



# Tracking the acquisition of L2 phonetic contrast

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## Summary

THIS study investigated the persistence of phonetic cue restructuring in a naturalistic learning environment. 17 native English speaking L2 learners of Korean were tracked over an 8 week period to explore the time course of acquisition of novel phonological contrasts signaled by VOT and  $f_0$ . Production and perception results suggest that learners can quickly learn to direct attention to a novel dimension even in the absence of explicit feedback, and that continued exposure has a small but significant impact on performance: participants were able to exert more accurate control over L2 phonetic dimensions over the course of the experiment.

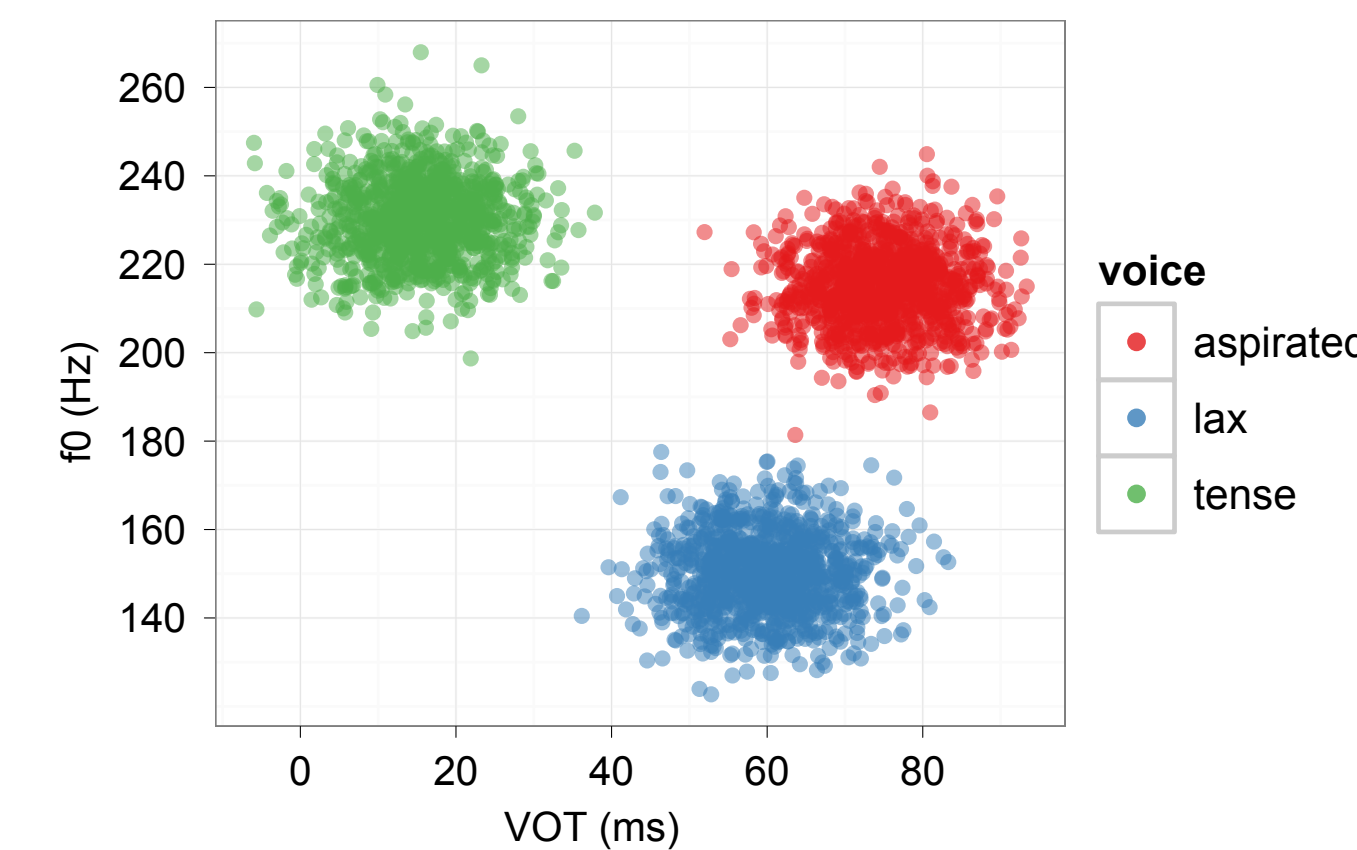
## Background

• Seoul Korean 3-way contrast between tense /pp/, lax /p/, and aspirated /p<sup>h</sup>/ voiceless stops [3]

• L1 English speaking late learners of Seoul Korean ('K2 learners') can learn to use  $f_0$  with explicit feedback [1]

1. Does *naturalistic exposure* (here, classroom instruction) have the similar impact as explicit feedback?
2. Does performance improve with exposure? If so, how?
3. Is perception ability related to production ability?

Figure 1: VOT and  $f_0$  of Seoul Korean stops [2].



## Methods

**Participants:** 17 naive K2 learners (9 female) from an Introductory Korean course meeting ~ five hours per week for 10 weeks. Participants took part in 8 consecutive weeks of production and perception testing.

**Production: 9 items × 5 repetitions**

다 따 타 가 까 카 바 빠 파  
/ta/ /tta/ /tha/ /ka/ /kka/ /kha/ /pa/ /ppa/ /pha/

• Fit tense vs. non-tense, lax vs. non-lax GLMMs [4]

**Perception: 3AFC & AX**

• Stimuli: male and female productions of /pha pa ppa/

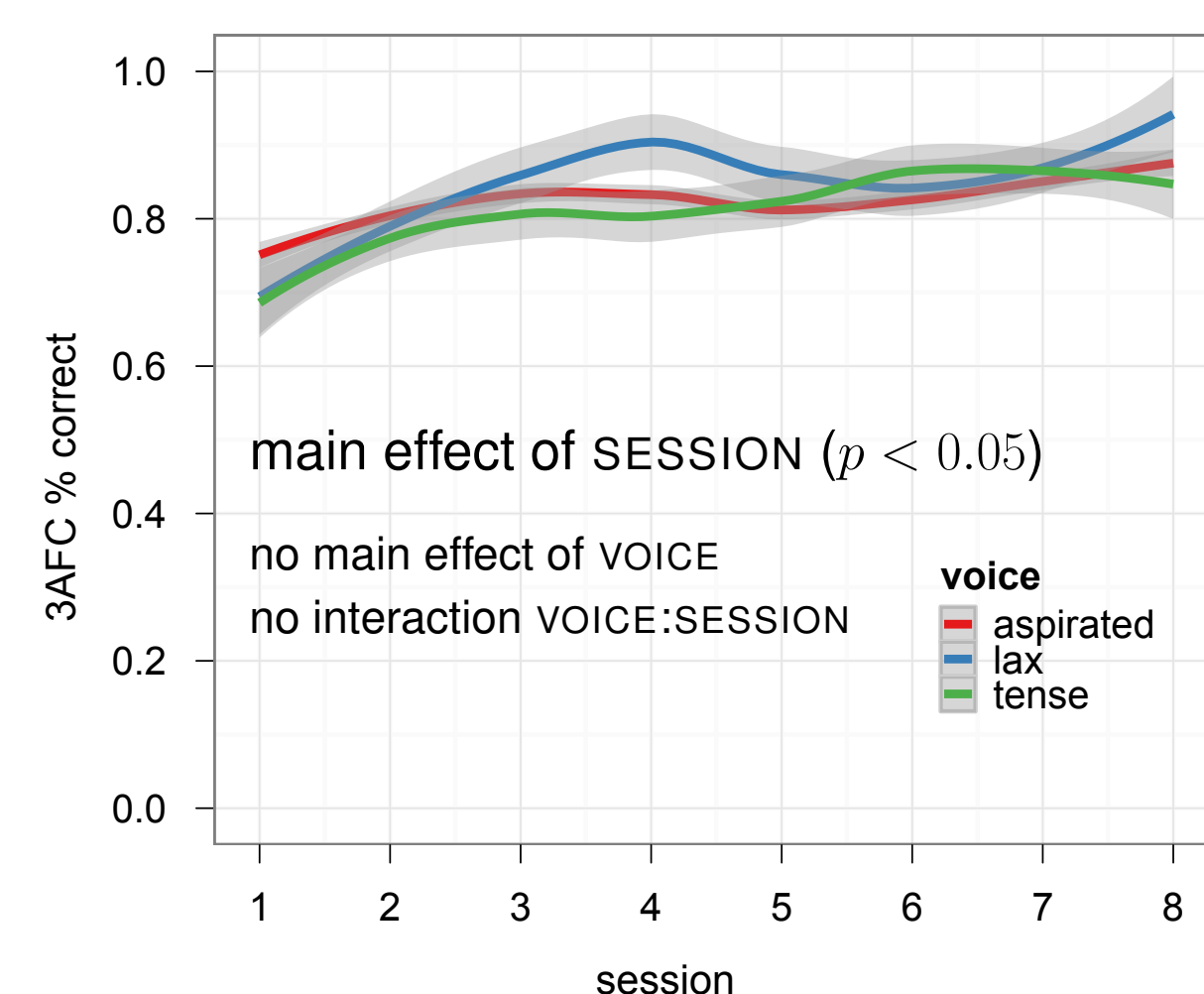
• 3AFC: 2 blocks × 6 repetitions

• AX: 8 blocks × 9 pairwise combinations; RTs converted to perceptual distances and input to multidimensional scaling [5]

• Measured VOT,  $f_0$ , H1-H2

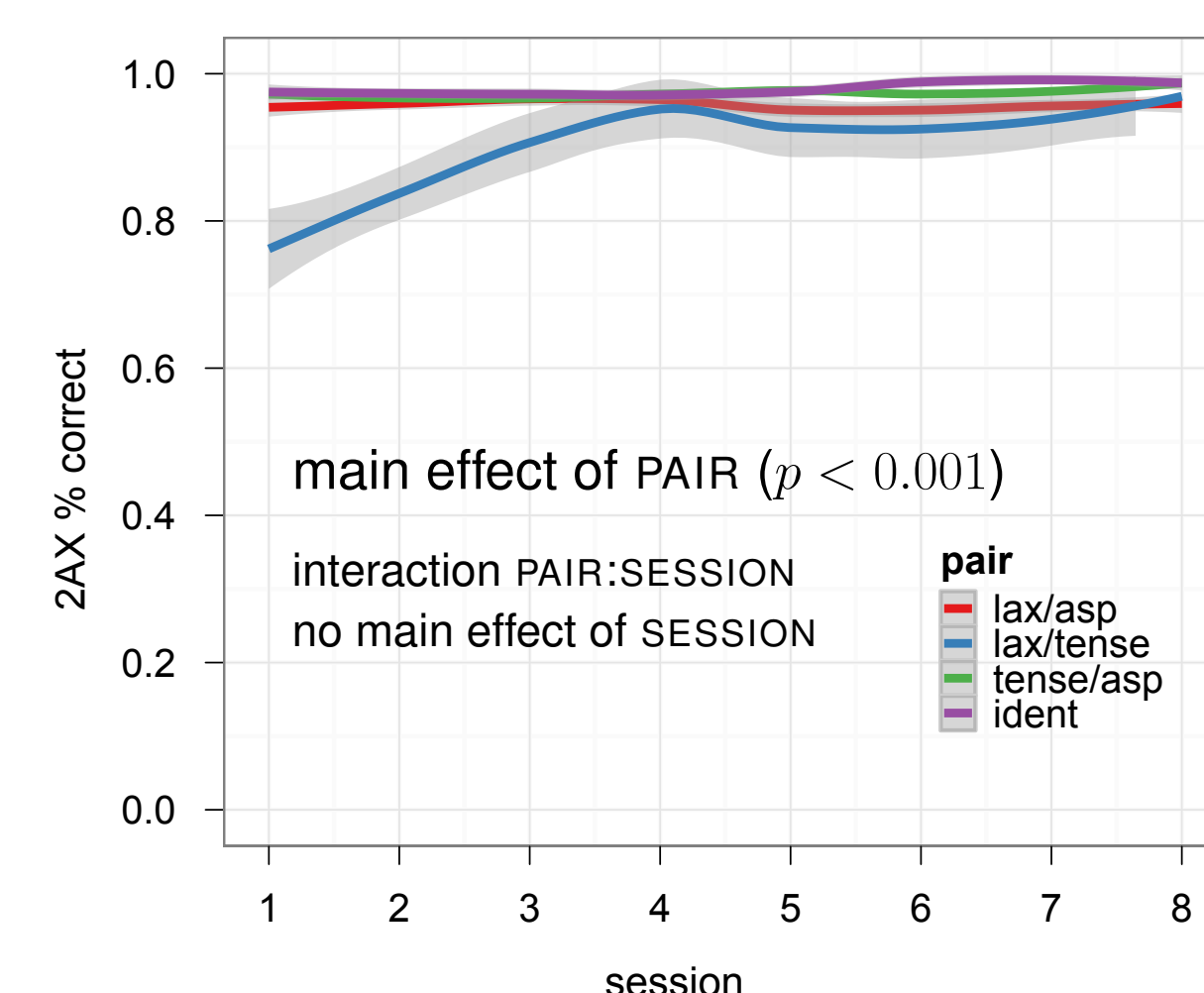
## Results: Perception

Figure 2: Mean 3AFC % correct by session.



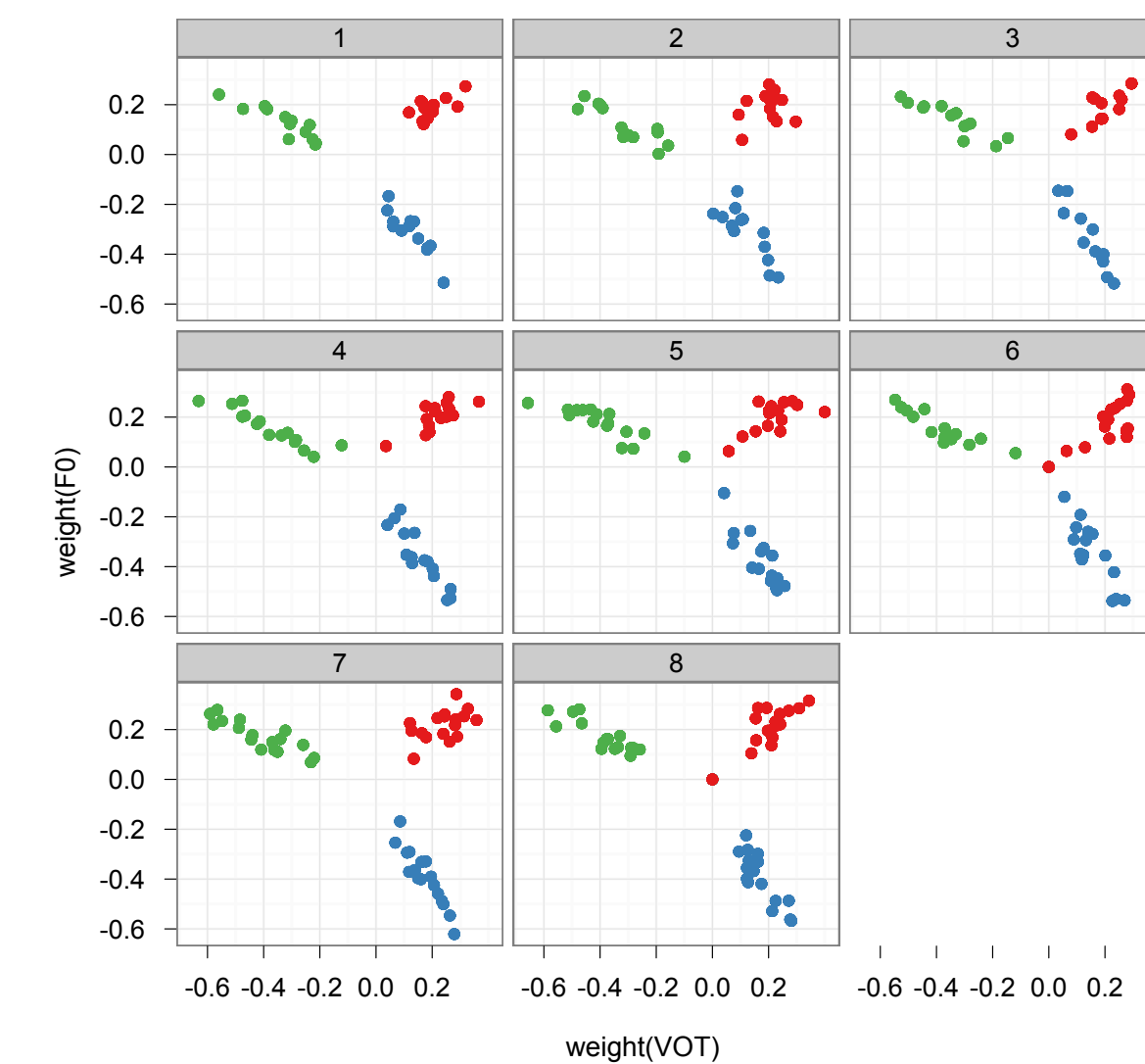
error ~ (session\*voice) + (1|subject)

Figure 3: Mean AX % correct by session.



error ~ (session\*pair) + (1|subject)

Figure 4: MDS cue weights by session.



## Results: Production/Perception

Figure 5: Participant-normalized VOT and  $f_0$  by session.

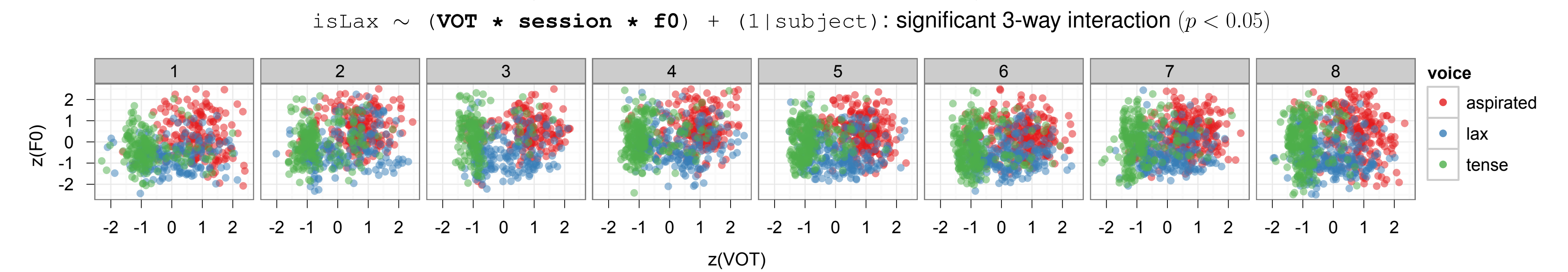


Figure 6: Participant-normalized VOT and  $f_0$  by talker. Row 1: males; row 2: females.

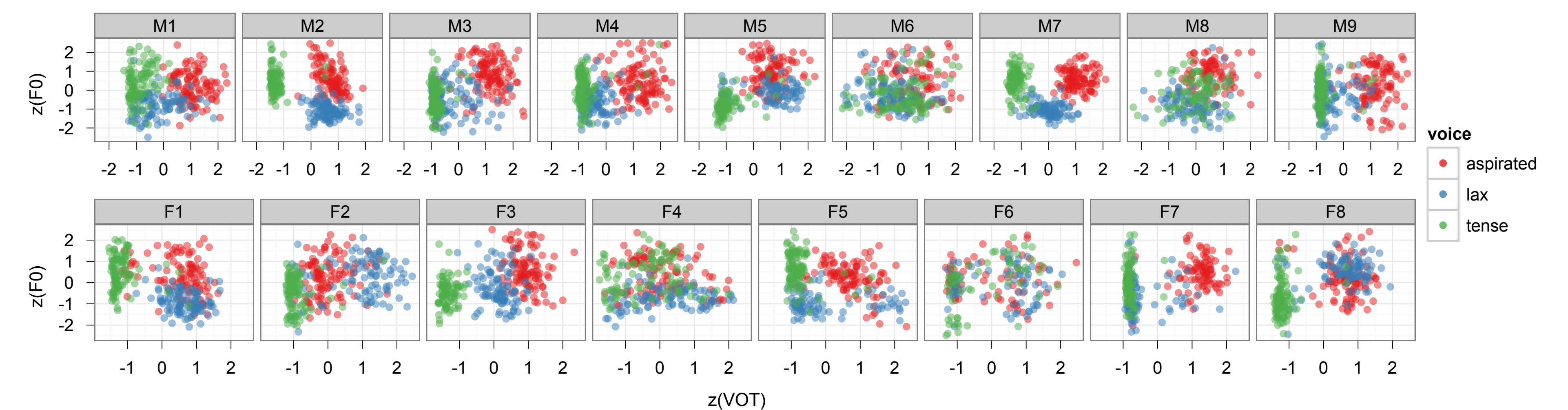
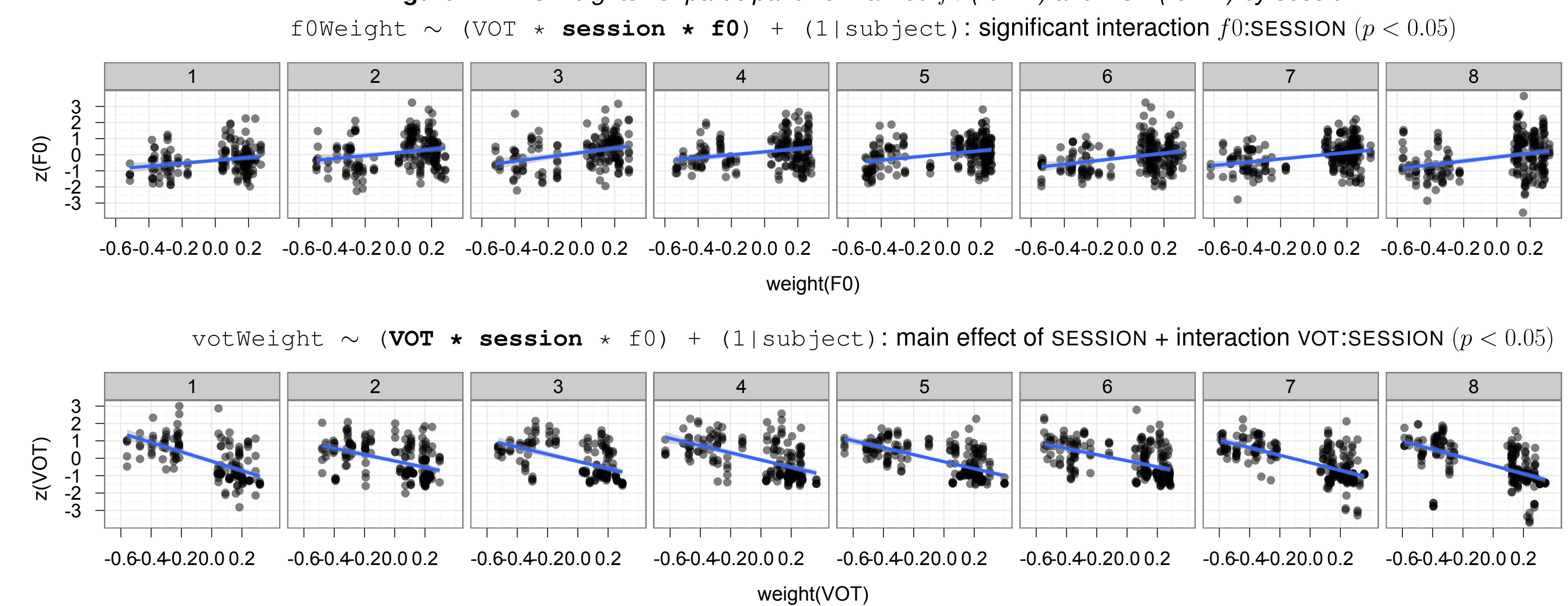


Figure 7: MDS weights vs. participant-normalized  $f_0$  (row 1) and VOT (row 2) by session.



## Conclusions

- K2 learners can perceive and (to some extent) control  $f_0$  in a relatively short time without explicit feedback
- Production and perception accuracy improves with continued exposure (though considerable between-subject variation obtains)
- Production-perception relationship becomes increasingly apparent over multiple test sessions

## References

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