

BACKGROUND & CURRENT STUDY

Perception of non-native sounds

Linguistic experience with native languages/dialects, together with psychoacoustic factors, play a role in perception of non-native sounds (e.g., Best, 1995; Flege, 1995; Qin et al., 2016; 2017; So, 2010).

Cue weighting in perception of lexical tones

Speakers of tone languages and non-tone languages attend to different cues of tones (e.g., Francis et al., 2008; Gandour, 1983; Huang, 2004; Qin et al., 2016).

- **Pitch contour** (e.g., rising vs. falling) is used more by tone language (Mandarin) speakers
- **Pitch height** (e.g., high vs. low) is used more by non-tone language (Seoul Korean) speakers

Current Study: Korean-speaking L2 learners of Mandarin

- **Native dialect** : Seoul Korean (non-tonal) vs. Kyungsang Korean (tonal/pitch accent) (e.g., Kang, 2014; Kim et al., 2002; Lee, 2008; Lee 2009; Lee et al., 2012; 2013; 2014; 2015; 2016)
- **Second language**: Mandarin (tonal)
- **Target language** : Cantonese (tonal)

Research Questions

- Do linguistic experience and psychoacoustic factors both influence non-native perception of lexical tones?
- Does native dialects modulate perception of Cantonese tones in terms of **pitch contour** vs. **pitch height**?

Predictions

- Yes, linguistic experience and psychoacoustics **both** affect the perception of non-native tones
- Yes, Kyungsang Korean (Kyungsang) listeners **differ** from Seoul Korean (Seoul) listeners by having a pattern similar to Mandarin listeners in term of using pitch contour and height

PARTICIPANTS

Native Dialect	Mandarin Prof. (/40)	Age 1 st Exposure	Years Instr.	Months Abroad
Seoul (n=24)	28.5 (SD: 4.4)	20.1 yrs (SD: 3.5)	2.45 yrs (SD: 1.6)	22.0 (19.2)
Kyungsang (n=13) (North=6;South=7)	26.8 (SD: 5.8)	19.1 yrs (SD: 3.7)	3.19 yrs (SD: 1.9)	38.0 (24.4)

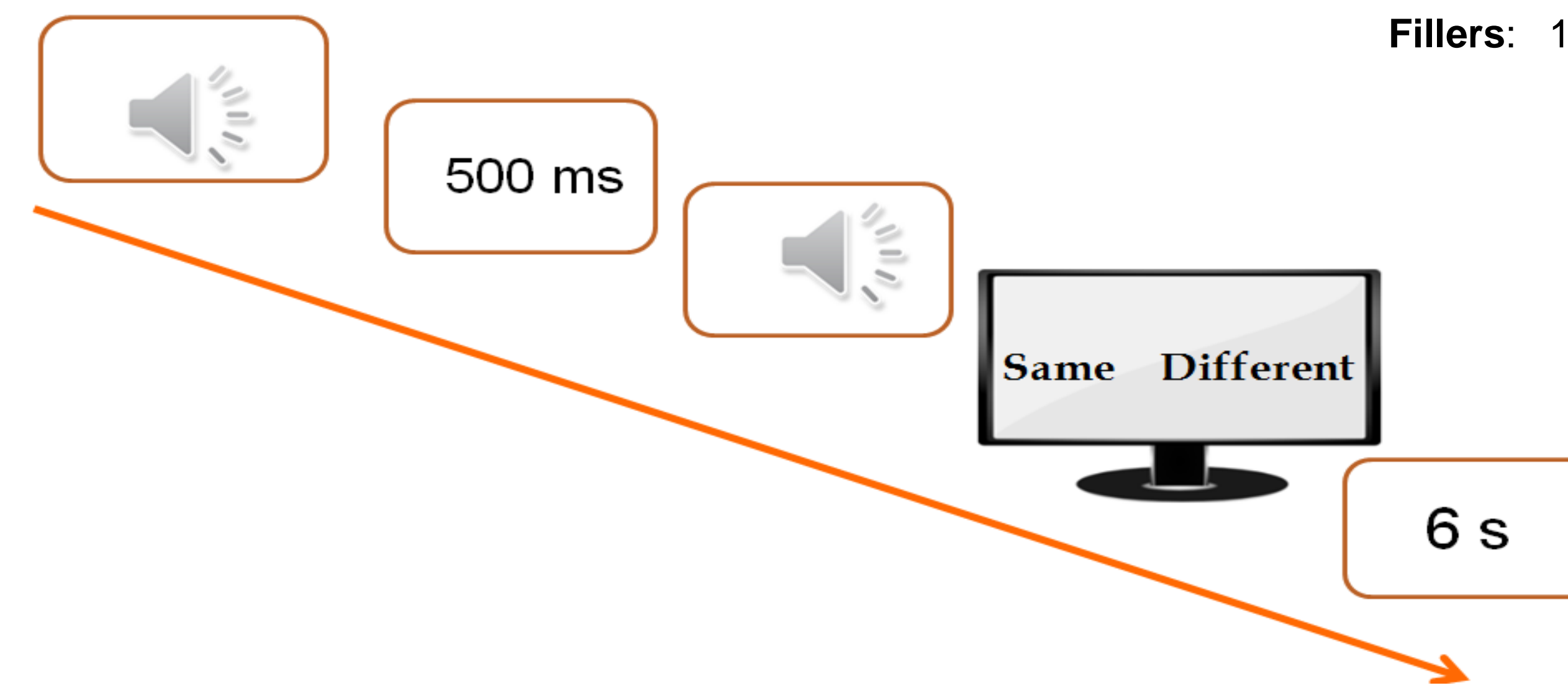
- Korean-speaking groups matched in Mandarin proficiency and experience with Mandarin
- Control groups: 15 (northern) Mandarin listeners (from Qin and Jongman, 2016)
- None of the three groups had been exposed to Cantonese tones before

PROCEDURE

AX forced-choice discrimination of Cantonese tones

Targets: 144 AB tone pairs

Fillers: 144 AA tone pairs



STIMULI

Speaker: Female native speaker of Hong Kong Cantonese

Syllables: [tɕɿ] (voiced initial) and [sɿ] (voiceless initial) each carrying four tones

Normalization: Duration was set to average value within each syllable; intensity was set to 70dB

Contour-Level tone pairs (pitch contour)	Level-Level tone pairs (pitch height)	Predicted Discrimination Difficulty
T1-T2 (larger acoustic difference)	T1-T6 (larger acoustic difference)	Easier
T2-T6 (smaller acoustic difference)	T3-T6 (smaller acoustic difference)	Harder

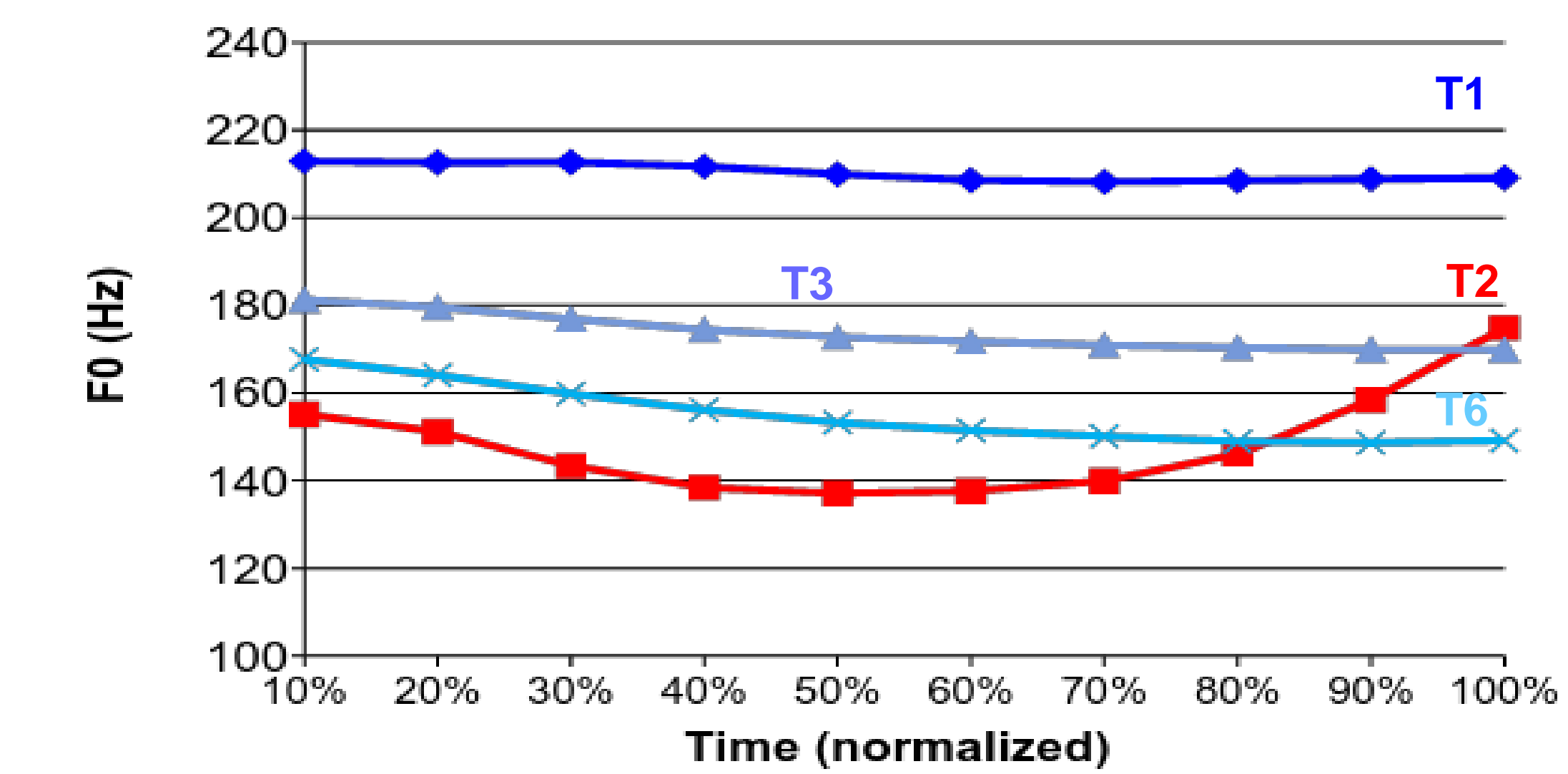


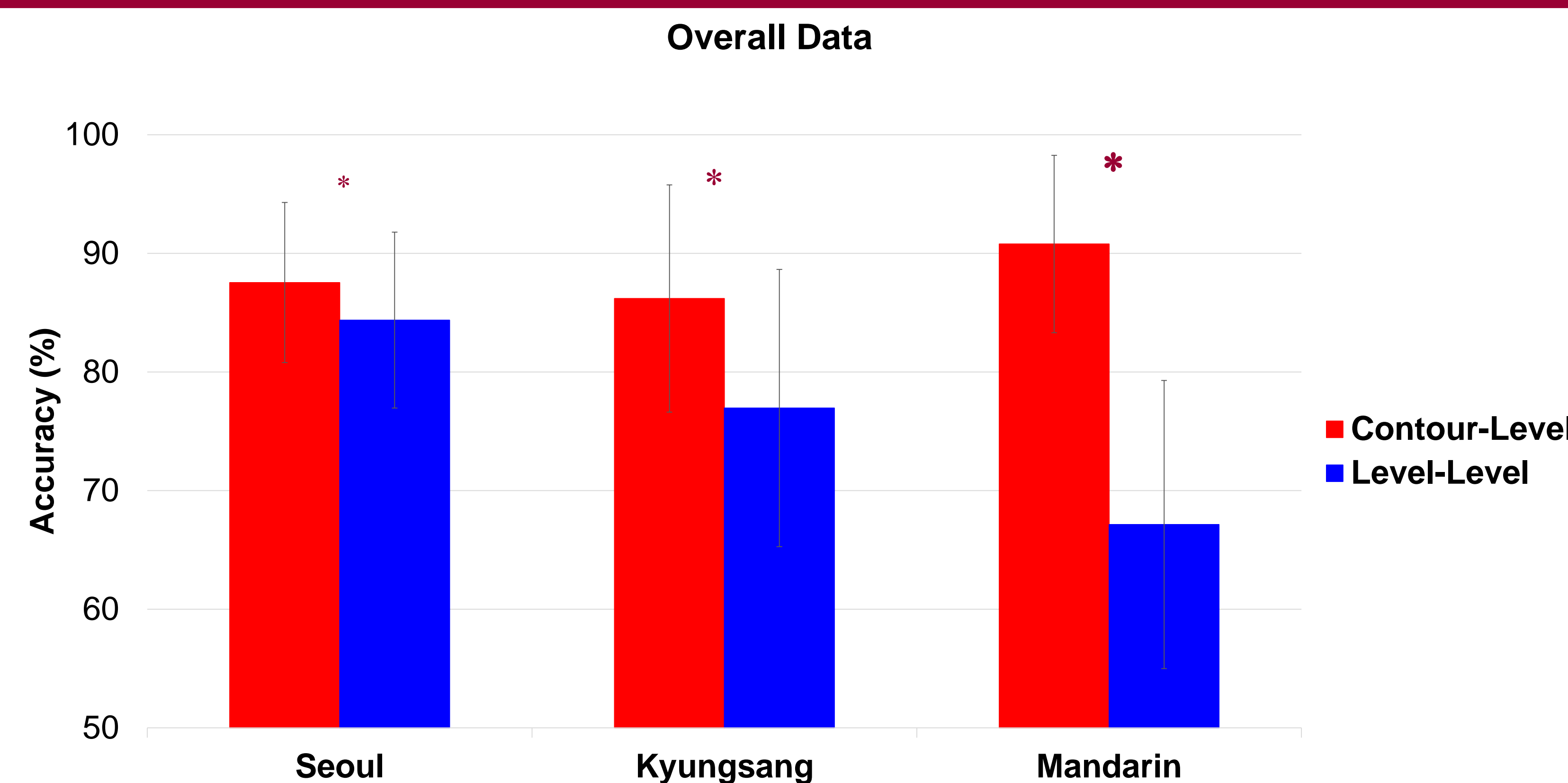
Figure: Time-normalized pitch tracks of tones in Contour-Level and Level-Level tone pairs

RESULTS

Mixed-effects models

Baseline = Mandarin speakers
Pair type baseline = level-level tone pairs
Effects: * $p < .05$, ** $p < .01$, *** $p < .001$

All data:
Pair Type***
Group (Seoul) X Pair Type**
Group (Kyungsang) X Pair Type***



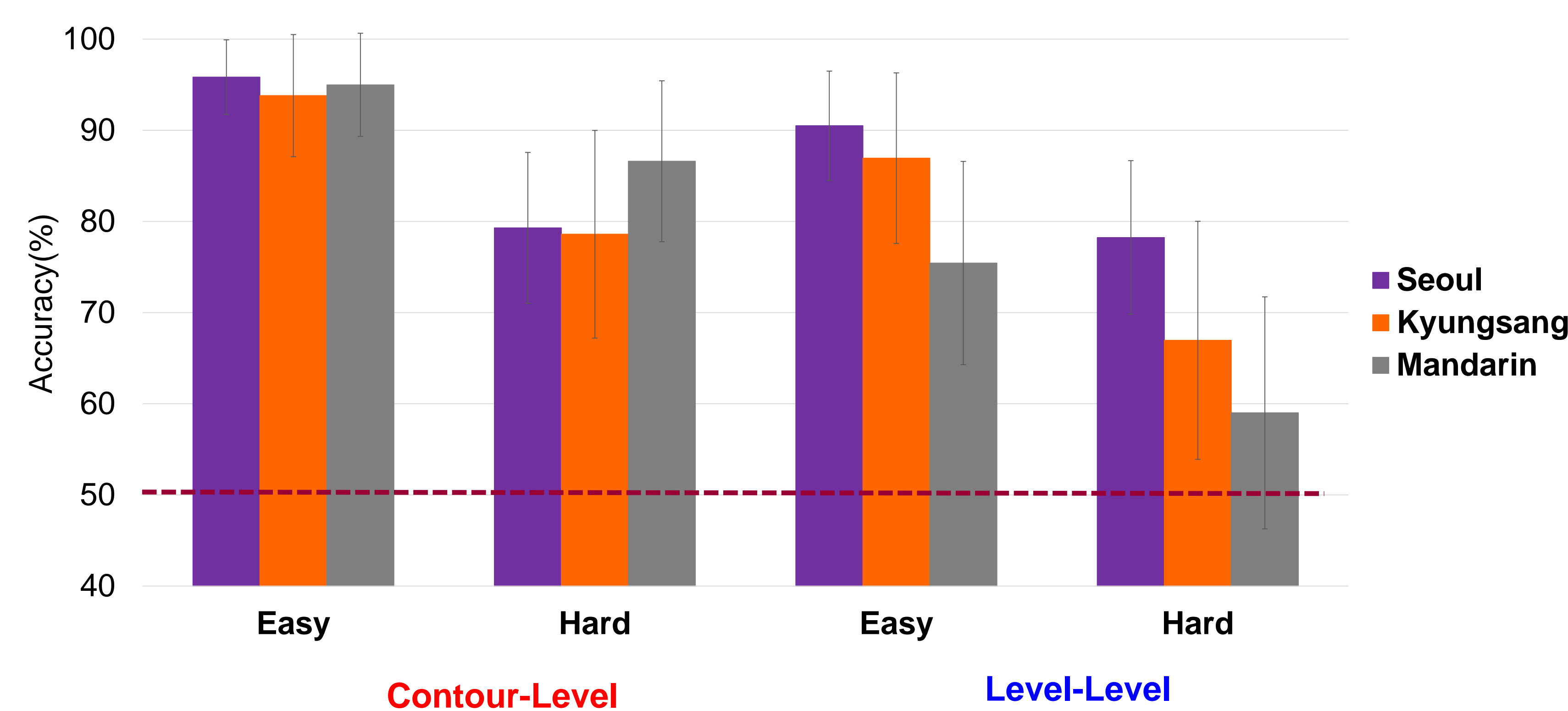
Mixed-effects models

Baseline = Kyungsang speakers
Pair type baseline = level-tone pairs
Effects: * $p < .05$, ** $p < .01$, *** $p < .001$

Learners' data:
Pair Type***
Group (Seoul) X Pair Type*

- Korean-speaking L2 learners perceived Contour-Level tone pairs better than Level-Level tone pairs
- Kyungsang listeners patterned more similar to Mandarin listeners than Seoul listeners, with a greater advantage of Contour-Level over Level-Level tone pairs

Individual tone pairs



Hard vs. Easy Contour-Level pairs

All data:
Tone Pair ***

All three groups found acoustically hard pairs more difficult than acoustically easy pairs

Hard vs. Easy Level-Level tone pairs

All data:
Tone Pair ***

All three groups found acoustically hard pairs more difficult than acoustically easy pairs

DISCUSSION & CONCLUSION

Both linguistic experience and psychoacoustic factors had an impact on the perception of Cantonese tones

Linguistic experience

- Kyungsang listeners patterned more similar to Mandarin listeners than Seoul listeners under the influence of their native (tonal/pitch accent) dialect
- Two Korean-speaking L2 groups patterned similarly with a higher accuracy for contour-level than level-level tone pairs due to their learning experience with Mandarin (vs. naïve listeners)?

Psychoacoustic factors

- Acoustically easy pairs showed higher accuracy than hard pairs for listeners with different native languages and dialects

Future studies

- More Kyungsang-speaking L2 learners of Mandarin as well as naïve Korean (Seoul and Kyungsang) listeners will be recruited to test the effect of native dialects and Mandarin learning experience

Conclusion

- Acoustics of tones and listeners' linguistic experiences both modulate listeners' perception of non-native tones
- L2 learners' native dialects, together with their L2 learning experience, affect their use of different pitch cues when perceiving tones from a new language

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