

An incremental cue-weighting approach to extended lexical tone training

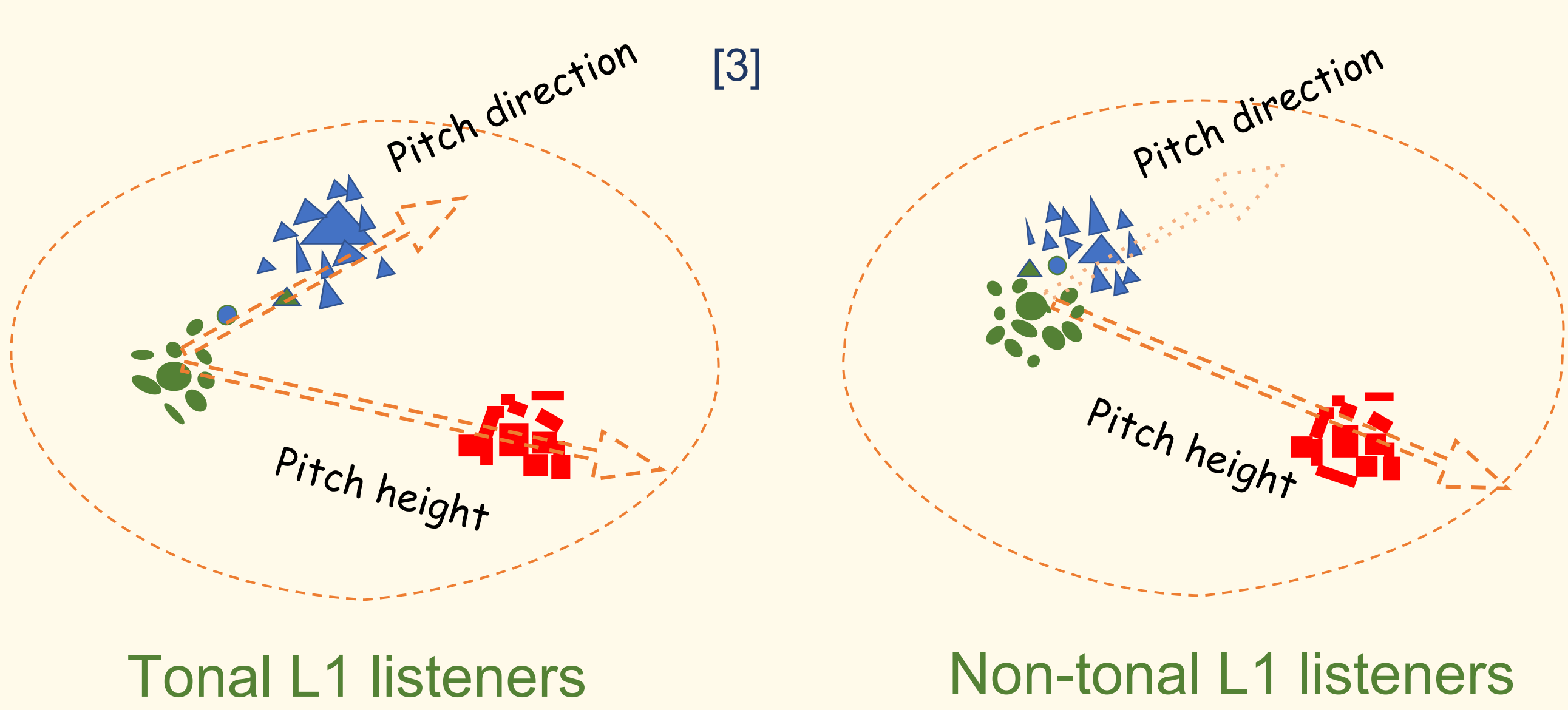
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Background

- First language (L1) affects perceptual **cue weighting** in L2 [1].
- Phonetic contrasts on **less-attended** acoustic dimensions are **more difficult** to discriminate [2].
 - Incremental cue training aims to **redirect weighting** to previously less-attended dimensions.
 - Our previous **one-session** training experiments showed that cue exaggeration boosted perception temporarily [5].

Attention-to-dimension models [4]

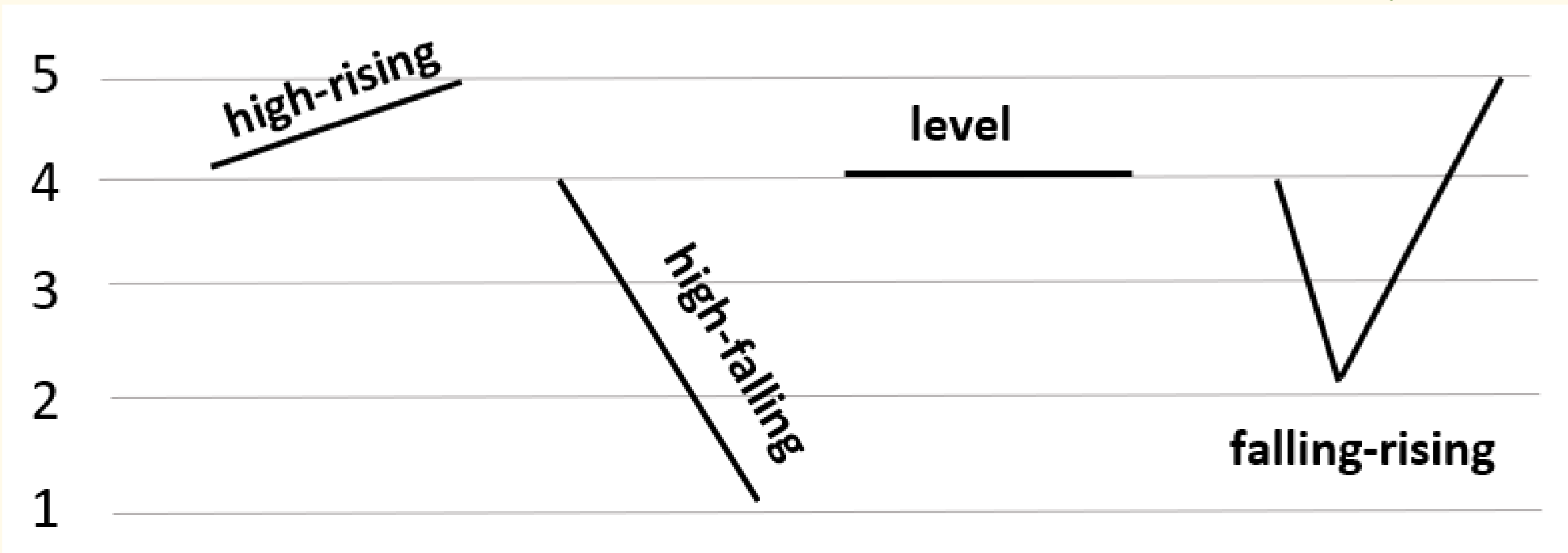


Research Questions

- Do **cue-exaggerated** stimuli facilitate novel lexical tone learning better than **fixed** stimuli exposure?
- How does the training effect change for a training course lasting **multiple days**?

Incremental Method

Pseudo-tonal system



Incremental cue training: incrementally reduced the exaggeration on *pitch direction* (tonal slope).

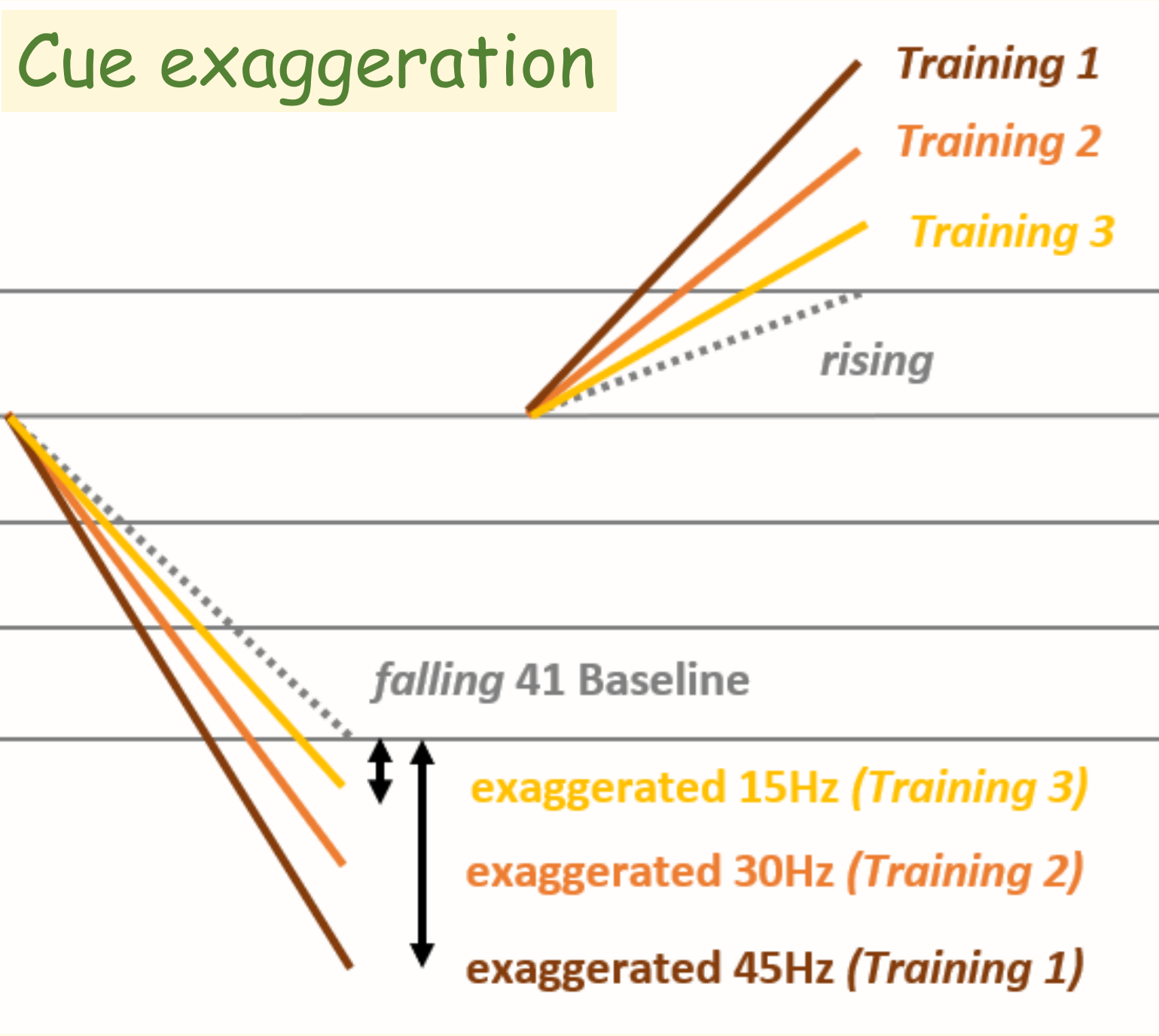
Participants: 61 L1 English listeners (no tone experience).



Exaggerating *pitch direction* cues could potentially benefit lexical tone perceptual learning more than fixed stimuli exposure. Nevertheless, direct manipulation of one acoustic dimension might not directly translate into L2 phonetic re-categorisation.

Experiment Design

lexical tone
e.g., tú vs tù

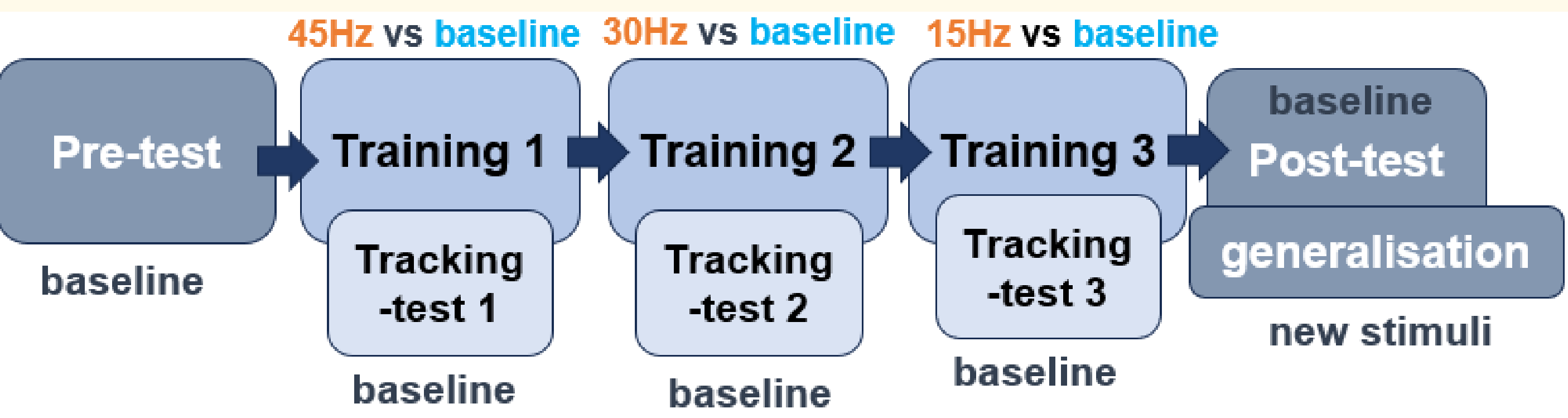


One trial example

ABX tasks
Button pressing

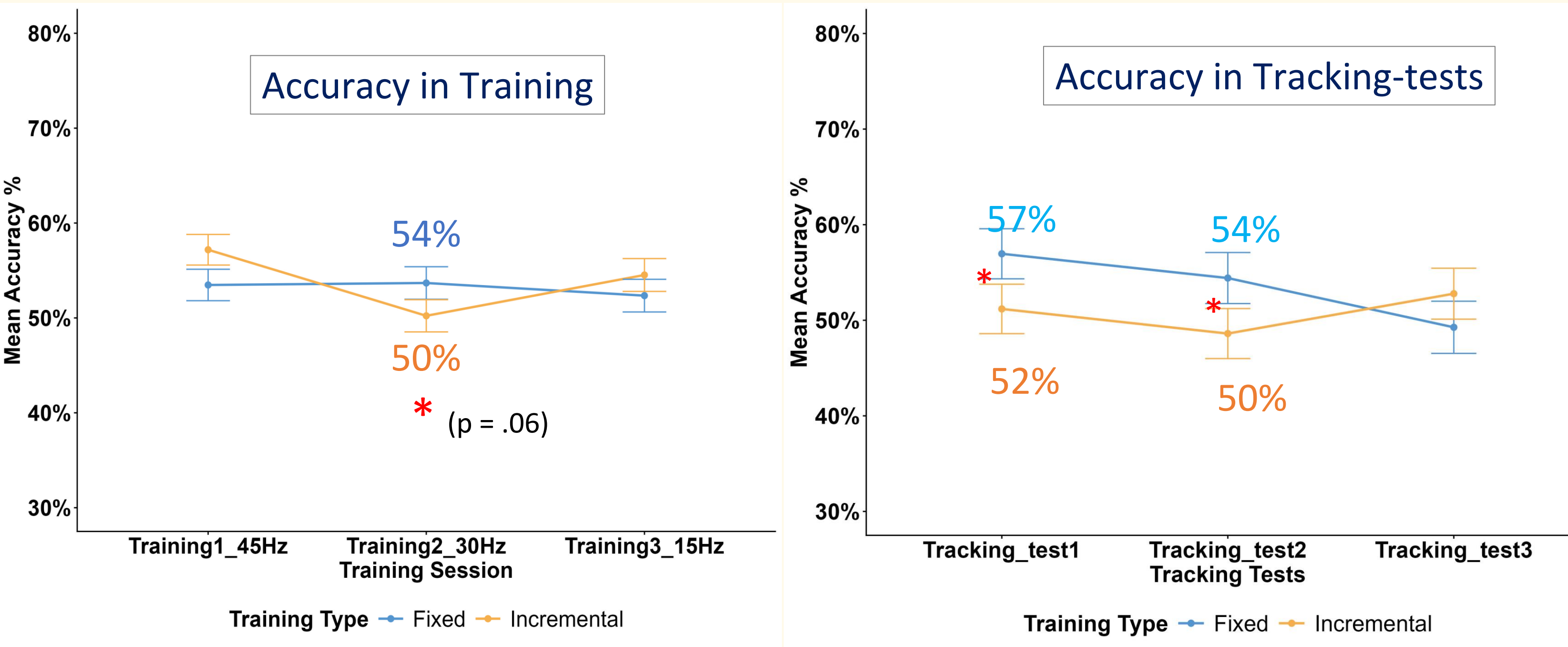
Incremental group (N=31)

Fixed group (N=30)

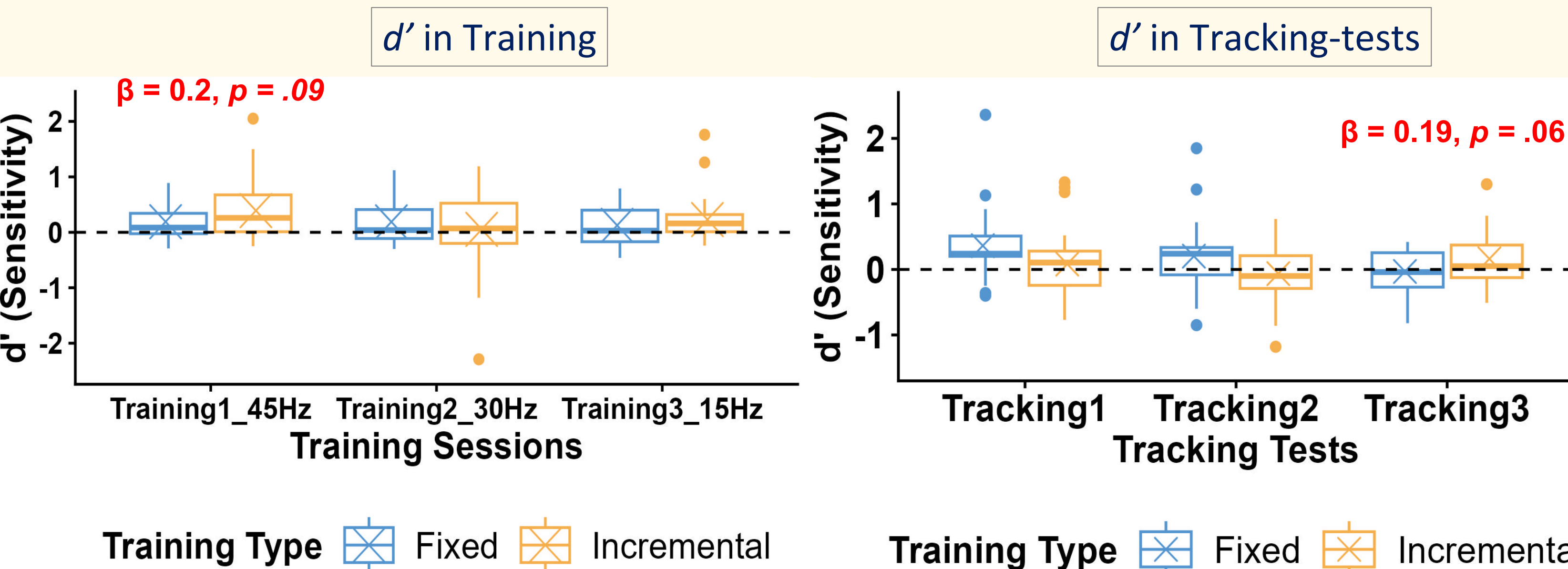


Results

- Training accuracy: **incremental** < **fixed** at Training 2.
- Tracking-tests accuracy: **incremental** = **fixed** at Tracking 3.



- d' (sensitivity):** **incremental** > **fixed** in Training 1 & Tracking 3.



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[1] P. Iverson, V. Hazan, & K. Bannister, 'Phonetic training with acoustic cue manipulations: A comparison of methods for teaching English/r/-/l/to Japanese adults', J. Acoust. Soc. Am., vol. 118, no. 5, pp. 3267–3278, 2005. [2] P. K. Kuhl & P. Iverson, 'Linguistic experience and the "perceptual magnet effect"', Speech Percept. Linguist. Exp. Issues Cross-Lang. Res., pp. 121–154, 1995. [3] B. Chandrasekaran, P. D. Sampath, & P. C. M. Wong, 'Individual variability in cue-weighting and lexical tone learning', J. Acoust. Soc. Am., vol. 128, no. 1, pp. 456–465, Jul. 2010. [4] A. L. Francis & H. C. Nusbaum, 'Selective attention and the acquisition of new phonetic categories', J. Exp. Psychol. Hum. Percept. Perform., vol. 28, no. 2, pp. 349–366, 2002. [5] Li, Y., White, L., & Khattab, G. (2023). Incremental cue training: a study of lexical tone learning by non-tonal listeners. In Proceedings of the 20th International Congress of Phonetic Sciences–ICPhS 2023. Newcastle University.