

# Foreign Influence and Sound Change: A Case Study of Cantonese Alveolar Affricates

Yizhou Lan

Nagoya University of Commerce and Business  
4-4 Komenoki, Nisshin, Aichi Prefecture, Japan  
anthonylan@nucba.ac.jp

## Abstract

Language contact is one major factor for language change. In some cases such changes are brought from a language of higher status. The present study examines a systematic phonological change among current young Hong Kong Cantonese speakers. L1 Cantonese Speakers of both genders in three age groups were tested for production of Cantonese alveolar affricates /ts/ and /ts<sup>h</sup>/ phonemes in a carrier sentence. English and Cantonese control sounds were also added to the reading list. Results show that speakers of the younger generation have a larger tendency in substituting /ts<sup>h</sup>/ and /ts/ with the English sound /tʃ/ in the back-vowel context. Two probable reasons to such change, language contact and gestural proximity, were identified. The findings clearly acknowledge a sociolinguistic change of /ts<sup>h</sup>/ > [tʃ] for the younger generation in contrast to the elder, and suggest that foreign influence that could be possibly traced back to the influence of the English language.

## 1 Introduction

Language change through languages contact has been recorded in ways including lexical or structural borrowing [1]. However, structural borrowing, especially that of sound change, is less commonly documented. This study explores a

sound change occurring in Cantonese by a probable language contact from English. The sound change under investigation is usually found among Cantonese speakers of younger generation. Recent studies have exemplified that many segmental (e.g., the merge between /n/ and /l/ [2]) and supra-segmental (e.g., tone merging between Cantonese tone 2 and tone 4 [3] [4]) sound changes had taken place in Cantonese. However, apart from the sound change within Cantonese itself, as has illustrated above, could it be probable that this dialect can accommodate foreign influences as well? The present study intends to test whether young speakers in their 20s will produce the Cantonese alveolar affricates /ts/ /ts<sup>h</sup>/ with an “English touch” as the post-alveolar laminal affricate [tʃ]. It attempts to tackle language change not from an evolutionary point view but from one of foreign contact: i.e., the language under investigation borrowing some new features from another language. To investigate this question, a production experiment sampling speakers from different age groups producing Cantonese and English sounds was performed.

## 2 Literature Review

Hong Kong Cantonese, a variant from the canonical Cantonese language or the *Yue* dialect, has a rich consonantal inventory including alveolar affricates (/ts/ and /ts<sup>h</sup>/) but without post-alveolar laminal affricates (/tʃ/ and /dʒ/). On the other hand, standard British and American English have a three-way distinction of /ts/, /tʃ/ and /dʒ/.

Descriptive and pedagogical literature has shown the phonetic similarity of these alveolar and post-alveolar affricates [5] [6] [7]. For example, investigations from AHSA [6] show that the English /tʃ/ & /dʒ/ are acoustically similar to the Cantonese sounds [ts<sup>h</sup>] & [ts] respectively. On one hand, the English /tʃ/ & /dʒ/ are palato-alveolar, the former being voiceless and the latter being voiced. But on the other hand, the Cantonese [ts<sup>h</sup>] & [ts] are alveolar, and both are voiceless. Despite the phonetic similarity, these post-alveolar affricates are still regarded as difficult sounds for Cantonese learners to acquire [5] [7]. Other studies, however, identify the Cantonese [ts] sound as an equivalent to English /tʃ/ among others in the Cantonese inventory [8], but such studies are extremely scarce.

Even though the pedagogical literature [7] [8] suggested pronunciation techniques to avoid the influence of Cantonese [ts<sup>h</sup>] & [ts] on /tʃ/ & /dʒ/ (which is an underlining support to the clear-cut differences of these sounds), the real Cantonese speech by young generation suggests something different. Anecdotal records have shown that the productions of fricatives are undergoing changes among young speakers of Cantonese.

Similar processes have been identified in some other languages in literature. From a diachronic point of view, language change influenced by foreign languages, or creolization, may take place within or across typological boundaries [9]. For example, a Mayan dialect has palatalized the nasal sounds /m, n/ under the influence of a neighboring communities (*ibid.*). Sri Lanka Creole has stress pattern rules transferred from Portuguese. A colonial inheritance was also identified from the latter, whose speakers are perceived to have more power and as higher-class individuals. Similarly, Lai & Gooden [10] identified the socio-phonetic change of [k̚]>[l] in Yami, a language in Taiwan, due to language contact with a more powerful language.

The reason for proposing foreign influence to resolve the current problem also lies in the observed instability of the alveolar affricates in Cantonese. Labov [11] denotes that the instability, usually age or class differences within a phoneme is a signpost for socio-phonetic change. Thus, the present study brings about a new possible explanation of foreign influence to the sound change of Cantonese in the current multilingual landscape of Hong Kong. Such an explanation

differs from mainstream theory suggesting these changes being mostly intrinsic within the evolution of a single language.

Thus, as backed up by previous literature, the study intends to investigate the following research questions:

1. How do Cantonese speakers of different age groups produce Cantonese words with /ts<sup>h</sup>, ts/ and English words with /tʃ/?
2. Can the sound change /ts<sup>h</sup>/ /ts/ > /tʃ/ be identified from any of these age groups?
3. If yes, what may be the underlying reason(s) for such sound change?

### 3 Methods

The study intends to test whether young speakers in their 20s produce the Cantonese alveolar affricate /ts<sup>h</sup>/ and /ts/ in an English accent as the post-alveolar laminal affricate [tʃ]. A production experiment is designed. In the experiment, 12 native Cantonese-speaking participants from three age groups read out both English and Cantonese stimuli in a recording booth. All recorded sounds are identified by three trained phoneticians.

#### 3.1 Participants

Participants are twelve speakers in three age groups, namely 20s, 30s and 60s (mean age=25.5, 37.4 and 61.6, std<3.506). The gender ratio is 1:1. They are all native Cantonese speakers, children of monolingual Cantonese parents, and are all educated with English. The 20s group are all college students and learned English from elementary school. No speech or hearing disorder has been reported. They are asked to read aloud the stimuli in front of a MD recorder in a sound booth.

#### 3.2 Stimuli

Stimuli words in the experiment consist of both target stimuli and control words. The target stimuli are 15 Cantonese character with their pronunciation having /ts<sup>h</sup>/ and /ts/ as the initial consonant. A series of control sound are also chosen to test the hypothesis of English foreign influence. Firstly, 15 Chinese characters whose pronunciation begins with /t<sup>h</sup>/ sounds are recorded for controlling age groups. Secondly, 10 monosyllabic English words with /tʃ/ as the initial consonant are also recorded for controlling language. All stimuli are grouped with vowel four

contexts: high front (/i, y/), high back (/u/), low front (/a, ɛ/), and low back (/ɔ/). The number of stimuli of each vowel context is not balanced because of the lack of words for some conditions. The complete list of stimuli Chinese characters and English words are listed in Table 1.

Chinese	English
/tʰ/	/tʃ/
他 濤 塔 投 肚 聽 天 提 太 臺 腿 湯 童 禿 屯	charge chirp chap chore check chuck choose choke cheek chick
/tsʰ/, /ts/	
擦 炒 遮 柴 癡 超 徹 拆 猜 徐 昌 沖 速 邨 黠	

Table 1: Chinese and English Stimuli

### 3.3 Procedure

The production experiment took place in a sound-proof booth in Hong Kong. First, the participants were asked to read aloud the Cantonese stimuli in a carrier sentence “佢嘅名係唔係叫\_\_\_\_\_?” (Is his name called\_\_\_\_\_?). For English words, a similar sentence “Now I say\_\_\_\_\_ again” was used. Both Cantonese and English carrier sentences were controlled for V\_\_V phonetic environment for the acoustic clarity of segmenting the target affricate for analysis. Participants were asked to read these carrier sentences for 10 times each in randomized order. The total number of tokens for Cantonese is 15 words × 2 word groups × 10 repetitions = 600 and for English, the total number is 10 words × 10 repetitions = 100. All carrier sentences were recorded by a Shure SM 57 Microphone with the sampling rate of 44100Hz in mono channel.

Then, the target sound in both Cantonese and English tokens were segmented from the sentence and stored as isolated sound tokens. The data of which was transferred to a laptop PC with a headphone for sound classification and judgement. To measure and classify the production in terms of phonemic transcription, three phonetically-trained Cantonese speakers listened to both Cantonese and English productions, and then judged their phonetic categorization.

## 4 Results

The results of the production experiment are presented in this section. For both Cantonese and English speech, we present statistical comparisons of the dependent variable of correct percentages of productions judged by the phonetically trained listeners, and the comparisons were grouped by the independent variables of age groups (participants in their 20, 30 and 60s) and vowel contexts.

### 4.1 Cantonese Speech

Overall, for Cantonese speech, the main factor of age group and the intermediate factor of vowel were examined for two groups of Cantonese words, the /tʰ/ control group and the experiment group. The inter-rater reliability for the Cantonese speech was 86%. Rater confidence was also high.

For the control group, 100% sound were pronounced as /tʰ/ as predicted, and we did not see any of the tokens with a palatalized sound change. Therefore, no further statistical comparison was done for the control group.

For the experiment group, overall findings of statistical comparisons showed that the 20s and 40s speakers are producing significantly different patterns for the sounds /tsʰ/ and /tʃ/. In detail, for age groups, it was found that only the 20s showed significantly more /tʃ/ sound tokens.

As for the effect of vowel context, the substitution of /tʃ/ only occurred after vowels of /ɔ/ and /u/ (p<.001), which are all back vowels (see Table 2). However, the /tsʰ/ sound remained less changed or even unchanged in vowels of /i/, /y/, /ɛ/, and /a/. One-way ANOVA comparisons showed that the differences between the three age groups were significant [F(2, 543)=3.245, p<.01]. Within the 20s and 30s group, the effect of the independent variable of vowel condition was significant, with the 20s’ age group having a larger significance. However, there was no significance of vowel quality for the 60s group [20s: F(5, 215)=3.245, p<.001; 30s: F(5, 149)=2.468, p<.05; 60s: F(5, 227)=2.045, p=.267].

Vowels	Stimuli	20s	30s	60s
/a/	擦 柴 炒 拆	85%	85%	90%
/ɛ/	遮 昌	100%	100%	100%
/i/	超 徹 癡	90%	100%	100%
/ɔ/	猜 徐 沖	42%	71%	89%

/u/	速黜	24%	56%	89%
/y/	村	89%	85%	100%

Table 2: Percentage of Cantonese /ts//ts<sup>h</sup>/ tokens pronounced correctly by three age groups, perceived by three phonetically-trained persons.

## 4.2 English Speech

The English speech of speakers from each age group was also investigated for qualitative analysis by phonetic judgement. The inter-rater reliability for the Cantonese speech is 92%. Rater confidence was very high. The results were shown below.

The correct English pronunciation of /tʃ/ is much higher for 20s young age group as expected. However, in terms of vowel context variability, the correct tokens of /tʃ/ productions mostly occurred after vowels of /ɔ/ and /u/ (see Table 3). One-way ANOVA comparisons showed that the differences between the three age groups were significant [F(2, 97)=2.253, p<.01]. The effect of the independent variable of vowel condition was significant as in the Chinese speech for all three age groups, with the 20s' age group having a larger significance.

Vowels	Stimuli	20s	30s	60s
/a/	charge chap chuck	43%	25%	22%
/ɛ/	chirp check	47%	30%	32%
/i/	chick cheek	48%	37%	32%
/ɔ/	chore choke	80%	71%	67%
/u/	choose	85%	65%	58%

Table 3: Percentage of English tokens pronounced correctly as /tʃ/ by three age groups, perceived by three phonetically-trained persons.

## 4.3 Summary

If we combine the vowel groups /i/ and /y/ for Cantonese, data in both languages can be divided into 5 vowel groups (/a, ɛ, i, ɔ, u/). The Cantonese and English data could show some common tendencies when they were superimposed together for each age group (See Figure 1). The English and Cantonese percentages seem inversely proportional for all groups but the 20s group shows the highest tendency in all three groups.

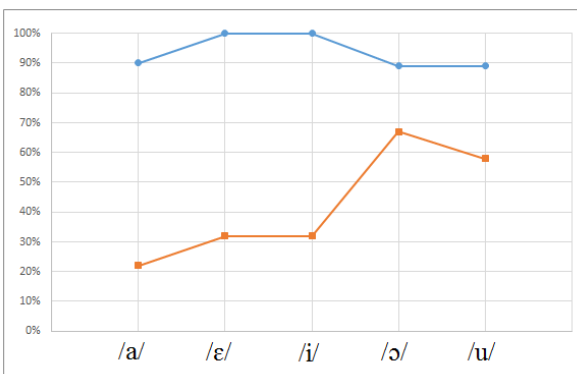
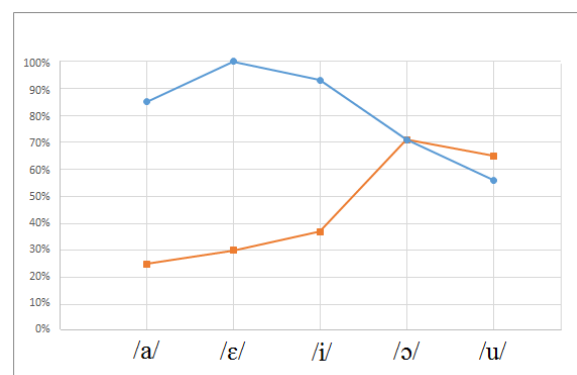
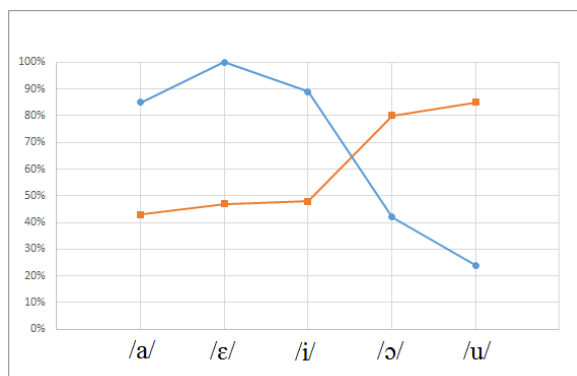


Figure 1: Average percentage of correct instances for the 20s (upper) 30s (center) and 60s (lower) age groups. The blue line represents Cantonese /ts//ts<sup>h</sup>/ and the red line represents English /tʃ/.

## 5 Discussions

In answering the research questions 1 and 2, we may conclude that the language change under discussion did exist. Speakers of all ages exhibited, at least to some extent, both [ts<sup>h</sup>] and [tʃ] in their productions of Cantonese /ts<sup>h</sup>/. We may also regard the “newly” discovered [tʃ] as an allophone of /ts<sup>h</sup>/ in the Cantonese inventory, especially for the 20s generation. In other words, the substitution of /ts<sup>h</sup>/

could be regarded as a sound change /ts<sup>h</sup>/ /ts/ > /tʃ/ in the group of young speakers. However, for 30s and 60s generations, the overall percentage of /tʃ/ tokens appeared significantly fewer compared with the 20s generation. Another important finding is that the difference in rates of correct production lies primarily in back vowel conditions (/ɔ, u/), as has been confirmed by post-hoc tests of the statistical analyses. The reasons for the language change and especially the effect of back vowel conditions will be addressed in the following.

As an attempt to answer research question 3, the rest of this section explains the reasons to this language change by proposing effects of (1) the universal gestural economy conditions in vowel contexts and (2) sociolinguistic contact of foreign sounds.

Firstly, the vowel condition can be attributed to anticipatory gestural economy. Results has shown that labialization is especially evident for words with back vowels. It is argued that this may be driven by speakers' gestural economic strategy to approximate these two sounds [12] seen in socio-phonetic changes. The backward movement of the tongue body involved in the alveolar → post-alveolar change is in accordance with the backward movement of the tongue body in back vowels [13], hence the greater inclination of this change.

Moreover, the English speech results show that the speakers had not pronounced the sound fully as English /tʃ/ but having a similar pattern of vowel variation, as shown in the inverse proportion of /ts, ts<sup>h</sup>/ and /tʃ/ in Figure 1. This further agrees with the gestural hypothesis of the language change stated above. The gestural economy of moving the tongue body up to form an affricate in anticipation of back vowels as pulling the tongue backward has made the sound change easier in gestural terms.

Secondly, the sound change of /ts/ > /tʃ/ as a whole can be regarded as from language contact. The Cantonese phonological inventory contains no post-alveolar sounds in general, and that the Chinese dialectal system is rare with laminal post-alveolar affricates. It is more plausible to consider this case as from foreign influence, despite the scarcity of such cases [14].

But what might have motivated the change from language contact? The /tʃ/ sound has affected the Cantonese language systematically in phonology instead of just through loan words. One

reason of such systematic change might be the social drive for the younger generation to acculturate or even assimilate to the western way of speaking. The "language identity" factor may have hoisted this sound as a more socially accepted norm in the peer group than the conventional /ts<sup>h</sup>/.

Tracing back the foreign influence leads to the sociolinguistic impact of such trend of changing. The senior and young participants of this study, without any linguistic knowledge, showed divided opinions towards it as the researcher seek their attitudes towards the change. When the researcher randomly sampled the senior group (60s)'s attitude towards such linguistic use, the response was that such usage "comes from younger generations", which is valid. They commented that such usage is "talking when biting the tongue", "pretentious" and "almost a kind of polluted language". However, when the researcher asks younger participants (20s), irrespective of whether they do use /tʃ/ or not, they responded that "everybody does that", "it's cute and lovely" and "I think it is going to be a norm in the future". Such polarized perceptions towards the same phenomenon in language change clearly portraits the ideological construct of a linguistic form; and in that new linguistic forms may or may not be welcomed by social ideals. A similar viewpoint was proposed by Labov [15] where the Canadian French /r/ sound pronunciation witnessed the coexistence of some clear-cut different productions, namely apical /r/ and uvular /r/, by speakers from two generations. He thus concluded that parental influence on the next generation often accelerates the polarization of sounds undergoing language change.

## 6 Conclusion

The study provides empirical evidence to an ongoing sound change in Hong Kong Cantonese. Young college students in around their 20s has been using a different variety of alveolar affricates /ts<sup>h</sup>/ and /ts/, producing it as the post-alveolar laminal affricate [tʃ]. Since this sound, with its place of articulation, does not appear in Cantonese phonology and is spoken only by younger generations, we speculate that language contact may be responsible for this undergoing sound change. Also, the cross-linguistic tendency of /tʃ/-substitution exists mainly in back vowel conditions was found in both Cantonese and English, as a

probable result from anticipatory gestural configurations. From the above two findings, we have identified an interwoven influence of articulatory phonetics and foreign influence. For future studies, there could be more foreign influences on other phonemes could be identified as young Cantonese speakers continue to be exposed to and identify themselves with the English language. In the long run, such features in the phonemic inventory may be preserved.

## References

- McMahon, A. M. (1994). *Understanding language change*. Cambridge University Press.
- Yang, C. (2013). Predicting language change, paper presented at the CUHK linguistic seminar.
- Zhang, C., Peng, G., & Wang, W. S. (2011). Inter-talker Variation as a Source of Confusion in Cantonese Tone Perception. *Proceedings of ICPhS XVII*, 2276-2279.
- Mok, P. P., Zuo, D., & Wong, P. W. (2013). Production and perception of a sound change in progress: Tone merging in Hong Kong Cantonese. *Language Variation and Change*, 25(03), 341-370.
- EDUHK. (2017). English Pronunciation Tips. Retrieved from [URL= http://webcache.googleusercontent.com/search?q=cache:eWPsLlzCZAwJ:ec-concord.ied.edu.hk/phonetics\\_and\\_phonology/wordpress/learning\\_website/comparison\\_of\\_english\\_and\\_canton.htm](http://webcache.googleusercontent.com/search?q=cache:eWPsLlzCZAwJ:ec-concord.ied.edu.hk/phonetics_and_phonology/wordpress/learning_website/comparison_of_english_and_canton.htm).
- AHSA, (2017). Cantonese Inventory. Retrieved from [URL= http://www.asha.org/uploadedFiles/practice/multicultural/CantonesePhonemicInventory.pdf](http://www.asha.org/uploadedFiles/practice/multicultural/CantonesePhonemicInventory.pdf).
- Hung, T. T. (2002). Towards a phonology of Hong Kong English. *Hong Kong English: autonomy and creativity*, 1, 119.
- Rogerson-Revell (2011). *English Phonology and Pronunciation Teaching*, Bloomsbury Publishing.
- Thomason, S. G., & Kaufman, T. (1992). *Language contact, creolization, and genetic linguistics*. Univ of California Press.
- Lai, L., & Gooden, S. (2014). Sociophonetic Variation in the voiced alveolar lateral fricative in Yami. Poster presented at NWAV, 43, 23-26.
- Labov, W. (1994). *Principles of linguistic change*. Vol. 1: Internal factors. Oxford: Blackwell
- Lawson, E., Scobbie, J. M., & Stuart-Smith, J. (2013). Bunched/r/promotes vowel merger to schwa: An ultrasound tongue imaging study of Scottish sociophonetic variation. *Journal of Phonetics*, 41(3), 198-210.
- Gick, B. (2003). Articulatory correlates of ambisyllabicity in English glides and liquids. *Phonetic Interpretation: Papers in Laboratory Phonology VI*, 222-236.
- Pavlenko, A. (2000). L2 Influence on L1 in Late Bilingualism. *Issues in Applied Linguistics*, 11(2), 175-205.
- Labov, W. (2014). The sociophonetic orientation of the language learner. *Advances in sociophonetics*, 15, 17-29.