

Background

- Individual differences (ID) in speech perception on many tasks
- Systematic for a given task over time
 - (Idemaru, Holt & Seltman, 2012; Strand et al. 2014; Yu & Lee, 2014)
- Cue weights are a measure of how much we attend to different acoustic phonetic dimensions for a particular contrast
 - (Holt & Lotto, 2003; Francis, Baldwin & Nusbaum, 2000)
- ID related to second language learning (Chandrasekaran et al., 2010) and cochlear implant use success (Moberly et al., 2014)
- VOT and f0 cues to stop voicing in English
 - correlated within individuals? (Schultz, Francis, & Llanos, 2012; Kong & Edwards, 2015)

Central questions

How systematic are ID in cue weights across contrasts?

Do ID in cue weights relate to other aspects of speech perception?

Methods

Cue Weighting Task

2AFC
2 cues varied orthogonally
5 steps x 5 steps
5 reps, 4 continua, 500 trials

Stimuli

Step 1: Tandem STRAIGHT (Kawahara et al. 2008) continua from natural endpoints

Step 2:
sock-shock Friction portion removed and cross spliced with vowel portion
bet-bat Vowel duration manipulated with PSOLA in Praat (Boersma & Weenick, 2013)

Step 3: 5 steps x 5 steps chosen

	Cue A	Cue B
sock-shock	Vowel Transition	Frication Noise
bet-bat	Formant Frequency	Vowel Duration
bog-dog	Vowel Transition	Burst Amplitude
Luce-lose	F0, F1	Duration ratio

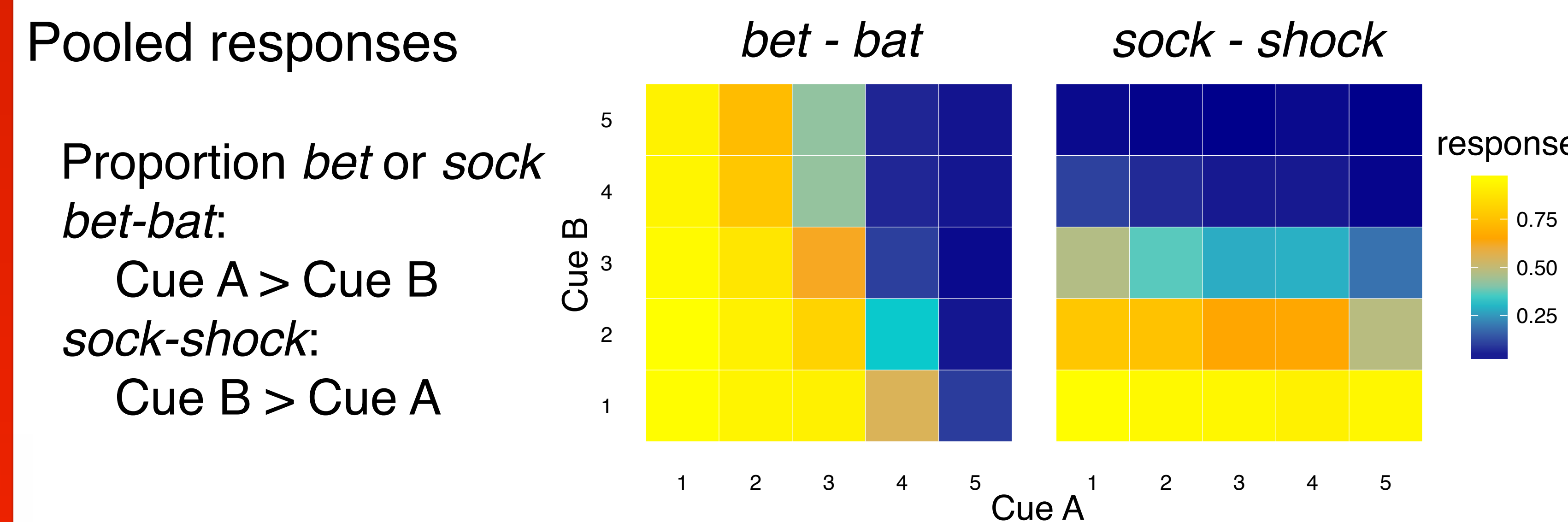
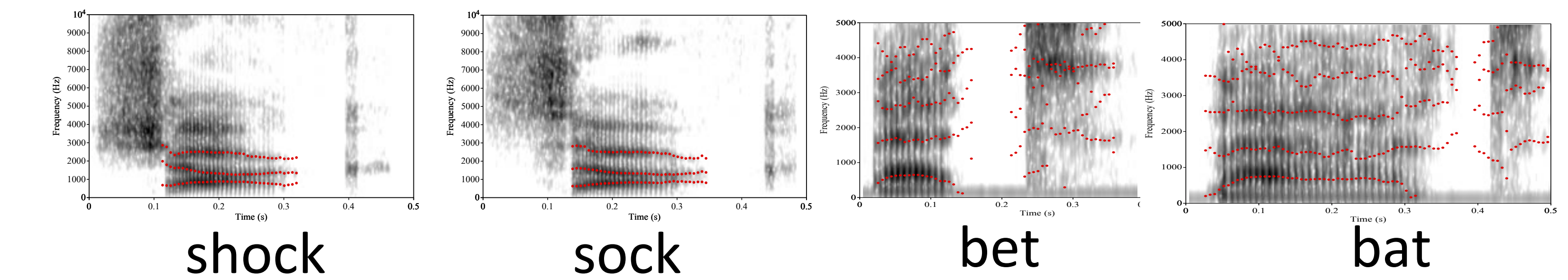
Participants

- 35 native English speakers

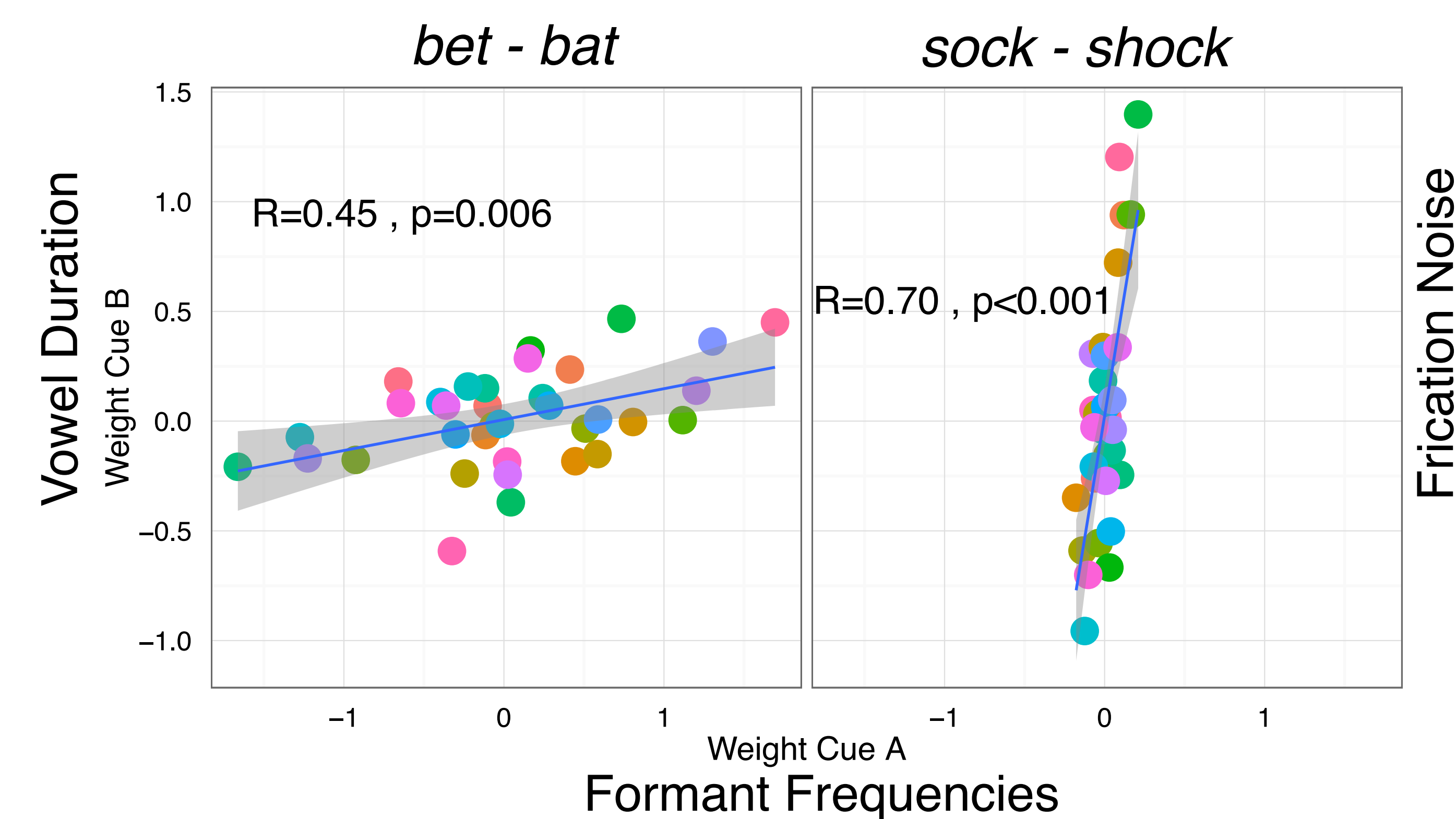
Analysis

Mixed model logistic regression

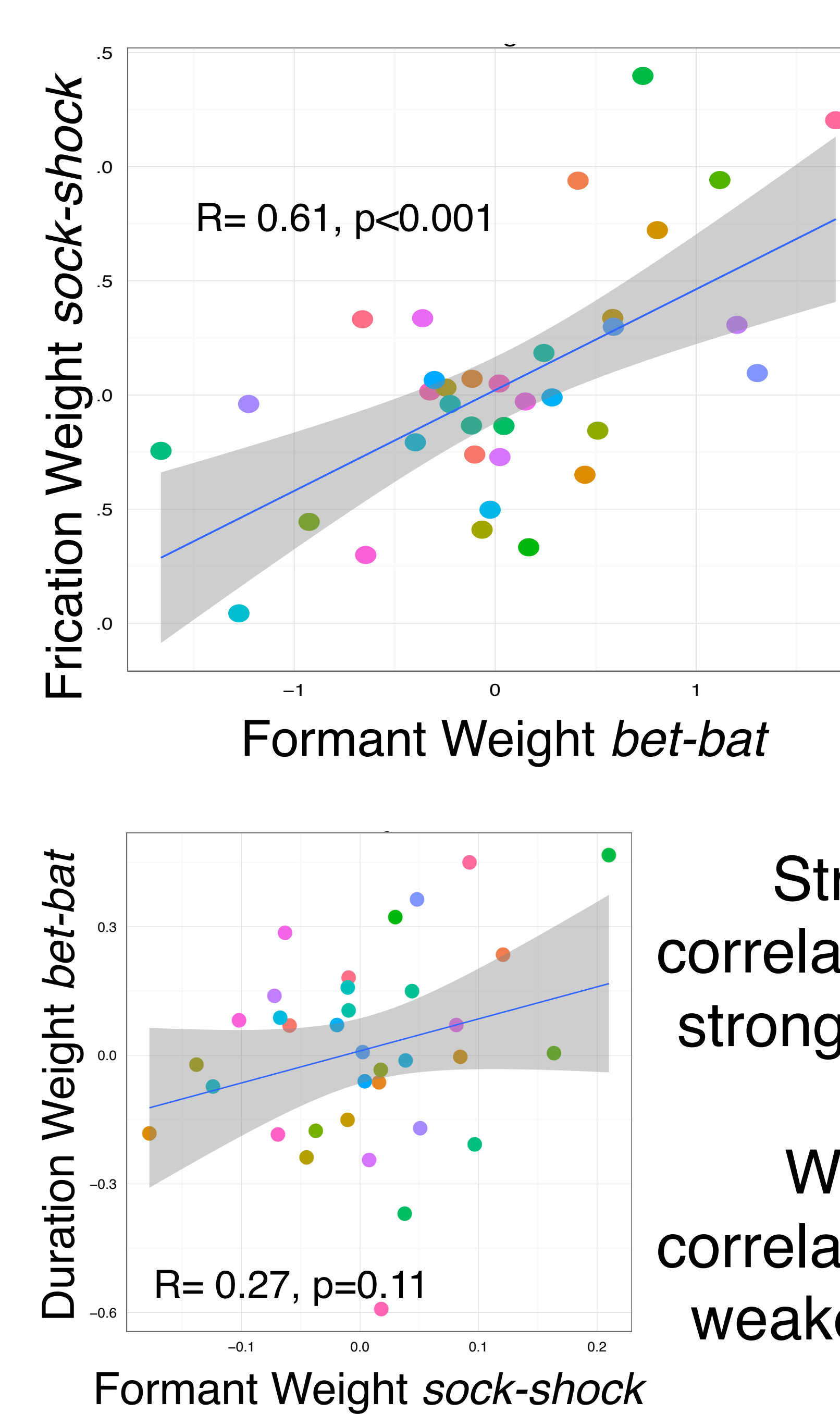
- One model per contrast
 - Fixed effects of Cue A and Cue B
 - Individual weights from random slopes for each cue by participant (deviations from the mean weight for the group shown. Model included a term for correlation between random slopes for the two cues)
- Pearson correlation on weights within and across contrasts



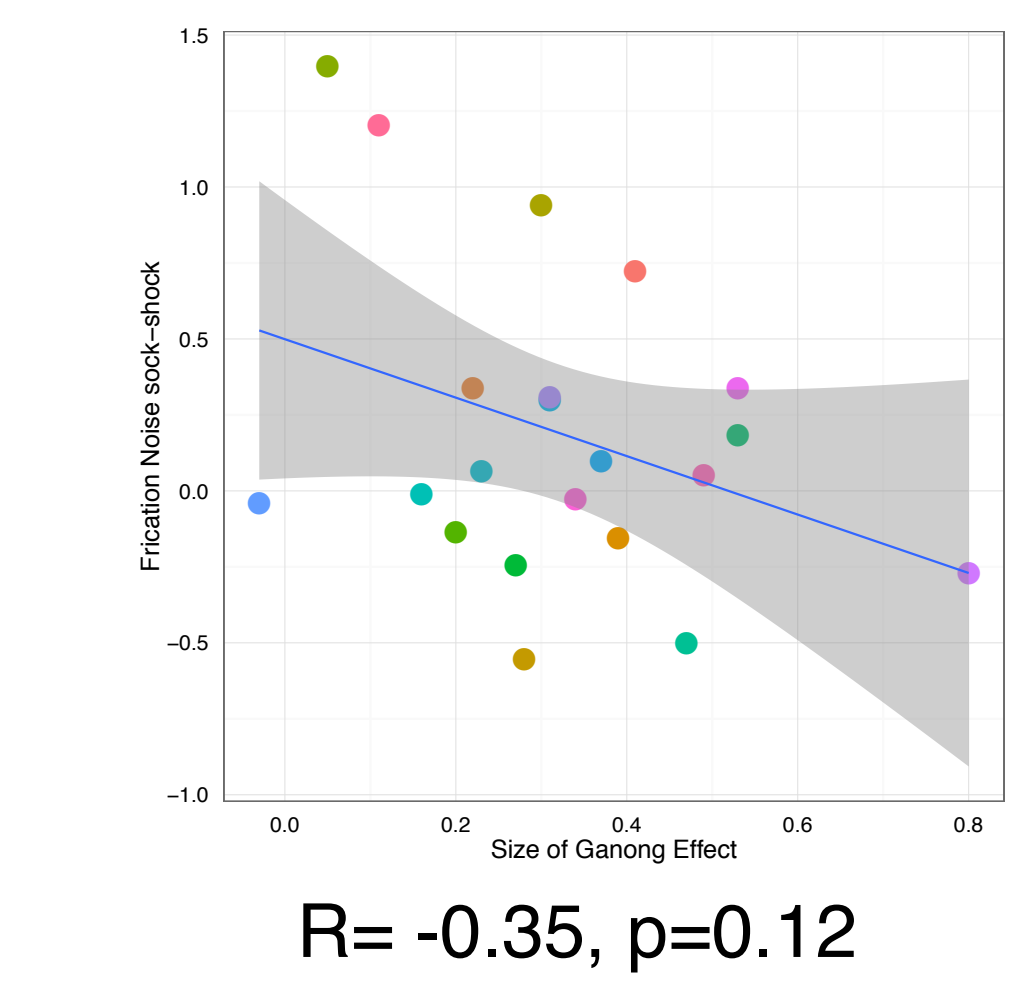
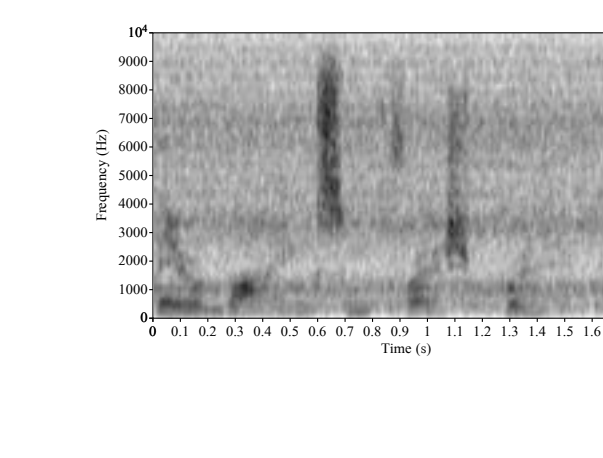
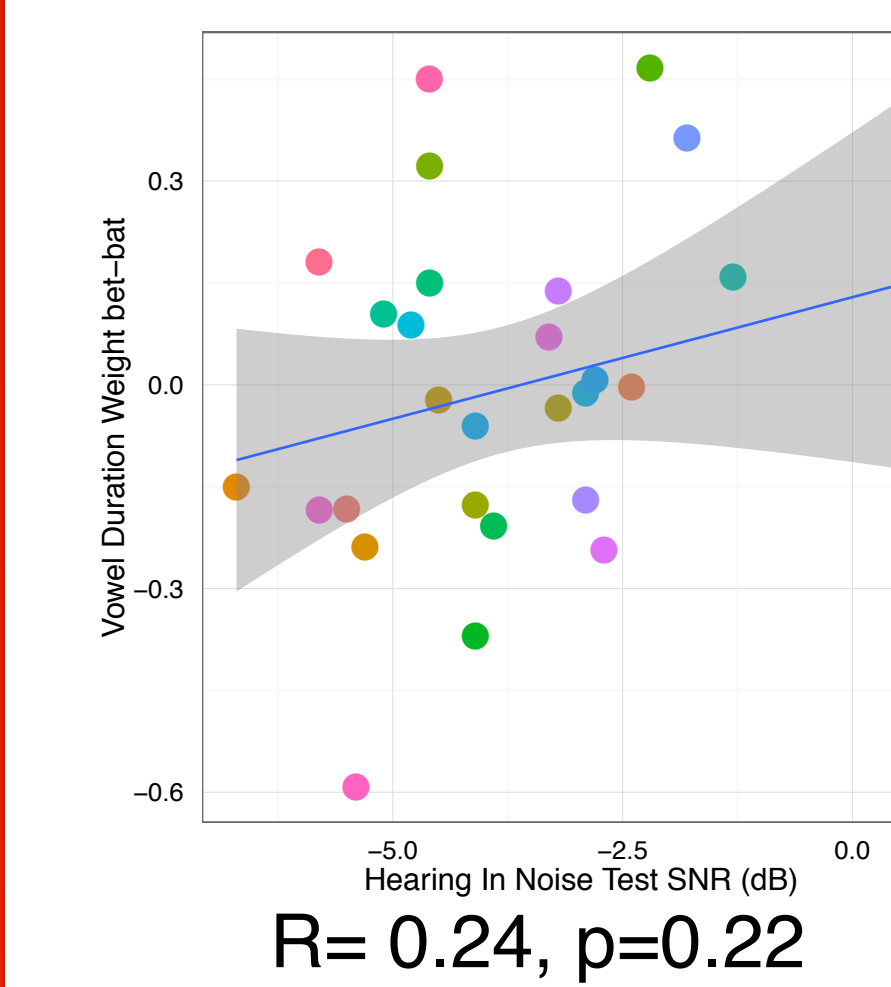
Cues are correlated **within** contrasts across individuals



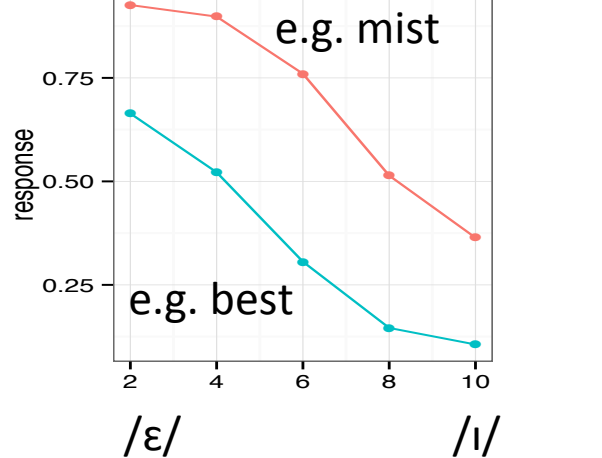
Cues are correlated **across** contrasts



No relationship to Hearing In Noise Test (HINT)



No relationship to size of Ganong effect



Discussion

- ID in cue weights positively correlated within and across contrasts
 - However preliminary data finds negative correlation within *bog-dog*
- Some individuals are better able to use acoustic-phonetic information from the speech signal
- ID in cue weights not correlated with hearing in noise
 - may rely on different skills
- ID in cue weights not correlated with degree of lexical influence in 2AFC
 - Use of context is separate from ability to extract phonetic information

Results