

# Effects of Mandarin Tones on the Production of English Intonation



Min Zeng (Waseda University) zengmin@fuji.waseda.jp, zengmin311@gmail.com

### Background

#### **Tone language and non-tonal language**

- Mandarin is a typical tone language
- English is a typical non-tonal language
- Mandarin speakers rely on their **lexical tones inventory** to produce English prosody (Ploquin, 2013)

### Intonation

• Deviations in the production of **L2** (second language) stress, rhythm and intonation may affect listeners' judgments more than deviations in the production of L2 vowels and consonants (Trofimovitch & Baker, 2006)

### **Pitch range**

- Mandarin EFL learners seem to have a wider pitch range than native English speakers, but only in single-word level (Ding, Hoffmann & Hirst, 2016)
- Both English and Mandarin speakers exhibited a considerably **narrower F0 range** overall in their **L2** than in their L1 (Viger, 2007)

## Methodology

#### **Participants**

- 6 males + 5 females = **11 American** native English speakers (**ES**)
- 6 males + 6 females = **12 Mandarin** speakers (English advanced level – TOEFL iBT > 80; **MS**)

### Materials & Stimuli

- 12 English **yes-no questions**, declarative sentences, and echo questions (9, 8 and 8 syllables, respectively)
- with English words: **fan**, pin, wall, line, **lawyer**, money, onion, winner, enemy, animal, **foreigner**, and millionaire at the end

### **Examples of voice recording materials**

- Did Ann go to see a new lawyer?
- Yes. Ann went to see a new *lawyer*.
- Really? Ann went to see a new *lawyer*?

#### **Procedures**

### **Research Questions**

- 1. How the pitch range of Mandarin EFL learners and native English speakers differ in producing English yes-no questions?
- 2. Do bilingual (Mandarin and English) and trilingual (Mandarin, English, and Japanese) speakers exhibit different pitch range in producing English yes-no questions?

- 1. Participants fill a questionnaire about their language background
- 2. Record voice of each participant (**three repetitions** of each sentence)
- 3. Use **Praat** to extract **pitch values** (Nuclear Pitch Accent (NPA),

**Phrase Accent** (PA), and **Boundary tone** (BT))

- > NPA is the last pitch accent in a phrase; PA is an additional tone after the NPA; **BT** is a rise or fall in pitch at the end of the intonational phrases or sentences. High boundary tone causes a rising pitch contour, signaling the question
- 4. Perform **MANOVA** (Multivariate Analysis of Variance) to compare pitch values of the **ES** and **MS** groups:

#### Independent Variables: Nationality and Gender

**Dependent** Variables: NPA & BT in **FAN**; NPA, PA, & BT in **LAWYER**; and NPA1, NPA2, PA, & BT in **FOREIGNER** 

### Results

#### **Pitch range** from NPA to BT of the ES and MS groups in English yes-no questions

#### Results of **MANOVA** to compare pitch values

(FAN, LAWYER, and FOREIGNER, respectively) between the ES and MS groups



Box's Test	Multivariate Test - Pillai's Trace						
Sig.	Effect	Value	F	df	Error df	Sig.	Partial Squar
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• The results of the Box's Test were **significant** for FAN, LAWYER, and

### **Discussions and Conclusion**

English speakers and Mandarin speakers show **clear pitch rising** in English yes-no questions **Pitch range:** 

#### Clear differences between gender; Mandarin speakers exhibited a higher pitch level than English speakers **Pitch level:**

#### → Mandarin's high pitch level influences Mandarin speakers in producing English intonation (cf, Ding, Hoffmann & Hirst, 2016; Eady, 1982; Ploquin, 2013)

### **Further Study**

- Analyze the remaining data for larger sample sizes to see if there were change in the results of the Box's Test
- Perform MANOVA for declarative sentences and echo questions to see if the results are consistent
- Divide the Mandarin speakers into two groups bilingual and trilingual group to see if the two groups had significant differences in pitch range at boundary tones

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