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The Phonetics of Taiwanese Hokkien

1. Introduction

1.1 Background

This paper describes the sounds of Taiwanese Hokkien, also known as Southern Min, a language spoken in Southeastern Asia, particularly in Mainland China and Taiwan. It belongs to the Sinitic language family group and has three main dialects: Chinese Hokkien, Taiwanese Hokkien, and Malaysian Hokkien. Taiwanese Hokkien serves as the standard dialect. There are approximately 52 million speakers. The language has a written system that uses Mandarin Chinese characters and Tâi-uân Bân-lâm-gí Lô-má-jī Phing-im Hong-àn (romanization system) to represent Hokkien pronunciation, although written Hokkien is rarely used in daily life (Jean DeBernardi, “Linguistic Nationalism: The Case of Southern Min,” accessed October 19, 2023, https://sino-platonic.org/complete/spp025_taiwanese.html). The pronunciation system of Taiwanese is quite complex, according to my search results from *Taiwanese Hokkien Common Words Dictionary*, Hokkien allows two pronunciations for a single word, i.e., literary-colloquial divergence. This divergence in Hokkien involves nearly two distinct phonetic systems.

1.2 Consultant

The consultant for this project is Xiao-Hong Luo, who is a graduating college student in Taipei, Taiwan. She came to the United States for tourism and to visit her relatives in Fullerton, Orange County, California. Born in Hualian, Taiwan in 2000, her native languages are Hokkien and Taiwanese Mandarin. Her father has a mixed heritage of native Taiwanese Islander and Chinese Mainlander descent, while her mother is a Chinese immigrant to Taiwan, originally from

Quanzhou City, Fujian Province. Her mother's native languages are Fujianese Hokkien and Mandarin with a Southern accent. Xiao-Hong received her education from elementary school to college in Mandarin in Taiwan. She converses in Hokkien with indigenous Taiwanese, her parents, and her grandparents who live in Fujian. Xiao-Hong's English ability is very limited and needs interpreters/translators to communicate other people in English.

1.3 References

Besides the website source published by Jean DeBernardi(1991), I also include three reference sources. The first reference for this project is *Taiwanese Hokkien Romanization Scheme User Manual*(2008), published by Chunfa Dong and supervised by Taiwan Department of Education. This manual uses the traditional vernacular tone as the official scheme. It lists the consonant, vowels and tone phonemes of Hokkien, basic Hokkien characters, and example words. The second reference source is *Mandarin-Hokkien Dictionary - Taiwanese Hokkien Version* (2011) published by Diancheng Huang and Changji Zhou, Kailangzazhi Enterprise Publishing Company in Tainan, Taiwan. The dictionary contrasts Mandarin and Taiwanese Hokkien words, supplemented with Pinyin and corresponding IPA symbols, including over 50,000 Mandarin example words and more than 70,000 Hokkien example words. The third reference is *Taiwanese Hokkien Common Words Dictionary* by Taiwan Department of Education, including more than 14,000 entries.

2. Consonants

	Bilabial		Alveolar		Velar		Glottal
Plosive	p	b	t		k	g	
Nasal		m		n		ŋ	
Affricate			ts	dz			

Fricative			s				h
Approximant				l			

Although there are different opinions, according to the official standards in Taiwan, the Taiwan Department of Education categorizes the common consonants of Taiwanese Hokkien as follows. It has 13 consonant phonemes, 6 monophthong phonemes, 8 diphthong phonemes and 8 tone phonemes. However, the sixth tone has now assimilated with the second tone, resulting in the use of seven tones in everyday conversations (Chunfa Dong(2008:3)). In addition, the affricative /dʒ/ is a controversial consonant in Taiwan Island, as well as its romanization “j” and its variant “l,” both of which were listed as orthographies in my resources. I also was informed by my speaker that in the western coastal cities of Taiwan, like Tainan and Kaohsiung, it is uncommon for individuals, including the elderly, to articulate this particular sound, but my consultant is from eastern Taiwan and this sound is available in her hometown Hualian, this sound is available in her phonetic inventory.

2.1 Plosives

The words #1, #2 and #5 in my word list consist of plosives in one syllable words, #3 and #4 are in two syllable words, all proceed the vowel /e/. The tones are pronounced with [11] in #1 and #2, [4?] in #3, [1?] in #4 and [4 1] in #5, which are distinct from /1 4/ in #1 and #2, /1?/ in #3, /4?/ in #4 and /11/ in #5. Here are two of the observations of the plosives: The first phonetic phenomenon is aspiration, which occurs in the word-initial position. The phonetic representation [k^he 1?] in the 4th word “khehki” reflects the realization of the plosive sound /ke 4?/. The presence of the aspirated initial [k^h] indicates a burst of air during articulation, distinguishing it from an unaspirated [k]. The second phonetic observation involves nasalization in the word-

initial position in #2. Although /b/ itself is a voiced plosive, it sounded more intense than expected during the speaker's pronunciation. Here, I recognize /b/ as a pre-nasalized consonant [ᵐb], but the durations for both are very brief and not easily noticeable, especially the second pronunciation.

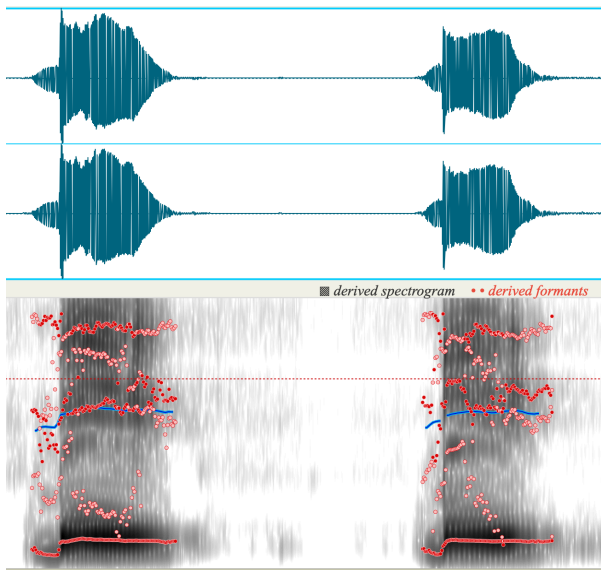


Figure 1: Praat screenshot from my speaker's pronunciations of #2, /be/.

Comment: Some of the sources I consulted combine the aspiration quality /h/ with /k/ or other consonants that have their unaspirated counterparts, treating them separately as consonant clusters, such as /kh/ (Chunfa Dong(2008:5)). However, this is not included in the IPA consonant chart required by the course LING 103, so I list the aspirations, such as /k^h/, in the phonetic transcription.

2.2 Nasals

The words numbered 6 to 8 in my word list consist of nasals in word-final positions as syllables. These include /m/, /n/, and /ŋ/, following the syllables /kian/, /kim/ and /han/, respectively. All nasals are pronounced with [ʰ], which are distinct from the phonemes /ɿ ʃ/.

Phonetic Positions of Nasals: In Taiwanese Hokkien, nasal sounds occur in both word-initial

and word-final positions. Two examples are provided where a nasal sound occurs. One instance is the word “kianma,” the nasal onset /m/ introduces a nasal quality in the following vowel /a/, resulting in nasalized articulation. The other illustration is found in the word “be,” as discussed in the plosives section (2.1), where the bilabial stop /m/ acts as a nasal onset, nasalizing the syllable /be/. The two instances illustrate the possible positions for nasal sounds in Hokkien.

2.3 Affricates

The words numbered 9 to 10 in my word list consist of /ts/ and /dz/ as affricates in word-initial positions. The tones are pronounced with [ɿ ɿ] in #9 and [ɿ ɿ] in #10, which is distinct from the phoneme /ɿ ɿ/ in #9. Firstly, the voiceless alveolar affricate /ts/ is realized as the voiced postalveolar fricative [ʒ] twice by my speaker. Because the two realizations are consistent, I conclude that the realizations were not due to mistakes or coincidences. There is no /ʒ/ consonant in Hokkien. Interestingly, in Mandarin, /ʒ/ is the first consonantal phoneme of the word “an actor.” So, I speculate that her realizations were influenced by Mandarin. Secondly, the symbol “j” in Taiwanese Hokkien does not correspond to the IPA symbol /j/. Instead, it is a romanization for the IPA symbol that represents the voiced affricate /dz/. In my recording, the articulation of /dz/ is being realized as [l]. This pronunciation deviation can be attributed to a tendency to realize /dz/ as the approximant /l/ in the Hokkien-phone world. Consequently, the interchangeable usage of “j” and “l” in orthographies is a reflection of this phonetic phenomenon.

2.4 Fricatives

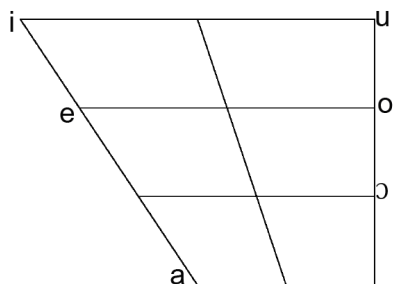
The words numbered 11 to 12 in my word list consist of /s/ and /h/ as fricatives in word-initial and word-final positions. The tones are pronounced with [ɿ ɿ] in both words, which are distinct from the phonemes. /s/ and /h/ can occur at the end or the final positions of words. The

fricative inventory in Hokkien is very small, and Hokkien does not have the /f/ consonant in its inventory. Based on my experience, when some speakers of Hokkien talking in foreign languages that include the /f/ consonant, they may substitute it with a sound that is closer to what they are familiar with, which would be /h/ in this case. In the past, when I listened to some Taiwanese people talking in Mandarin, I did notice a substitution of /f/ sounds with /h/ sounds.

2.5 Approximant

The word numbered 13 in my word list is the approximant in word-final position. The tone is pronounced with [ɿ], which is distinct from the phoneme. Here, I would like to introduce a distinction between /l/ and the nasal /n/. The reason for addressing these two together is that theoretically, Hokkien distinguishes between these two consonants. However, many native Hokkien speakers could not distinguish between these two consonants when they spoke with me in Mandarin. So, I doubt whether they can distinguish them in Hokkien. Besides the confusion between /l/ and /n/, it is noteworthy that Hokkien does not entail trill. So, during conversations with Taiwanese or Fujianese, I observed that many native Hokkien speakers face challenges in differentiating between /l/ and /r/ when speaking a language that includes both of these consonants, such as Mandarin. Nevertheless, my speaker is able to distinguish /l/ and /n/.

3. Vowels



3.1 Monophthongs

The words numbered 14 to 19 in my word list consist of the six monophthongal phonemes in Taiwanese Hokkien, all following the consonant /k/. I was informed by my speaker that there is a divergence between two vowel systems in Taiwan. While certain areas adhere to a simpler five-vowel system—comprising /i, e, a, o, u/—my speaker is from an area where a more complete six-vowel system /i, e, a, o, u, ɔ/ is in use. From the audio recordings I have listened, it appears that the vowel sounds in Hokkien share lots of similarities with English vowels. However, it is worth noting that the rounded vowel /u/ is pronounced with reduced roundness in many words in of the wordlist. For instance, in #15 and #18, the two words including /u/ were transcribed as [ɯ]. In addition to the roundness quality, it also appears that /u/ is realized with a more front positioning rather than being fully at the back. I tried producing /hu ʔl . ke ʔl / using the back vowel /u/ and compared it with the speaker; I could tell they were completely different. So, I believe the position is close to /i/ and /u/ by adding an “advanced” diacritic under each [ɯ].

3.2 Diphthongs

The words numbered 14 to 19 in my word list consist of the eight diphthongal phonemes in Taiwanese Hokkien, accompanying the consonants /k/, /d͡z/ or /s/. The sound qualities of most Hokkien diphthongs are similar to English diphthongs. What requires special attention here is that in Hokkien, the interchangeable use of the diphthong “ue” and the monophthong “e” is common. For instance, in my word list, #27, “to shave,” originally spelled as “kue,” can be interchangeably used as “ke.” Similarly, #11, “to rob,” the monophthong “sekiap” can be replaced with “suekiap,” and both variations here are acceptable in Hokkien, as both are listed in the dictionaries. However, #12, “a system,” the “he” cannot be replaced with “hue.” It is safer to say that “ue” can always be replaced with “e.” In Hokkien dialects, there are variations in the use

of “ue” or “e.” Nevertheless, whether adhering to the “ue” variant or the “e” variant, the native Hokkien speakers are able to understand each other regardless of which vowel is chosen, informed by my speaker. While going through my references, I observed that both of these vowels are documented side by side in the orthography column of the dictionaries.

4. Allophones

Three allophones are deducted after the completion of the phonetic transcription, ranging from consonants to tones. (1) Firstly, the theory presented in the course states “voiceless stops are aspirated when they are an onset of...or word initial, but not after /s/” (week 2 handout, Ling 103) could be illustrated here by various examples, such as the aspirations of /k/ realized as /k^h/ in #4, #6, and #7. (2) Secondly, there are optional changes in the tone patterns in the word-final position. The pronunciation of the second syllable in many disyllabic words is realized as the [11] tone in spoken Hokkien, regardless of the phonemic tones. The examples include all nasals, #9, and #16. (3) Finally, the voiced alveolar affricate /d͡z/ is realized as the approximant [l], as seen in examples such as #10, and the two adjacent words, #21 and #22.

5. Lexical Prosody: Tones

The words numbered from 28 to 34 in my word list are the seven tones in Hokkien. Although Hokkien has more tones than Mandarin, like many other languages prevailing in south China, its distinct features lie in the presence of the two checked tones. One is high checked tone, and the other is low checked tone, as illustrated by #31 and #34. The distinctive feature of checked tones in Hokkien is the use of glottal stops, treated as a tone rather than a consonant, leading to a sensation of constriction in the throat at the end of words. So, the diacritic “glottal stop” checked tones in Taiwanese Hokkien have a unique quality in the phonetic expression.

After listening to the speaker's pronunciation, I believe this particular quality is similar to creaky voice. Theoretically, they both exhibit a common feature, wherein during production, the vocal cords undergo significant tightening, leading to a state of short and tense in vocal cords. For instance, the creaky voice is noticeably produced in the word #31 in the context of [to₂⁷ ɿʔ]. For a clearer production, refer to the second phonetic transcription in #16, [k₂⁷ ɿʔ], which was the first checked tone with creaky voice I labeled in my transcription because it is more distinct.

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Appendix:

Taiwanese Hokkien Word List

	Phoneme	Phonemic Transcription	Phonetic Transcription		English Gloss	Orthography
	Consonant - Plosives					
1	/p/	/pe 1 1/	[pe 11]	[pe 11]	“a bunch of”	pe
2	/b/	/be 1 1/	[^m be 11]	[^m be 11]	“a horse”	be
3	/t/	/lik 1? . te 1 1/	[lik̚ 1?. te 1 1]	[lik̚ 1?. te 1 1]	“green tea”	likte
4	/k/	/ke 1? . ki 11/	[k ^h ē 1? . ki 11]	[k ^h ē 1? . ki 11]	“a flight”	khehki
5	/g/	/ge 11/	[ge 1 1]	[ge 1 1]	“a sprout”	ge
	Consonant - Nasals					
6	/m/	/kian 1 1 . ma 1 1/	[k ^h ian 1 1 . mā 11]	[k ^h ian 1 1 . mā 11]	“a dog and a horse”	kianma
7	/n/	/kim 1 1 . na 1 1/	[k ^h im 1 1 . nã 11]	[k ^h im 1 1 . nã 11]	“to arrest”	kimna
8	/ŋ/	/han 1 1 . ŋa 1 1/	[ḥan 1 1 . ṅã 11]	[ḥan 1 1 . ṅã 11]	“beautiful”	hangna
	Consonant - Affricates					
9	/ts/	/tsu 1 1 . ian 1 1/	[ʒ ^h u 1 1 . ian 11]	[ʒ ^h u 1 1 . ian 11]	“an actor”	tsuian
10	/dz/	/dzu 1 1 . ki 1 1/	[lu 1 1 . ki 1 1]	[lu 1 1 . ki 1 1]	“on time”	juki/luki
	Consonant - Fricatives					
11	/s/	/se 1 1 . kiap 1?/	[sue 1 1 . kia ^{p̚} 1?]	[sue 1 1 . kia ^{p̚} 1?]	“to rob”	suekiap/ sekiap
12	/h/	/te 1 1 . he 11/	[t ^h e 1 1 . he 1 1]	[t ^h e 1 1 . he 1 1]	“a system”	tehe
	Consonant - Approximant					
13	/l/	/pøk 1? . le 1 1/	[pøk̚ 1? . le 11]	[pøk̚ 1? . le 11]	“small gift”	pokle
	Vowel - Front					
14	/i/	/huat 1? . ki 1 1/	[ḥua 1? . ṅã 11]	[ḥua 1? . ṅã 11]	“law”	huatki
15	/e/	/hu 11 . ke 1 1/	[ḥu 1 1 . ke 11]	[ḥu 1 1 . ke 11]	“false”	huke
16	/a/	/ka 1?/	[kã 1?]	[kã 1?]	“to use”	ka
	Vowel - Back					

17	/o/	/ko 1 J/	[ko 1 J]	[ko 1 J]	“a stick”	ko
18	/u/	/ku 1 J . taŋ 1 J/	[kɯ 4 1 . taŋ 11]	[kɯ 4 1 . taŋ 11]	“weightlifting”	kutang
19	/ɔ/	/kiap 4ʔ . kək 4ʔ/	[kiaᵑ 1ʔ . kək̚ 4ʔ]	[kiaᵑ 1ʔ . kək̚ 4ʔ]	“a valley”	kiapkook
Diphthongs						
20	/ai/	/kai 11 . ki. au 1 J/	[kai 11 . ki . au 1 J]	[kai 11 . ki . au 1 J]	“to understand”	kaikiau
21	/au/					
22	/ia/	/dzian 44/	[lian 1 J]	[lian 1 J]	“to practice”	jian/lian
23	/iu/	/dziu 4 1 . bi 1 J/	[liu 4 1 . bi 1 J]	[liu 4 1 . bi 1 J]	“charming”	jiubi/liubi
24	/io/	/sio 4ʔ . lio 1ʔ/	[ɕio 1ʔ . lio 4ʔ]	[ɕio 1ʔ . lio 4ʔ]	“to love”	siolio
25	/ua/	/tia 1 J . sua 4ʔ/	[thia 1 J . sua 1ʔ]	[thia 1 J . sua 1ʔ]	“end”	tiasua
26	/ui/	/pɔ11 . kui 1 J/	[pʰɔ44 . kui 11]	[pʰɔ44 . kui 11]	“railway construction”	pokui
27	/ue/	/kue 11/	[kʰue 11]	[kʰue 11]	“to shave”	ke/kue
Tones						
28	/11/	/lion 4 1 . toŋ 11/	[lion 4 1 . toŋ 11]	[lion 4 1 . toŋ 11]	“midwinter”	liongtong
29	/1 J/	/ta 4ʔ . toŋ 1 J/	[ta 1 J ʔ . toŋ 1 J]	[ta 1 J ʔ . toŋ 1 J]	“partner”	tatong
30	/4 J/	/to 4 J . toŋ 4 J/	[tho 11 . toŋ 4 J]	[tho 11 . toŋ 4 J]	“appropriate”	totong
31	/4ʔ/	/tok 4ʔ/	[toᵑ 4ʔ]	[toᵑ 4ʔ]	“to monitor”	tok
32	/4 1/	/toŋ 4 1 . ku 11/	[toŋ 4 1 . kɯ 11]	[toŋ 4 1 . kɯ 11]	“co-living”	tongku
33	/44/	/toŋ 44 . ki 11/	[toŋ 44 . ki 11]	[toŋ 44 . ki 11]	“motivation”	tongki
34	/1ʔ/	/kip 4ʔ . tok 1ʔ/	[kip 1ʔ . tok 1ʔ]	[kip 1ʔ . tok 4ʔ]	“drug use”	kiptok
Example Sentence						
Phonemic Transcription		/gua 1 J ai 4 J . gua 1 J e 4 1 . ka 11 hion 11 . tai 44 uan 44 /				
Phonetic Transcription		[ua 11 ai 4 J . gua 11 e 44. kʰa 11 hion 11 . tai 44 uan 1 1]				
		[ua 11 ai 4 J . gua 11 e 44. kʰa 11 hion 11 . tai 44 uan 1 1]				
English Meaning of Each Word		Gua: I. ai: Love. gua-e: My. ka-hiong: Hometown. Tai-uan: Taiwan.				
English Meaning of Sentence		“I love my hometown Taiwan.”				
Orthography		Gua ai gua-e ka-hiong Tai-uan.				