Lexical tone in L2 Mandarin: The relation between categorical perception and real-time spoken word recognition
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Research Questions

RQ1: How do L2 learners process tonal cues along with segmental cues in Mandarin spoken word recognition?

RQ2: Does L2 learners’ use of tonal cues in spoken word recognition relate to the ability to perceive tone categorically?

Background

Tone is contrastive in Mandarin. Native speakers of Mandarin (L1ers)
• perceive tone pair continua categorically (Hual et al., 2004)
• use tonal and segmental cues concurrently in spoken word recognition (Malmi & Joannis, 2010)

Second language learners of Mandarin (L2ers)
• find tone challenging to master (Wang et al., 2006)
• perceive tone less categorically than L1ers (Shen & Froud, 2016, 2018; categorical perception (CP) is correlated with L2 proficiency (Liu et al., 2016)
• can identify tone in isolated syllables, but show difficulty in processing tone lexically (Field et al., 2018)

→ No study has investigated the relationship between CP and lexical processing of tone in L2 Mandarin
→ Contribute towards a better understanding of “the bridge between phonemes and words” in L2 processing (Wong & Perrachione, 2007)

Participants

• L1ers: 30 native Mandarin speakers born and raised in China
• L2ers: 29 English-speaking learners of Mandarin; most recruited from intermediate to advanced Chinese classes in Hawai‘i and China; age of onset: >12 years; self-rated proficiency: M = 2.90/5 (SD=0.5); listening proficiency test score: M = 76.86% (SD=17.46%)

Visual World (VWP) Eye-tracking Experiment:
3 AOIs: Target, Competitor, Distractor; all monosyllabic concrete nouns
• 3 conditions, differ in phonological overlap of competitor with the target: SC: Segment competitor differs from target only by tone (gou – gou3) RC: Rhyme competitor shares rhyme with target (gou – shou3) VC: Vowel competitor shares vowel with target (gou – dou4)
• 36 critical trials = 12 sets (same target) * 3 conditions; 60 fillers

Method & Procedure

1. Background questionnaire
2. Familiarization and naming
3. Visual World Eye-tracking Experiment
4. Tone Identification Task
5. Listening proficiency test

Tone Identification Task:
• For each of the 6 tone pairs, 9-step continua (with /kou/) and a 4-step continuum (with /kou/) were created from naturally produced sounds using the FSOLA method (Mouloua & Lancho, 1995)
• Participants hear a sound and categorize it as sound A or B (blocked by tone pair)

Results

→ RQ1: Compared to native speakers, L2 learners weigh tonal cues less than segmental cues. This is true even for learners with above-chance accuracy in recognizing words by tone alone on trials with correct mouse click.

→ RQ2: The more L2 learners perceive tone categorically, the more they rely on tonal cues during spoken word recognition.

Summary & Conclusions

References


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