



'NO' vs 'ANIYO': BACK VOWEL DIPHTHONGIZATION IN HERITAGE KOREAN

{ANDREW CHENG} UNIVERSITY OF CALIFORNIA, BERKELEY andrewcheng@berkeley.edu ASA 2019, SAN DIEGO 2aSC6

BACKGROUND

- Bilingual vowel system shows effects of both languages [1, 2].
- AOA affects degree and direction of L1/L2 vowel systems [3, 4], but effects on heritage speaker bilinguals are understudied [5].
- Past study of Korean vs. English found English GOAT had higher F1 and F2 than Korean /o/, GOOSE had higher F2 than Korean /u/ [6].
- California English speakers tend to front and diphthongize back vowels (in particular GOOSE) [7]; does acquisition of backed, monophthongal Korean /u/ interfere?
- Current study compares bilinguals' back vowels (English GOAT, GOOSE and Korean /o, u/). Hypothesis: English back vowels will differ in F2 from Korean back vowels (i.e., heritage bilinguals have acquired distinct vowel systems).

METHODS

- Data from casual bilingual interviews, comprising Korean interview (2-16 min., mean=8), Korean reading task, and English interview (17-52 min., mean=31). Code-switching allowed.
- Interlocutors: five trained Korean-English bilinguals of varying age, gender, ethnicity (subjects not counterbalanced).
- Speech digitally recorded, transcribed, and automatically aligned; formants for vowels taken from 25/50/75% of vowel duration.
- Hz values converted to Bark for normalization.
- Average 180 GOAT, 120 GOOSE, 80 /o/, and 40 /u/ tokens per subject, from interviews only, used in lmer/ANOVA analysis.

SPEAKERS

- 31 Korean Americans analyzed (out of 40), all residing in California and dominant in English, proficient in Korean.
- 10 male, 21 female; age range 18-32 years (mean=22.9); 20 2nd generation (born in the US), 11 1.5 generation.

RESULTS

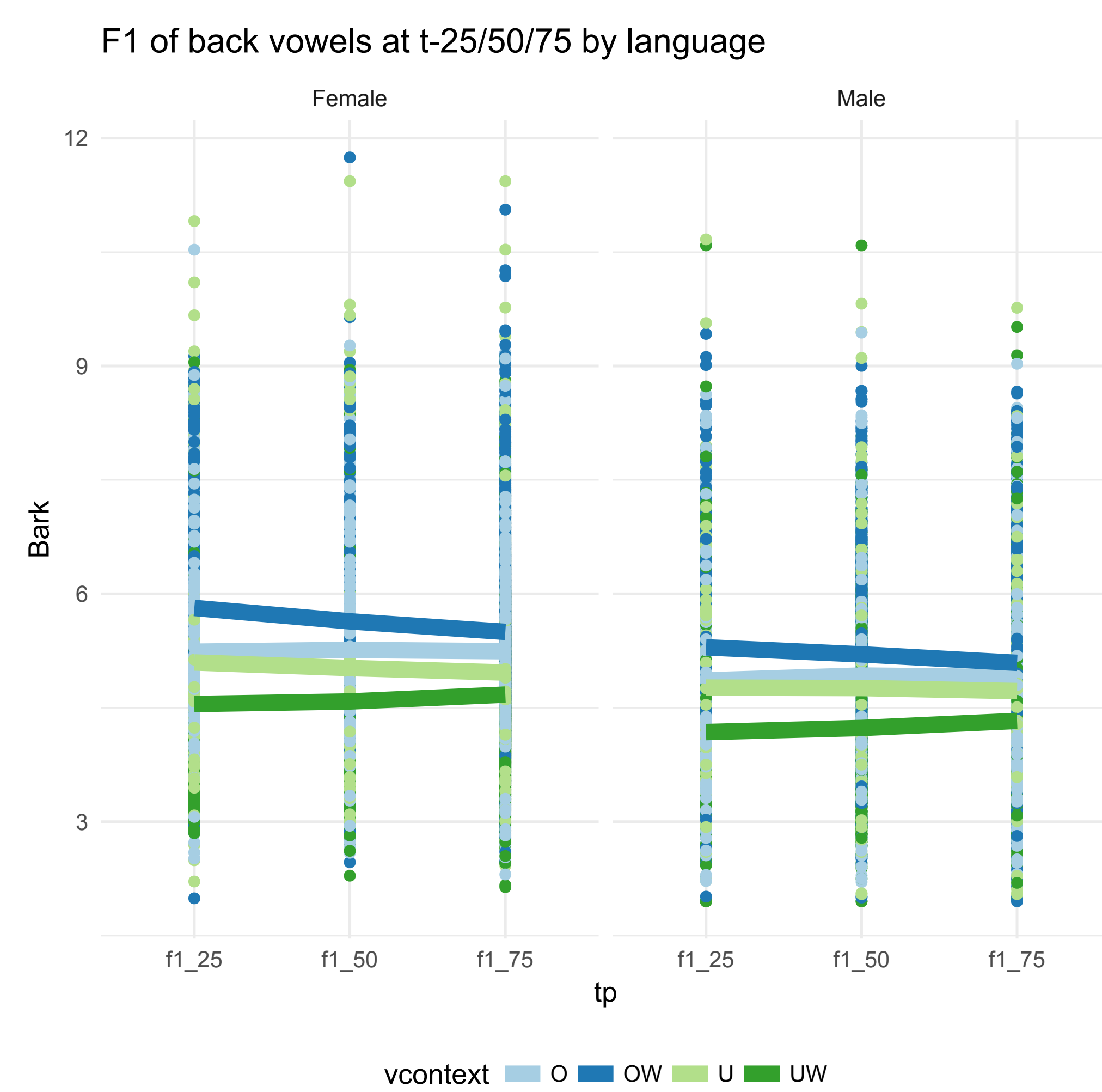


Figure 1: F1 of GOAT (OW), /o/, and /u/ decreases slightly or remains constant over vowel duration, while GOOSE (UW) increases slightly, for both male and female speakers. Over vowel duration, vowel targets appear to converge.

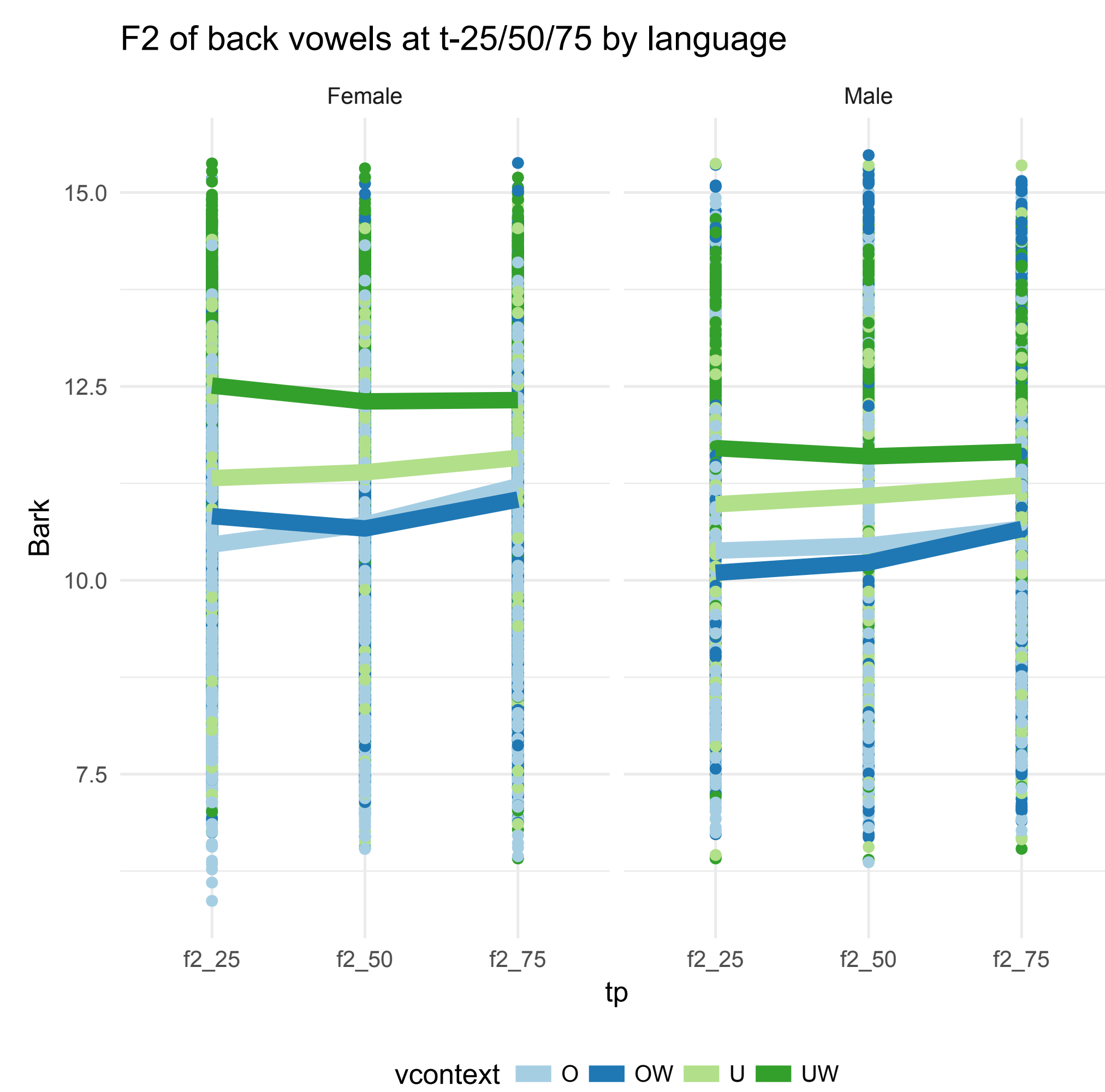


Figure 2: F2 of GOAT (OW), /o/, and /u/ increases over vowel duration. F2 of GOOSE (UW) slightly decreases, although F2 of both English vowels has a noticeable curved trajectory, which Korean /o/ matches (for female speakers).

Language did not significantly change the lmer model for GOOSE, /u/ F2, due to effect of following segment on English, but not Korean. Lmer model adding interaction of language and following segment resolves this. Vowel trajectories quite similar for English and Korean vowels, in particular diphthongized GOAT and /o/.

Pooled Back Vowels, English and Korean

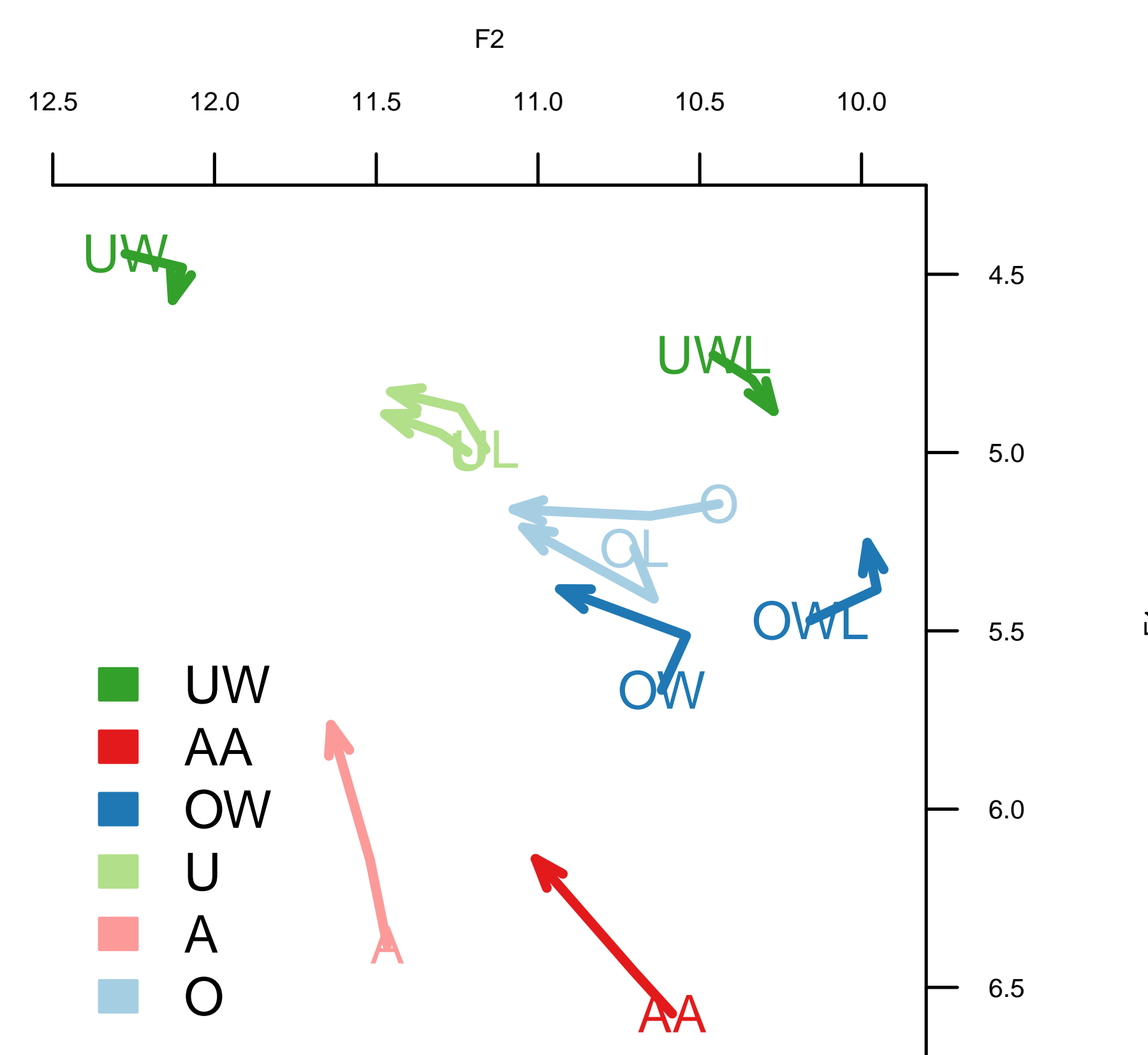


Figure 3: Vowel trajectories of GOAT (OW), /o/, GOOSE (UW), /u/, English /a/ (AA), and Korean /a/, with pre-lateral back vowels separated.

Korean /o,u/ by style

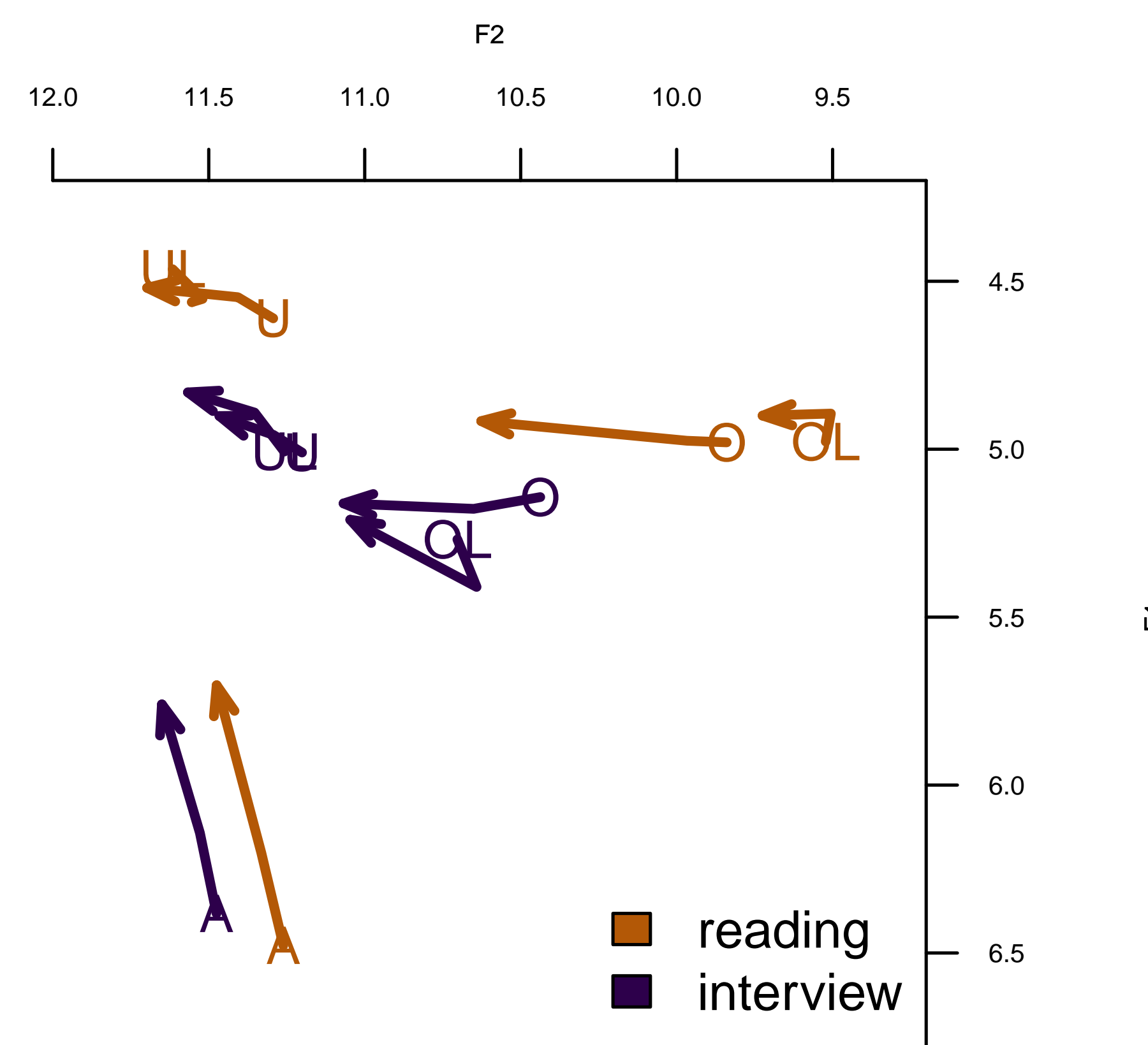


Figure 4: Korean back vowel trajectories, split by speech style, with low-central /a/ for comparison.

STATS

Linear mixed effects regression models created for F1/F2 at 50% of each vowel. Base model created with fixed effects of Gender, following, and previous segment, and a random effect of Subject. Test models added language (lx), then language:following segment interaction (lxint). Likelihood Ratio Tests of base/lx and lx/lxint using ANOVA.

model	Df	AIC	Chisq	Pr(>Chisq)
base_O_F1	126	89244		
lx_O_F1	127	89176	70.417	2.2e-16***
lxint_O_F1	138	89122	75.744	9.756e-12***
base_O_F2	126	107610		
lx_O_F2	127	107554	58.309	2.24e-14***
lxint_O_F2	138	107553	23.427	0.01438*
base_U_F1	105	52349		
lx_U_F1	106	52325	26.386	2.796e-07***
lxint_U_F1	117	52325	22.202	0.02285*
base_U_F2	105	61823		
lx_U_F2	106	61823	1.5698	0.2102
lxint_U_F2	117	61752	93.589	3.291e-15***

Generation as fixed effect did not improve models.

DISCUSSION

- For bilingual speakers, language affects the realization of back vowel F1 and F2. English GOAT has higher F1, lower F2 than Korean /o/. English GOOSE has lower F1, higher F2 than Korean /u/ (dependent on following segment).
- /o/, but not /u/, appears to show diphthongization and fronting. Reading style has lower formants overall.
- In the pipeline: reanalysis using Generalized Additive Models (GAMs).

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