Is Taiwanese bi Really the Same as English bee?

-- A Comparative Study of Stop Consonants in Taiwanese and English in Terms of VOT

台語的'米'/bi/ 和英語的 bee 真的一樣嗎? -- 從 Voice Onset Time 的觀點看台語和英語的閉塞音之異同

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1. Introduction

1.1. Purpose of the study

Taiwanese voiced stop consonants /b/ (e.g. bi 米) and /g/ (e.g. gai 礙) are phonologically classified as the same category as /b/ (bee) and /g/ (guy) in English, as listed in table 1. However, many Taiwanese learners of English perceive English /b d g/ as Taiwanese /p t k/. Consequently, there are two crucial different romanization schemes for transliterating the Taiwanese: 1) To use roman letters b d g to represent /p t k/, and p t k to represent /p t h/. 2) To use b g to represent /b g/, and p t k to represent /p t k/. This paper intend to answer why English stop consonants are perceived differently by different Taiwanese speakers in terms of Voice Onset Time (VOT).

1.2. Stop consonants in Taiwanese and English

	Taiwanese				English	
Labial	b	p	p^h		b	p
Alveolar		t	t^h		d	t
Velar	g	k	\mathbf{k}^{h}		g	k

Table 1

2. Methodology

2.1. Sorftware

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2.2. VOT measurements

All Taiwanese stop consonants in table 1 were recorded and measured in the syllable structure of CV with 5 repetitions. Words in CV structure were all pronounced as the first tone since there are seven tones in Taiwanese. The data of VOT in English is adopted from Lisker and Abramson (1964) for comparison here.

2.3. The speaker

A 28-year-old male Taiwanese speaker.

3. Results and Findings

3.1. VOT in Taiwanese (in msec)

	/b/	/p/	$/p^h/$	/t/	$/t^h/$	/g/	/k/	$/k^h/$
Av.	-78	10	74	11	84	-70	20	113
R11	12:-57	0:30	50:101	8:19	60:113	-111:-30	19:25	92:122
Sd.	15	8	13	6	17	25	3	12

↑ Table 2

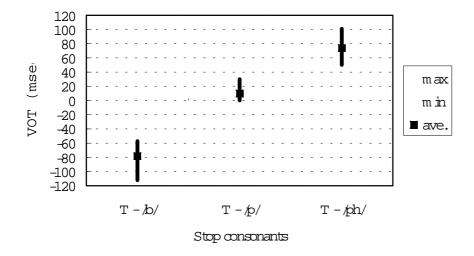
3.2. VOT in English (in msec)

/	/b/	/p/	/d/	/t/	/g/	/k/
Av.	1/-101	58	5/-102	70	21/-88	80
R. 0:5/-1	130:-20	20:120	0:25/-155:-40	30:105	0:35/-150:-60	50:135

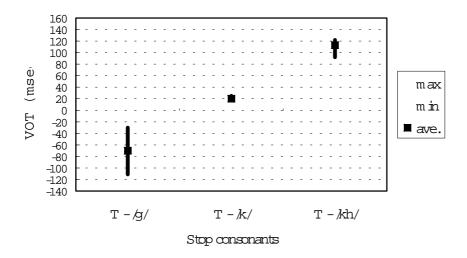
↑ Table 3

3.3. Findings

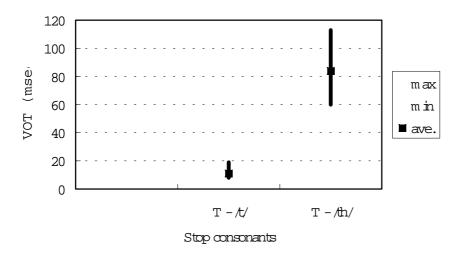
- Unlike English, there are two VOT ranges in Taiwanese voiceless stop consonants, which make distinction between aspirated and un-aspirated.



↑ Figure 1

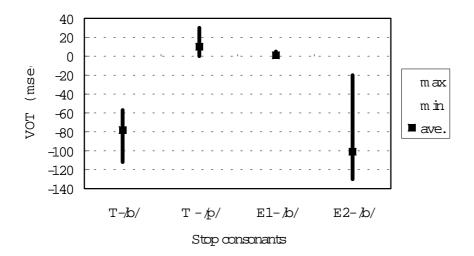


↑ Figure 2

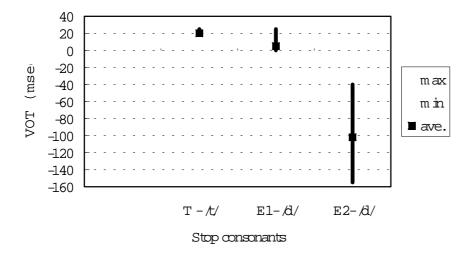


↑ Figure 3

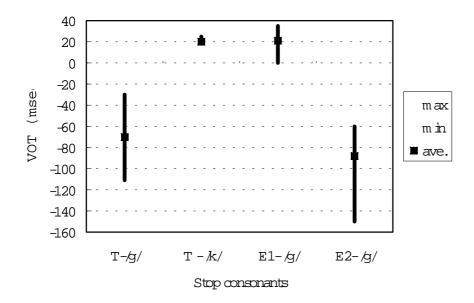
- Although segments such as /b/ are supposed to be the same phoneme in Taiwanese and English, they are phonetically not comparable to each other because they have different VOT ranges.
- An overlap of VOT between English /b d g/and Taiwanese /p t k/ occurred and this phenomenon may cause misleading perceptions on consonants when Taiwanese speakers learn English.



↑ Figure 4



↑ Figure 5



↑ Figure 6

4. Conclusion

Voiced stop consonants in English have a wider range of VOT, and it overlaps with the range of the unaspirated voiceless stop consonants in Taiwanese. Consequently, many Taiwanese speakers perceive the Taiwanese voiceless consonants /p t k/ as the voiced consonants /b d g/ in English. Teachers and learners of the Taiwanese and English languages should be aware of the overlapping phenomenon.

5. Suggestions for further studies

Selected References

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