ENHANCING L2 SPEECH PERCEPTION USING MOBILE-ASSISTED AUDITORY AND AUDIOVISUAL TRAINING

PENN STATE UNIVERSITY

NA-YOUNG RYU

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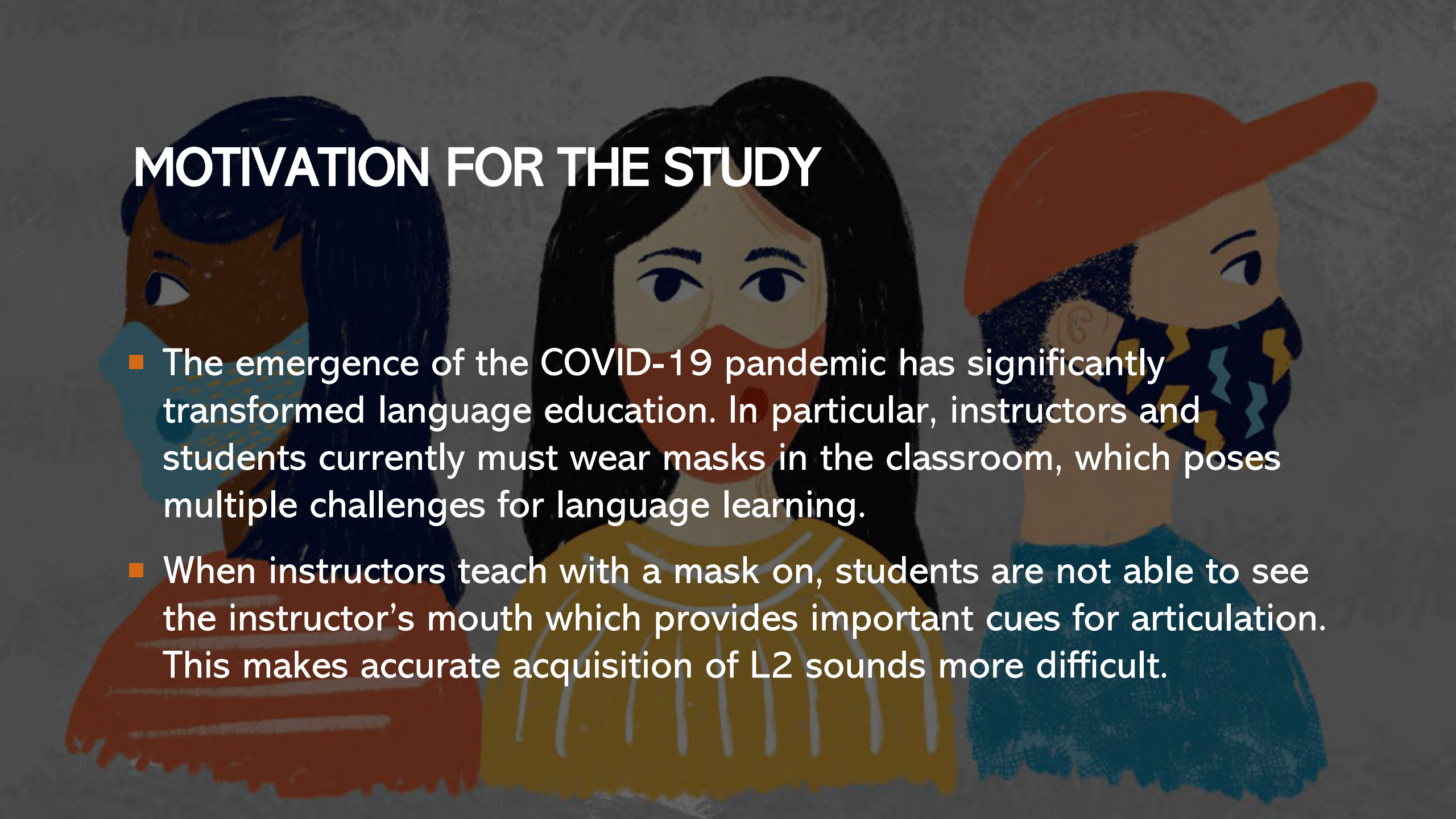


MOTIVATION FOR THE STUDY

- The emergence of the COVID-19 pandemic has significantly transformed language education. In particular, instructors and students currently must wear masks in the classroom, which poses multiple challenges for language learning.
- When instructors teach with a mask on, students are not able to see the instructor's mouth which provides important cues for articulation. This makes accurate acquisition of L2 sounds more difficult.

SPEECH PERCEPTION

- Speech perception: multimodal process, involving the integration of **auditory information** (i.e, hearing) and **visual cues** (i.e, lipreading)
- Sumby & Pollack (1954): In face-to-face conversation, speech perception is influenced by the **actual sound of speech** as well as **facial and lip movements of speakers**.
- Bernstein et al (2013): visual speech provides guidance on learning phoneme distinctions because it is correlated with auditory features and contains associated phonemic cues.

AUDITORY AND AUDIOVISUAL TRAINING IN L2 SPEECH

- Most of the auditory (AO) and audiovisual (AV) perceptual training studies have investigated **L2 English** and have found **competing results** (Hardison et al., 2003; Hazan et al., 2005, 2006; Inceoglu 2016).
  - Perception and production of L2 sounds can be trained more effectively using audiovisual speech than auditory speech only (Hardison, 2003, Hazan et al., 2005, Hirata and Kelly, 2010 Kawase et al., 2008; Lidestam et al., 2014, Richie and Kewley-Port, 2008)
  - Inceoglu (2016): There were no significant differences in the perception of French nasal vowels between the L2 American English AV and AO groups. However, the pronunciation accuracy of the audiovisual training group improved significantly compared to the AO training group, suggesting that seeing facial gestures are helpful to improve L2 pronunciation.
- **To date, there are no studies of online auditory and audiovisual perceptual training on the perception of Korean sounds.**

PURPOSE OF THIS STUDY

- Develop web-based auditory and audiovisual training programs to help L2 learners of Korean improve their perception and pronunciation of Korean vowels.
- Assess the effects of online auditory and audiovisual perceptual training on the perception of Korean vowels by English-speaking learners.
  - Whether L2 learners can benefit from online training to make better use of phonetic information in the perception of Korean vowels with and without access to visual speechreading cues.

ONLINE PERCEPTUAL TRAINING

ONLINE AUDITORY AND AUDIOVISUAL PERCEPTUAL TRAINING PROGRAMS ARE DEVELOPED USING JSPSYCH.

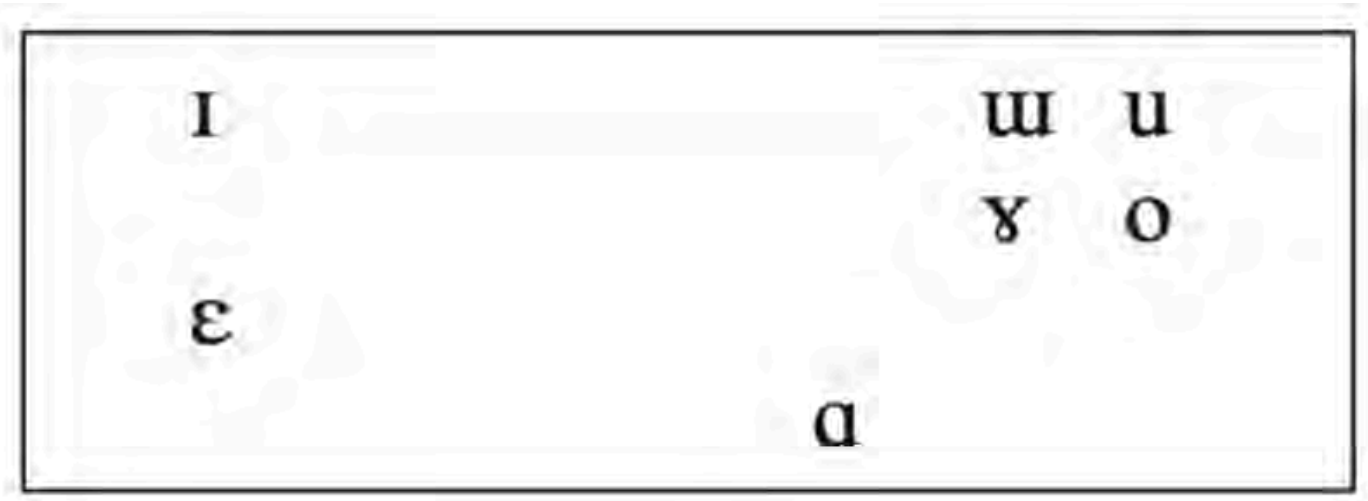
LEARNERS ACCESS A TRAINING WEBSITE USING THEIR MOBILE DEVICES ANYTIME AND ANYWHERE.

MOBILE-ASSISTED LANGUAGE LEARNING (MALL)

- MALL is the use of smartphones and other mobile technologies in language learning.
- Mobile technology can offer numerous practical uses in language learning.
  - It helps overcome many limitations in a traditional classroom (Ahn & Lee, 2015).
    - Lack of language-use opportunities, Individualized learning, feedback and interactions
  - It offers a seamless learning experience (Liu & Chen, 2015).
    - Learners can practise at their own pace, at a time and location of their choosing.

INVENTORY OF KOREAN VOWELS

- Korean seven simple vowels



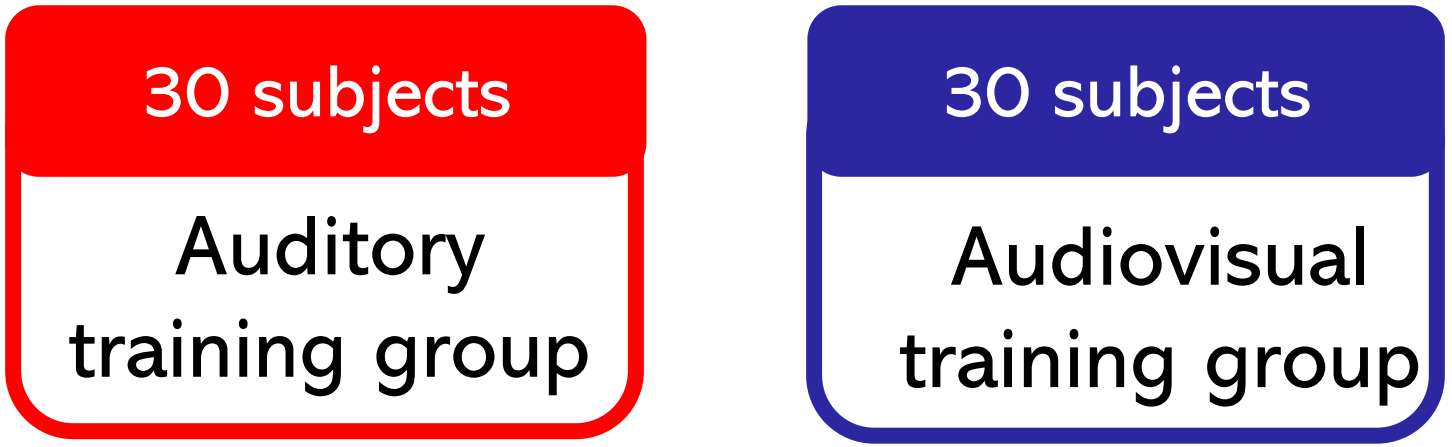
RESEARCH QUESTIONS

(1) Does **auditory and audiovisual perceptual training** improve L2 learners' perception of Korean vowels?

(2) Does **audiovisual perceptual training** lead to greater improvement in the perception of Korean vowels than **auditory-only perceptual training**?

PARTICIPANTS

- 60 native English speakers enrolled in the online Korean beginning course at the Penn State University, USA.
- Assigned to two groups of 30 each.



PROCEDURE

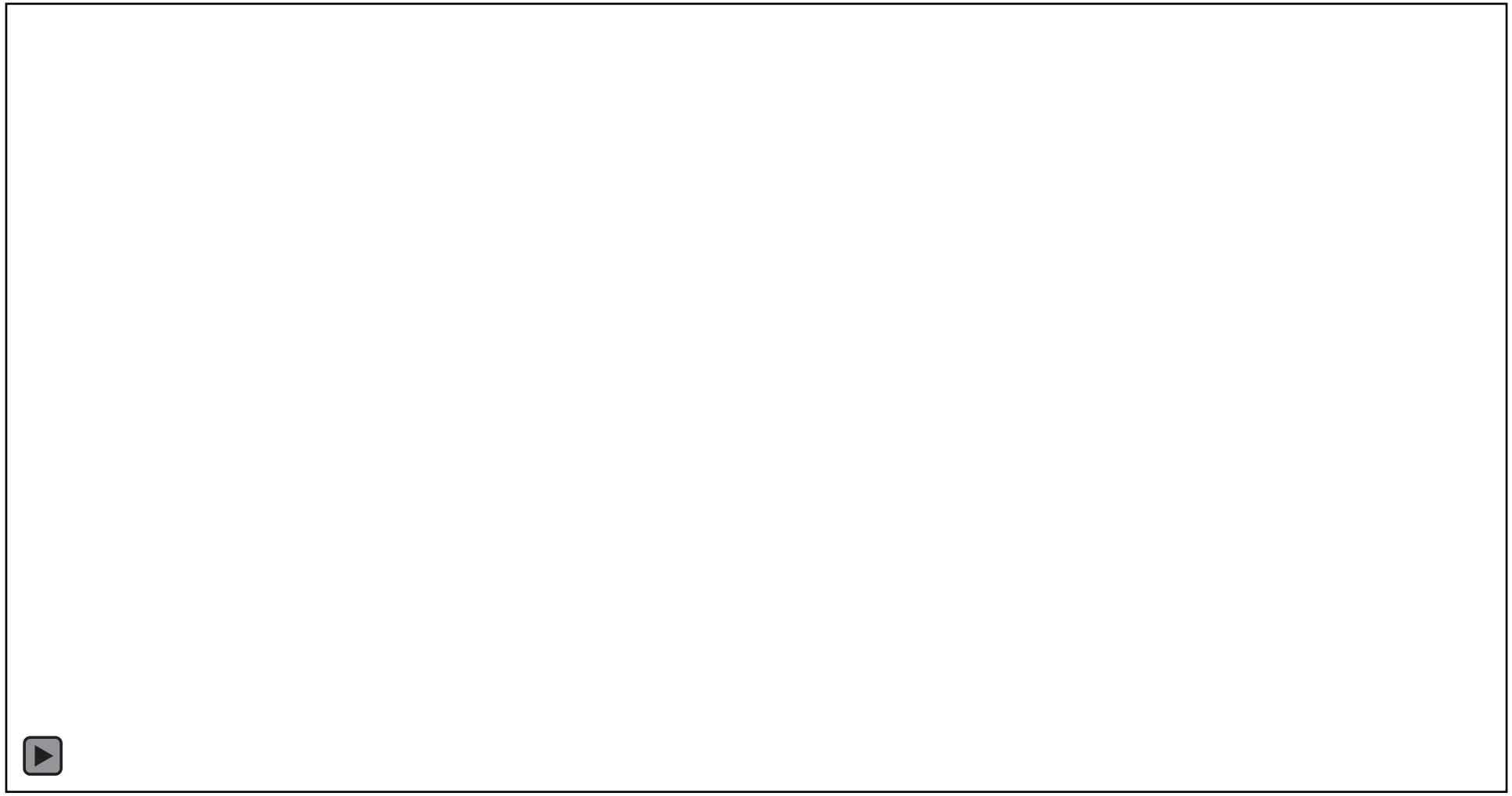
- All groups completed online identification tasks using their mobile phones for the pre- and post-tests.
  - Identification: learners heard a sound and were asked to click the corresponding vowel on their mobile screen.

- The two training groups took part in three identification training sessions held over a period of approximately 1 week, each session lasting about 20 minutes.

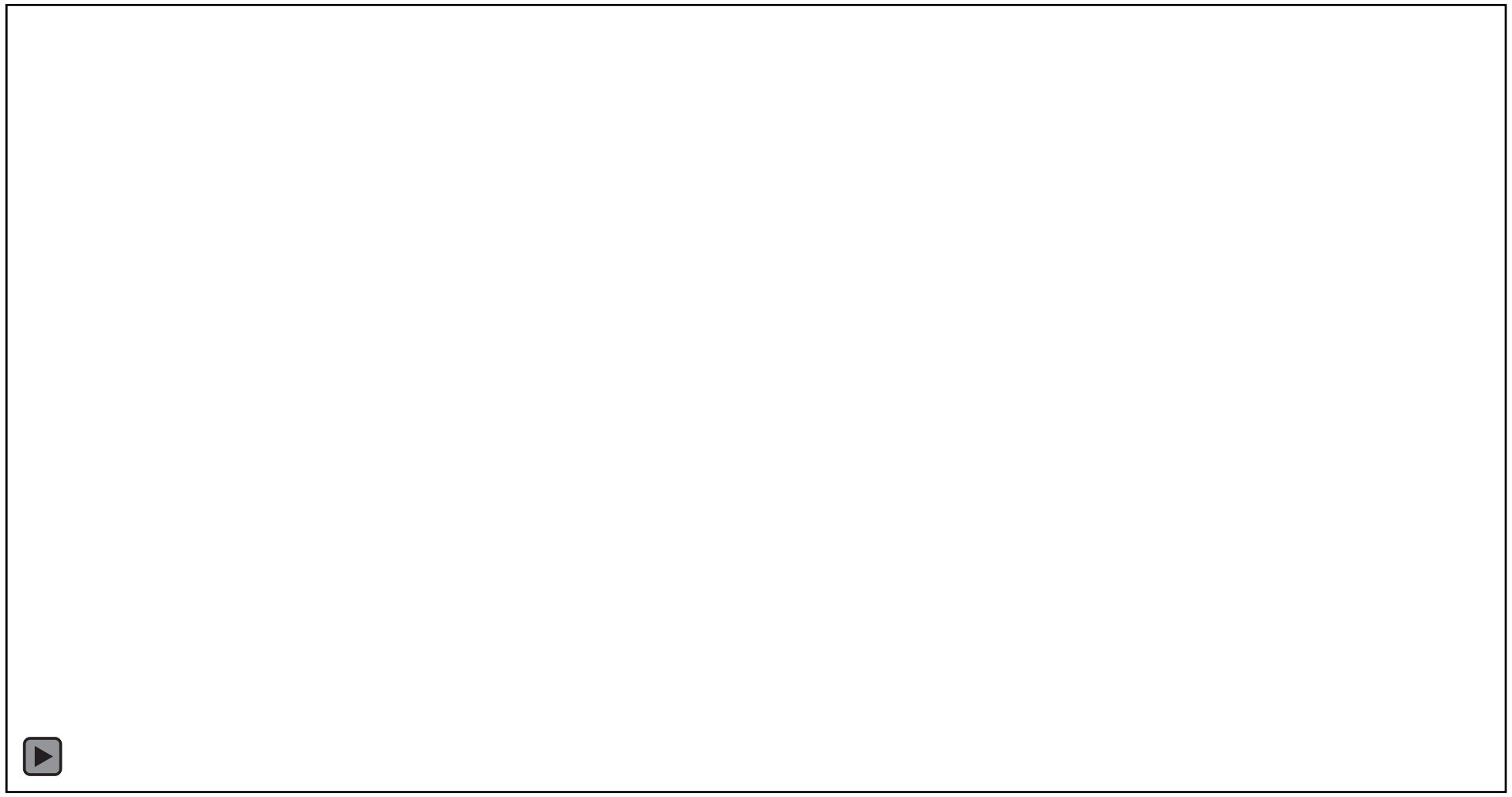
SPEECH MATERIALS

- The stimuli of pre-, post-tests and online training sessions consisted of a total number of 196 tokens.
  - 98 CV words (7 vowels * 14 consonants) * 2 speakers
  - All stimuli were recorded by native Korean speakers.

AUDITORY PERCEPTUAL TRAINING



AUDIOVISUAL PERCEPTUAL TRAINING

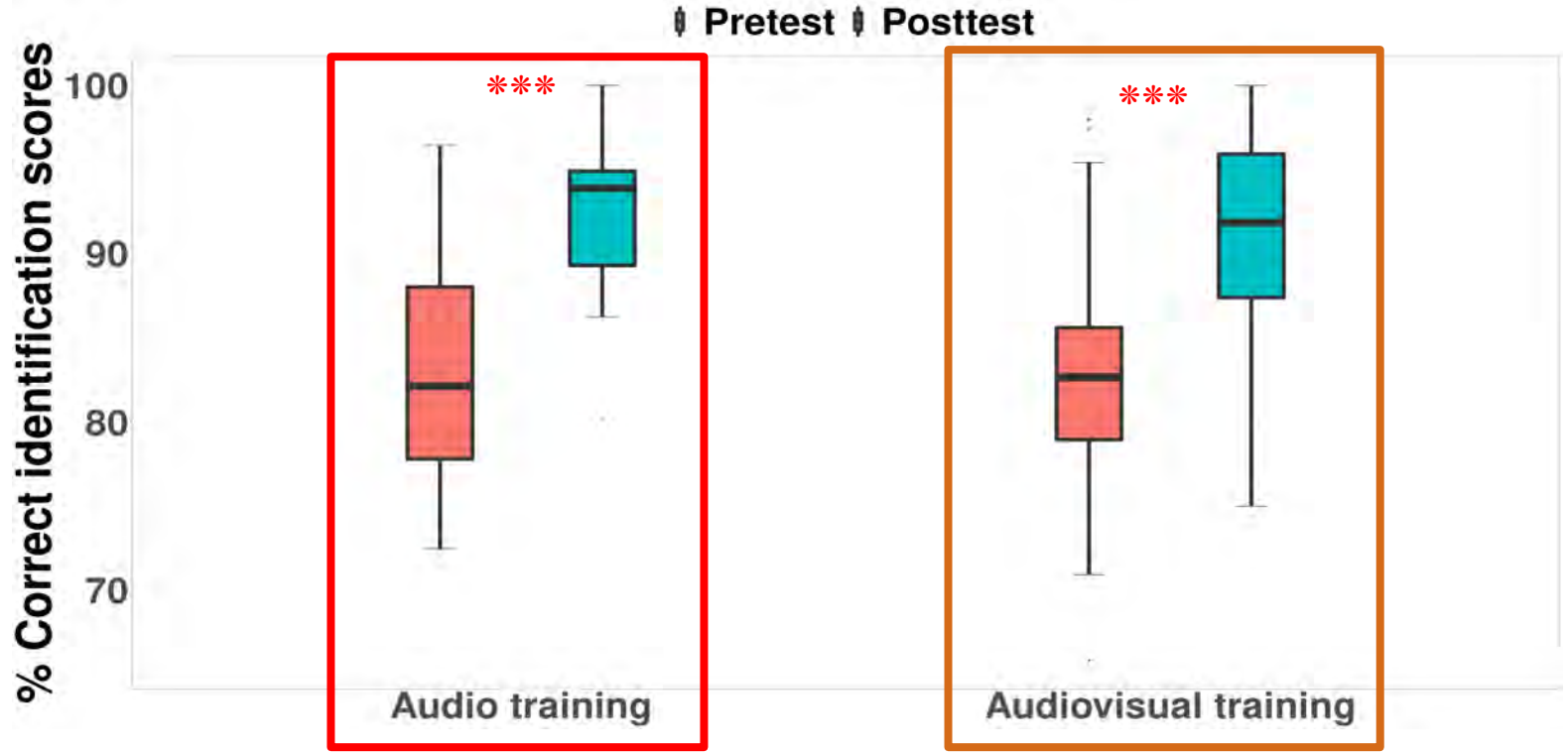


STATISTICAL ANALYSIS

- A mixed-effects logistic regression model in R (Baayen 2008; R CoreTeam 2017)
  - The package *lme4* (Bates et al 2011)
  - Dependent variable: Response (correct vs. incorrect)
- Fixed effects: Test (pre-test vs. post-test), training group (auditory training group vs. audiovisual training group), and their interactions
- Random effects: Subject, item

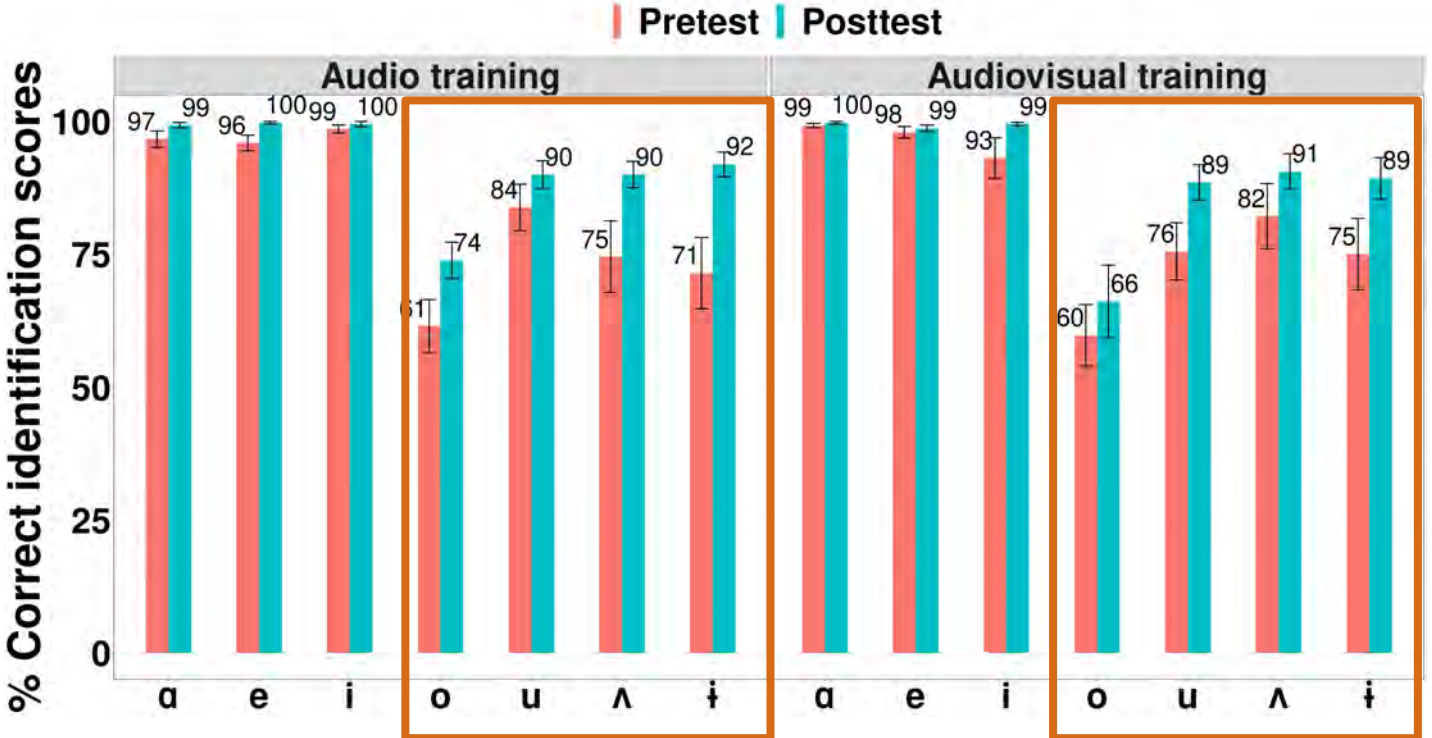
EFFECTS OF AUDITORY AND AUDIOVISUAL TRAINING

- Audio-only training group & Audiovisual training groups: there is significant difference in the identification accuracy of the vowels between pre-test and post-test
- Both training is effective for L2 learners to improve their perceptual learning of Korean vowels

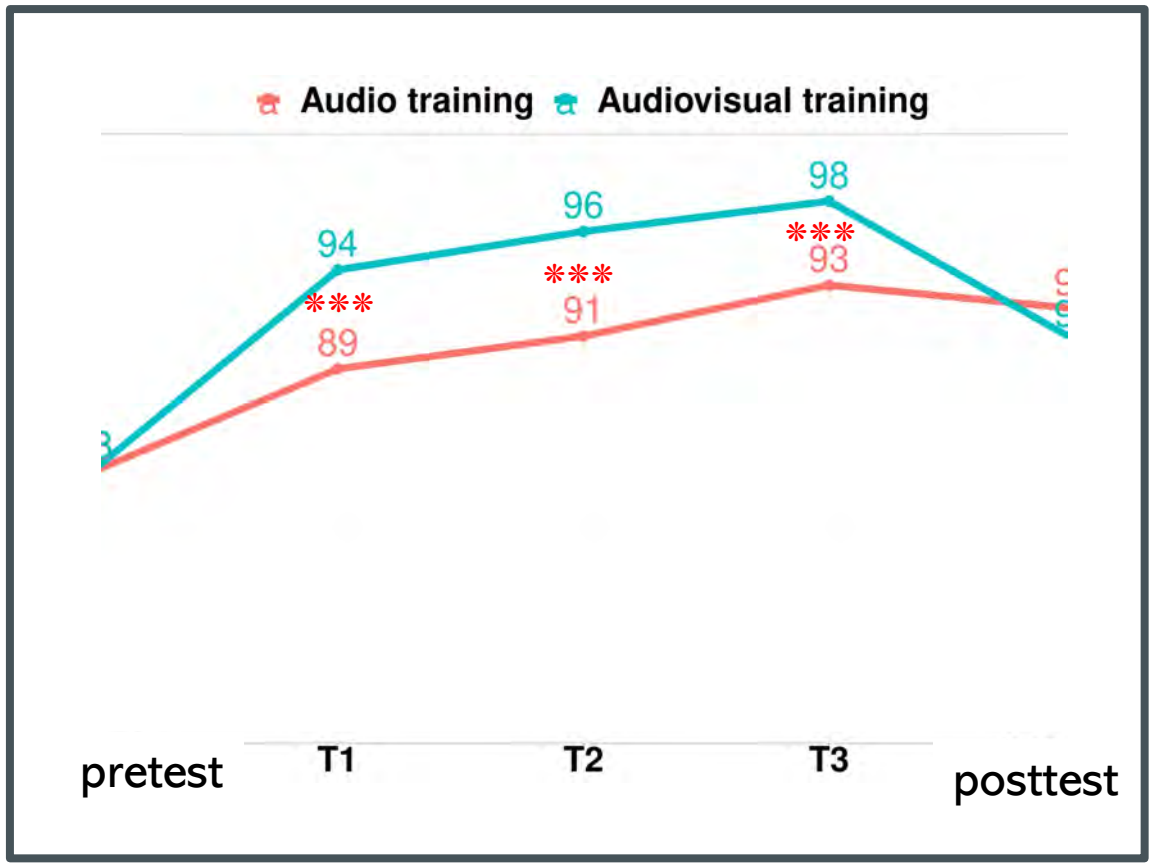


PERCEPTUAL ACCURACY OF KOREAN VOWELS

- The hierarchy of difficulty of Korean vowel perception: **/o, ɨ, ʌ , u/ > /a, e, i/**
- Perception of all Korean vowels including difficult vowels to perceive **/o, ɨ, ʌ , u/** significantly improved.



LEARNERS' PERCEPTUAL DEVELOPMENT OF L2 VOWELS DURING TRAINING SESSIONS



- Pre- and Post-test: There were no significant differences between the two groups.
- Training sessions: There were significant differences between the groups in all sessions, suggesting that audiovisual training is more effective in the perception of Korean vowels than the auditory-only training.

WHAT HAPPENED TO THE AUDIOVISUAL TRAINING GROUP?

- Possibility 1: The audiovisual training group memorized the relation between the image and the sound during the training sessions.
- Possibility 2: The audiovisual training with visual cues might reinforce the learners' phonological representations during training, but the perceptual learning does not remain without the visual information.

SUMMARY OF THE FINDINGS

- This study examined the effects of auditory and audiovisual perceptual training on the perception of Korean vowels by L2 English-speaking learners.

Finding 1	Finding 2
(1) Both training groups significantly improved their perceptual accuracy of Korean vowels. ↓ Perceptual learning of L2 vowels can be enhanced by both methods of online training.	(2) There was no significant difference between the two training groups at post-test. ↓ Perceptual training with audiovisual tokens does not lead to greater improvement in the perception of L2 vowels than training with only auditory tokens.

PEDAGOGICAL IMPLICATIONS

- Innovative pedagogical tools such as web-based audiovisual and audio-only training programs can significantly improve learners' perception of L2 sounds in the context of online and distance learning.
- These online training programs can be freely used by L2 learners as well as language instructors both inside and outside of the classroom to enhance L2 learning.

Comments & Questions

Na-Young Ryu (nmr5569@psu.edu)