vital in the study of speech perception and multilingual learning. Baese-Berk and Kato (2020) examine the interplay between speech perception and production in English, with Japanese learners of English as EFL. It was found that even though non-native speakers may perceive similar speech sounds in two languages, they may not be able to associate those sounds with corresponding letters. Moreover, they state that speech production depends on auditory perception, and for effective speech production, speakers should receive accurate input from both visual and auditory sources simultaneously.

Phonetic interference or negative transfer from L1 to L2 involves processing auditory or visual information, crucial for speech perception and production (Garman, 1994). Ji and Jiang (2022) examined the impact of dialectal background on the perception and production of English vowels, confirming the significant role of dialect in language transfer and the complex

interplay between L1 and L2 acquisition. Correspondingly, Baese-Berk and Kato (2020) found that Japanese learners of English may perceive similar sounds in both languages but struggle to associate them with corresponding letters. These findings confirm that effective speech production depends on accurate auditory and visual input.

Methodology

Standard English or BBC English contains six short vowels (Ronnakiat & Jitwiriyanont, 2012), while Standard Thai features a broader range with nine short vowels (Nathong, 2017). This research focuses on six common English short vowels—/ɪ/, /e/, /æ/, /ʌ/, /ʊ/, and /ɒ/, excluding the schwa (/ə/), which are not typically classified among the core short vowels. The study also considers their counterparts in the Standard Thai vowel inventory. These six vowels represent key correspondences and thus form the core of this investigation.

English short vowel perception and production among Southern Thai Dialect speakers were analyzed. The English short vowel correspondences include SVSC 1: /ɪ/ → /e/, SVSC 2: /ʌ/ → /ɒ/, SVSC 3: /e/ → /ɪ/, SVSC 4: /e/ → /æ/, SVSC 5: /ɪ/ → /æ/, and SVSC 6: /ʊ/ → /ɒ/. The first four vowel correspondences are from Thongchuay (1991), while the other two were those observed by the researcher during pronunciation classes.

This study, in compliance with ethical standards, received approval from the Institutional Review Board at Prince of Songkla University. The research protocol, which included participant recruitment, consent procedures, and data collection methods, was also approved by the IRB. All participants voluntarily signed consent forms, ensuring the study adhered to the approved protocol.

Population and Sample

The study involved 143 undergraduate students enrolled in an English pronunciation course at Prince of Songkla University. From these, 88 participants who scored in the bottom 30% on speech perception and production pre-tests were selected and divided into two groups based on linguistic background: the STD group (n = 45) consists of native speakers of the Southern Thai Dialect. In contrast, the STL group (n = 43) comprises speakers of Standard Thai who have frequent contact with the Southern Thai Dialect through family or community, resulting in varying degrees of dialectal influence. This selective sampling enabled a focused analysis of learners most affected by English short vowel difficulties. It also highlighted how dialectal

L1 variation can intensify these challenges, contributing to a deeper understanding of pronunciation issues among Southern Thai EFL learners.

Instruments

To ensure content validity via the Index of Item-Objective Congruence, all research instruments were reviewed by three phonology experts from different institutions. A pilot test was then conducted with a small group of participants from the previous semester's equivalent course.

The Basic Personal Information Questionnaire

An online questionnaire was created to gather basic personal details such as age, gender, hometown, L1 or dialect, preferred language, and the language primarily used with family and friends. It was administered on the first day of the course after obtaining the students' consent. The responses helped identify participants' L1s as either Standard Thai or the Southern Thai Dialect.

The Speech Perception and the Speech Production Tests

The Speech Perception and Production Tests were administered to evaluate participants' ability to recognize English short vowel deviations. Eighteen meaningful words containing a single consonant sound common to both English and Thai, covering all possible vowel correspondences, listed in Appendix A, were used for both tests. All target words were designed to end in voiceless stop consonants (/p/, /t/, /k/) to reduce articulatory influence, in line with Kitikanan's (2020) recommendation to account for possible coarticulatory effects in speech analysis.

In the Speech Perception Test, minimal pairs were formed from 18 target words based on vowel correspondences outlined by Thongchuay (1991) to assess vowel perception. Distractor words reflecting Southern Thai Dialect vowel patterns are listed in Appendix B. Participants listened to two-choice audio items and selected the word with the target vowel sound, highlighting vowel qualities characteristic of the Southern Thai Dialect (see Appendix C). The test was administered in class following the completion of the Basic Personal Information Questionnaire. In the Speech Production Test, participants recorded and submitted pronunciations of the same 18-word list within one week.

Finally, the speech perception scores were compared with the speech production scores to explore the relationship between speech perception and production.

The Vowel Sound Variations Log Form

Participants' scores were documented from the Speech Perception and Production Tests on the Vowel Sound Variations Log Form, concentrating exclusively on the accuracy of English short vowel sounds. A score of "1" denoted correct pronunciation, while "0" indicated incorrect pronunciation. Phonological errors outside the six target vowel correspondences observed in the Speech Production Test were not included in the scoring.

Data Analysis

Production tests were evaluated by the researcher and a native English speaker using a predefined rubric, with high inter-rater reliability confirmed by intraclass correlation coefficients (ICC; Cronbach's $\alpha = .991$ for the pretest and .958 for the posttest). Descriptive statistics and a post hoc test following one-way ANOVA were employed to identify prevalent vowel correspondences and highlight challenges in pronunciation accuracy. Additionally, cross-tabulation was used to visually illustrate the interplay between speech perception and production abilities in the STL and STD groups.

Results and Discussion

Most Challenging English Short Vowels and Emergence of New Vowel Variations

To gain a clearer understanding of the participants' pronunciation challenges, particularly concerning English short vowel sounds, a detailed analysis of their speech production was conducted. These scores reflected the six English short vowel correspondences produced by both the STL and STD groups. Thongchuay's work (1991) on SVSC1-SVSC4 provides a solid foundation for understanding English short vowel correspondences in Southern Thailand, while SVSC5 and SVSC6 were identified through classroom observations during a pronunciation course.

Table 2 presents the total error scores documented in the Vowel Sound Variations Log Form. Each error represents a deviation from standard English pronunciation, influenced by the Southern Thai accent, with higher scores indicating more frequent mispronunciations.

Table 2

The Frequency of Mispronounced Short Vowel Sounds as Reflected in Vowel Correspondences Observed in the Speech Production Test

	STD (N=45)				STL (N=43)				Total (N=88)			
	$\bar{x}$	***SD***	**Min**	**Max**	$\bar{x}$	**SD**	**Min**	**Max**	$\bar{x}$	***SD***	**Min**	**Max**
Total: 18 scores	17.00	1.21	14	18	17.05	1.88	10	18	17.02	1.56	10	18
SVSC1	.02	.15	0	1	.16	.92	0	6	.09	.65	0	6
SVSC2	.00	.00	0	0	.05	.21	0	1	.02	.15	0	1
SVSC3	**.20**	.55	0	2	.05	.30	0	2	**.13**	.45	0	2
SVSC4	**.62**	1.11	0	4	**.58**	1.37	0	5	**.60**	1.24	0	5
SVSC5	.00	.00	0	0	.00	.00	0	0	.00	.00	0	0
SVSC6	**.16**	.64	0	3	.12	.50	0	3	**.14**	.57	0	3

Note. Bolded values indicate notable descriptive trends; SVSC 1: /ɪ/ → /e/, SVSC 2: /ʌ/ → /ɒ/, SVSC 3: /e/ → /ɪ/, SVSC 4: /e/ → /æ/, SVSC 5: /ɪ/ → /æ/, and SVSC 6 = /ʊ/ → /ɒ/

Table 2 reveals the frequency and types of vowel substitutions observed during the speech production test. First, mispronunciations in five of the six vowel correspondences, with no errors for the vowel shift from /ɪ/ to /æ/ (SVSC5). The vowel /e/ that was pronounced as /æ/ (SVSC4) had the highest error rate, 0.62 for STD and 0.58 for STL, highlighting a key challenge in producing English short vowels. Second, both participant groups commonly mispronounced Thongchuay's (1991) SVSC1-SVSC4. In contrast, SVSC6, derived from the researcher's classroom observations, had minimal errors, with an average error frequency like that of the vowel shift from /e/ to /ɪ/ (SVSC3). Lastly, no additional English short vowel sound correspondences beyond the tested SVSC1-SVSC6 were observed. Participants did not show unexpected variations in pronouncing English short vowels.

In addition to vowel substitutions, a few phonological convergence errors were recorded: lengthening of short vowels was the most frequent across both groups; addition of /s/ after /t/ and substitution of /t/ with /tʃ/ in final positions occurred at about half that frequency; and the use of unaspirated [p] and [t] instead of the aspirated [pʰ] and [tʰ] expected in initial positions was much less frequent.

To validate these results, a post hoc test for one-way ANOVA was conducted to identify the most problematic English short vowels in speech production. Each vowel correspondence was tested for significant differences in mispronunciation rates. The results are detailed in Table 3.

Table 3

The Most Frequent Mispronunciation of English Short Vowel Sounds as Reflected in Vowel Correspondence in the Speech Production Test

Group	(I) SVSC	(J) SVSC	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
STD	4	1	**.600***	.121	.000	.36	.84
		2	**.622***	.121	.000	.38	.86
		3	**.422***	.121	.001	.18	.66
		5	**.622***	.121	.000	.38	.86
		6	**.467***	.121	.000	.23	.70
STL	4	1	**.419***	.155	.007	.11	.72
		2	**.535***	.155	.001	.23	.84
		3	**.535***	.155	.001	.23	.84
		5	**.581***	.155	.000	.28	.89
		6	**.465***	.155	.003	.16	.77

Note. Statistically significant results ($p < .05$) are indicated by boldface and an asterisk (*); SVSC 1: /ɪ/ → /e/, SVSC 2: /ʌ/ → /ɒ/, SVSC 3: /e/ → /ɪ/, SVSC 4: /e/ → /æ/, SVSC 5: /ɪ/ → /æ/, and SVSC 6 = /ʊ/ → /ɒ/

The post hoc test for the one-way ANOVA, as shown in Table 3, aligns with the descriptive statistics in Table 1, demonstrating statistically significant error rates across all six vowel correspondences for both sample groups. The vowel variation from /e/ to /æ/ (SVSC4) was notably the most problematic for both groups, which aligns with Chanavong's (1997) and Tichinpong's (2006) claims.

In conclusion, the descriptive statistics and post hoc analysis from the one-way ANOVA revealed that SVSC4 posed the greatest challenge for both STD and STL groups, accompanied by a few observed errors that were not penalized. No additional English short vowel sound correspondences were observed during the production test.

Discussion

The descriptive statistics in Tables 2 and 3 reveal common mispronunciation patterns likely resulting from L1 interference or phonological transfer influenced by dialect contact. First, the vowel sound

shift from /e/ to /æ/ (SVSC4) was the most mispronounced among the six English short vowel sound correspondences. This finding aligns with Thongchuay's (1991) study, which identified the /e/ to /æ/ correspondence as common in the Southern Thai Dialect and Thongdaeng accent. Studies by Chanavong (1997) and Tichinpong (2006) also suggest that this correspondence may be rooted in the southern dialect's phonetic structure, characterized by a lowering of tongue height (Kingkham, 2004). This correspondence poses a significant challenge for L2 and L3 learners, potentially reducing intelligibility and comprehensibility—particularly when minimal vowel contrasts carry different lexical meanings (Kingkham, 2004; Tichinpong, 2006; Thongchuay, 1991) While both STD and STL participants showed the same mispronunciation of the vowel /e/ was realized as /æ/, distinguishing between L1, L2, and L3 speakers is crucial because their language acquisition pathways differ, potentially affecting the sources of interference and learning processes. For STD speakers, whose L1 is the Southern Thai Dialect and for whom English functions as an L3, transfer effects predominantly stem from L1 phonological interference, especially due to differences in vowel quality compared to English. This leads to vowel substitutions or shifts that deviate from standard English pronunciations. In contrast, STL speakers acquire English as an L2 and have Standard Thai as their L1, which shares a similar vowel inventory with English. However, their phonological system is also influenced by ongoing contact with speakers of the Southern Thai dialect in their environment. This dialect contact results in phonetic and phonological interference, such as vowel lowering or substitution, occurring unconsciously despite Southern Thai Dialect not being their L1. Such contact-induced variation affects their English vowel production, highlighting the significant role of both L1 vowel similarity and dialectal influence in shaping L2 phonological outcomes. Understanding these distinctions helps contextualize how dialectal phonology and language contact influence vowel mispronunciations, despite similar surface errors. Moreover, the findings align with Chaira's (2015) observation that Indonesian learners substitute /æ/ with /e/, potentially due to mismatches in phonetic quality. Similarly, Ji and Jiang (2022) found that learners from dialectally diverse Chinese regions struggle with English lax-tense vowel distinction, reinforcing the role of dialectal phonology in shaping new language production errors. Additionally, Paramal (2019) highlighted that EFL students in Pattani, influenced by Pattani Malay, similarly show difficulty with short vowel contrasts when pronouncing English words.

Second, no participants in either group exhibited the vowel substitution from /ɪ/ to /æ/ (SVSC5), indicating that such occurrences may be attributable to occasional slips or errors during practice rather than systematic mispronunciation. The tongue height when moving from /ɪ/ to

/æ/ is much lower than in studies by Kingkham (2004), Tichinpong (2006), and Thongchuay (1991), which found that short vowel variations in the Southern Thai Dialect involve lowering the tongue to an adjacent position. Thus, SVSC5 does not align with these studies.

Third, Table 2 highlights the emergence of the vowel shift from /ʊ/ to /ɒ/ (SVSC6) as a novel correspondence of vowel sounds. Among the six correspondences, SVSC6 ranks third in error frequency for both groups, with rates of 0.16 for STD and 0.12 for STL (see Table 2), indicating that both MTI and LC contribute to vowel deviations. Quantitatively, SVSC6's average error frequency is comparable to the vowel shift from /e/ to /ɪ/ (SVSC3), demonstrating that it is not an isolated pattern. Qualitatively, SVSC6 closely resembles SVSC2 (/ʌ/ → /ɒ/) due to shared articulatory features like backness and roundedness, which provide a phonetic basis for learner confusion. Together, these findings confirm the phonological plausibility and emerging significance of SVSC6 among Southern Thai EFL learners. Like SVSC1, SVSC3, and SVSC4, SVSC6 exemplifies the substitution of unfamiliar vowels with more articulatorily accessible ones, a pattern likely influenced by the participants' dialectal vowel inventories. This suggests that the observed production difficulties are not arbitrary but stem from perceptual limitations shaped by L1 or dialectal exposure, which constrain learners' ability to distinguish and reproduce certain English vowel contrasts accurately. Consequently, SVSC6 may reflect a systematic substitution process driven by L1 phonology, dialect contact, and an articulatory economy.

Finally, a few non-penalized errors involved short vowel lengthening, reflecting MTI and LC influences and supporting Chanavong's (1997) finding of lengthened short vowels in Southern Thai, especially in monosyllables.

In summary, the variation from /e/ to /æ/ (SVSC4) was the most challenging for participants in Southern Thailand, aligning with characteristics observed in the Southern Thai Dialect. Additionally, the emergence of the variation from /ʊ/ to /ɒ/ (SVSC6) was noted, consistent with observations from the pronunciation class.

Perception–Production Accuracy Interplay and the Influence of MTI and LC Across STD and STL Learners

This study aimed to identify the root causes of English short vowel mispronunciations among students in Southern Thailand by examining the interplay between speech perception and production. To capture this relationship, Table 4 presents three interaction types:

Type 1 reflects congruence, where perception and production are either accurate or inaccurate.

Type 2 represents accurate perception but inaccurate production, indicating a production gap despite correct auditory discrimination.

Type 3 indicates inaccurate perception but accurate production, suggesting possible imitation or rote articulation without accurate phonological awareness.

This classification highlights whether learners' production aligns with their perception, offering insight into internal phonological mapping shaped by L1 interference.

Table 4

Types of Interplay between Speech Perception and Production

	Perception and Production Test Scores					
	STD Group (n = 45)		**STL Group (*n* = 43)**		**Total (*n* = 88)**	
	n	**%**	**n**	**%**	**n**	**%**
SVSC1	Chi-Square = 0.405, p = 0.817 (ns)					
Type1	**40**	**88.89**	**37**	**86.05**	**77**	**87.50**
Type2	4	8.89	4	9.30	8	9.09
Type3	1	2.22	2	4.65	3	3.41
Total	45	100.00	43	100.00	88	100.00
SVSC2	Chi-Square =0.001, p = 0.974 (ns)					
Type1	**26**	**57.78**	**30**	**69.77**	**56**	**63.64**
Type2	14	31.11	9	20.93	23	26.14
Type3	5	11.11	4	9.30	9	10.23
Total	45	100.00	43	100.00	88	100.00
SVSC3	Chi-Square = 6.560, ***p* = 0.038***					
Type1	**28**	**62.22**	**37**	**86.05**	**65**	**73.86**
Type2	13	28.89	5	11.63	18	20.45
Type3	4	8.89	1	2.33	5	5.68
Total	45	100.00	43	100.00	88	100.00
SVSC4	Chi-Square = 5.309, p = 0.070 (ns)					
Type1	**19**	**42.22**	**28**	**65.12**	**47**	**53.41**
Type2	14	31.11	6	13.95	20	22.73
Type3	12	26.67	9	20.93	21	23.86
Total	45	100.00	43	100.00	88	100.00
SVSC5	Chi-Square =0.001 sig=0.974 (ns)					
Type1	**44**	**97.78**	**42**	**97.67**	**86**	**97.73**
Type2	1	2.22	1	2.33	2	2.27
Type3	0	0.00	0	0.00	0	0.00

	Perception and Production Test Scores					
	STD Group (n = 45)		**STL Group (*n* = 43)**		**Total (*n* = 88)**	
	n	**%**	**n**	**%**	**n**	**%**
Total	45	100.00	43	100.00	88	100.00
SVSC6	Chi-Square = 1.768 sig = 0.413 (ns)					
Type1	**38**	**84.44**	**39**	**90.70**	**77**	**87.50**
Type2	4	8.89	1	2.33	5	5.68
Type3	3	6.67	3	6.98	6	6.82
Total	45	100.00	43	100.00	88	100.00

Note. SVSC 1: /ɪ/ → /e/, SVSC 2: /ʌ/ → /ɒ/, SVSC 3: /e/ → /ɪ/, SVSC 4: /e/ → /æ/, SVSC 5: /ɪ/ → /æ/, and SVSC 6 = /ʊ/ → /ɒ/; Type 1 = perception and production both accurate or both inaccurate (congruence), Type 2 = accurate perception but inaccurate production, and Type 3 = inaccurate perception but accurate production; Bolded values indicate notable descriptive trends while statistically significant results ($p < .05$) are indicated by boldface and an asterisk (*);

Table 4 shows the interplay between perception and production of English short vowels among participants. Statistical analysis revealed that Type 1 interactions (both perception and production are either accurate or inaccurate) were most common across SVSC1-SVSC6 in both groups. The STD group showed significantly lower Type 1 values than the STL group for SVSC3, χ^2 (1, N = 88) = 6.56, p = .038, indicating a meaningful group difference. However, the difference for SVSC4 was not statistically significant, χ^2 (1, N = 88) = 5.31, p = .070. These results are consistent with findings from international studies. For example, Nushi and Makiabadi (2018) investigated Iranian EFL learners and found that speech perception is heavily shaped by phonetic experience and auditory exposure. Similarly, Baese-Berk and Kato (2020) studied Japanese EFL learners, emphasizing that accurate speech production relies on precise auditory perception combined with visual input. Therefore, the findings suggest that the STL group's better vowel perception may likely stem from phonetic similarities between their L1 and English, which could lead to more accurate production, thereby reinforcing the well-established link between perception and production in new language acquisition.

Further investigation into MTI and LC revealed that STD participants (L1 is the Southern Thai Dialect, L3 is English) and STL participants (L1 is STL, L2 is English) showed different patterns. Mispronunciations by STD participants were attributed to MTI, while errors by STL participants influenced by the Southern Thai Dialect were due to LC.

To study the impact of MTI and LC on speech perception and production, the /e/ sound, often mispronounced as /æ/, was selected. The post hoc value for the one-way ANOVA of SVSC4 is shown in Table 3.

Statistical analysis revealed that the STD group, associated with MTI, exhibited significantly higher mispronunciation rates than the STL group, whose errors were related to LC. This trend was consistent across SVSC1-SVSC3 (Thongchuay, 1991), with SVSC4 showing a significant difference at the 0.05 level. However, based on classroom observations, mispronunciation rates were similar for SVSC5 and SVSC6.

Further analysis of the data in Table 4 examined the interplay between speech perception and production, and the correlation between the STD and STL groups. The STD group demonstrated lower accuracy than the STL group in both the perception and production of English short vowel sounds. This was particularly evident in the short vowel variation from SVSC3 (from /e/ to /ɪ/), with a Chi-Square value of 6.560 ($p = 0.038$), and SVSC4 (from /e/ to /æ/), with a Chi-Square value of 5.309 ($p = 0.070$).

In conclusion, the interplay between speech perception and production was evident. The influence of L1 among STD participants and dialect exposure among STL speakers significantly affected the acquisition of English phonological units, often overriding these units in their target language, English.

Discussion

The interplay between speech perception and production was examined, focusing on three types of interactions for each English short vowel sound correspondence. Type 1 Interplay consistently scored highest across all vowel correspondences, supporting Flege (1995) and Best and Tyler (2007) on the importance of accurate speech perception for precise pronunciation. Misperceptions can lead to pronunciation errors, consistent with Weinreich's (1968) findings, and are particularly pertinent to EFL learners whose L1 is the Southern Thai Dialect or who experience LC.

Chi-square analysis (Table 4) shows the STD group had lower Type 1 Interplay rates than the STL group, with significant differences in SVSC3 (/e/ → /ɪ/) and SVSC4 (/e/ → /æ/). This indicates greater L1 interference affecting both perception and production in the STD group. Hu and Lu (2022) similarly reported that deeply rooted dialectal influences contribute significantly to mispronunciations in English among Chinese learners. This aligns with Siregar's (2017) findings on Indonesian EFL learners, who also face challenges due to dialectal variations in the language learning process. Conversely, the STL group, influenced more by LC than by deep-rooted dialectal systems, made fewer pronunciation errors. These results support the view that L1 shapes pronunciation accuracy in L2 or L3 learning, with linguistic heritage influencing both perception and production, in line with Best and Tyler (2007), Lenneberg (1967), and Yule (2010).

Additionally, the post hoc test in Table 3 reveals that the STD group showed lower performance compared to the STL group in the vowel shift from /e/ to /æ/ (SVSC4). Mispronunciation of the /e/ sound is particularly challenging for EFL learners in Southern Thailand, often as /æ/. This issue affects both L2 and L3 participants. The STL group's better performance may be due to the overlap in vowels between their L1 and English, facilitating accurate pronunciation. Despite the potential use of the Thongdaeng accent, their vowel qualities more closely resemble those of English, facilitating pronunciation. Conversely, STD participants exhibit language divergence, with /e/ in the Southern Thai Dialect corresponding to /æ/ in English, leading to mispronunciations. This finding supports the Phonological Permeability Hypothesis (Amaro & Rothman, 2010), which suggests that L1 phonological patterns can influence the acquisition of L2/L3, even when language learning takes place after the critical period.

In summary, MTI and LC influence speech perception and production among English language learners in Southern Thailand differently, represented by the STD and STL groups, respectively. The STL group's L1, Standard Thai, shares English short vowels, enabling better perception of these vowels, which in turn supports more accurate production and fewer mispronunciations. Conversely, the STD group's Southern Thai Dialect involves vowel correspondences that differ from English, leading to greater pronunciation challenges. This suggests that stronger perception skills, facilitated by closer L1-L2 vowel similarities, positively impact production accuracy, highlighting the crucial interplay between perception and production in L2 pronunciation.

Conclusion

This study highlights how MTI and LC contribute to mispronunciations of English short vowels and their correspondences among EFL learners in Southern Thailand, which in turn can reduce intelligibility and comprehensibility due to changes in vowel quality. Both MTI and LC significantly affect speech perception and production accuracy, with the shift from /e/ to /æ/ being the most challenging. A newly observed shift from /ʊ/ to /ɒ/ provides further insight into dialectally influenced vowel substitution patterns among Thai EFL learners. This finding invites deeper investigation into how phonetic proximity, L1 dialectal features, and perceptual salience interact to shape L2 vowel pronunciation. The interplay between speech perception and production affects learners' ability to perceive and differentiate English short vowels, impacting pronunciation accuracy and consistency. Targeted pronunciation instruction is essential to address these issues and improve communication.

Recommendations

The observed variations in English short vowels, especially the shift from /e/ to /æ/, among STD and STL participants underscore the need to raise awareness among teachers and students. These findings reflect how MTI and LC shape learners' perception and production patterns, with the interplay between these two processes significantly influencing pronunciation accuracy.

Consequently, it is crucial to consider multilingual context factors in designing language teaching and cross-linguistic communication. Both perception and production training are essential for enhancing the recognition and pronunciation of English vowel variations and their corresponding sounds. For perception training, minimal pair discrimination exercises may be used to help students distinguish between similar vowels and become more aware of their pronunciation patterns. Additionally, exercises focusing on the correct vowels with phonetic transcription will help students understand the precise articulation of each vowel. For production training, English short vowel repetition drills with diagrams to show tongue placement, lip rounding, and other articulatory features should be included. Furthermore, while students practice these exercises, have them record themselves and listen to the playback before providing feedback on their pronunciation.

Future research could explore the effectiveness of pronunciation instruction targeting challenges from MTI and LC. Studies might compare traditional and innovative methods, examine long-term outcomes, and further investigate the perception–production link. Attention should also be given to non-targeted errors observed during production, such as vowel lengthening, which may affect overall pronunciation accuracy.

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Appendix A

Word List for Vowel Sound Perception and Production Tests

1. pit
2. bit
3. wit
4. fit
5. chit
6. hit
10. peck
11. deck
12. neck
13. set
14. bet
15. met

7. nut
8. cut
9. hut
16. cook
17. look
18. hook

Appendix B

Word Pairs for Vowel Sound Perception Test (Stimulus and Distractor)

	Stimulus	Distractor	Initial sound	Final sound
SVSC1	pit	pet	/p/ voiceless bilabial stop	/t/ voiceless alveolar stop
	bit	bet	/b/ voiced bilabial stop	
	wit	wet	/s/ voiceless alveolar fricative	
SVSC2	nut	not	/n/ alveolar nasal	/t/ voiceless alveolar stop
	cut	cot	/k/ voiceless velar stop	
	hut	hot	/h/ glottal fricative	
SVSC3	peck	pick	/p/ voiceless bilabial stop	/k/ voiceless velar stop
	deck	dick	/d/ voiced alveolar stop	
	neck	Nick	/n/ alveolar nasal	
SVSC4	set	sat	/s/ voiceless alveolar fricative	/t/ voiceless alveolar stop
	bet	bat	/b/ voiced bilabial stop	
	met	mat	/m/ bilabial nasal	
SVSC5	fit	fat	/f/ voiceless labiodental fricative	/t/ voiceless alveolar stop
	chit	chat	/tʃ/ voiceless palatal affricate	
	hit	hat	/h/ glottal fricative	
SVSC6	cook	cock	/k/ voiceless velar stop	/k/ voiceless velar stop
	look	lock	/l/ alveolar lateral	
	hook	hock	/h/ glottal fricative	

Note. SVSC 1 = the vowel sound correspondence from /ɪ/ to /e/, SVSC 2 = from /ʌ/ to /ɒ/, SVSC 3 = from /e/ to /ɪ/, SVSC 4 = from /e/ to /æ/, SVSC 5 = from /ɪ/ to /æ/, SVSC 6 = from /ʊ/ to /ɒ/

Appendix C

Vowel Sound Perception Test

1. 🗣 (Click to hear /pɪt/.)
   ○ pit ○ pet
2. 🗣 (Click to hear /dek/.)
   ○ dick ○ deck
3. 🗣 (Click to hear /hʌt/.)
   ○ hot ○ hut
4. 🗣 (Click to hear /fɪt/.)
   ○ fat ○ fit
5. 🗣 (Click to hear /bet/.)
   ○ bet ○ bat
10. 🗣 (Click to hear /wɪt/.)
    ○ wet ○ wit
11. 🗣 (Click to hear /kʌt/.)
    ○ cot ○ cut
12. 🗣 (Click to hear /nek/.)
    ○ neck ○ Nick
13. 🗣 (Click to hear /set/.)
    ○ sat ○ set
14. 🗣 (Click to hear /tʃɪt/.)
    ○ chit ○ chat

6. 🗣 (Click to hear /kʊk/.)
   ○ cock ○ cook
7. 🗣 (Click to hear /nʌt/.)
   ○ nut ○ not
8. 🗣 (Click to hear /hɪt/.)
   ○ hat ○ hit
9. 🗣 (Click to hear /pek/.)
   ○ pick ○ peck
15. 🗣 (Click to hear /lʊk/.)
   ○ look ○ lock
16. 🗣 (Click to hear /met/.)
   ○ met ○ mat
17. 🗣 (Click to hear /bɪt/.)
   ○ bet ○ bit
18. 🗣 (Click to hear /hʊk/.)
   ○ hock ○ hook