

# Dialectal variation and change in production and perception of the Korean fricative contrast



Jessamyn Schertz<sup>1,2</sup>, Yoonjung Kang<sup>3,2</sup>, Sungwoo Han<sup>4</sup>

<sup>1</sup>University of Toronto Mississauga, <sup>2</sup>University of Toronto, <sup>3</sup>University of Toronto Scarborough, <sup>4</sup>Inha University

## BACKGROUND

**Ambiguity** Laryngeal status of “nonfortis” Korean /s/ is ambiguous (Chang 2013): shares properties of both lenis and aspirated series.

**Dialectal variation** /s/ has high f0 in Seoul, but Kang (2014) found that speakers in Dandong, China produced /s/ with low f0, suggesting different trajectories of change

**Perception/Production** Seoul speakers have little/no f0 difference in **production** of /s/ vs. /ss/ (Kang et al. 2009), but f0 influences **perception** (Chang 2013).

KOREAN FRICATIVES				STOPS/AFFRICATES		
	VOT	f0			VOT	f0
		Seoul	Dandong			
fortis /ss/	unaspirated	high	high	fortis /cc/	unaspirated	high
nonfortis /s/	aspirated	high	low	aspirated /c <sup>h</sup> /	(most) aspirated	high(est)
				lenis /c/	aspirated	low

## QUESTIONS

1. Is there ongoing change in the use of f0 and VOT to signal the fricative contrast in Seoul and Dandong Korean?
2. Are production differences reflected in perceptual cue-weighting strategies?
3. How does this fit in with changing status of f0 and VOT in the three-way (stop/affricate) laryngeal contrast occurring in both dialects (Kang et al., 2017)?

## METHODS

### PARTICIPANTS (n=128)

- **Dandong:** 30 M, 34 F, 20-84 years
- **Seoul:** 30 M, 34 F, 20-83 years

### PRODUCTION TASK

- Fricative-initial words (6 in Seoul, 9 in Dandong), spoken in isolation.
- Following vowel /a/ or /i/.
- 1856 total tokens analyzed (2 reps).
- Measured f0 at vowel midpoint and VOT (/a/ context only).

### PERCEPTION TASK

- Forced-choice task (/sM/ vs. /ssM/)
- Stimuli manipulated from productions by 1 male and 1 female talker
- 288 total trials, blocked by talker

### MANIPULATED PARAMETERS

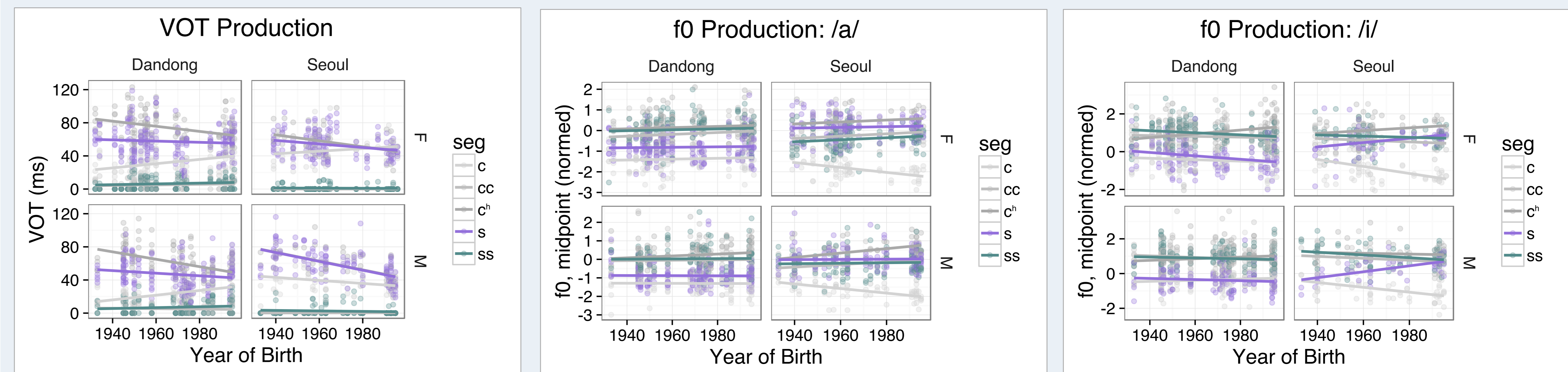
<b>Talker Gender</b>	(Older) male, (Younger) female
<b>Aspiration</b>	3 steps: 0-90 ms
<b>f0</b>	3 steps (varied by gender)
<b>Base vowel</b>	from nonfortis or fortis fricative
<b>Base consonant</b>	from nonfortis or fortis fricative

### ANALYSIS

- 4 Linear mixed-effects models.
- 2 dimensions (VOT or f0) \* 2 modalities (perception and production).
- Focus on effects/interactions involving laryngeal category.

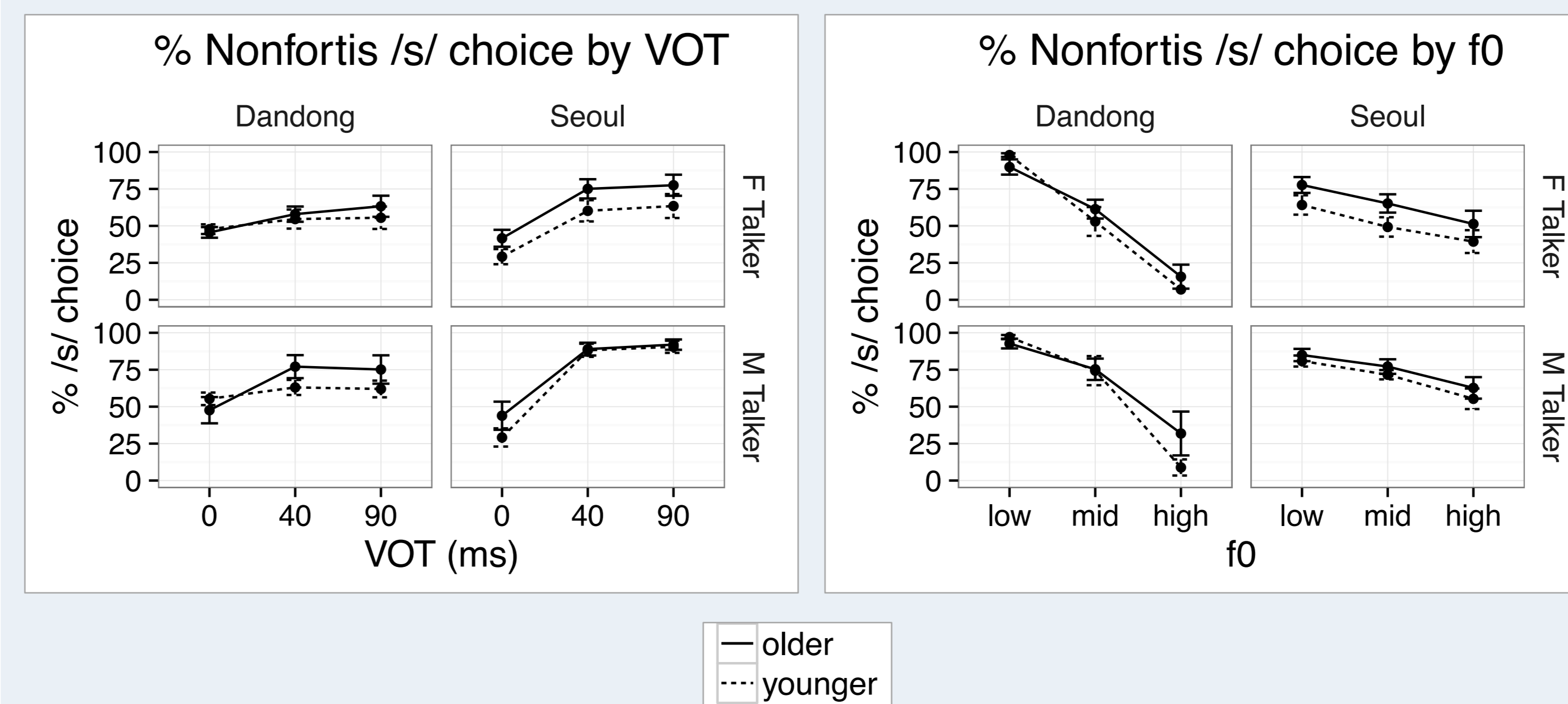
<b>Response variable</b>	VOT or f0
<b>Predictor variables</b>	Laryngeal affiliation (production) or Laryngeal response (perception) * Year of Birth * Dialect * Gender * Talker Gender (perception only)
<b>Random effects</b>	Laryngeal category (and talker gender for perception), by participant

## PRODUCTION RESULTS



Dimension	Overall effect	Dialect/Gender variation	Change over time?
VOT	/s/ > /ss/	Dandong males have a smaller effect than other groups	Decreasing use of VOT (all groups)
f0 - /a/	Varies by dialect	Dandong males and females: /ss/ > /s/ Seoul females: /s/ > /ss/ (no effect for males)	None
f0 - /i/	/ss/ > /s/	Younger Seoul speakers have no distinction	Decreasing use of f0 in Seoul

## PERCEPTION RESULTS



	Overall effect	Dialect/Gender/Talker Gender variation	Change over time?	
VOT	Longer VOT elicits more /s/ response	Seoul listeners rely on VOT more than Dandong listeners. Seoul listeners rely on VOT more for male than female talker.	Dandong	Younger listeners rely on VOT less than older listeners <b>for male talker only.</b>
			Seoul	None
f0	Lower f0 elicits more /s/ response	Dandong listeners rely on f0 more than Seoul listeners.	Dandong	Younger listeners use f0 more than older.
			Seoul	None

## DISCUSSION

### DIALECTAL VARIATION

- Dandong vs. Seoul difference confirmed.
- /s/ has low f0 (like lenis) in Dandong and high f0 (like aspirated) in Seoul Korean.
- f0 differentiates /s/ from /ss/ in Dandong **production**, but not (consistently) in Seoul. This is reflected in **perception** in the greater use of f0 in Dandong (vs. Seoul) listeners.

### PERCEPTION/PRODUCTION MISMATCH

- (Small) change in Dandong perceptual cue weighting not reflected in production.
- This could be driven by the affiliation of /s/ with the lenis stop/affricate category in Dandong, which shows clearer age-related change.
- Dandong speakers rely more on f0 than VOT, even though VOT better differentiates productions.
- Use of f0 in Seoul perception of /s/-/ss/ does **not** reflect production values, which show no contrast, or even show the opposite patterns (Seoul Female /a/) (see also Chang 2013, Kang et al. 2009)
- However, in a related task eliciting hyperarticulated /s/-/ss/ minimal pairs, the same Seoul speakers **do** show an f0 difference in the same direction as the perception patterns.