

# Does mother tongue influence have a greater effect on L2 speech perception or production? A study of the learning of English by Cantonese ESL learners in Hong Kong

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**1 Introduction** Most studies on second language phonology learning by Cantonese ESL learners in Hong Kong have focused on speech production and have often attributed learner difficulties to the differences between the English and Cantonese phonological systems (e.g. Bolton & Kwok 1990; Chan 2006a, 2006b; Chan & Li 2000; Hung 2000; Kenworthy 1987; Stibbard 2004). Mother tongue influence is often regarded as the main source of difficulties, reduced to a formula somewhat like “more differences between the native and target languages = more difficulties in the learning of the target sounds”, or “L2 sounds non-existent in the native language = sounds difficult to produce”.

However, these studies only focus on the production of L2 speech sounds, and the perception of these sounds has largely been ignored, so the extent of mother tongue influence on the perception of L2 speech sounds by Cantonese ESL learners remains an unexplored area. However, it has been claimed in the literature that perception informs production (Flege 1995, Munro & Derwing 1995, Rochet 1995, Schmid & Yeni-Komshian 1999), so ESL learners’ perception of L2 speech sounds and the extent of mother tongue influence on L2 speech perception are also worth investigating.

**2 The Study** The main objective of the present study was to analyze the perception and production of English speech sounds by advanced Cantonese ESL learners in Hong Kong and to investigate the extent of mother tongue influence on their learning of English speech sounds.

2.1 Participants: A group of forty advanced Cantonese ESL learners in Hong Kong participated in the study. They were all English majors studying at three local universities. They all started their learning of English at the age of six or below, so they have all learnt the language for at least thirteen years.

2.2 Target Sounds: The English and Cantonese vowel systems are very dissimilar and the two languages do not have many vowels in common. However, there are many consonants which are found in both languages (e.g. /f/, /s/, /w/) and some which are only found in the target language (e.g. /v/, /z/, /r/). Given this variation, only consonants were included as the perceptual and production targets in this paper.

2.3 Speech Perception Tasks: The study included a series of speech perception tasks, which investigated the learners’ perception of English speech sounds spoken in isolation and embedded in words.

Task 1: Categorical Discrimination Task: The participants were requested to listen to lists of English sounds spoken in isolation. Each list consisted of three sounds, two of which were the same (e.g. /f, v, v/, /s, s, z/). The participants had to determine for each trial whether the middle item was the same as the first item or the third item.

Task 2: Word Discrimination Task: English words (e.g. fan) were spoken twice with an inter-word interval of about 2 seconds. A response sheet with the recorded words (e.g. fan) and corresponding words differing in only one phoneme (e.g. van) was given to the participants. For each word that the participants had heard (e.g. fan), they had to circle the right word from the corresponding minimal pair (e.g. fan, van) given on the response sheet.

Task 3: Picture Discrimination Task: Target English words were placed in carrier sentences (e.g. Now I say fan). After listening to each sentence, the participants had to choose between corresponding pictures showing the word just spoken (e.g. fan) and another word differing in only one phoneme (e.g. van).

2.4 Speech Production Tasks: The speech production tasks investigated the learners' production of English sounds embedded in isolated words and embedded in words in context.

Task 1: Reading of isolated words: The participants were given a list of 115 isolated words and asked to read the words one by one (e.g. she, sell, ash, sock).

Task 2: Reading of minimal pairs: A paired word-list of 66 English minimal pairs containing the target sounds (e.g. choke, joke; choice, Joyce) were given to the participants, who read the words pair by pair.

Task 3: Reading in context: The participants were asked to read three passages of 362 words, 255 words and 275 words respectively. The passages were chosen specifically for the study, with some adaptations made to include as many target sounds as possible.

2.5 Data Analysis: 2.5.1 Perception Tasks: The proportion of correct and incorrect judgments by each participant on each sound pair in each task was computed in an attempt to uncover the L2 sounds or sound categories that the participants often misperceived and the frequency with which a particular target sound was misperceived as another.

2.5.2 Production Tasks: The recordings of the participants' speech production were played to two to three transcribers for accuracy judgment. The percentages of correct production of a target L2 sound by each participant were computed. Sound productions that were modified in one way or another were counted as non-target productions and those which did not exhibit any modifications were counted as target productions. For sounds which had been incorrectly produced, the frequency with which they were mispronounced as a particular sound was also calculated.

**3 Results** The results of the study showed that the participants' perceptual abilities were different from their production abilities. Mother tongue influence also had different effects on the participants' perception and production of English speech sounds.

3.1 Perception: Obstruents which are found only in English (e.g. /z/, /ʃ/, /v/ and /θ/) were, on the whole, not more poorly perceived than those shared by both the Cantonese and English phonological systems (e.g. /s/, /f/). For example, /z/ received an overall perception accuracy rate of 81% and /s/ also received a similar overall accuracy rate of

84% when the two sounds were contrasted with each other. The difference between these two sounds was not significant at the 0.05 significance level. There was practically no difference between the /ʃ/ and /s/ pair, both receiving an overall perception accuracy rate of 99.6% when they were contrasted with each other. Some obstruents non-existent in Cantonese were even perceived more accurately than those which are shared by the two language systems. Take the pair /v/ and /f/ as an example. 93% of /v/ were perceived correctly while only 79% of /f/ were perceived correctly when they were contrasted with each other, and the difference between their accuracy rates was most obvious in Task 2. /θ/ was also much more accurately (70%) perceived than /f/ (54%) in Task 3 although overall the perception accuracy rates between the two were very similar.

The participants' performance on sonorant consonants showed similar patterns. A case in point is the approximant /r/, which is not found in Cantonese. This sound has often been documented in the literature as a highly problematic sound for Cantonese ESL learners, yet it received an overall perception accuracy rate of 99%. In contrast, the participants responded with only 89% perception accuracy to /w/, a semi-vowel found in both languages. This difference was significant at the 0.05 significance level, showing that the participants found the former easier to perceive than the latter.

**3.2 Production:** The participants' production of obstruents which are found in both the Cantonese and English phonological systems (e.g. /f/, /s/) was better than their production of English obstruents which are non-existent in Cantonese (e.g. /θ/, /v/, /ð/ and /z/). Their production of English voiceless obstruents was also better than their production of English voiced obstruents. For voiceless obstruents, over 90% of production accuracy rates were found for most cases (e.g. 98.6% for /f/ and 97.6% for /s/). The only exception was /θ/, which received a production accuracy rate of only 71.9%. For voiced obstruents, much poorer accuracy rates were observed (e.g. 15.3% for /v/, 3.68% for /ð/ and 7.8% for /z/). Voicing contrasts and phonemic inventory gaps seemed to be the main factors contributing to production difficulties.

The participants' production of English sonorant consonants was on average better than that of voiced obstruents. Overall accuracy rates were largely over 80%. Even /r/ received a moderately high production accuracy rate of 87.5%. The only exception was final /l/, which received an accuracy rate of only about 13%. It should be noted that although /l/ is a phoneme existent in both the Cantonese and English phonological systems, it is found only in initial position in Cantonese but in both initial and final positions in English. Such an allophonic gap may also contribute to the production difficulties.

**4 Discussion** The results of the present study give confirmatory evidence to the claims of previous research studies on L2 speech production by Cantonese ESL learners in Hong Kong, that the learners encounter more difficulties with L2 sounds which are non-existent in their native phonological system than those which are shared by both the native and target languages. However, the results also suggest that the learners' perception of English speech sounds behaves in a different manner. Absence of a non-native sound in a learner's native language does not inevitably result in perception difficulties, and presence of a sound in both the native and target phonemic inventories does not categorically facilitate perception. Thus, a learner's mother tongue repertoire

does not necessarily form the basis of perceptual abilities and inventory gaps may not be the principle source of perception problems.

The findings of the study have pedagogical significance. Although the ultimate goal of most L2 pronunciation learning programmes is correct production, ESL teachers are suggested to target both L2 perception and L2 production. L2 sounds which cause tremendous production problems, such as /θ/ and /r/, should, without doubt, be given priorities in both perception and production training, but their popular substitutes, such as /f/ and /w/, should also be included for contrast purposes, especially for perception. The difference between voiced and voiceless obstruents should also be given attention.

**5 Conclusion** This paper discusses the effect of mother tongue influence on second language speech perception and production. A series of L2 speech perception and speech production tasks were conducted with forty advanced Cantonese ESL learners in Hong Kong. Only the analysis of English consonants was included in this paper. The results of the study suggest that for advanced Cantonese ESL learners in Hong Kong, mother tongue influence is stronger on production than on perception. Further research is needed to investigate the perception and production of other English speech sounds, such as vowels, by the same group of learners. Students from different linguistic backgrounds and at different proficiency levels should also be included in future studies.

## 6 References

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