From Lexical Tone to Sentence Intonation: Training Mandarin Speakers of English

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Introduction

- Native speakers of tonal languages, such as Mandarin, have difficulties acquiring the sentence intonation of stress-accent languages like English
  - ‘Ma’ in Mandarin changes the meaning of the word
  - ‘bread’ in English only changes the sentence meaning
- Research on the acquisition of suprasegmentals is scarce in comparison to that on sound acquisition and almost exclusively descriptive

Introduction

- Previous work has found that Mandarin ELLs:
  - Assign pitch accents to each word in a sentence including monosyllabic function words (Juffs 1990, McGory 1997)
  - Produce non-target like boundary tones in most sentence types (Meng & Wang 2006)
  - Produce pauses rather than boundary tones to signal sentence endings (Chen 2006)
- Suggests that ELLs whose native language is tonal reinterpret sentence intonation in English as it is interpreted in their native language

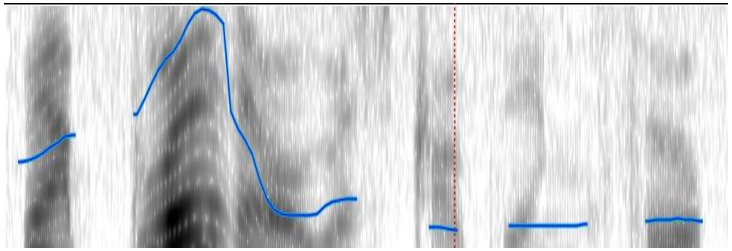
Introduction

- Goals of the project:
  - Assess the prevalence of the aforementioned patterns by means of a direct imitation task given to 10 highly proficient Mandarin ELLs
  - We will explore the learnability of the most salient patterns from the above imitation task in a perception training experiment
    - 6 one hour sessions containing high variability stimuli (Bradlow &Pisoni 1997, Wang & Jongman 1999)
    - Pre-, post-, generalization and retention tests

Introduction

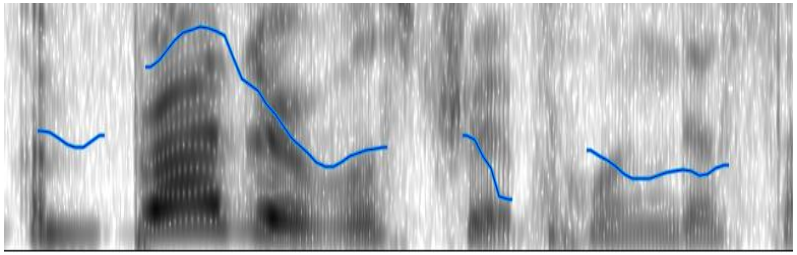
- Results from the imitation task show:
  - Mandarin ELLs were able to imitate a wide variety of pitch movements, but failed at imitating a lack of pitch movement

Native English



My brother was dribbling the soccer ball

Chinese



My brother was dribbling the soccer ball

Introduction

- Indicates that they could not produce a word without a pitch pattern
- Also indicates that subjects related a particular pitch pattern with a word in isolation and then insert that pitch shape directly into a sentence without changing it

Methods: Subjects

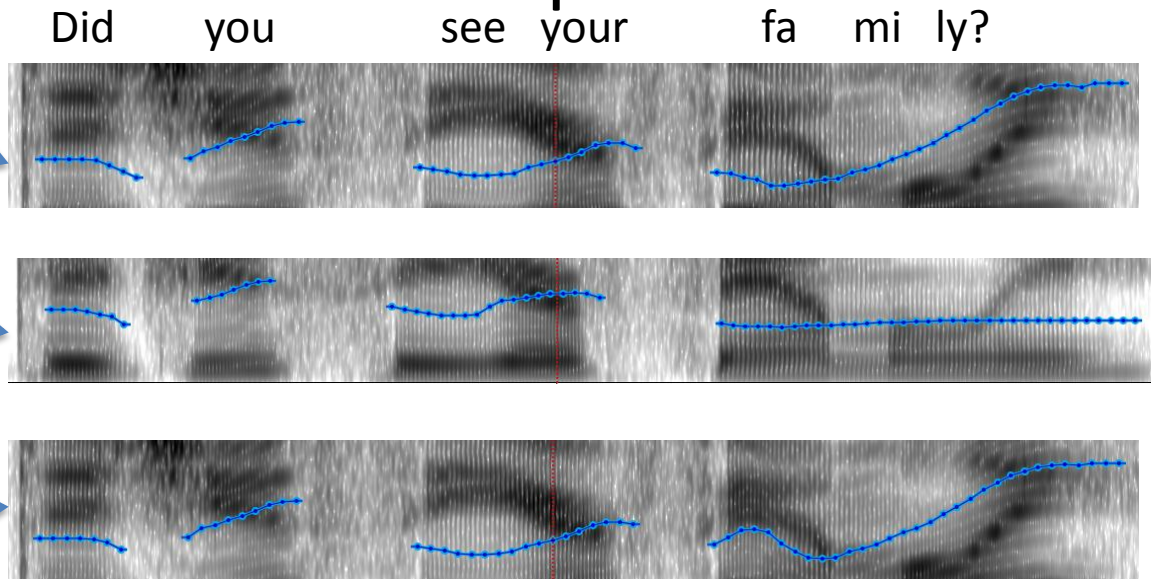
- 7 native speakers of Mandarin who were advanced speakers of English
- Average age of: 18.5 years
- All had lived in the US for less than a year

Methods: Materials

- 25 two syllable target words
- 25 three syllable target words
- Two speakers- one male and one female
- Each word read twice:
  - With the stress on the correct syllable FA-mi-ly
  - With the stress on the incorrect syllable fa-mi-LY

Methods: Materials

- Each target word inserted into the end of a yes/no question with the stress on the correct syllable
- 3 manipulations of the same question:
  - Native
  - Flat
  - Chinese



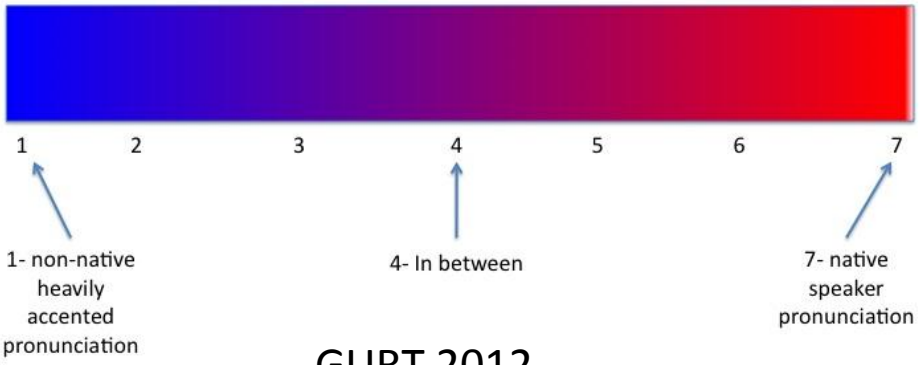
Methods: Pre- Post-Tests

- Word task:
  - They hear one word and answer: On which syllable is the stress?

3 2 1

FA • MI • LY

- Sentence task
  - They listen to one sentence and answer: Is this the native pronunciation of the English question?



GURT 2012

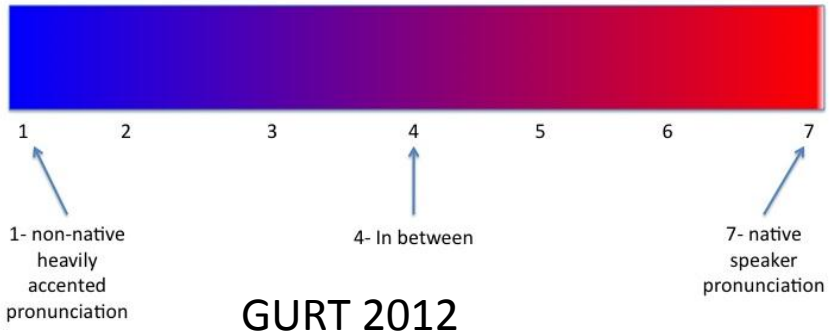
Methods: Training Procedure

- Week 1→ 3 sessions with 2 tasks each focusing on individual target words
- Feedback given
  - On which syllable is the stress?

3 2 1

FA • MI • LY

  - Is this the native pronunciation of the English word?



GURT 2012

Methods: Training Procedure

- Week 2 → 3 sessions with 3 tasks each focusing on target words embedded within sentences
- Feedback given

1 Which of these is the most native-like pronounced English question?

- Pairing of native question with either flat OR Chinese question with two answer choices

A

B

2 Which of these is the most native-like pronounced English question?

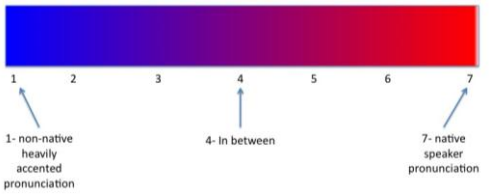
- Pairing of any combination of native, flat, and Chinese questions with three answer choices

A

B

Neither

3 Is this the native pronunciation of the English question?

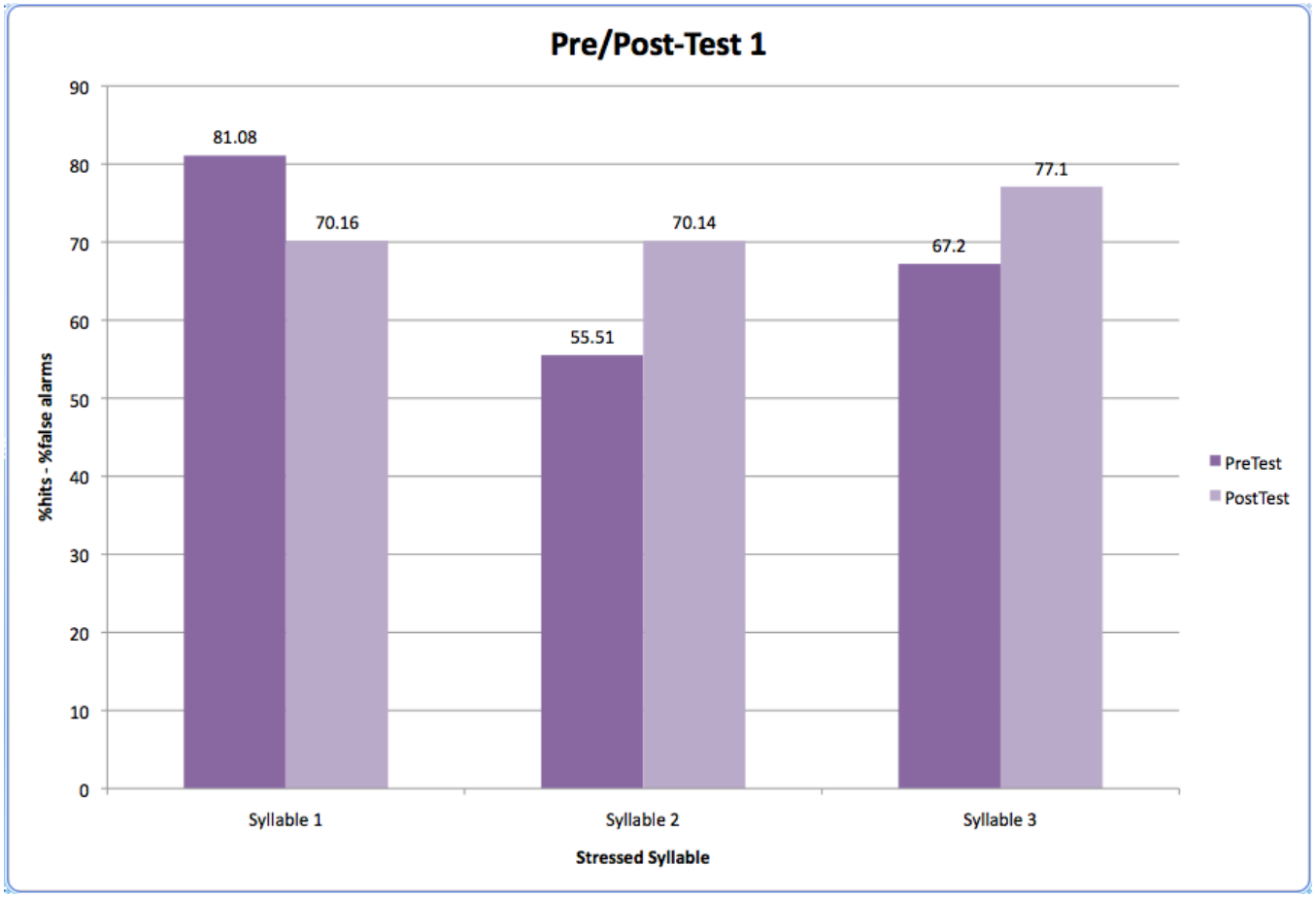


Pre/Post-Test Results: Words

- On which syllable is the stress?

3 2 1

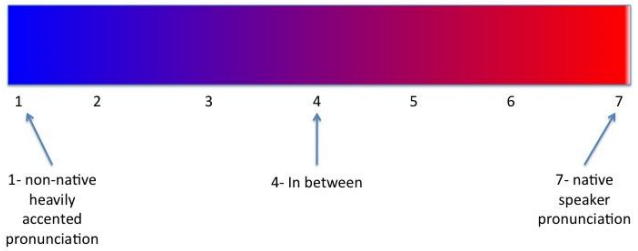
FA • MI • LY

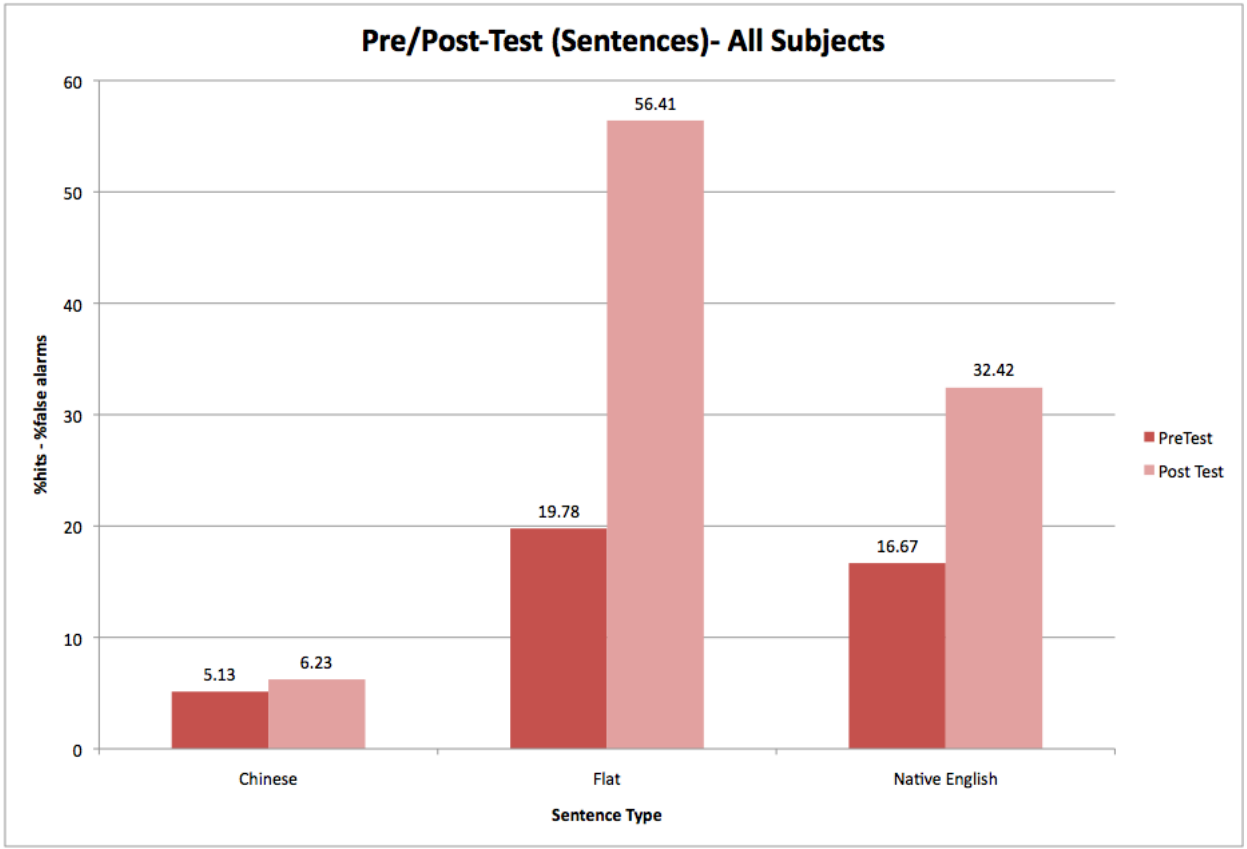


In general, speakers identified the stressed syllable of a word better in the post-test.

Pre/Post-Test Results: Sentences

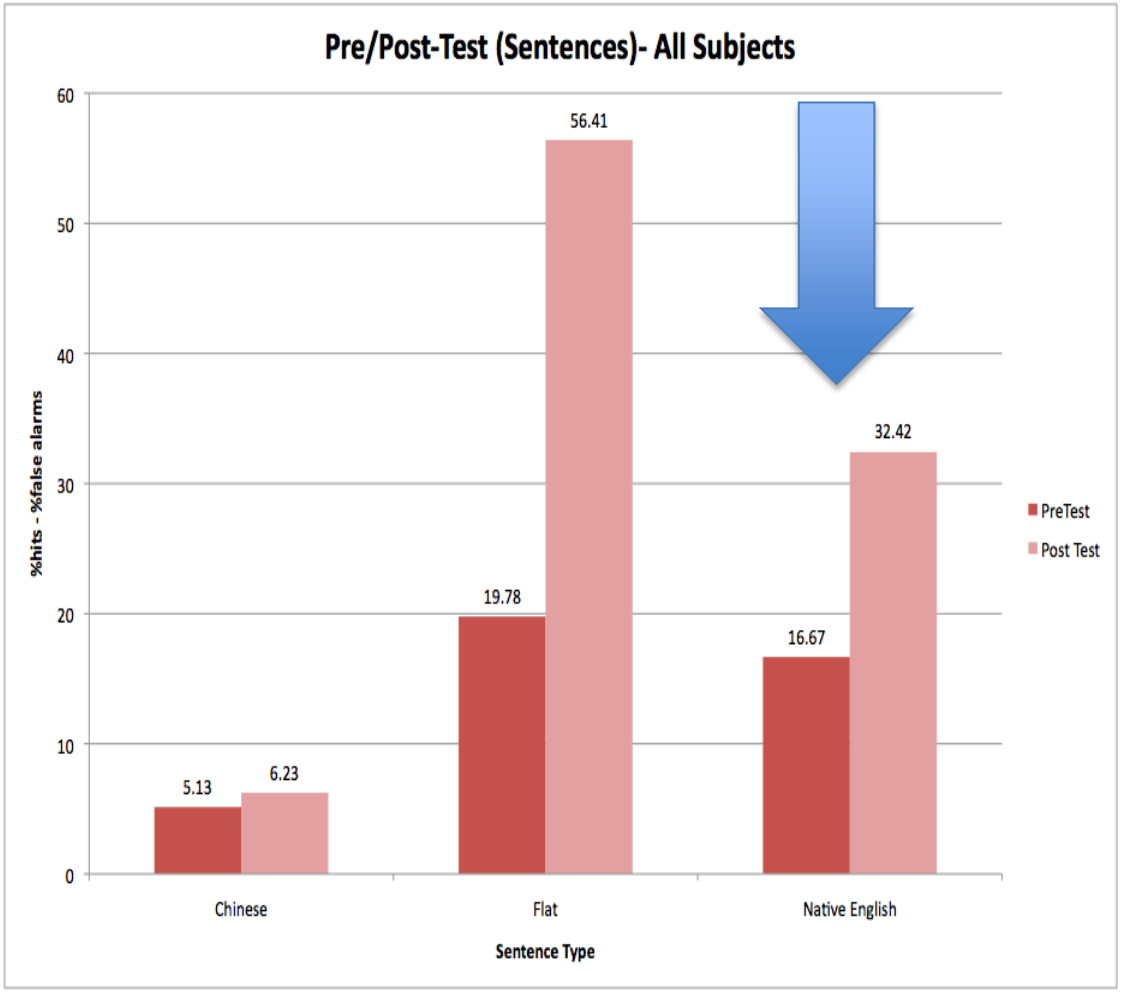
- Is this the native pronunciation of the English question?

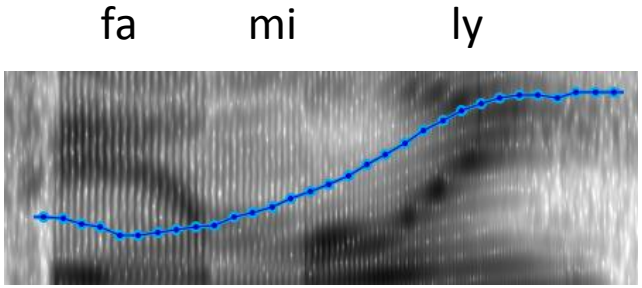




In general, subjects performed better in the post-test than in the pre-test, showing learning of the English yes/no question intonation pattern

Pre/Post-Test Results: Sentences





Participants rated as correct the native English pattern more often in the post-test

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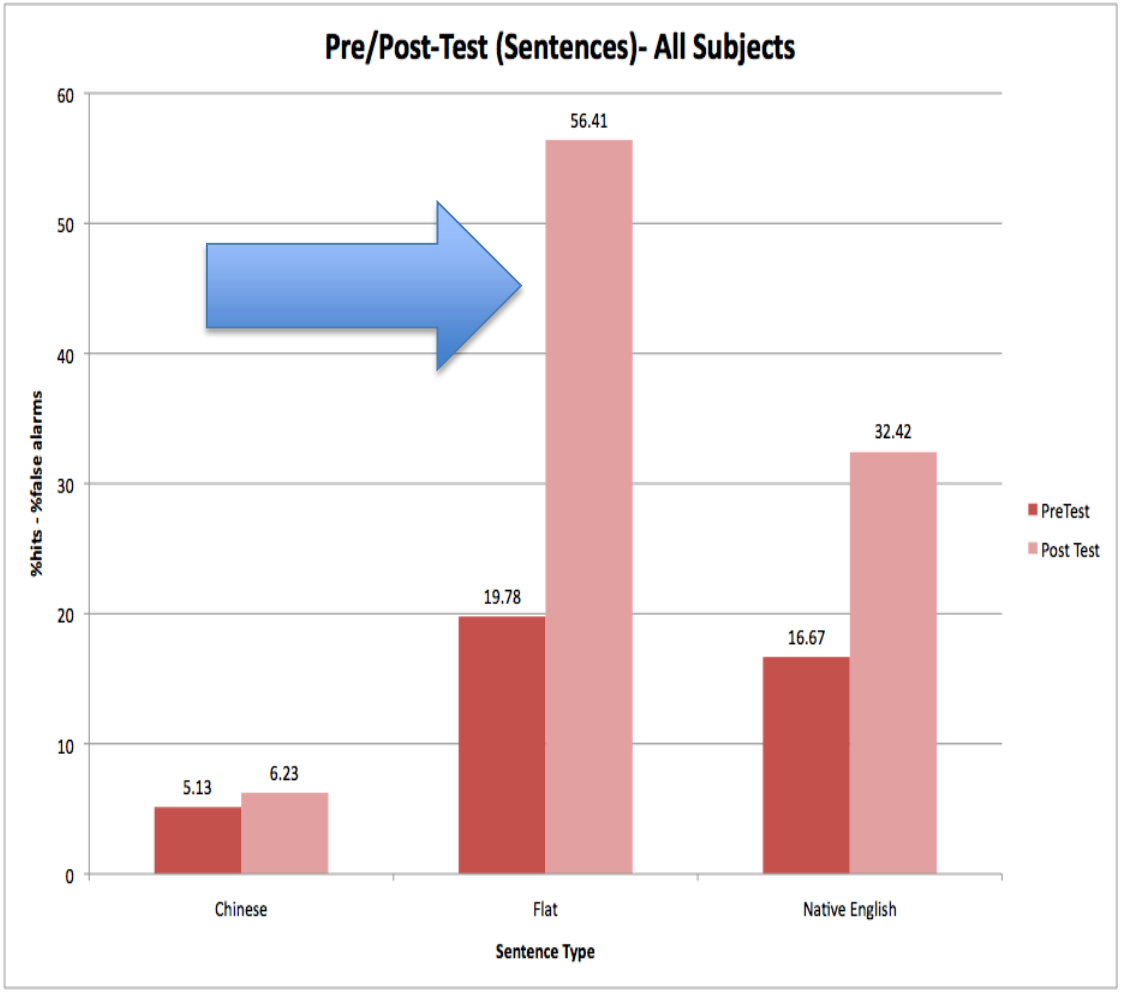
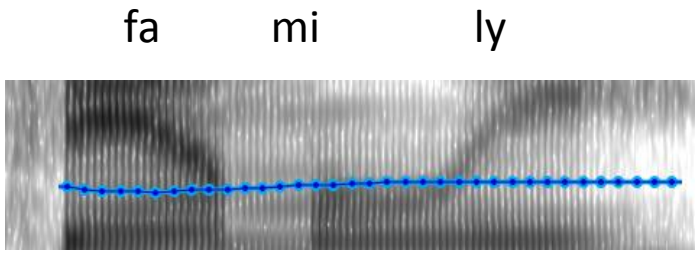
Pre/Post-Test Results: Sentences





Participants learned to rate as incorrect questions with a low boundary tone

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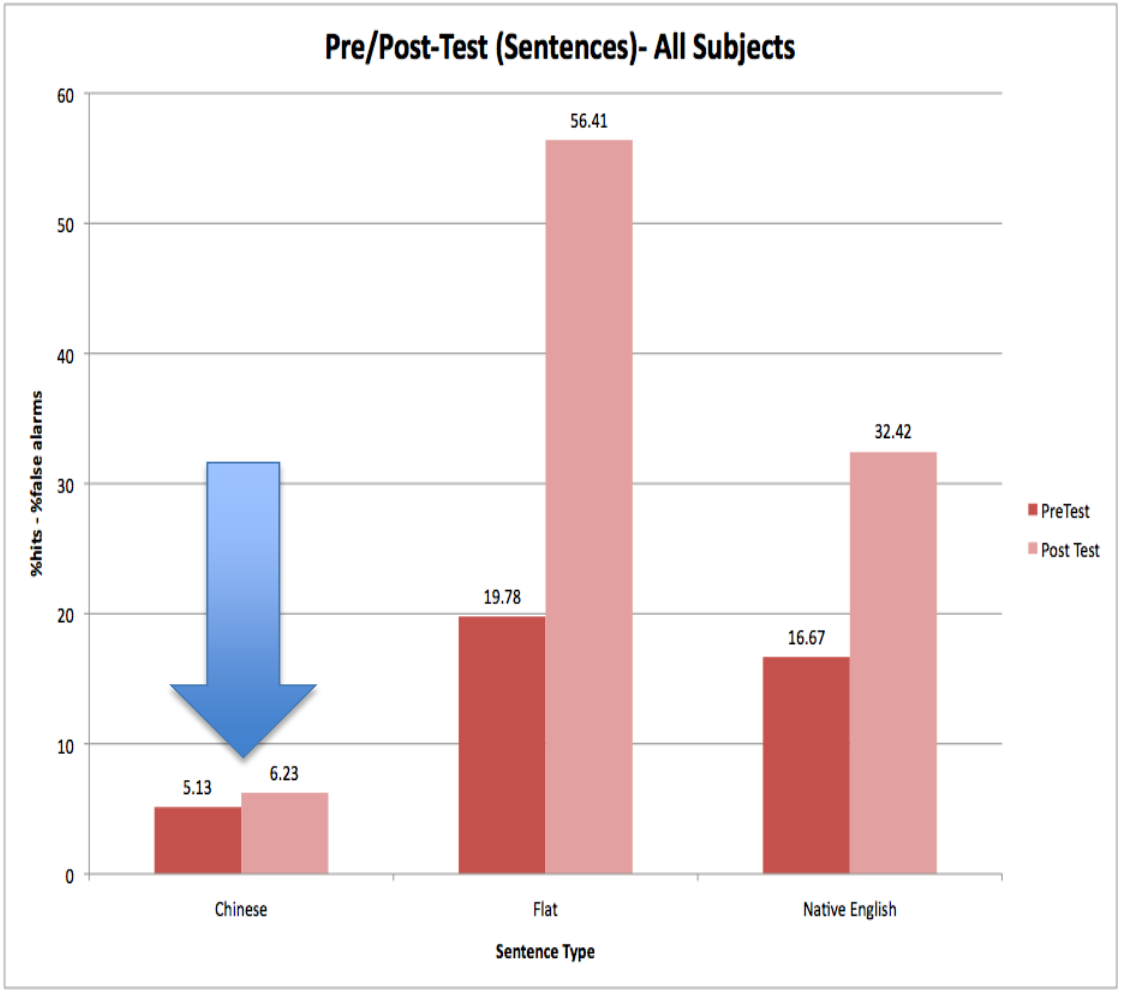
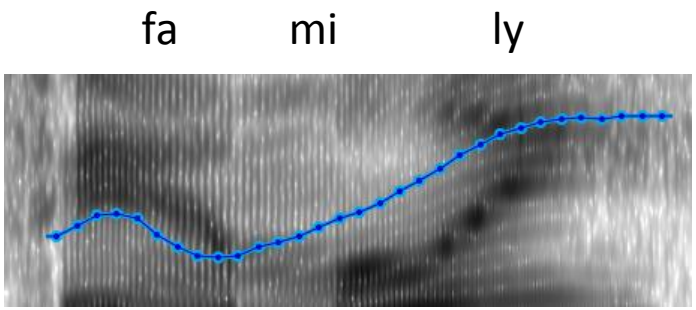
Pre/Post-Test Results: Sentences





Participants had trouble rating as incorrect a H* nuclear pitch accent, which is the most common error in Mandarin pronunciation of English questions

Summary

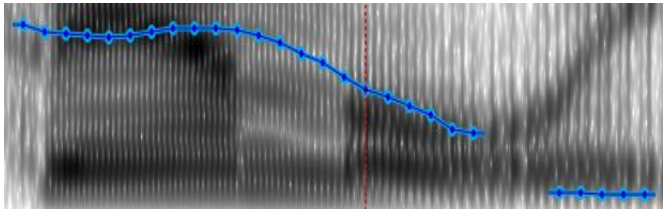
- Overall, Mandarin speakers of English learned to dissociate pitch shape from lexical meaning
  - Word in isolation:
    - They learned to associate the stressed syllable with an F0 peak (H*) and the end of a word with a low boundary tone (L%)
  - Word in context:
    - When the target word is embedded in a question, they learned to associate question meaning with a high boundary tone (H%)
    - They learned to associate the stressed syllable of the target word with an F0 valley (L*)
    - However, they persisted in also associating the stressed syllable of the target word with an F0 peak (H*)

Summary

Learned:

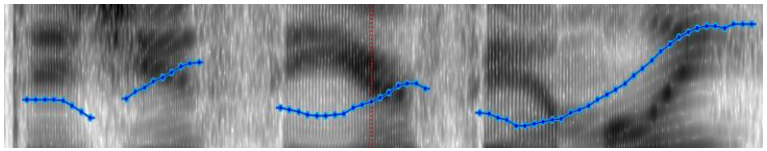
Word in isolation

fa mi ly

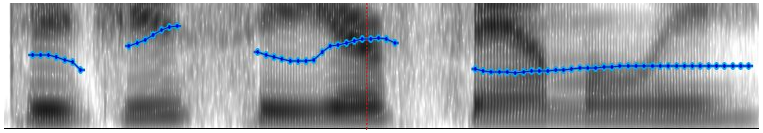


H* L%

Word in context



Question

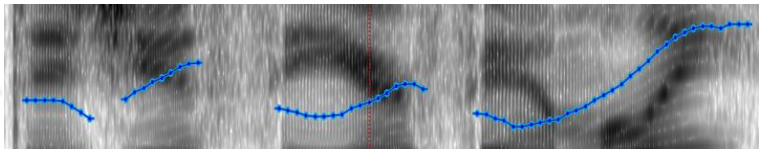


Not a question

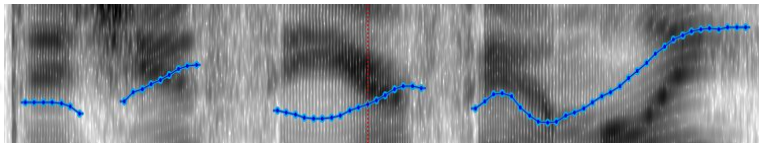
Mistakes:

Word in context

Native English Pronunciation of a Question



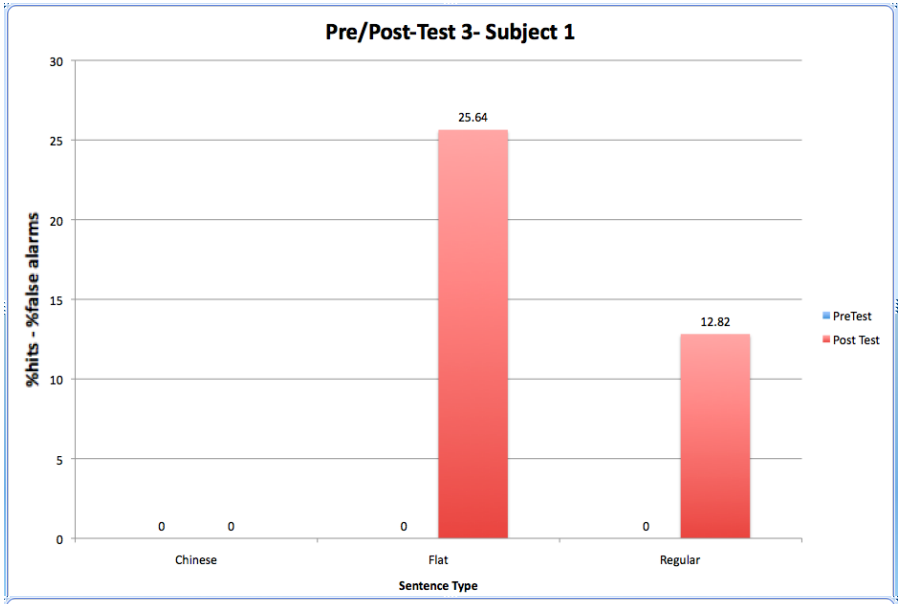
Native

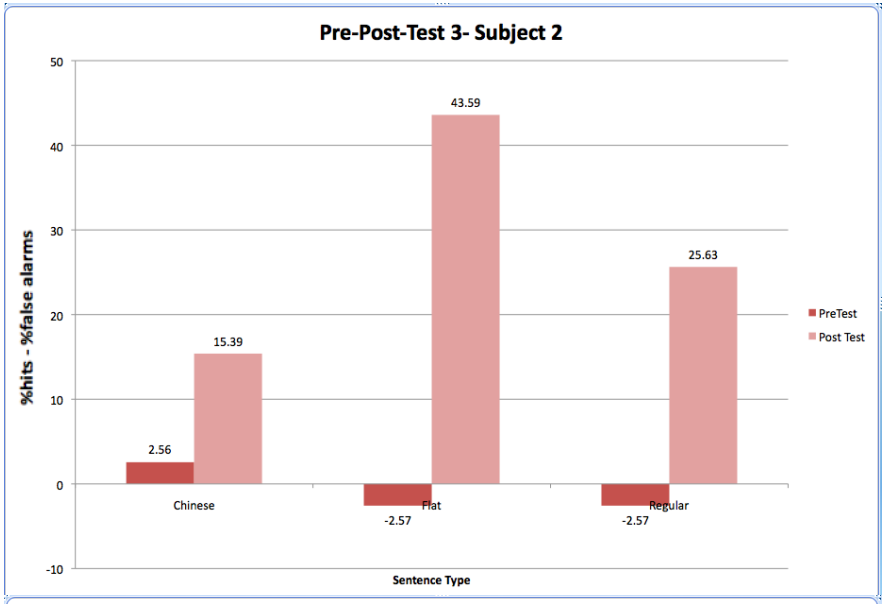


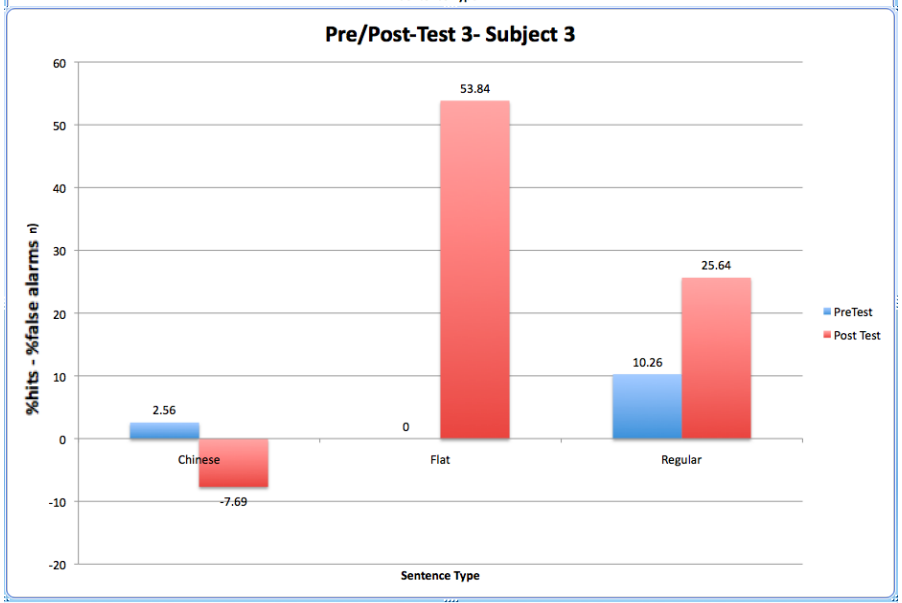
Chinese

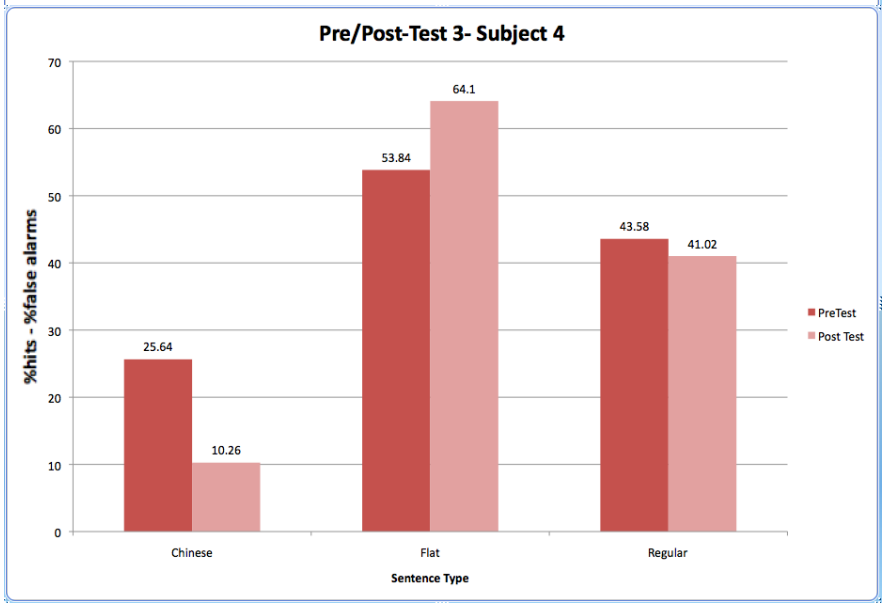
Can subject variation account for the larger amount of learning of boundary tones?

Pre/Post-Test Results: Subject Variation

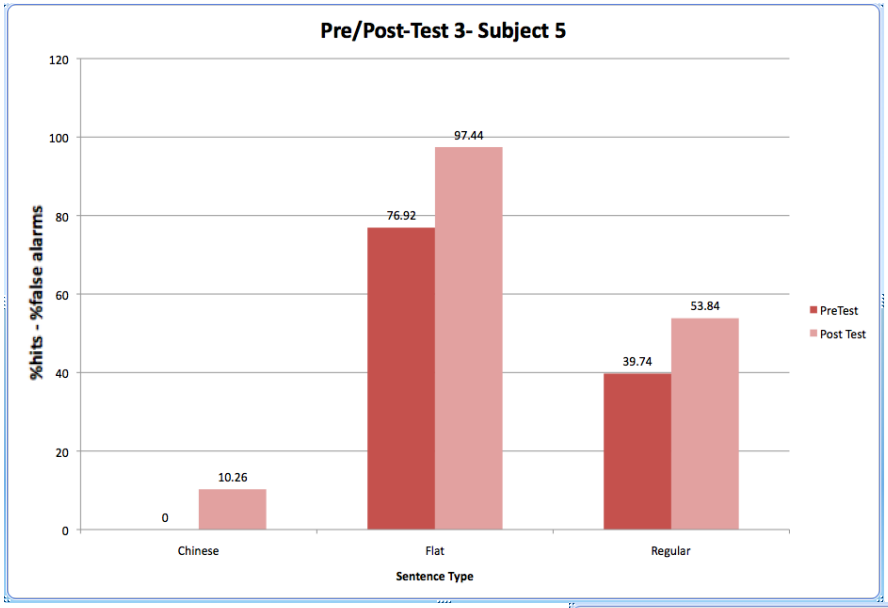


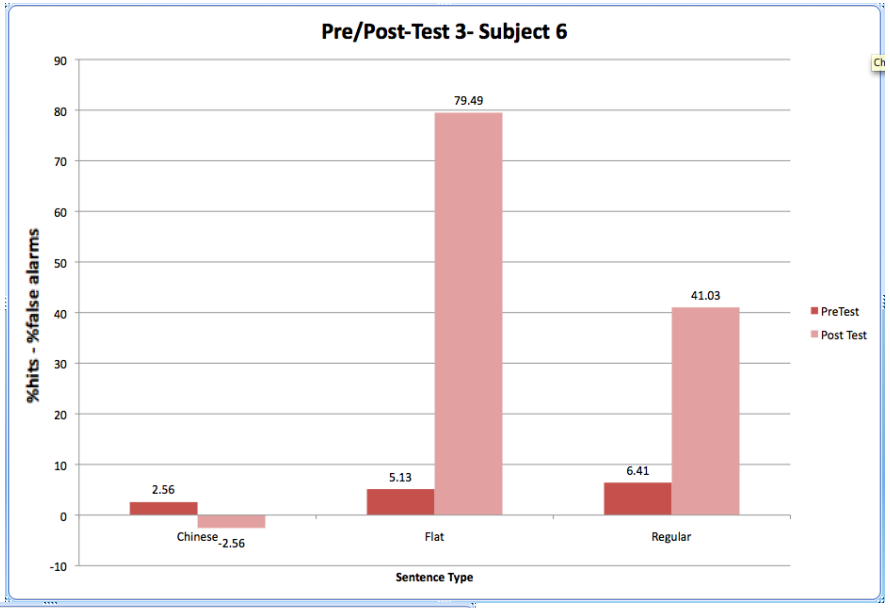


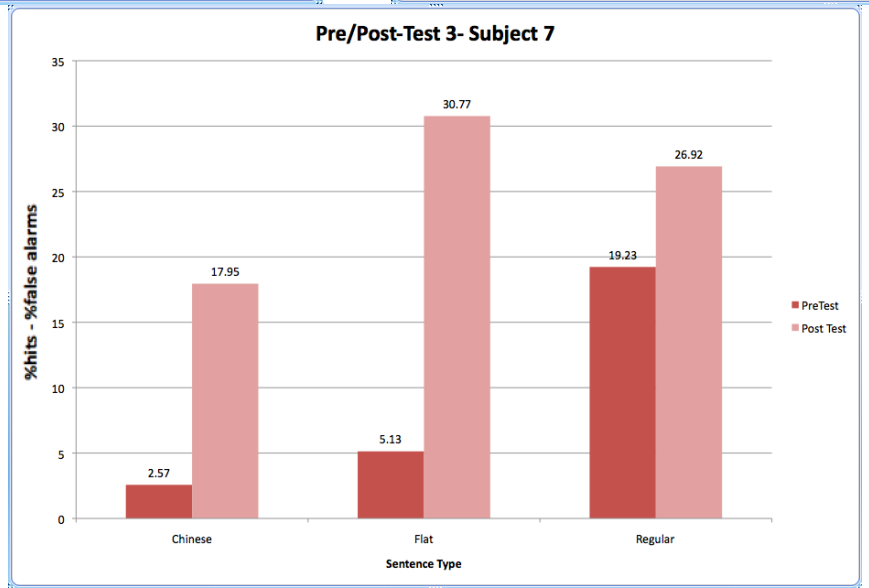




Pre/Post-Test Results: Subject Variation







Summary

- For every subject, the most learning occurred in the flat sentences, showing that they learned to dissociate a low F0 with a question boundary tone (H%)
- All but one subject (4) learned to associate high boundary tones with native English questions
- Subjects showed much variation in the amount of learning for Chinese-like questions
- Therefore, they are still learning to dissociate a high F0 from and associate a low F0 with the nuclear pitch accent of a question (L*)

General Discussion

- Before training, subjects were adept in identifying the stress of words in isolation
- However, they were not able to identify the native pronunciation of an English question, showing that changing the pitch shape of a word because of sentence intonation was still difficult for them

General Discussion

- After training, subjects began to associate pitch shapes with sentence meanings while dissociating pitch shapes from word meanings
- They first learned to associate boundary tones with questions
- They are still working on associating nuclear pitch accents only to low F0 (L*) and not to high F0 (H*)