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THE SOUND CORRESPONDENCE OF TEOCHEW, HAKKA, AND CANTONESE

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Abstract

This research is based on a theory in Historical Comparative Linguistics. This theory is also called a diachronic theory, which involves the analysis of the form and regularity of changes in common languages such as those accompanied by sound changes. The objects of the research are Teochew (TC), Hakka (HK), and Cantonese (CO) dialects used in Medan city. These three dialects are categorized into the Sino-Tibetan family. Sino-Tibetan (ST) as one of the largest language families in the world, with more first-language speakers than even Indo-Europeans, is having more than 1.1 billion speakers of Sinitic (the Chinese dialects) constitute the world's largest speech community. According to STEDT (Sino-Tibetan Etymological Dictionary and Thesaurus), Chinese is considered as a Sino-Tibetan language family. The research method used is the qualitative method. The data collection method and technique used to refer to the conversation method with the techniques of recording and writing. The data were analyzed using the qualitative method of glottochronology. The result of the research shows that TC, HK, and CO were related in terms of sound correspondences and were separated thousands of years ago. TC and HK were related and both corresponded identically, one similar vowel, one similar consonant, one different phoneme, and one similar syllable. TC and CO were related and both corresponded to one similar vowel, one similar vocalic cluster, one similar consonant, one different phoneme, and one similar syllable. HK and CO were related and both corresponded identically, one similar vowel, one similar consonant, one different phoneme, one different vocalic cluster, and one similar syllable. From all the findings and discussion in this research, the writer has concluded that HK and CO are the closest dialects among the three compared dialects.

Keywords: sound correspondence; glottochronology; Teochew; Hakka; Cantonese

Introduction

This research discusses the sound correspondences among three different languages. The languages raised in this research are Teochew, Hakka, and Cantonese in Medan, North Sumatra, Indonesia. Medan, as the capital of the province of North Sumatra Indonesia, particularly Medan is a multicultural city consisting of various kinds of ethnicities with various regional languages. The regional languages in Indonesia have similarities in the pronunciation of several vocabulary words. Similarities among regional languages can occur due to language interactions.

Dialects especially Teochew (TC), Hakka (HK), and Cantonese (CO) are chosen as the languages to be analyzed to build and develop dialects, a study towards dialects is a mandatory point to be taken. It is fundamentally based on an awareness that dialects have an essential function and position among Indonesians. Dialects in Indonesia are mostly analyzed synchronically. Analyzing dialects in a diachronic way is rare. It also happens on comparing a language with the other languages in terms of finding the kinship, especially among Sino-Tibetan languages. The writer also would like to clarify that the Chinese living in Indonesia especially in

the districts of Medan, Medan city, is not merely Hokkien as there are Teochew, Hakka, and Cantonese people who mostly reside in Medan compared to other ethnic groups. One of the goals in Comparative Linguistic History is to question cognate languages by making comparisons of the elements that show kinship (Crowley, 2010; Keraf, 1990; (Widayati et al., 2016)).

This research is aimed to identify the similarities and differences in terms of sounds among Teochew, Hakka, and Cantonese. Langacker (1972: 329-330) states that the tool is a comparative method that is systematic sound correspondence in related languages. For him, differences in the phonetic form in correspondence devices systematic. Corresponding sounds do not have to be the same but appear regularly in the same position in words that are similar to both in terms of form and meaning. In this explanation, he does not use the term device phonemic correspondence but uses the term sound correspondence which the data is phonetic data. According to Crowley (1992: 93), sound correspondence is sound devices in related words reflected by a single language. Crowley (1992: 106) explains that sound correspondence devices involving sounds that are phonetically similar. Therefore, in this study, aspects of language were used as the basis for phonological comparisons to count the calculation of kinship.

There are several writings that are used as references or literature reviews in this research, Veniranda's article (2015) entitled "Oral and Nasal Vowels in Pontianak Teochew". This article contributes to showing the writer how the vowels in Teochew is pronounced by the speakers.

Meng's article entitled "A Contrastive Phonetic Study between Cantonese and English to Predict Salient Mispronunciation by Cantonese Learners of English". This article describes further the comparison of both Cantonese and English which makes an interference for a Cantonese speaker to pronounce English. It provides a vivid explanation and figures of the vowels and consonants in Cantonese which helps the writer a lot in discovering the consonants and vowels in Cantonese. (Meng et al., 2007)

Then, there is an article by Sagart (2006) entitled "Gan, Hakka and the formation of Chinese dialects" that the writer adopts about Hakka which analyzes further how the words in Gan and Hakka were derived from the Old Southern Chinese and some of the words in Hakka, Yue, and Min are the innovation of the derivational words. It also proves that there is a contact between Gan and Hakka, meaning, Gan-Hakka used to be all together before the migration of the northerners to the south. This fact contributes to Hakka language history.

Finally, there is Zang's article (2019) entitled "Phylogenetic Evidence for Sino-Tibetan Origin in Northern China in the Late Neolithic". This article is using a Bayesian phylogenetic approach that provides alternative opportunities methods to circumvent the limitation from the glottochronology method (uses lexical data to estimate absolute divergence times). These approaches permit flexible evolutionary models and are a powerful tool for inferring evolutionary tempo and mode of change in language families worldwide.

Research Method

This research was conducted with a qualitative method through Sino-Tibetan Swadesh List pronounced by the informants. Qualitative research according to Earl (2014) refers to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of the object of the study and not to their counts or measures. There are many Teochew, Hakka, and Cantonese speakers in Medan, and this population is too large for the flexibility of the research. Therefore, samples of Medan Tembung, Medan Area, and Medan Timur districts have been taken since there are more percentages of Chinese people living there.

In order to collect the data in this research, the writer used the method of by Sudaryanto (2015) called conversation or cakap method which enables the writer to bait into a conversation with the informants face to face with recording and note-taking techniques by asking the informants to pronounce their ethnic group dialects based on the glossaries provided from Sino-Tibetan Swadesh List. Then by asking them to pronounce each of the words and their pronunciation was recorded by using a recorder as soon as it was uttered. After that, the recording voices were transcribed into phonetic transcriptions or phonetic symbols, so that the phonemes could be analyzed easily.

Any study that uses sound change theories of comparative historical linguistics should know the terminology of correspondence and the terminology of variations. Mahsun (1995:29) and Keraf (1996:79) report that correspondence terminology is used to explain the sound changes that occur regularly in a particular position on any appearance of that sound whereas a variation is of sound changes that are not regular occurrences (sporadic). Crowley (1992:385), Mahsun (1995:34), and Keraf (1996:90) express that sound changes are characterized by a variety of sound changes which can be classified into several types, such as assimilation, dissimilation, metathesis, contraction, and syncope.

The sound changed carry on the nature and the character of each In determining kinship on TC, HK, and CO, the following procedures were taken. First, the basic vocabulary list was not taken into account (i) empty words, namely glossless words, (ii) loan words, and (iii) complex words. Second, bound morphemes were separated from the basic word. That is, if the words collected contained bound morphemes, the morpheme was separated first so that it was easier to set the same pair of words or not. Third, the word pairs belonging to relatives fulfilled one of the following conditions: (i) the pair was identical, that was, all the phonemes were correct; (ii) the couple corresponded phonemically; (iii) the pair was phonetically similar, which had the same articulatory position; and (iv) the pair had a different phoneme because of the environmental influences it entered.

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Results and Discussion

The Sound Correspondence of TC ~ HK

Table 1 Identical Pair of TC ~ HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	four (25)	[si]	[si]
2.	animal (44)	[kʰim siu]	[kʰim siu]
3.	grass (60)	[cʰau]	[cʰau]
4.	rope (61)	[sɔk]	[sɔk]
5.	smell (105)	[pʰi]	[pʰi]
6.	die (109)	[si]	[si]
7.	split (115)	[puŋ]	[pun]
8.	stab (116)	[cʰiam]	[cʰiam]
9.	float (143)	[pʰu]	[pʰu]
10.	salt (155)	[jam]	[jam]
11.	old (184)	[lau]	[lau]

The table above has 11 words which are paired identically or 5.3 %.

Table 2 Consonant Correspondence ŋ ~ ŋ of TC ~ HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	here (9)	[cə peŋ]	[li pʰeŋ]
2.	there (10)	[hiɔ peŋ]	[ke pʰeŋ]
3.	all (17)	[nɔŋ cɔŋ]	[loŋ coŋ]
4.	heavy (31)	[taŋ]	[cʰoŋ]
5.	worm (50)	[tʰaŋ]	[cʰoŋ]
6.	neck (87)	[aŋ kuŋ]	[kiaŋ kin]
7.	swell (146)	[ceŋ]	[cuŋ]
8.	wind (163)	[huaŋ]	[foŋ]
9.	red (172)	[aŋ]	[foŋ]

The sound correspondence of ŋ ~ ŋ in final position on the table above shows the correspondence in TC ~ HK on cə peŋ ~ li pʰeŋ; hiɔ peŋ ~ ke pʰeŋ; nɔŋ cɔŋ ~ loŋ coŋ; taŋ ~ cʰoŋ; tʰaŋ ~ cʰoŋ; aŋ kuŋ ~ kiaŋ kin. The table above has 9 words which correspond on ŋ ~ ŋ or 4.3 %.

Table 3 Consonant Correspondence k ~ k of TC ~ HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	dog (47)	[kau]	[kiau]
2.	louse (48)	[sak]	[sek ma]
3.	fruit (54)	[kue ci]	[sui kɔ]
4.	root (57)	[kəŋ]	[kin]

5.	bark (58)	[ki]	[su kin]
6.	horn (68)	[kak]	[kɔk]
7.	white (175)	[pek]	[pʰak]
8.	straight (189)	[tek]	[cʰək cʰək]

The sound correspondence of k ~ k in initial position on the table above shows the correspondence in TC ~ HK on kau ~ kiau; kue ci ~ sui kɔ; kəŋ ~ kin; ki ~ su kin; kak ~ kɔk. Meanwhile, the k ~ k correspondence in final position is shown on sak ~ sek ma; pek ~ pʰak; tek ~ cʰək cʰək. The table above has 8 words which correspond on k ~ k or 3.9 %.

Table 4 Consonant Correspondence s ~ s of TC ~ HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	when (14)	[ti si]	[ki sə]
2.	thin (35)	[saŋ] [pɔk]	[səu] [pʰɔk]
3.	suck (95)	[suk]	[sək]
4.	wash (132)	[sɔi]	[se]
5.	count (139)	[səŋ]	[suan]
6.	ice (165)	[səŋ]	[siet]
7.	burn (169)	[siɔ]	[sau]
8.	mountain (171)	[sua]	[san]
9.	new (183)	[seŋ]	[sin]

The sound correspondence of s ~ s in initial position on the table above shows the correspondence in TC ~ HK on ti si ~ ki sə; saŋ ~ səu; suk ~ sək; sɔi ~ se; səŋ ~ suan; səŋ ~ siet; siɔ ~ sau; sua ~ san; seŋ ~ sin. The table above has 9 words which correspond on s ~ s or 4.3 %.

Table 5 Consonant Correspondence t^h ~ t^h of TC ~ HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	hair (71)	[t^hau mɔ]	[t^hiau na mau]
2.	head (72)	[t^hau]	[t^hiau na]
3.	breathe (99)	[t^hau k^hui]	[t^hiau hi]
4.	sun (147)	[zit t^hau]	[nik t^hiau]
5.	stone (156)	[ciɔk t^hau]	[sak t^hiau]
6.	sky (162)	[t^hi]	[t^hien]

The sound correspondence of t^h ~ t^h in initial position on the table above shows the correspondence in TC ~ HK on t^hau mɔ ~ t^hiau na mau; t^hau ~ t^hiau na; t^hau k^hui ~ t^hiau hi; zit t^hau ~ nik t^hiau; ciɔk t^hau ~ sak t^hiau; t^hi ~ t^hien. The table above has 6 words which correspond on t^h ~ t^h or 2.9 %.

Table 6 Vowel Correspondence a ~ a of TC ~ HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	three (24)	[sa]	[sam]

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2.	father (43)	[pa]	[apa]
3.	turn (126)	[waŋ]	[wan]
4.	night (177)	[am me]	[am pu]
5.	cold (181)	[ŋaŋ]	[laŋ]

The sound correspondence of a ~ a on the table above shows the correspondence in TC ~ HK on sa ~ sam; pa ~ apa; waŋ ~ wan; am me ~ am pu; ŋaŋ ~ laŋ. The table above has 5 words which correspond on a ~ a or 2.4 %.

Table 7 Different Phoneme Ø – ŋ of TC – HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	fish (45)	[həØ]	[əŋ]
2.	hear (102)	[t^hiaØ]	[t^haŋ]
3.	think (104)	[siɔØ]	[siɔŋ]
4.	fear (106)	[kiaØ]	[kiaŋ]
5.	sing (141)	[c^hioØ kua]	[c^hɔŋ kɔ]
6.	green (173)	[c^heØ]	[c^hiaŋ]
7.	name (207)	[miaØ]	[miaŋ]

The sound correspondence of Ø – ŋ in the final on the table above shows the correspondence in TC - HK on həØ - əŋ; t^hiaØ - t^haŋ; siɔØ - siɔŋ; kiaØ – kiaŋ; c^hioØ kua - c^hɔŋ kɔ; c^heØ - c^hiaŋ; miaØ – miaŋ. The table above has 7 words which shows the difference of 1 phoneme on Ø – ŋ or 3.4 %.

Table 8 One Syllable Similarity of TC ~ HK

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Hakka (HK)
1.	bone (65)	[kut]	[kut t^hiau]
2.	nose (75)	[p^hi]	[p^hi koŋ]
3.	fingernail (79)	[cəŋ kak]	[siu cə kak]
4.	rain (151)	[lɔk hou]	[lɔk sui]
5.	because (206)	[iŋ wei]	[iŋ wui]

The table above has 5 words which shows one similar syllable or 2.4 %.

The Sound Correspondence of TC ~ CO

Table 9 Consonant Correspondence k ~ k of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	this (7)	[ci kai]	[i kɔ]
2.	that (8)	[hi kai]	[kɔ kɔ]
3.	narrow (34)	[ɔik]	[cak]
4.	thin (35)	[saŋ] [pɔk]	[sau] [pɔk]
5.	meat (63)	[bak]	[yok]
6.	horn (68)	[kak]	[kɔk]
7.	liver (91)	[kua]	[kɔn]

8.	white (175)	[pek]	[pak]
9.	straight (189)	[tek]	[cek]

The sound correspondence of k ~ k in initial position on the table above shows the correspondence in TC ~ CO on ci kai ~ i kɔ; hi kai ~ kɔ kɔ; kak ~ kɔk; kua ~ kɔn. Meanwhile, the k ~ k correspondence in final position is shown on ɔik ~ cak; pɔk ~ pɔk; bak ~ yok; pek ~. pak; tek ~ cek. The table above has 9 words which correspond on k ~ k or 4.3 %.

Table 10 Consonant Correspondence m ~ m of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	what (12)	[si mie]	[me je]
2.	animal (44)	[kʰim siu]	[kʰam sau]
3.	feather (70)	[mɔ]	[mou]
4.	drink (92)	[lim]	[jam]
5.	salt (155)	[jam]	[jim]
6.	fog (161)	[mɔŋ]	[mou]

The sound correspondence of m ~ m in initial position on the table above shows the correspondence in TC ~ CO on si mie ~ me je; mɔ ~ mou; mɔŋ ~ mou. Meanwhile, the m ~ m correspondence in final position is shown on kʰim siu ~ kʰam sau; lim ~ jam; jam ~ jim. The table above has 6 words which correspond on m ~ m or 2.9 %.

Table 11 Consonant Correspondence t^h ~ t^h of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	hair (71)	[tʰau mɔ]	[tʰou fat]
2.	head (72)	[tʰau]	[tʰou]
3.	see (101)	[tʰɔi]	[tʰai]
4.	hear (102)	[tʰia]	[tʰiaŋ]
5.	sky (162)	[tʰi]	[tʰin]

The sound correspondence of t^h ~ t^h in initial position on the table above shows the correspondence in TC ~ CO on tʰau mɔ ~ tʰou fat; tʰau ~ tʰou; tʰɔi ~ tʰai; tʰia ~ tʰiaŋ; tʰi ~ tʰin. The table above has 5 words which correspond on t^h ~ t^h or 2.4 %.

Table 12 Consonant Correspondence ŋ ~ ŋ of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	long (28)	[təŋ]	[cʰiɔŋ]
2.	heavy (31)	[taŋ]	[cʰoŋ]
3.	worm (50)	[tʰaŋ]	[cʰoŋ]
4.	guts (86)	[təŋ]	[cʰiɔŋ]
5.	neck (87)	[aŋ kuŋ]	[kiaŋ]
6.	wind (163)	[huaŋ]	[fɔŋ]
7.	ice (165)	[səŋ]	[sit] [peŋ]
8.	red (172)	[aŋ]	[hoŋ]

9.	with (203)	[eŋ]	[jɔŋ]

The sound correspondence of ŋ ~ ŋ in final position on the table above shows the correspondence in TC ~ CO on təŋ ~ c^{h}iɔŋ; taŋ ~ c^{h}oŋ; t^{h}aŋ ~ c^{h}oŋ; təŋ ~ c^{h}iɔŋ; aŋ kuŋ ~ kiaŋ; huaŋ ~ fɔŋ; səŋ ~ peŋ; aŋ ~ hoŋ; eŋ ~ jɔŋ. The table above has 9 words which correspond on ŋ ~ ŋ or 4.3 %.

Table 13 Consonant Correspondence s ~ s of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	four (25)	[si]	[se]
2.	small (32)	[sɔi]	[sai]
3.	rope (61)	[sɔk]	[seŋ]
4.	suck (95)	[suk]	[sɔk]
5.	wash (132)	[sɔi]	[sei]
6.	sand (157)	[sua]	[sa]
7.	burn (169)	[siɔ]	[siu]
8.	mountain (171)	[sua]	[san]

The sound correspondence of s ~ s in initial position on the table above shows the correspondence in TC ~ CO on si ~ se; sɔi ~ sai; sɔk ~ seŋ; suk ~ sɔk; sɔi ~ sei; sua ~ sa; siɔ ~ siu; sua ~ san. The table above has 8 words which correspond on s ~ s or 3.9 %.

Table 14 Consonant Correspondence t ~ t of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	big (27)	[tua]	[tai]
2.	short (33)	[tɔ]	[tin]
3.	bone (65)	[kut]	[kuat]
4.	fall (127)	[tɔ]	[tit]
5.	earth (159)	[ti kiu]	[te k^{h}au]

The sound correspondence of t ~ t in initial position on the table above shows the correspondence in TC ~ CO on tua ~ tai; tɔ ~ tin; tɔ ~ tit; ti kiu ~ te k^{h}au. The table above has 5 words which correspond on t ~ t or 2.4 %.

Table 15 Consonant Correspondence c ~ c of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	all (17)	[nɔŋ cɔŋ]	[loŋ coŋ]
2.	bird (46)	[ciau]	[ciɔk]
3.	fruit (54)	[kue ci]	[kɔ ci]
4.	heart (90)	[sim caŋ]	[sam cɔŋ]
5.	swell (146)	[ceŋ]	[coŋ]
6.	sharp (191)	[ciam]	[cim]

The sound correspondence of c ~ c in initial position on the table above shows the correspondence in TC ~ CO on nɔŋ cɔŋ ~ loŋ coŋ; ciau ~ ciɔk; kue ci ~ kɔ ci; sim caŋ ~ sam cɔŋ; ceŋ ~ coŋ; ciam ~ cim. The table above has 6 words which correspond on c ~ c or 2.9 %.

Table 16 Same Vocalic Cluster au ~ au of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	thick (30)	[kau]	[hau]
2.	dog (47)	[kau]	[kau]
3.	flow (144)	[lau]	[lau]
4.	sun (147)	[zit t^hau]	[jit t^hau]
5.	rotten (187)	[c^hau]	[c^hau]

The sound correspondence of au ~ au in final position on the table above shows the correspondence in TC ~ CO on kau ~ hau; kau ~ kau; lau ~ lau; zit t^hau ~ jit t^hau; c^hau ~ c^hau. The table above has 5 words which correspond on au ~ au or 2.4 %.

Table 17 Vowel Correspondence a ~ a of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	three (24)	[sa]	[sam]
2.	mother (42)	[ma]	[ama]
3.	father (43)	[pa]	[apa] [lou tau]
4.	louse (48)	[sak]	[sat]
5.	cold (181)	[ŋaŋ]	[laŋ]

The sound correspondence of a ~ a on the table above shows the correspondence in TC ~ CO on sa ~ sam; ma ~ ama; pa ~ apa; sak ~ sat; ŋaŋ ~ laŋ. The table above has 5 words which correspond on a ~ a or 2.4%.

Table 18 Different Phoneme ŋ – n of TC – CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	man (human being) (38)	[naŋ]	[yan]
2.	root (57)	[kəŋ]	[kən]
3.	split (115)	[puŋ]	[fən]
4.	turn (126)	[waŋ]	[wan]
5.	count (139)	[səŋ]	[sin]
6.	new (183)	[seŋ]	[sən]
7.	near (197)	[kəŋ]	[k^hən]
8.	because (206)	[iŋ wei]	[yan wei]

The sound correspondence of ŋ – n on the table above shows the correspondence in TC – CO on naŋ – yan; kəŋ - kən; puŋ - fən; waŋ – wan; səŋ – sin; seŋ - sən; kəŋ - k^hən; iŋ wei - yan wei. The table above has 8 words which shows the difference of 1 phoneme on ŋ – n or 3.9 %.

Table 19 Different Phoneme Ø – ŋ of TC – CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	think (104)	[siɔØ]	[siɔŋ]
2.	fear (106)	[kiaØ]	[kiaŋ]

3.	sing (141)	[cʰioØ kua]	[cʰiɔŋ]
4.	green (173)	[cʰeØ]	[cʰiaŋ]
5.	name (207)	[miaØ]	[miaŋ]

The sound correspondence of Ø – ŋ on the table above shows the correspondence in TC – CO on siɔØ - siɔŋ; kiaØ – kiaŋ; cʰioØ kua - cʰiɔŋ; cʰeØ - cʰiaŋ; miaØ – miaŋ. The table above has 5 words which shows the difference of 1 phoneme on Ø – ŋ or 2.4 %.

Table 20 One Syllable Similarity of TC ~ CO

No.	Sino-Tibetan Swadesh List	Teochew (TC)	Cantonese (CO)
1.	when (14)	[ti si]	[kei si]
2.	knee (82)	[kʰa tʰau wu]	[sək tʰau]
3.	throw (136)	[kak tiau]	[tiau]
4.	rain (151)	[lɔk hou]	[lɔk sui]
5.	dirty (188)	[la tak]	[la tʰat]

The table above has 5 words which shows one similar syllable or 2.4 %.

The Sound Correspondence of HK ~ CO

Table 21 Identical Pair of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	all (17)	[loŋ coŋ]	[loŋ coŋ]
2.	three (24)	[sam]	[sam]
3.	big (27)	[tai]	[tai]
4.	heavy (31)	[cʰoŋ]	[cʰoŋ]
5.	father (43)	[apa]	[apa]
6.	worm (50)	[cʰoŋ]	[cʰoŋ]
7.	flower (59)	[fa]	[fa]
8.	horn (68)	[kɔk]	[kɔk]
9.	blow (98)	[cʰɔi]	[cʰɔi]
10.	think (104)	[siɔŋ]	[siɔŋ]
11.	fear (106)	[kiaŋ]	[kiaŋ]
12.	live (108)	[saŋ]	[saŋ]
13.	fight (111)	[ta kau]	[ta kau]
14.	hit (113)	[ta]	[ta]
15.	sit (124)	[cʰɔ]	[cʰɔ]
16.	turn (126)	[wan]	[wan]
17.	pull (134)	[lai]	[lai]
18.	tie (137)	[pɔŋ]	[pɔŋ]
19.	say (140)	[kɔŋ]	[kɔŋ]
20.	water (150)	[sui]	[sui]
21.	rain (151)	[lɔk sui]	[lɔk sui]
22.	river (152)	[hɔ]	[hɔ]

23.	fire (167)	[fɔ]	[fɔ]
24.	road (170)	[haŋ]	[haŋ]
25.	mountain (171)	[san]	[san]
26.	green (173)	[cʰiaŋ]	[cʰiaŋ]
27.	yellow (174)	[wɔŋ]	[wɔŋ]
28.	cold (181)	[laŋ]	[laŋ]
29.	left (200)	[cɔ]	[cɔ]
30.	name (207)	[miaŋ]	[miaŋ]

The table above has 30 words which are paired identically or 14.5 %.

Table 22 Consonant Correspondence k ~ k of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	that (8)	[ke ke]	[kɔ kɔ]
2.	when (14)	[ki sə]	[kei si]
3.	dog (47)	[kiau]	[kau]
4.	root (57)	[kin]	[kən]
5.	nose (75)	[pʰi koŋ]	[pei kɔ]

The sound correspondence of k ~ k on the table above shows the correspondence in HK ~ CO on ke ke ~ kɔ kɔ; ki sə ~ kei si; kiau ~ kau; kin ~ kən; pʰi koŋ ~ pei kɔ. The table above has 5 words which correspond on k ~ k or 2.4 %.

Table 23 Consonant Correspondence t^h ~ t^h of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	hair (71)	[tʰiau na mau]	[tʰou fat]
2.	head (72)	[tʰiau na]	[tʰou]
3.	knee (82)	[cʰik tʰiau]	[sək tʰau]
4.	spit (96)	[tʰui hiau lan]	[tʰou]
5.	sun (147)	[nik tʰiau]	[jit tʰau]

The sound correspondence of t^h ~ t^h on the table above shows the correspondence in HK ~ CO on tʰiau na mau ~ tʰou fat; tʰiau na ~ tʰou; cʰik tʰiau ~ sək tʰau; tʰui hiau lan ~ tʰou; nik tʰiau ~ jit tʰau. The table above has 5 words which correspond on t^h ~ t^h or 2.4 %.

Table 24 Consonant Correspondence s ~ s of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	four (25)	[si]	[se]
2.	thin (35)	[səu] [pʰɔk]	[sau] [pɔk]
3.	tree (51)	[su]	[si]
4.	eat (93)	[sək]	[sek]
5.	suck (95)	[sək]	[sɔk]
6.	laugh (100)	[siau]	[siu]
7.	die (109)	[si]	[sei]

8.	wash (132)	[s̲e]	[s̲ei]
9.	count (139)	[s̲uan]	[s̲in]
10.	burn (169)	[s̲au]	[s̲iu]
11.	new (183)	[s̲in]	[s̲ən]

The sound correspondence of s ~ s on the table above shows the correspondence in HK ~ CO on s̲i ~ s̲e; s̲əu ~ s̲au; s̲u ~ s̲i; s̲ək ~ s̲ek; s̲ək ~ s̲ɔk; s̲iau ~ s̲iu; s̲i ~ s̲ei; s̲e ~ s̲ei; s̲uan ~ s̲in; s̲au ~ s̲iu; s̲in ~ s̲ən. The table above has 11 words which correspond on s ~ s or 5.3 %.

Table 25 Consonant Correspondence j ~ j of HK~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	leaf (56)	[j̲ap]	[j̲ip]
2.	wing (84)	[j̲ik]	[j̲ek]
3.	salt (155)	[j̲am]	[j̲im]
4.	smoke (166)	[j̲en]	[j̲un]
5.	day (178)	[j̲it]	[j̲at]
6.	round (190)	[j̲en]	[j̲in]
7.	far (198)	[j̲en]	[j̲ün]
8.	with (203)	[j̲uŋ]	[j̲ɔŋ]

The sound correspondence of j ~ j on the table above shows the correspondence in HK ~ CO on j̲ap ~ j̲ip; j̲ik ~ j̲ek; j̲am ~ j̲im; j̲en ~ j̲un; j̲it ~ j̲at; j̲en ~ j̲in; j̲en ~ j̲ün; j̲uŋ ~ j̲ɔŋ. The table above has 8 words which correspond on j ~ j or 3.9 %.

Table 26 Consonant Correspondence m ~ m of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	what (12)	[m̲a'e]	[m̲e je]
2.	not (16)	[m̲ɔi]	[m̲ou]
3.	tail (69)	[m̲i]	[m̲ei]
4.	feather (70)	[m̲au]	[m̲ou]
5.	full (182)	[m̲an]	[m̲un]

The sound correspondence of m ~ m on the table above shows the correspondence in HK ~ CO on m̲a'e ~ m̲e je; m̲ɔi ~ m̲ou; m̲i ~ m̲ei; m̲au ~ m̲ou; m̲an ~ m̲un. The table above has 5 words which correspond on m ~ m or 2.4 %.

Table 27 Consonant Correspondence ŋ ~ ŋ of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	I (1)	[ŋ̲ai]	[ŋ̲ɔ]
2.	we (4)	[ŋ̲ai te ni]	[ŋ̲ɔ te]
3.	bite (94)	[ŋ̲at]	[ŋ̲au]
4.	hear (102)	[t^{h}aŋ̲]	[t^{h}iaŋ̲]
5.	swell (146)	[cuŋ̲]	[coŋ̲]
6.	wind (163)	[foŋ̲]	[fɔŋ̲]
7.	red (172)	[foŋ̲]	[hoŋ̲]

The sound correspondence of ŋ ~ ŋ on the table above shows the correspondence in HK ~ CO on ŋai ~ ŋɔ; ŋai te ni ~ ŋɔ te; ŋat ~ ŋau; tʰaŋ ~ tʰiaŋ; cuŋ ~ coŋ; foŋ ~ fɔŋ; foŋ ~ hoŋ. The table above has 7 words which correspond on ŋ ~ ŋ or 3.4 %.

Table 28 Consonant Correspondence cʰ ~ cʰ of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	long (28)	[cʰɔŋ]	[cʰiɔŋ]
2.	guts (86)	[cʰɔŋ]	[cʰiɔŋ]
3.	sew (138)	[cʰa]	[cʰe]
4.	sing (141)	[cʰɔŋ kɔ]	[cʰiɔŋ]
5.	dust (158)	[fei cʰən]	[fui cʰən]
6.	rotten (187)	[cʰu]	[cʰau]

The sound correspondence of cʰ ~ cʰ in the initial position on the table above shows the correspondence in HK ~ CO on cʰɔŋ ~ cʰiɔŋ; cʰɔŋ ~ cʰiɔŋ; cʰa ~ cʰe; cʰɔŋ kɔ ~ cʰiɔŋ; fei cʰən ~ fui cʰən; cʰu ~ cʰau. The table above has 6 words which correspond on cʰ ~ cʰ or 2.9 %.

Table 29 Vowel Correspondence a ~ a of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	forest (52)	[san pa]	[sam pa]
2.	dig (181)	[wak]	[wat]
3.	walk (121)	[haŋ lu]	[haŋ lo]
4.	wipe (133)	[cʰat pʰek]	[cʰat]
5.	white (175)	[pʰak]	[pak]

The sound correspondence of a ~ a in the medial position on the table above shows the correspondence in HK ~ CO on san pa ~ sam pa; wak ~ wat; haŋ lu ~ haŋ lo; cʰat pʰek ~ cʰat; pʰak ~ pak. The table above has 5 words which correspond on a ~ a or 2.4 %.

Table 30 One Syllable Similarity of HK ~ CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	you (plural) (5)	[ŋi te ŋin]	[ne te]
2.	they (6)	[ki te ŋin]	[hoi te]
3.	how (15)	[jɔŋ pan]	[tim jɔŋ]
4.	many (18)	[sə fən tɔ]	[tɔ]
5.	few (20)	[ik tik]	[ja tik]
6.	man (adult, male) (37)	[nam cai]	[nam jen]
7.	fruit (54)	[sui kɔ]	[kɔ ci]
8.	foot (80)	[kiɔk pʰan]	[kiɔk min]
9.	leg (81)	[ŋi kiɔk]	[kiɔk kua]
10.	moon (148)	[ŋik kɔŋ]	[jit kɔŋ]

The table above has 10 words which shows one similar syllable or 4.8 %.

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Table 31 Different Vowel i – ei of HK - CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	you (singular) (2)	[ni]	[nei]
2.	skin (62)	[p^hi]	[p^hei]
3.	fat (66)	[p^hi]	[fei]
4.	fly (120)	[pi]	[fei]
5.	stand (125)	[k^hi]	[k^hei]

The sound correspondence of i - ei in the final position on the table above shows the correspondence in HK – CO on ni – nei; p^hi - p^hei; p^hi – fei; pi – fei; k^hi - k^hei. The table above has 5 words which shows one different vowel or 2.4 %.

Table 32 Different Vowel ei – i of HK - CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	blood (64)	[hiet]	[hit]
2.	hunt (112)	[ta liek]	[ta lit]
3.	cut (114)	[c^hiet]	[c^hit]
4.	freeze (145)	[kiet]	[kit]
5.	sky (162)	[t^hien]	[t^hin]
6.	snow (164)	[lɔk siet]	[sit]
7.	ice (165)	[siet]	[sit] [peŋ]
8.	year (179)	[nien]	[nin]

The sound correspondence of ei - i in the medial position on the table above shows the correspondence in HK – CO on hiet – hit; ta liek - ta lit; c^hiet - c^hit; kiet – kit; t^hien - t^hin; lɔk siet – sit; siet – sit; nien – nin. The table above has 8 words which shows one different vowel or 3.9 %.

Table 33 Different Vocalic Cluster iu – au of HK - CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	animal (44)	[k^him siu]	[k^ham sau]
2.	hand (83)	[siu]	[sau]
3.	swim (119)	[iu sui]	[jau sui]
4.	flow (144)	[liu]	[lau]
5.	earth (159)	[t^hi k^hiu]	[te k^hau]
6.	right (199)	[jiu]	[jau]

The sound correspondence of iu - au in the final position on the table above shows the correspondence in HK – CO on k^him siu - k^ham sau; siu – sau; iu sui - jau sui; liu – lau; t^hi k^hiu - te k^hau; jiu – jau. The table above has 6 words which shows one different vocalic cluster or 2.9 %.

Table 34 Different Vocalic Cluster au – ou of HK - CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	wife (40)	[lau p^hɔ]	[lou p^hɔ]
2.	husband (41)	[lau koŋ]	[lou koŋ]

3.	grass (60)	[cʰau]	[cʰou]
4.	old (184)	[lau]	[lou]
5.	good (185)	[hau]	[hou]

The sound correspondence of au - ou in the final position on the table above shows the correspondence in HK – CO on lau pʰɔ - lou pʰɔ; lau koŋ – lou koŋ; cʰau - cʰou; lau – lou; hau – hou. The table above has 5 words which shows one different vocalic cluster or 2.4 %.

Table 35 One Similar Syllable of HK - CO

No.	Sino-Tibetan Swadesh List	Hakka (HK)	Cantonese (CO)
1.	he (3)	[ki he nam cai]	[hoi he nam cai]
2.	stick (53)	[muk tʰou]	[muk]
3.	tooth (77)	[ŋa cʰə]	[ŋa]
4.	neck (87)	[kiaŋ kin]	[kiaŋ]
5.	sea (154)	[tʰai hɔi]	[hɔi]

The table above has 5 words which shows one similar syllable or 2.4 %.

Conclusions

After analyzing the data based on the similarities and differences among TC, HK, and CO, it can be concluded that the sound correspondences between TC ~ HK consist of ŋ ~ ŋ in the final position, k ~ k in both initial and final positions, s ~ s in an initial position, th ~ th in an initial position, vowel correspondence of a ~ a, and sound change of Ø – ŋ in final position. The sound correspondences between TC ~ CO consists of k ~ k in an initial position, m ~ m in the final position, th ~ th in initial position, ŋ ~ ŋ in final position, c ~ c in initial position, s ~ s in initial position, t ~ t in initial position, au ~ au in the final position, vowel correspondence of a ~ a, sound change of ŋ – n in the final position, and sound change of Ø – ŋ in final position.

The sound correspondences between HK ~ CO consists of k ~ k in initial position, th ~ th in initial position, s ~ s in initial position, j ~ j in initial position, m ~ m in an initial position, ŋ ~ ŋ in the final position, ch ~ ch in an initial position, a ~ a in medial position, sound change i – ei in the final position, ei – i in medial position, iu – au in the final position, au – ou in final position.

TC tends not to have /n/ sound when it happens to be a vocalic cluster or diphthong as shown in table 19. CO has /ŋ/ in final position when there are diphthongs /iɔ/ and /ia/, and or mid-back rounded vowels /o/ and /ɔ/. HK is the only dialect compared to the other two which has triphthong /iau/ as in tables 5 and 23.

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