English and Thai Speakers' Perception of Mandarin Tones

Ying Li

Ph.D in Linguistics
Newcastle University

E-mail: y.li38@newcastle.ac.uk

Language experience is frequently viewed as a significant factor that affects language learners' perception of non-native speech sounds (So & Best, 2010).

The present study, therefore, investigates the influence of listeners' L1 on their perception of foreign lexical tones. Particularly, it examines whether tone language speakers are more likely to perceive non-native lexical tones than non-tone language speakers. If they are, to what extent they could outperform the non-tone language speakers.

Do tone language speakers are better able to perceive foreign lexical tones than non-tone language speakers?

Supporting evidence:

Lee et al., (1996)

Wayland and Guion (2004)

Gandour (1983, 1984)

Nonetheless, in Lee et al., (1996), the Cantonese subjects had an extensive exposure to Mandarin, which may have benefited their perception of Mandarin tones. In comparison, the English subjects were not exposed to Mandarin as the Cantonese did.

Moreover, it has been revealed that listeners who are musically trained generally had better performance on non-native lexical tone perception than listeners without musical training backgrounds (Alexander, Wong, & Bradlow, 2005); Burnham & Brooker, 2002; Gottfried & Riester, 2000).

Comparison of Mandarin, English, and Thai

English is a non-tone language. Both Mandarin and Thai are lexical tone languages(Yip, 2002, p.2; Tingsabadh, K., & Deeprasert, 1997).
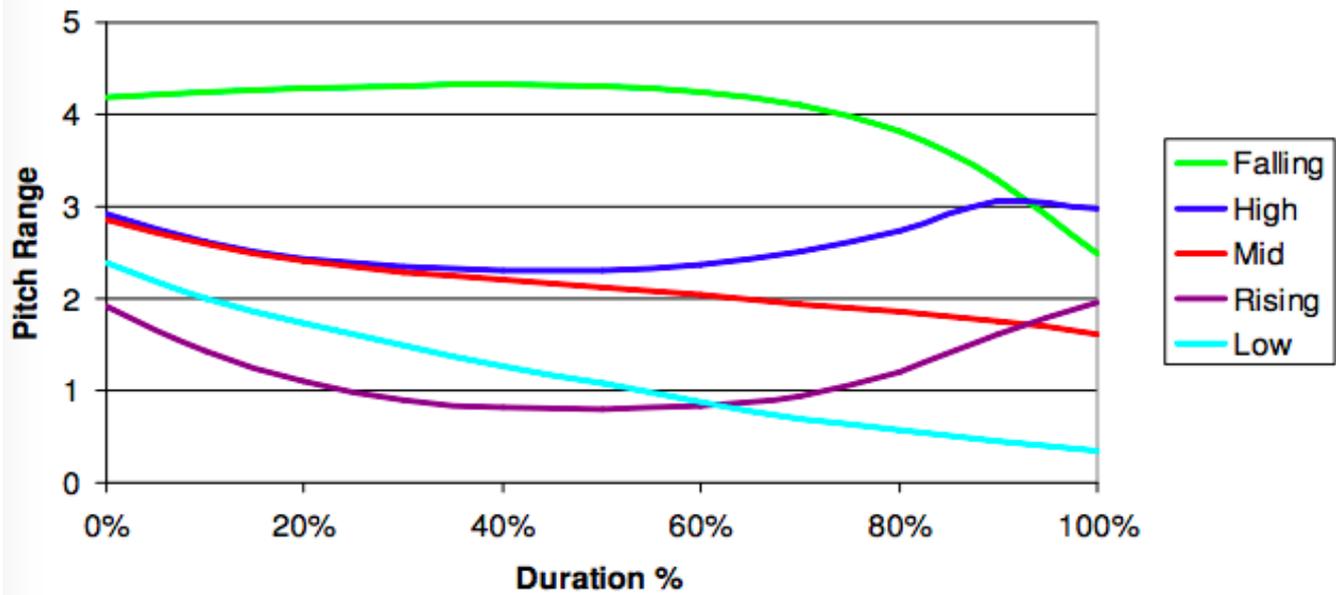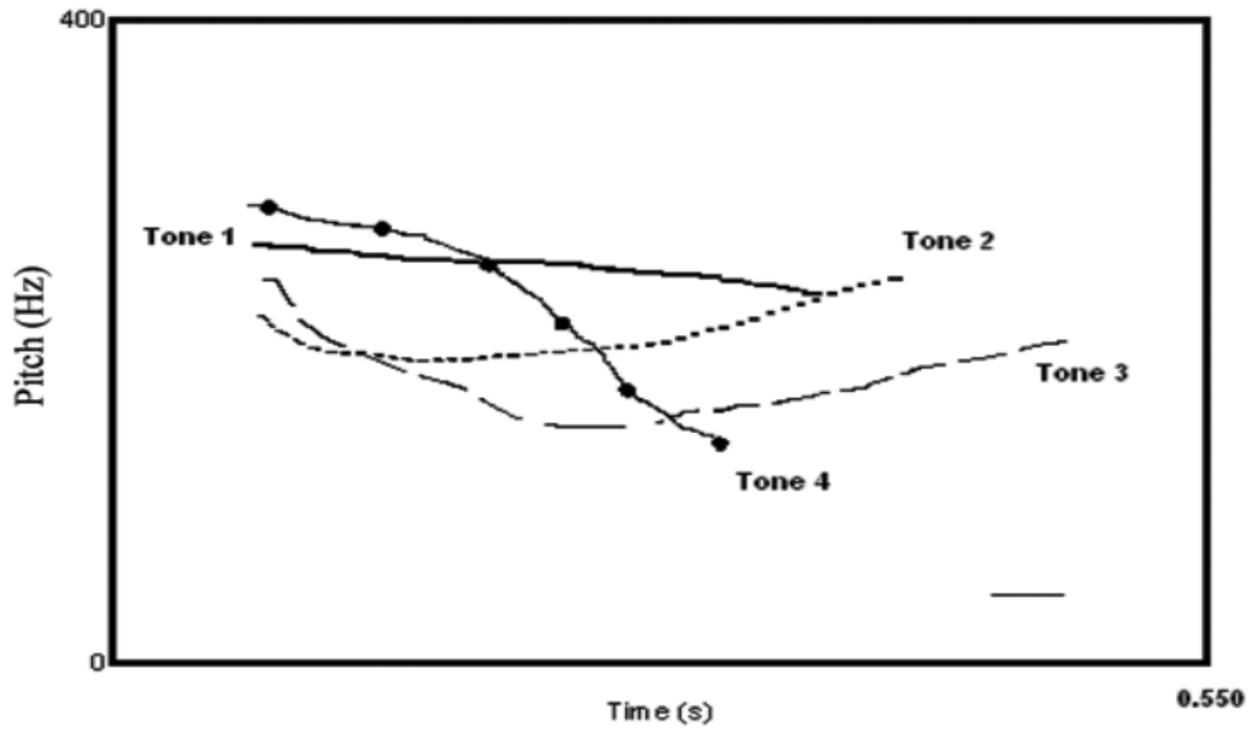
Mandarin has four tones: *high level* (Tone 1; hereafter T1), *mid rising* (Tone 2; hereafter T2), *falling rising* (Tone 3; hereafter T3), and *high falling* (Tone 4; hereafter T4) (Chao, 1930).

Thai has five tones—*mid, low, falling, high,* and *rising*.

The *high* tone in Thai is lack in in Mandarin. The rest of the 4 Thai tones are found to have their counterparts in Mandarin tones. Specifically: mid ≈ T1; low ≈ T3; falling ≈ T4; rising ≈ T2 (Kwanrean, 2001). Nevertheless, it was revealed that Mandarin T2 and T3 have shorter duration than the *low* and *rising* tones in Thai (Kwanrean, 2001).
In the present paper, Thai refers to Bangkok Thai.

a

Tone 1 [55] ———
Tone 2 [35] ----------
Tone 3 [214] ─ ─ ─
Tone 4 [51] ●━━●

Pitch (Hz)
400
0
Time (s)
0.550

Tone 1
Tone 2
Tone 3
Tone 4

Pitch Range
5
4
3
2
1
0
0%   20%   40%   60%   80%   100%
Duration %

Falling
High
Mid
Rising
Low

Methodology

Participants

24 native Thai participants from Bangkok (12 female, 12 male; age range: 21-29) and 21 native English participants from London and York (11 female, 10 male; age range: 19-30).

All the participants were born and raised in their home countries (Thailand and U.K.). None of them had any knowledge on Mandarin, had any chance to contact with Mandarin speakers, or had been musically trained prior to or during the time of the study.

A female (age=21) and a male (age=23) native Mandarin speaker were recruited to produce the stimuli for the perception test. They were born and raised in Beijing China, and was doing her Bachelor's degree at a University in Beijing.

Stimuli

Mandarin syllables: *di, da, du, chi, cha,* and *chu*. In IPA, the syllables are pronounced as /ti/, /ta/, /tu/, /tʂhi/, /tʂha/, and /tʂhu/). /ki/, /ka/, /ku/, for familiarization task.

The target words were embedded in the middle position of a carrier sentence in Chinese [把X标出来(in English: Mark the X; in IPA: [pa] X [tu] [tsʰeu][laɪ]).

Each stimulus sentence was produced 2 times by a native male Mandarin speaker (age=34) and another 2 times by a native female Mandarin speaker (age=29). Each sentence was repeated 3 times and randomized in the identification test, thus yielding to a total number of 288 tokens. In the familiarization task, there were 24 tokens in total (3 syllables × 4 tones × 2 speakers).

Procedure

Familiarization task: It was a self-paced task. The participants were given 3 minutes to do the task. They were asked to listen to each of the speech samples as many times as they could.

Four-alternative forced-choice identification task: the participants were asked to select the tone that they heard in each trial, and give a confidence score regarding their answers (0=totally guessing; 4=absolutely sure). No feedback was given.

Thai and English participants' accuracy in the perception of the 4 Mandarin Tones in the identification test.

The participants' confidence scores in the identification of the 4 tones
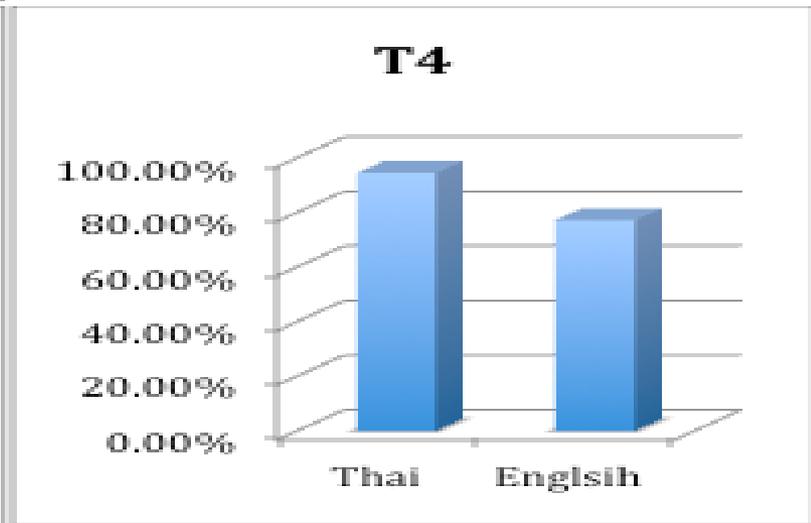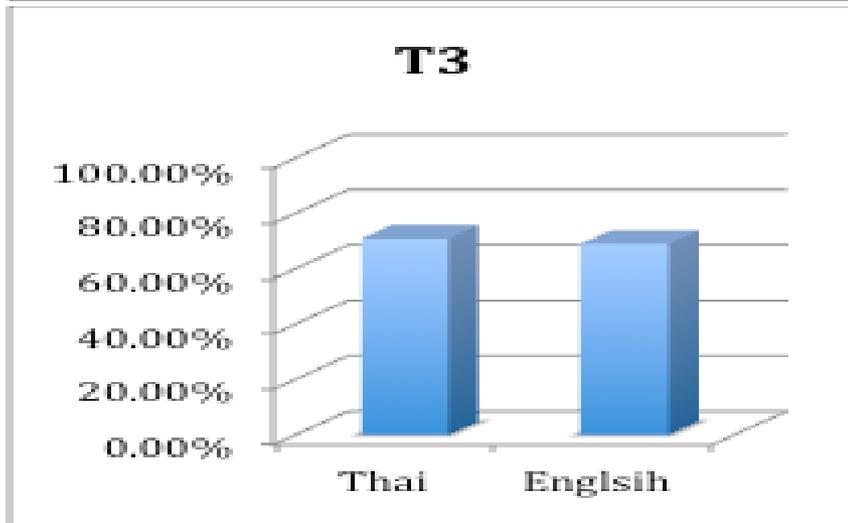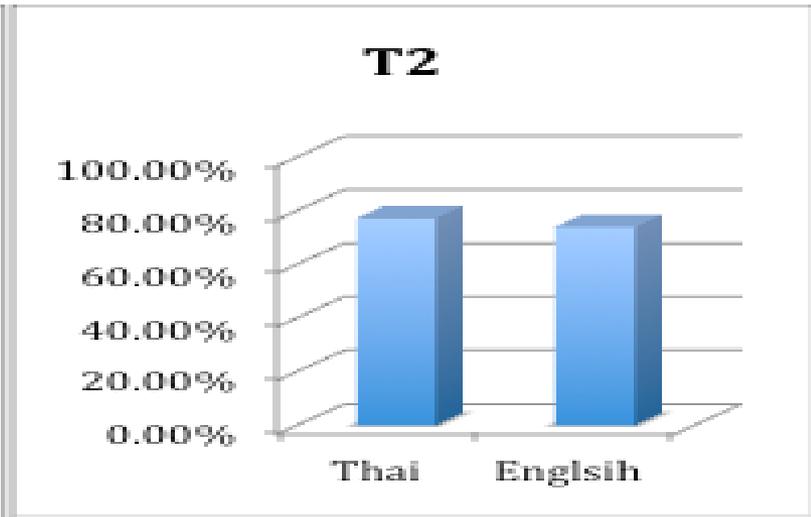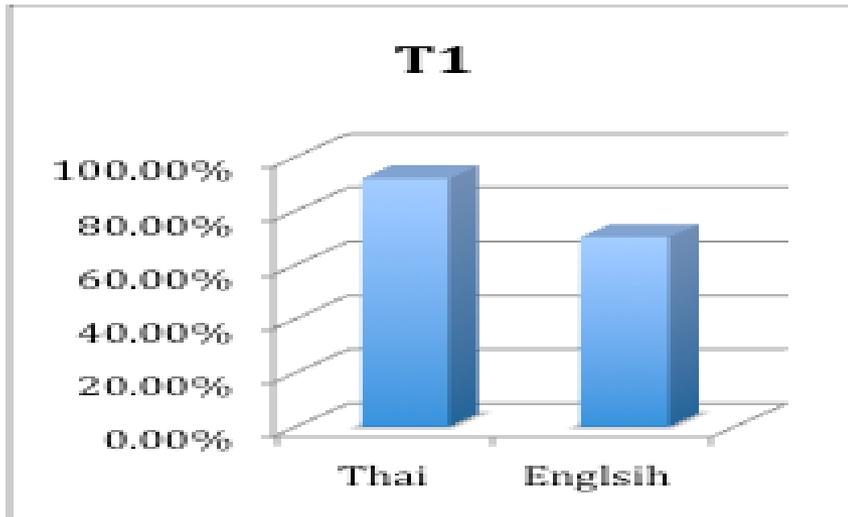
The Thai and English participants' A-prime scores in the identification test
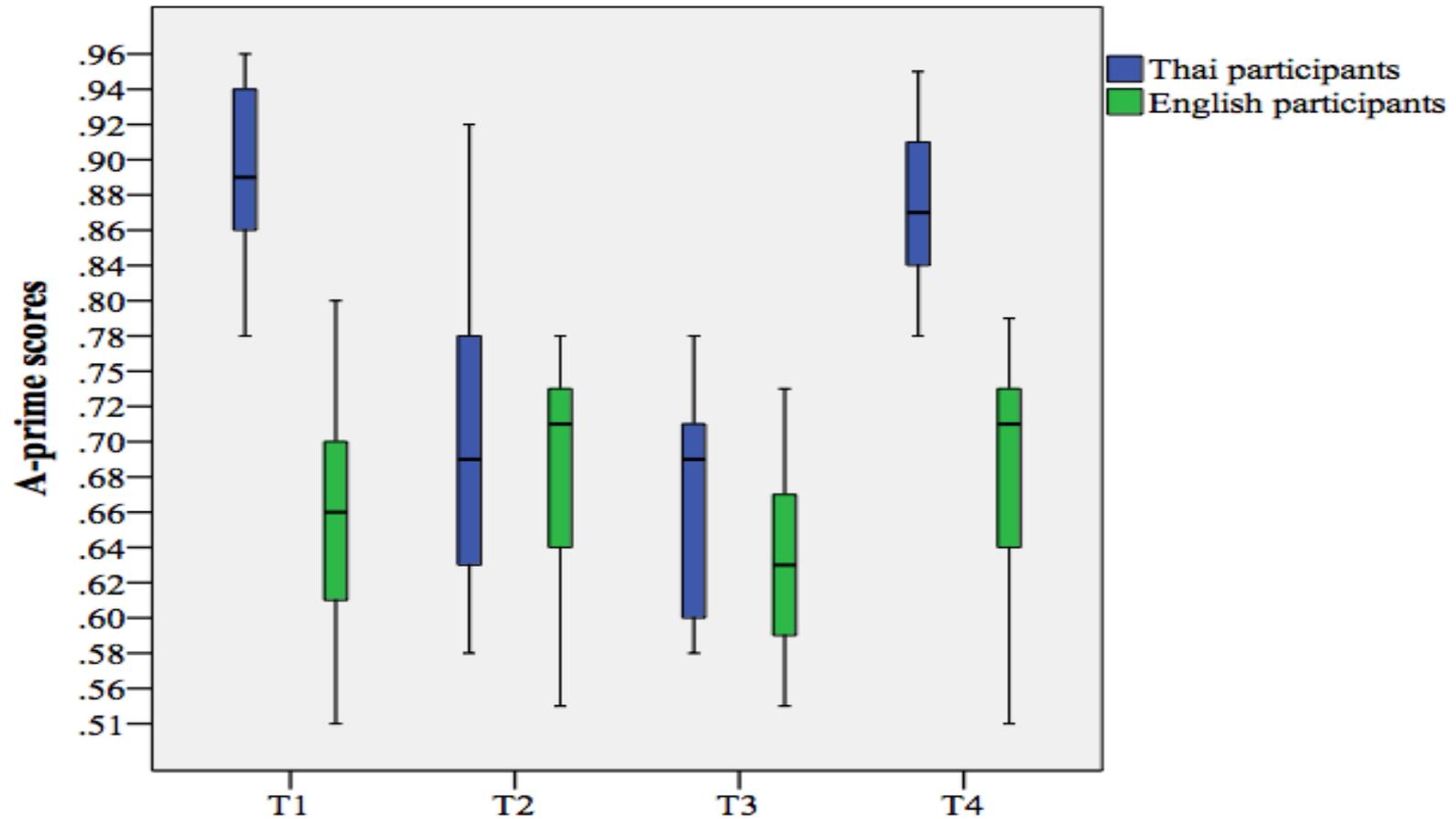
Statistic analysis

- *tone difference* (F (3, 60)=37.99, p<0.001) and the interaction between *tone difference* and *group difference* (F(3, 129)=43.07, p<0.001) all found to have displayed significant effect on the participants' *A′* scores (*Mauchly's Test of Sphericity*=0.518).

- *gender difference* was found to be non-significant for the Thai participants (F(1, 19)=0.06, p=0.81) and English participants' (F(1, 22)=0.37, p=0.55) *A′* scores.

Thai participants' confusion matrices in the identification test

target	Responses (%)				
	T1	T2	T3	T4	Total
T1	**82.01%**	6.40%	5.94%	5.65%	100.00%
T2	5.23%	**67.25%**	24.71%	2.81%	100.00%
T3	3.20%	29.03%	**60.98%**	6.79%	100.00%
T4	4.55%	6.77%	4.21%	**84.47%**	100.00%

English participants' confusion matrices in the identification test

target	Responses (%)				
	T1	T2	T3	T4	Total
T1	**60.29%**	21.45%	9.97%	8.29%	100.00%
T2	18.50%	**64.08%**	15.33%	2.09%	100.00%
T3	9.34%	21.90%	**59.01%**	9.75%	100.00%
T4	8.83%	9.44%	9.53%	**72.20%**	100.00%

Findings

1. The Thai participants significantly outperformed the English participants in the identification of T1 and T4.

2.the two groups of participants showed different confusion patterns among the 4 Mandarin tones. Thai participants' most significant confusion lied in the identification between T2 and T3. The English participants, however, displayed serious confusions in T1-T2 and T2-T3.

Thank you!