

# Teaching Mandarin tones to native English speakers: Tone-mimicking hand gestures vs assimilation to English intonational categories.

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# Research Background

- Tone-mimicking gestures are held to be effective in enabling English-speaking learners of L2 Mandarin to discriminate the four Mandarin lexical tones (Morett & Chang, 2015).
- This cross-modal support may be limited, as L2 learners still need to interpret the visual information into an appropriate auditory format.
- An auditory-only method of lexical tone training is suggested by consideration of the Perceptual Assimilation Model for L2 learners, which proposes that L2 learners assimilate L2 sounds to existing L1 categories at points of relative similarity in the L1 and L2 phonological inventories (Best & Tyler, 2007).

# Research Question

- The comparison of within-modality and cross-modality training methods on native English speakers' learning of Mandarin tones.

# Research Purpose

- We compared the effect of two training methods on English speakers' learning of Mandarin lexical tones:
  1. Gesture observation (GO): Observation of hand gestures that mimic tone contours.
  2. Tone assimilation (TA): Assimilation of Mandarin tones to English intonational categories.

# Research Design

- Between-subject design
- Participants:
  - 75 native British English speakers with no experience of any tonal language.
  - They were randomly assigned to one of the three training groups.
- Training conditions:
  - Gesture observation (GO)
  - Tone assimilation (TA)
  - Baseline control (BC)

# Research Design

- Training videos:
  - Gesture observation (GO): The instructor presented the Mandarin stimuli using her hand to mimic the corresponding lexical tone pitch contour.

tone 1 vs. tone 2

bi1



bi2



# Research Design

- Training videos:
  - Tone assimilation (TA): Mandarin tones 1, 2, 3 and 4 were explicitly compared to English hesitation, question, uncertainty, and statement intonation contours respectively, with each tone and its corresponding English intonation contour demonstrated before the presentation of the training videos.

tone 1 vs. tone 2

hesitation intonation vs. question intonation

bi1



bi2



# Research Design

- Training videos:
  - Baseline control (BC): The videos were presented in a similar way as in the GO and TA conditions, except that the instructor did not perform pitch-mimicking hand gestures and the English intonation comparisons were not discussed.

tone 1 vs. tone 2

bi1



bi2

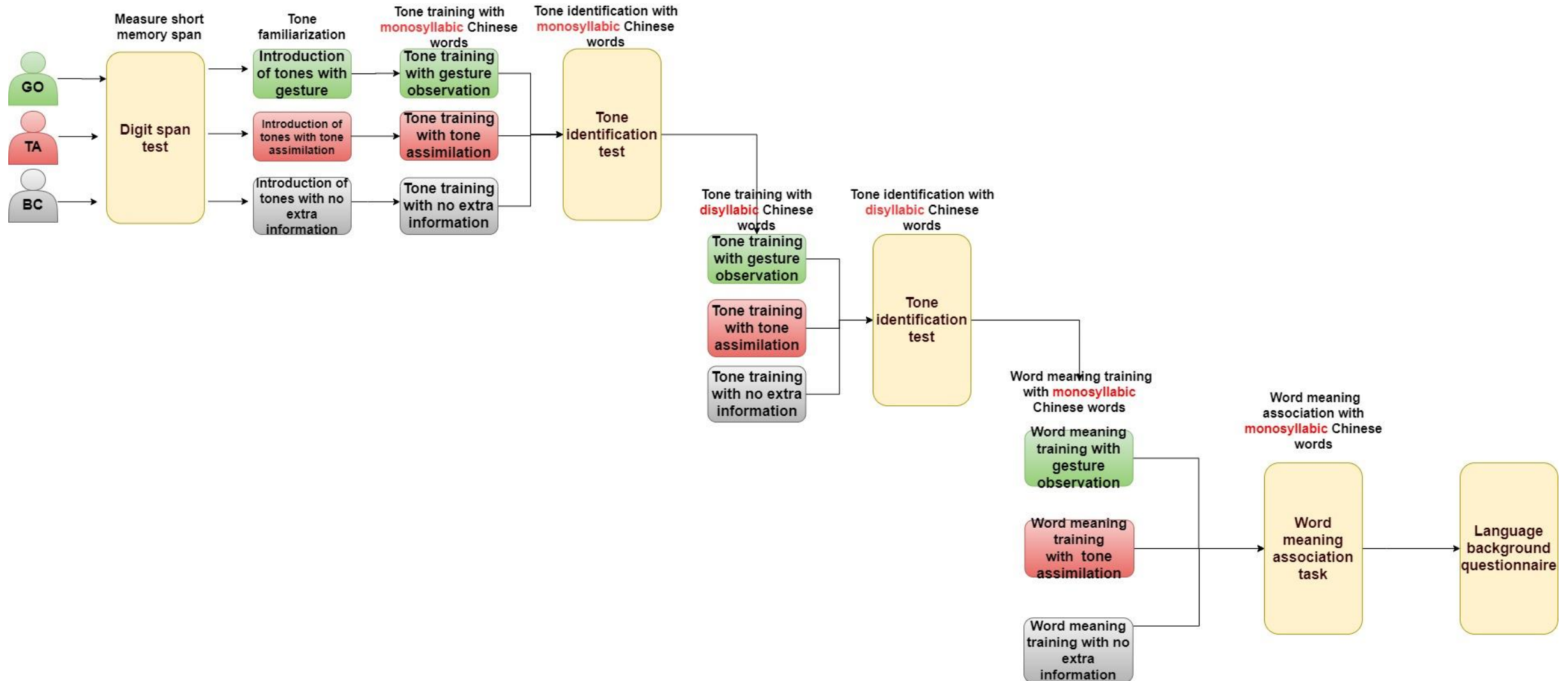




# Procedure

1. Digit span test.
2. Tone identification test with monosyllabic Chinese words.
3. Tone identification test with disyllabic Chinese words.
4. Word meaning identification test with monosyllabic words.
5. Language background questionnaire.

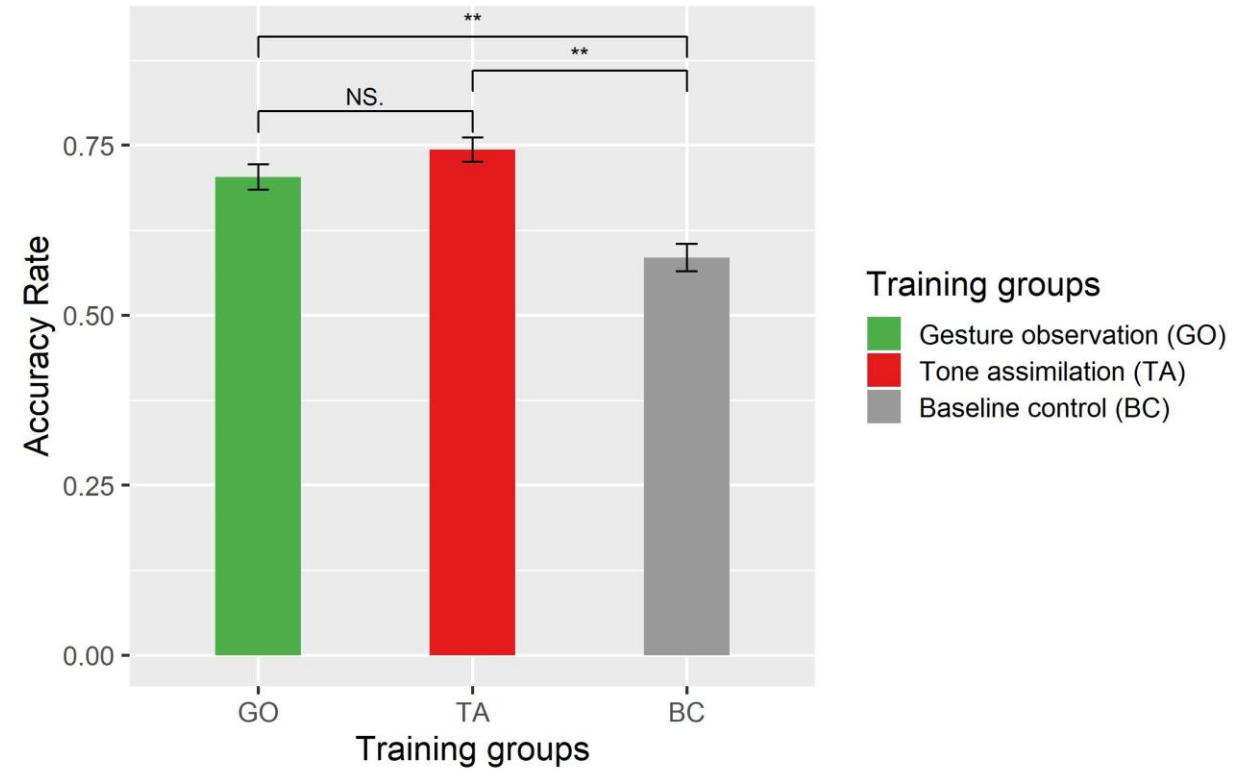
# Research Design



# Results

- Mean accuracy (%) in the tone identification task with monosyllabic Chinese words.

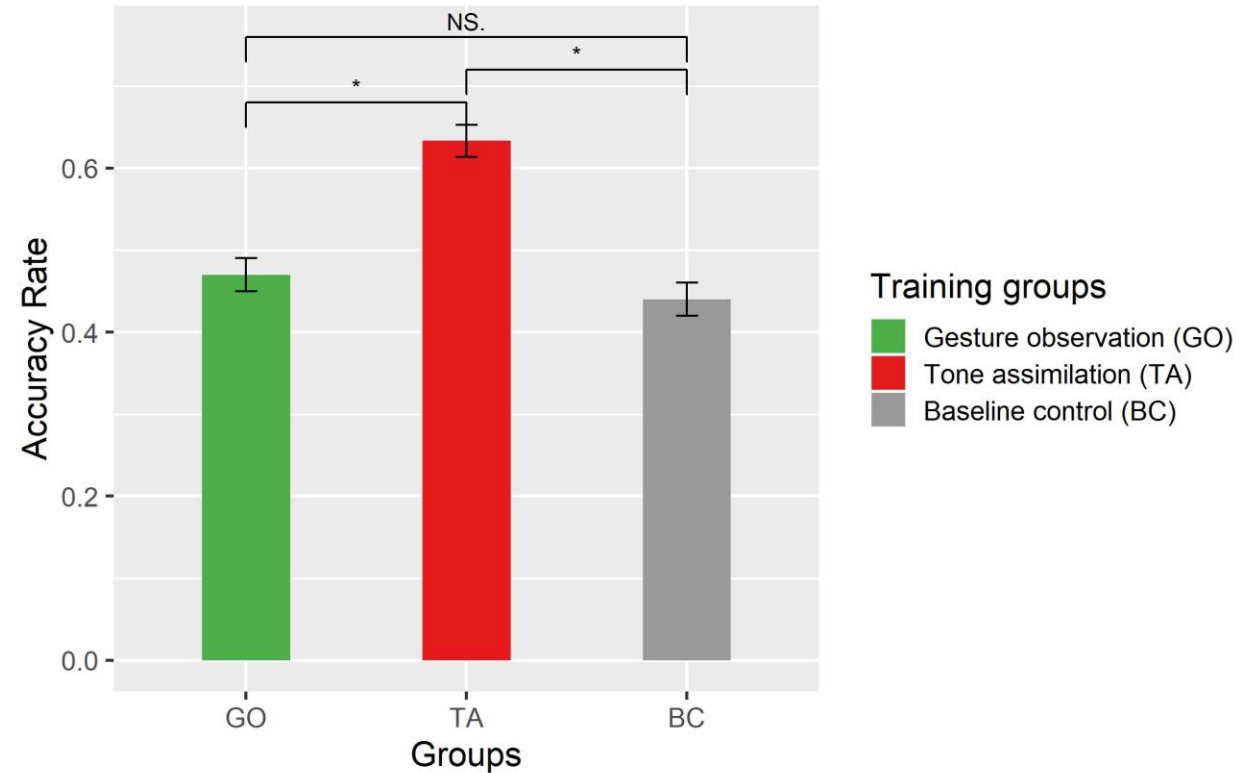
| Group               | Mean | Std. Error |
|---------------------|------|------------|
| Gesture observation | 70.3 | 1.9        |
| Tone assimilation   | 74.3 | 1.8        |
| Baseline control    | 58.5 | 2.0        |



# Results

- Mean accuracy (%) in the tone identification task with disyllabic Chinese words.

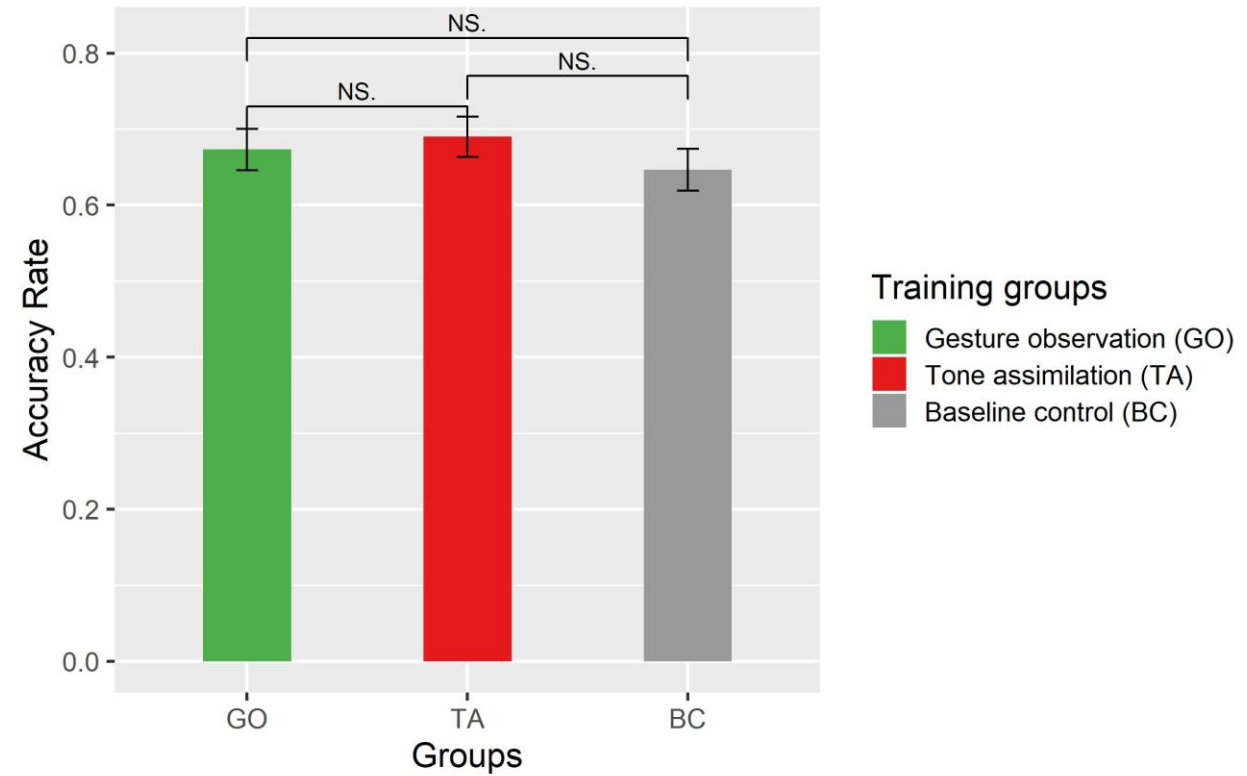
| Group               | Mean | Std. Error |
|---------------------|------|------------|
| Gesture observation | 47.0 | 2.0        |
| Tone assimilation   | 63.3 | 2.0        |
| Baseline control    | 44.0 | 2.0        |



# Results

- Mean accuracy (%) in the word meaning association task with monosyllabic Chinese words.

| Group               | Mean | Std. Error |
|---------------------|------|------------|
| Gesture observation | 67.3 | 2.7        |
| Tone assimilation   | 69.0 | 2.7        |
| Baseline control    | 64.7 | 2.8        |



# Discussion

- Both gesture observation and tone assimilation are helpful for English-speaking learners of Mandarin to learn L2 lexical tones at the initial stage.
- When the lexical tone combinations became more complicated (e.g., disyllabic Chinese words), a within-modality training method (TA) may be more helpful than a cross-modality method (GO).
- A similar pattern of accuracy rates was found in the word meaning association task, but differences were not statistically robust:
  - Training was brief while word meanings take time to assimilate.

# Conclusion

- Both within-modality and cross-modality training methods are beneficial in training English-speaking learners of perceiving the differences among Mandarin tones.
- A within-modality training method could be more beneficial when learners perceive and differentiate more complicated tone combinations.

# References

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