Identification of Mandarin Tone-2 and Tone-3 in Disyllabic Contexts by Chinese Natives and Japanese Students

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Introduction

• The acoustic performance of the tones of Mandarin is believed mainly to follow the pattern of f0, which is also the major clue in its tonal perception.
• The practical running speech, the f0 pattern has more or less deviation due to coarticulation. Native speakers neglect those deviations and regard them as the same phoneme. Tone context does have an effect on Mandarin tonal identification.

Method

Stimuli and subjects

• 15 samples of Mandarin disyllabic tonal stimuli and subjects
• Each sample played in random arrangement once, with a 4.5 second interval in between.
• Sounds played by computer automatically.

Procedure

• Sounds played by computer automatically.
• Participants fill out questionnaire.
• Each sample played in random arrangement once, with a 4.5 second interval in between.
• A short period of orientation before test, in which they were given 20 samples.

Results

On the T2-T3 continuum

Chinese: the perceptual boundary is distinct and there is a significant tendency of the interaction between tone contexts and the identification of T2 and T3. FT2(1, 7) = 6.44, p<0.05; FT3(1, 7) = 6.10, p<0.05. To make it more concise, the perceptual boundary between T2 and T3 emerges later along the continuum when the test syllable possesses the post position other than the preposition.

In all, tone perception is vulnerable to contexts for Japanese as well but consistency is higher among Chinese.

On the T2-T3* continuum

Chinese: there is a significant interaction between tone-identification and tone contexts. FT2(1,7)=12.37, p<0.05; FT2(1,7)=13.51, p<0.05; FT3(1,7)=48.02, p<0.05; FT4(1,7)=17.34, p<0.05, together with a gradient from easy-to-difficult pattern among Chinese: T3+X>T2+X>T4+X>T1+X. They perceive the test contours in these three contexts (+T1, +T2, +T4) as T3(*) from the fifth contour; perceive the first three contours as T2 while perceive the fourth to seventh as T1, and identify the eighth to twelfth contours, namely, the low-falling ones as T4.

Japanese: the result is quite similar to that of Chinese; however, the test contexts which have an H tone feature like T1+X and T2+X are difficult for Japanese to perceive as T1 whereas not by Chinese. This suggests that the H tone feature has stronger effects on Japanese students’ perception of T1; there is significant difference between the identification results of Chinese and Japanese on T1+X. Most of Chinese participants take them as T4, while the majority of Japanese take as T3 (*).

Conclusion

• Both Chinese natives and Japanese learners are affected by tone contexts in perceiving Mandarin tones.
• Chinese natives can adopt the phonological rules in depending while identifying tones, but Japanese cannot adopt them in some cases.
• Both Chinese natives and Japanese learners are affected by tone contexts in perceiving Mandarin tones.

Procedure

• Sounds played by computer automatically.
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Japanese: perceptual boundary between T2 and T3 from Japanese students is not as evident as Chinese participants. However, significant interaction is also found between tone context and perceptual identification. T2(1, 7) = 9.01, p<0.05; FT3(1, 7) = 14.04, p<0.05; T2-T3 continuum in T1+X combination are more likely to be identified by Japanese students as T2 compared to other combinations. Similar results can be seen in T4+X. When the contours of the T2-T3 are before the context tone, they have better chance to be identified as T3. It is less difficult to learn tones before than after.

References