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## **Cantonese Tones**

### **1. Introduction**

Cantonese, 廣東話 or 粵語, is one of the seven major dialect groups and is spoken mainly in the south east area of China, such as Hong Kong, Guangdong, Guangxi, and Macau. According to the Handel handout, Cantonese is most closely related to 客家話 and the other southern dialects. In Hong Kong, Macau, and Guangdong schools, while the students learn to write and read standard (traditional) Chinese, Cantonese is the main language used for communication. In Hong Kong and Macau business, media, and government, Cantonese is also the main language used. According to Omniglot, Cantonese has two forms of written language; a formal version that differs from spoken Cantonese but is understandable by Mandarin speakers, and a colloquial version that is more similar to spoken Cantonese and therefore unintelligible by Mandarin speakers.

In Hong Kong, people place an importance on being able to speak Mandarin Chinese for academic or professional pursuits, as there are increasingly more interactions with mainland China. However, due to political and cultural differences, Hong Kong citizens put up some degree of resistance against using Mandarin. This has led to language use becoming an indicator of your social status; preferring Cantonese usually suggests that the speaker supports Hong

Kong's uniqueness, while preferring Mandarin suggests a focus on supporting more connections between Hong Kong and mainland China



Figure 1: Map of the southern region of China, areas where Cantonese is mainly spoken in red  
(Khor, 2016)

## 2. Tones:

Both Mandarin Chinese and Cantonese are tonal languages but differ in number of tones and checked syllables. Mandarin Chinese has four main tones: high flat tone (55), mid rising tone (35), mid-low rising tone (214), and high falling tone (51). Mandarin Chinese also has a fifth tone, 輕聲 or light tone, but the report will focus only on the four major tones, which can be seen in figure 2 below.

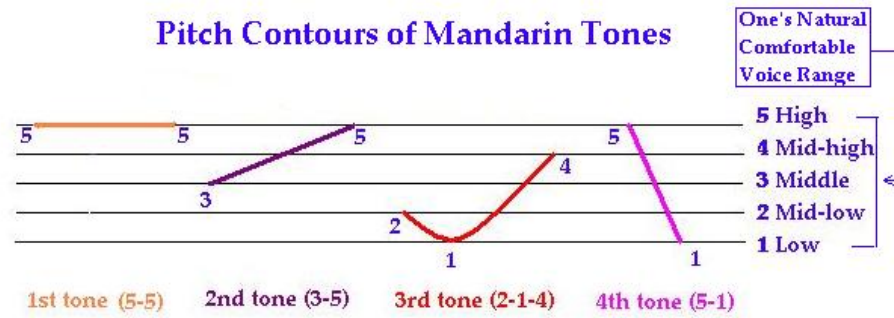


Figure 2: Pitch contours of Mandarin tones (Zhang)

According to Hanyu Fangyan Zihui, Cantonese tones can be split in to nine distinct tones based on the traditional organization:

Modern term:	Traditional term:	Tone levels:	Tone register level:
1	阴平	53 and 55	high level, high falling
2	阴上	35	Mid rising
3	阴去	33	Mid level
4	阳平	21	Low falling, very low level
5	阳上	23	Low rising
6	阳去	22	Low level
7 (1)	上阴入	5	High level, checked syllable
8 (3)	下阴入	33	Medium level, checked syllable
9 (6)	阳入	22 and 2	Low level, checked syllable

Table 1: traditional organization of Cantonese tones

However, tones 7-9 are actually checked versions of other tones, as they have the same tonal levels as the non-checked version, for example tone 7 has the same tonal levels as tone 1, but is

checked. In modern linguistics, these tones are organized into six distinct phonemic tones (Bauer & Benedict, 1997), which can be seen in figure 3. The equivalent tone is in parenthesis.

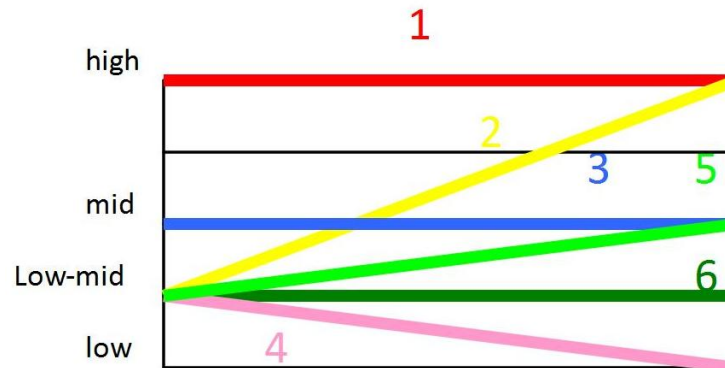


Figure 3: Pitch contours of Cantonese tones (Leung & Lam, 2008)

### 3. Method

#### 3.1. Informant

The informant is an associate instructor for Chinese classes at IU. She is a 25 year-old female graduate student from Hong Kong. Her first language (L1) is Cantonese, L2 is English (started learning at 3 years old), and L3 is Mandarin Chinese (started learning at 6 years old). During her time at IU, she has said that her Chinese has gotten worse due to the English environment and mentioned that she must purposefully find times to practice Chinese to keep up her fluency. Her parents and other older family members cannot speak Mandarin, while people in her generation can speak both Mandarin and Cantonese, so the environment has a large impact on which language she uses. Generally speaking, she uses Cantonese with other Hongkongers for conversations, but she switches to Mandarin when in a more professional work environment.

#### 3.2. Word list

The following word lists were created using Hanyu Fangyan Zihui and the Cantonese dictionary in Pleco. Once they were gathered, the words were confirmed with the informant to correctly represent and cover the target tones in Cantonese.

Mandarin Chinese word list:

上衣、遷移、可以、容易

老師、準時、出使、就是

Cantonese Word List:

牙医、桌椅、同意、质疑、可以、正义、收益、一百、翻譯

古诗、歷史、考試、準時、城市、不是，正式、抵錫、飲食

### **3.3. Recording**

Due to the medical situation, I was unable to record the production in person. Instead, I sent the word list to the informant and asked her record it. She used her phone to record it in her apartment and sent the audio files through Signal once she was finished.

### **3.4. Analysis (Praat)**

Once the recordings were completed, they were loaded into Praat for analysis. Each target tone bearing syllable was located in the recording, after which the F0 frequencies from the tone bearing vowel were recorded and copied into excel. Once in excel, the F0 frequency values were organized based on tones and word, then plotted in a scatterplot.

## 4. Results

### 4.1. Mandarin tones

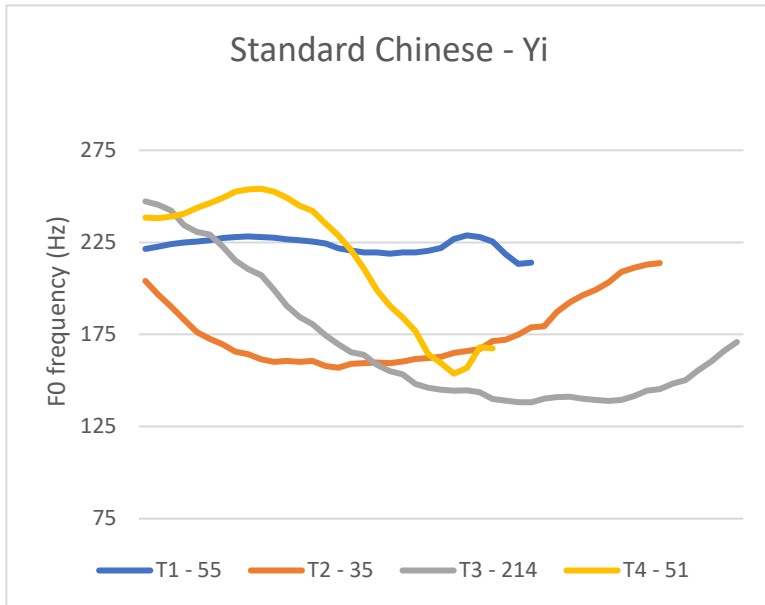


Figure 4 (left): F0 frequency values for tones 1-4 in Standard Chinese from the syllable “Yi”

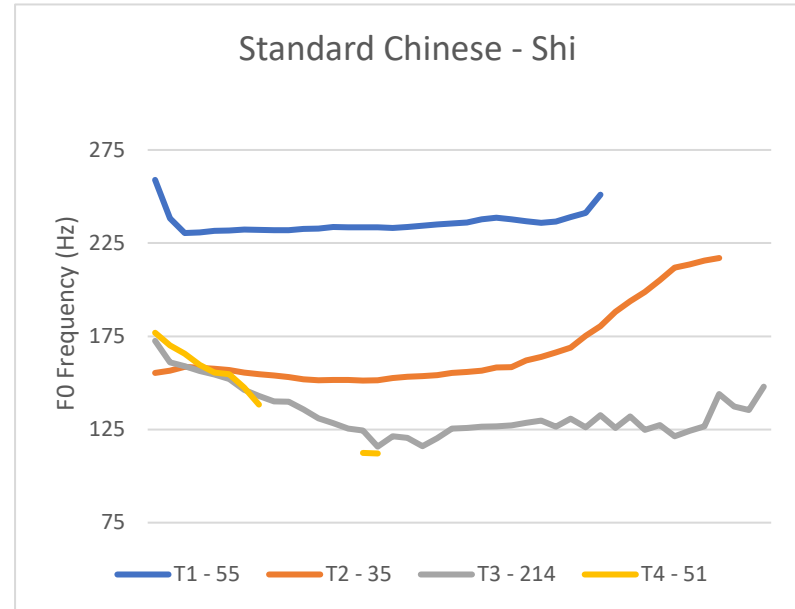


Figure 5 (right): F0 frequency values for tones 1-4 in Standard Chinese from the syllable “Shi”

In figures 4 and 5, the standard Chinese tones differ slightly due to coarticulation effects and errors in pitch tracking in praat. The coarticulation effects are particularly prominent in tones 3 and 4, mainly tone sandhi and tonal reduplication. For “kěyǐ”, the 3-3 tone pattern changes to 2-3 through tone sandhi, which leads the “yǐ” to start higher than normal due to the raised ending point of the second tone. For “chū shǐ”, there is very little coarticulation, so the third tone is realized only as a low tone. “Róngyì” has a similar environment to that of “kěyǐ”, mainly that the second tone raises the starting point of the following tone. Lastly, “jiùshì” has two fourth tones in a row, so instead of producing two fully-realized fourth tones, the second tone starts lower than it normally would.

## 4.2. Tones in Cantonese

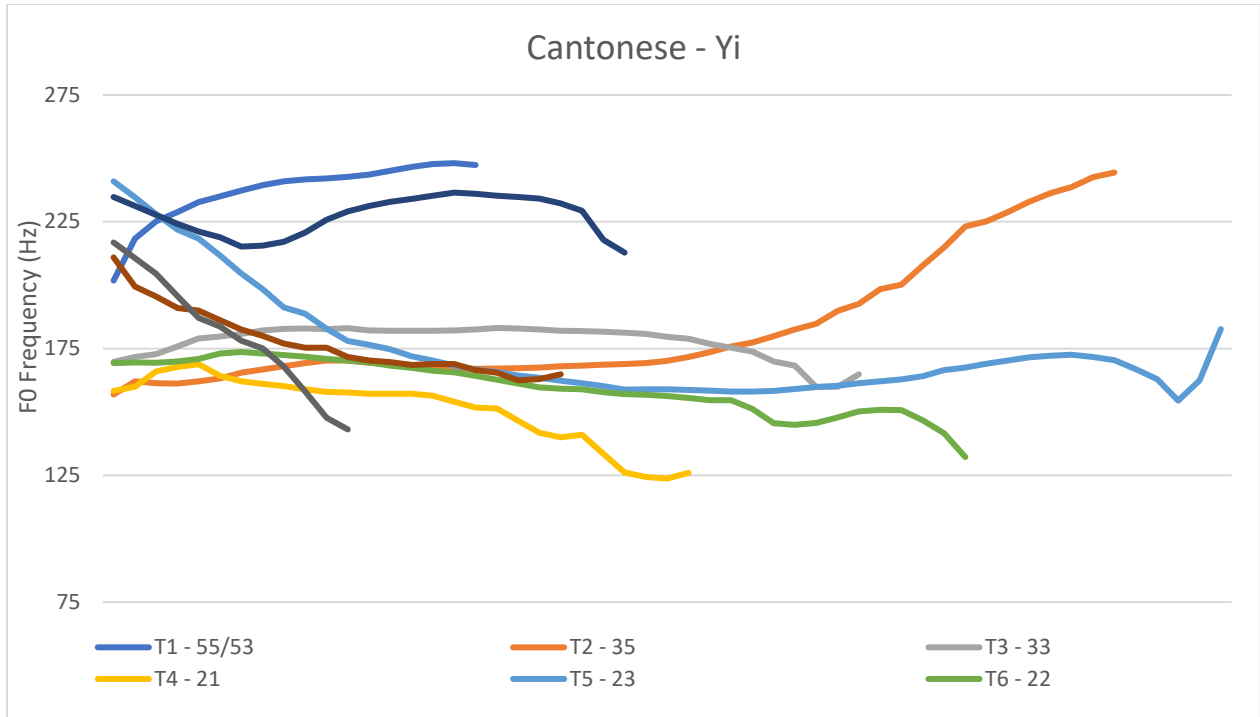


Figure 6: F0 frequency values for tones 1-9 in Cantonese from the syllable “Yi”

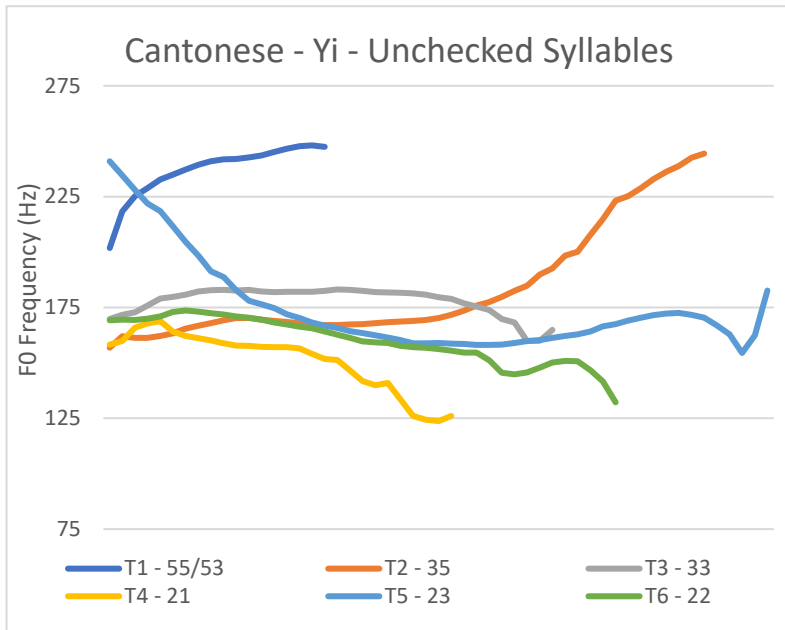


Figure 7 (left): F0 frequency values for unchecked tones 1-6 in Cantonese from the syllable “Yi”

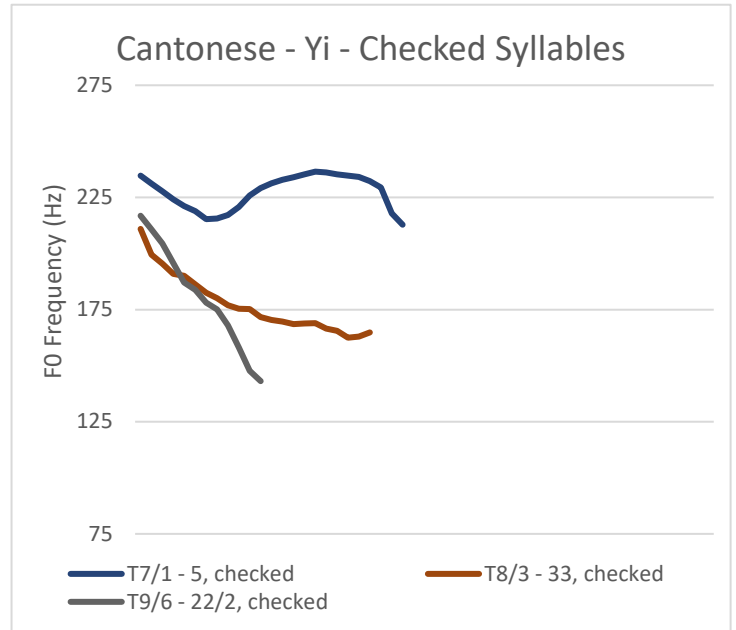


Figure 8 (right): F0 frequency values for checked tones 7-9 in Cantonese from the syllable “Yi”

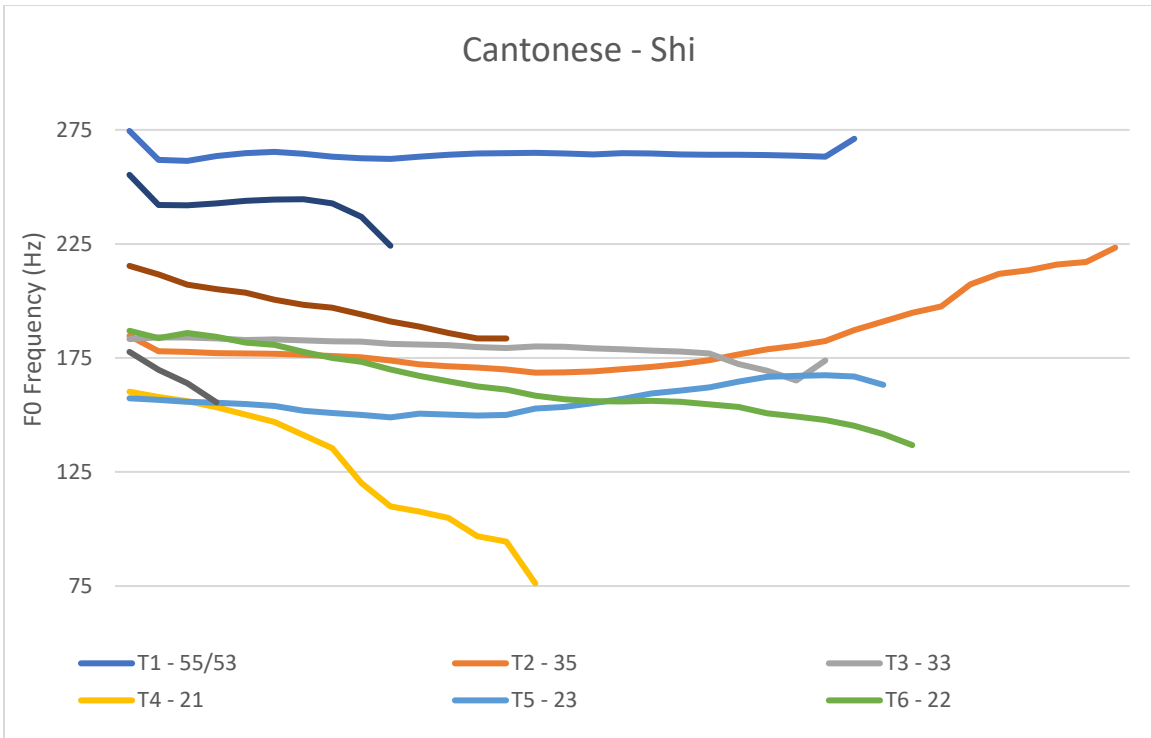


Figure 9: F0 frequency values for tones 1-9 in Cantonese from the syllable “Shi”

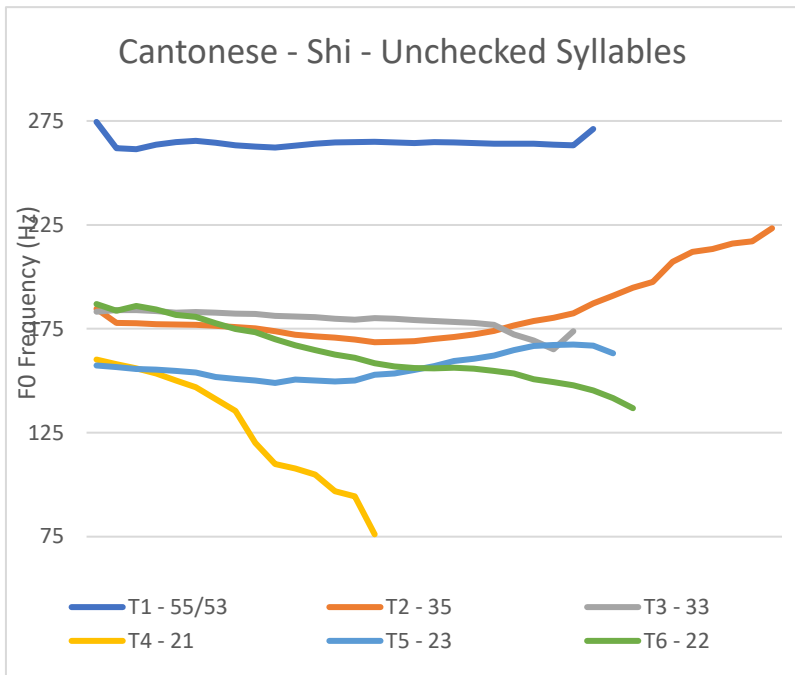


Figure 10: F0 frequency values for unchecked tones 1-6 in Cantonese from the syllable “Shi”

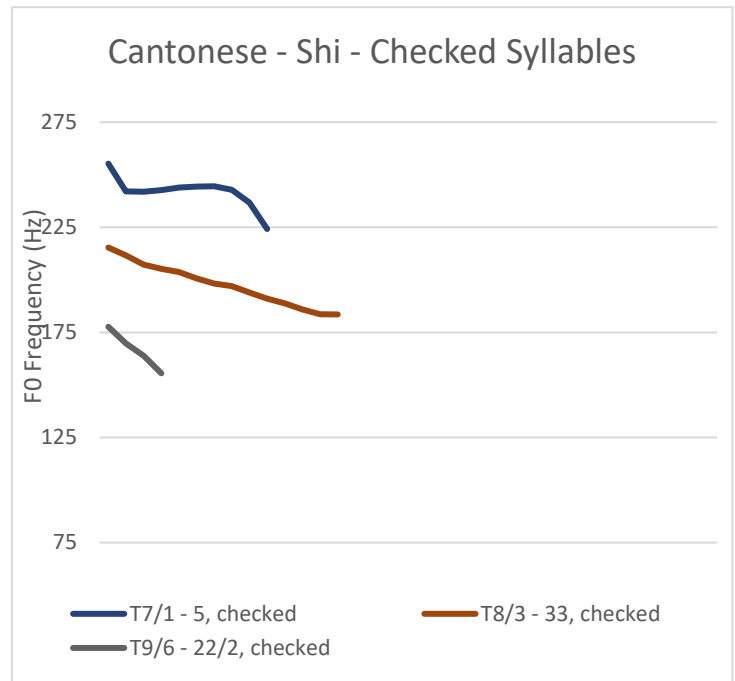


Figure 11: F0 frequency values for checked tones 7-9 in Cantonese from the syllable “Shi”



Similar to the Mandarin tones, the Cantonese tones differ in figures 6 and 9, also from coarticulation effects and pitch tracking errors in praat.

### **4.3. Comparison**

As seen in charts 1 and 2, there are 4 tones in Standard Chinese: T1 is a high, flat tone that has a F0 frequency of 225 Hz, T2 is a mid-high, rising tone that starts with an F0 of 160 Hz and rises to 225 Hz (though some have a dip at the beginning, dropping from 200 Hz to 160 Hz), T3 is a low, flat tone that stays around the frequency range of 150-175 Hz (though some also have a dip at the beginning, dropping from 250 Hz to 150 Hz), and T4 is a high, falling tone that starts at around 225 Hz and drops to 150 Hz.

In charts 3 and 4, it can be seen that there are 9 tones (6 unchecked, 3 checked) in Cantonese: T1 is a high, flat tone (55) that has a F0 frequency of 250 Hz, T2 mid-high, rising tone (35) with a frequency range of 175 Hz to 225 Hz, T3 is a mid, flat tone (33) occurring at 175 Hz, T4 is a low, falling tone (21) starting at 150 Hz and dropping to around 100 Hz, T5 is mid, rising tone (23) that starts below 175 Hz and slightly rises, T6 is a low, flat tone (22) that has a F0 frequency of 175 Hz. The next three checked tones are traditionally categorized as separate tones, but based on pitch levels, are checked versions of some of the first six tones: T7 is a short, high flat tone (5) that has a F0 frequency of around 225 Hz (checked version of T1), T8 is a short, mid flat tone (33) that has a F0 frequency of around 190 Hz (checked version of T3, though the recorded F0 frequencies are slightly above T3), and T9 is a short, low flat tone (22/2) with a F0 of around 160 Hz (checked version of T6).

## **5. Discussion**

Based on the results, Cantonese has nine tones based on traditional organization: a high flat tone (55), mid rising tone (35), mid flat tone (33), low falling tone (21), low rising tone (23), low flat tone (22), checked high flat tone (5), checked mid flat tone (33), and a checked low flat tone (22/2). This matches the organization found in *Hanyu Fangyan Zihui*, which follows the original Chinese phonology theories more closely. However, there are two points of intrigue that appear when looking at Cantonese, both come from checked syllables. First, based on pitch range and overall contour, there appear to be six distinct pitch levels for tones, as the checked syllables phonetically similar, yet shorter, versions of the non-checked sounds (Bauer & Benedict, 1997). There are still differences in productions for this speaker, so more utterances in a wider variety of context from different speakers would be needed to further clarify this point. Secondly, the informant suggested that tones 7 and 8 appear to be in complementary distribution; tone 7 (5) occurs with high vowels, while tone 8 (33) occurs with low/back vowels. I did not have the required resources or knowledge to explore this, so the complementary distribution of the two tones would be an interesting area for further future studies.

## References

- Bauer, R. S., Benedict, P. K. (1997). *Modern Cantonese Phonology* (Mouton de Gruyter, Berlin).  
Chap, 2, 109-276.
- Daxue, B. (1964). *Hanyu fangyan zihui*. Beijing: Wenzhi gaige chubanshe.

Khor, S. (2016). *The Origins Of The Hokkien, Cantonese, And Other Chinese Dialect Groups In Malaysia*. Says. <https://says.com/my/lifestyle/history-ancestral-origin-spoken-dialect-of-chinese-people-in-malaysia>

Leung, T.Y., Lam, T.Y. (2008). *Jyutping (Tones)*. Cantonese Every Day. <https://cantoneseeveryday.wordpress.com/2008/11/13/cantonese-romanization-system-jyutping-tones/>

Omniglot. *Cantonese (廣東話/粵語)*. Omniglot. <https://www.omniglot.com/chinese/cantonese.htm>

Pleco. (2020). *Pleco Cantonese Dictionary*. Pleco. <https://www.pleco.com/>

Zhang, J. *Mandarin Tones*. MIT. <http://web.mit.edu/jinzhang/www/pinyin/tones/index.html>