ABSTRACT

This study explores the effect of two training paradigms for learning Mandarin tones in pedagogical contexts. Eighteen beginning learners of Chinese with different first language background received three weeks of training as extra curriculum CALL activities. Based on learners’ choices, one group (the A Group, n=10) received perceptual training only with auditory input involving four-way forced choice identification tasks with immediate feedback. A second group (the AV Group, n=8) received perceptual and production training with auditory and visual input. At post test, both groups improved significantly in perceptual accuracy of Mandarin tones as compared with a control group (the C Group, n=10) and perceptual learning also generalized to new stimuli by a new speaker. Both training groups’ production accuracy of Mandarin tones also improved significantly at post test. The findings show that both training paradigms are effective and laboratory based training techniques can be implemented in CALL contexts.

INTRODUCTION

Mandarin Chinese contrasts four lexical tones, with Tone 1 having high-level pitch, Tone 2 high-rising pitch, Tone 3 low-dipping pitch, and Tone 4 high-falling pitch. The phonetic features of tones are acoustically manifested by the fundamental frequency (F0) values (pitch height) and F0 contours (pitch movement). For native Mandarin speakers, the primary cue for tone contrasts is pitch contours (Liu & Samuel, 2004; Xu, 1997). Therefore, native Mandarin listeners attach more importance to “contour” than the absolute “height” dimensions of tones (Wang, Spence, Jongman, & Sereno, 1999, 2003). Learners of Mandarin with no lexical tonal experience often demonstrate
difficulties in the perception and production of Mandarin tone contrasts (Wang et al., 1999, 2003). There is also evidence that native speakers of tone languages have difficulties perceiving and producing non-native tones accurately. For example, native Cantonese and Hmong (both are tone languages) speakers demonstrated greater difficulties in identification of Mandarin tones than native English speakers (So, 2005; Wang, 2006). It is speculated that tone language speakers’ difficulties with non-native tonal contrasts is not due to the lack of experience with tones but rather to the lack of one-to-one mapping between the L1 and L2 tones. Such mismatches between the two tonal systems may cause confusion to the learners when the similar but not identical L1 tones interfere with the perceptual contrasts of L2 tones, especially at beginning stage of learning (Wang, 2006).

Computer-based training using speech technology has proved to be effective for learning L2 speech contrasts at both segmental and suprasegmental levels (see more detailed discussions in the next section). However, there is a significant gap between some of the key research findings of laboratory studies and techniques that have actually been put into pedagogical practice (Wang & Munro, 2004). This is because most laboratory based studies on L2 speech learning are theoretically rather than pedagogically motivated and most training experiments have aimed at testing some specific theoretical hypotheses regarding learning rather than exploring different training methods for ultimate improvement through such training (see more discussions in the next section). This study attempts to address this disparity by applying some of the techniques used in previous laboratory-style training studies in CALL environment. In particular, two computer-based training paradigms: perceptual only (auditory input using a custom designed software) and perceptual with production training (auditory and visual input using Kay Elemetrics’ Sona Speech II software) were implemented and compared for their effectiveness in the acquisition of Mandarin lexical tones. The participants, 18 beginning level Mandarin learners (enrolled in a an introductory Chinese as a foreign language course in a U.S. university) with different L1 background received six hours of training within three weeks as extra curriculum activities. They chose one of the two training paradigms based on their preferences.

The research questions to be addressed are:

1. Will trainees improve their perception and production accuracy of Mandarin lexical tones after taking either perceptual training (auditory input only) or perceptual with production training (auditory and visual input)?
2. Will the perception with production training result in better learning outcomes in production accuracy than the perception training only?
3. If both training paradigms are effective, what are the advantages of each?

BACKGROUND

Computer-based perceptual training has proved to be effective in modifying adult speakers’ L2 speech perception and production in both segmental and suprasegmental aspects of spoken language. In the past two decades, research has focused on L2 segmental contrasts (Jamieson & Morosan, 1986, 1989; Kinston, 2003; Rochet, 1995; Wang & Munro, 1999, 2004), with a large number of studies dealing with the acquisition of the English /r/ and /l/ contrast by native Japanese speakers (Bradlow, Pisoni, Akahana-Yamada, & Tohkura, 1997; Hardison, 2003; Lively, Logan, & Pisoni, 1993; Lively, Pisoni, Yamada, Tohkura, & Yamada, 1994; Logan, Lively, & Pisoni, 1991, 1993; Strange & Dittmann, 1984). Results have shown that after weeks of perceptual training, trainees improved significantly in identification accuracy of target L2 consonant contrasts (Jamie-