The Role of Attention in Perceptual Learning Through Acoustic Dimension Reweighting

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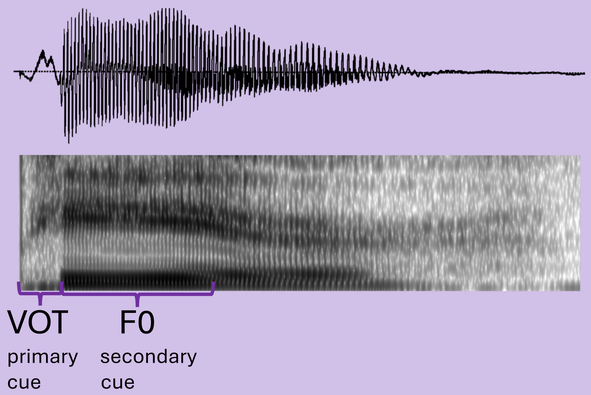
Research Question

Aim: Determine the extent to which endogenous redirection of attention predicts dimensional reweighting.

Multiple Dimensions in Perception:
b/p (L1 ENG)

- Primary cue: Voice Onset Time (VOT)
- Secondary cue: F0 (pitch)

(Lisker 1978, 1986, Lisker and Abramson, 1964)



Dimensional Reweighting:

- Listeners learn to rely on secondary dimension if it predicts *bier/pier* reliably when primary dimension does not

(Harmon et al,. 2019, Kapatsinski et al., 2024)

Hypothesis

- Learners should **upweight F0** and **downweight VOT**
- Directing attention to F0 should help listeners to learn to rely on F0

Study Design

- **Attention task:** 2 attention groups asked to pay attention to either *intensity* (loudness) or *F0* (pitch) in attention task by judging sounds as same/different based on F0 or intensity
- **Reweight training:** *F0* perfectly predicts beer/pier, *VOT* equally matched to beer/pier
- Pretest posttest design

Pretest		• F0: 180 Hz & 260 Hz • VOT: 20 ms & 50 ms • Intensity: 70 dB
Alternation Task / Attention Task		• F0: difference 80 Hz • 180 Hz & 260 Hz • Intensity: difference 4 dB • 66 dB & 70 dB • VOT: 20 ms & 50 ms
Reweight Training		• F0: 180 Hz & 260 Hz • VOT: 20 ms & 50 ms • Intensity: 70 dB
Posttest		• F0: 180 Hz & 260 Hz • VOT: 20 ms & 50 ms • Intensity: 70 dB

Pretest & Posttest

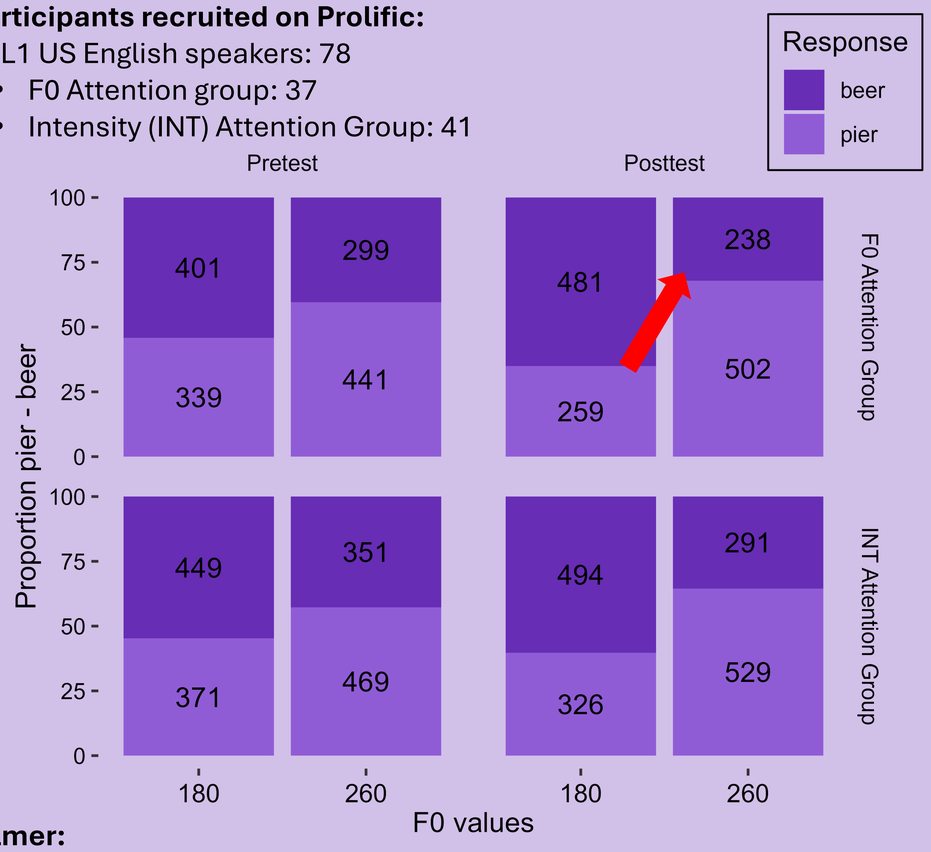
Attention Task

Reweight Training

Findings

Participants recruited on Prolific:

- L1 US English speakers: 78
  - F0 Attention group: 37
  - Intensity (INT) Attention Group: 41



Glmer:

- Predictors: F0, VOT, Test, Attention Group
  - 3-way interaction: (F0 & VOT)*Test*Attention Group
- Significances:
  - F0 & VOT → low values predict *pier* & high values predict *beer*
  - VOT*Test → **VOT downweighting** at Posttest
  - F0*Test*Attention Group → more **F0 upweighting** by F0 attention group at posttest (compared to INT attention group)

Conclusion:

- Directing attention to F0 helps to learn to rely on F0
- Learners learn to **upweight F0** and **downweight VOT**

Thanks to the for funding this project!

Any Questions?
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