

ORTHOGRAPHY-INDUCED GRADIENT WEIGHT EFFECTS IN PORTUGUESE ACQUISITION BY L1 MANDARIN LEARNERS

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Naïve L1 Mandarin speakers are sensitive to *word-final syllable weight* in the perception of Portuguese stress, which doesn't come from Mandarin

INTRO

- Portuguese (Pt) regular stress (L2) (> 70% lexicon; Garcia 2014)
 - Heavy final syllable → final stress
jornál, *carnavál* ‘newspaper’, ‘carnival’
 - Light final syllable → penult stress (PU)
caválo, *planálto* ‘horse’, ‘plateau’

Weight matters most in final position

- Mandarin stress (L1)? (Qu 2013)
 - Weight is not sensitive to syllable shape (Duanmu 2007), but heavy syllables have longer duration
 - DONG (T1) XI (T1) vs. DONG (T1) xi (T0)
“East West” vs. “Thing”
↑
duration (Lin 1985)
 - Perception of stress/prominence ~ syllable duration ~ phonological weight

Research Question

Will L1-Mandarin be able to use durational difference to perceive Portuguese stress?

Yes: Cue-based transfer. Learners can (re)use acoustic correlates employed in their L1 to acquire a novel L2 structure (Francis et al. 2000; Escudero & Boersma 2004)

No: Stress deafness. Duration is not the main cue (e.g., pitch; Archibald 1997, Wang 2008)

EXPERIMENT 1

- Subjects: 21 L1 Mandarin with moderate English (LexTALE score = 30, SD = 7.23; 0-100 scale) and no knowledge of Pt
- Task: Auditory stress identification

请选择刚听到的单词中，哪个音节是重读音节（大写字母表示重读）。
请按“A”键选择左侧的选项，按“L”键选择右侧的选项，按“空格键”如果你不清楚。
Please indicate which option contains the stressed syllable (uppercase) that you just heard.
Press “A” for the option on the left, “L” for the option on the right and “Space” if you are not sure.

JOfo

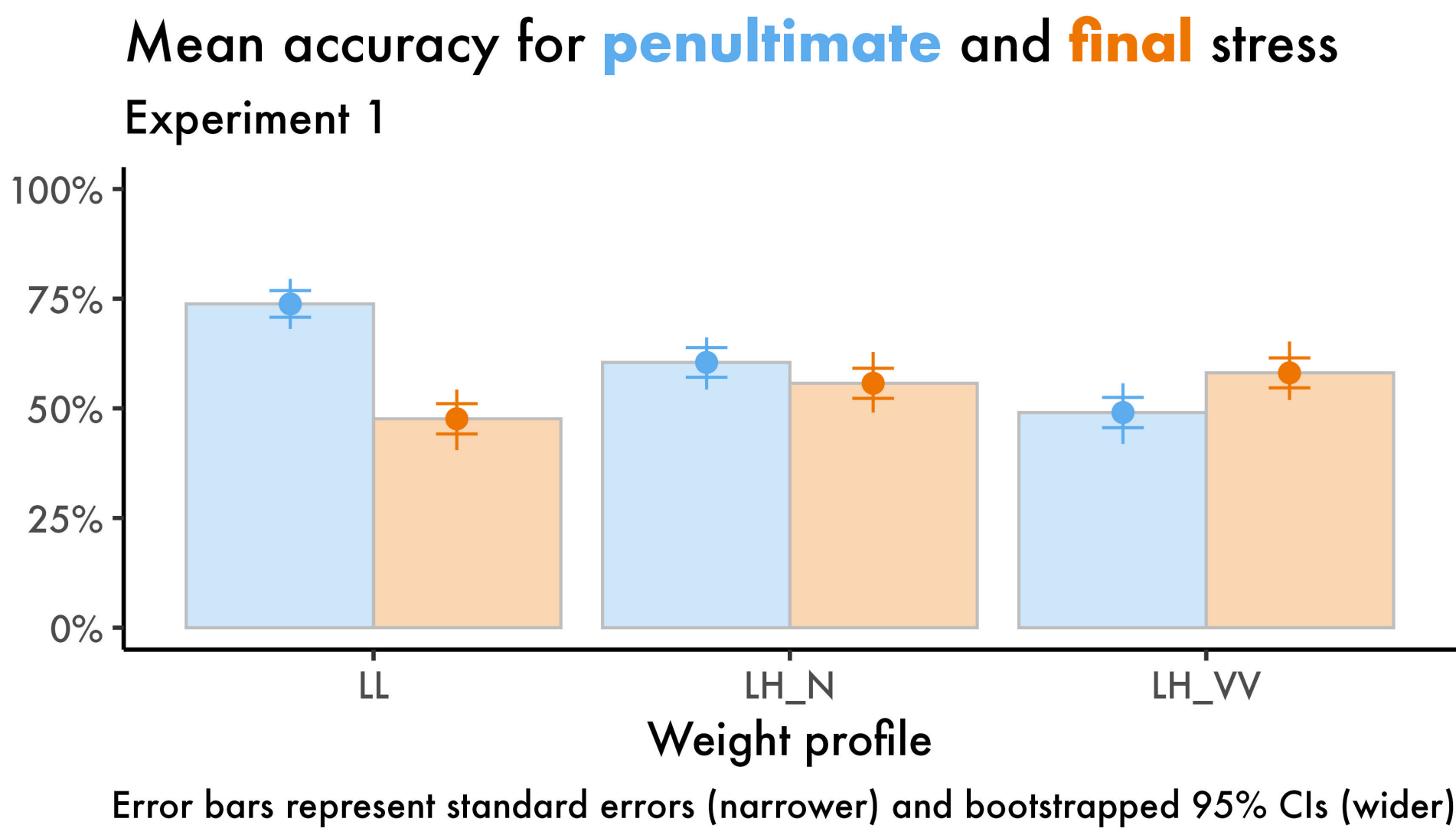
我不清楚~
I don't know

joFO

- Stimuli: 60 Portuguese disyllabic pseudowords
 - PU: 10 LL, 10 LH_N, 10 LH_VV
 - Final: 10 LL, 10 LH_N, 10 LH_VV

	Penultimate	Final
10 LL	JOfo	joFO
10 LH_N	PAbem	paBEM
10 LH_VV	DAcai	daCAI
	harder	easier

RESULTS



STATS

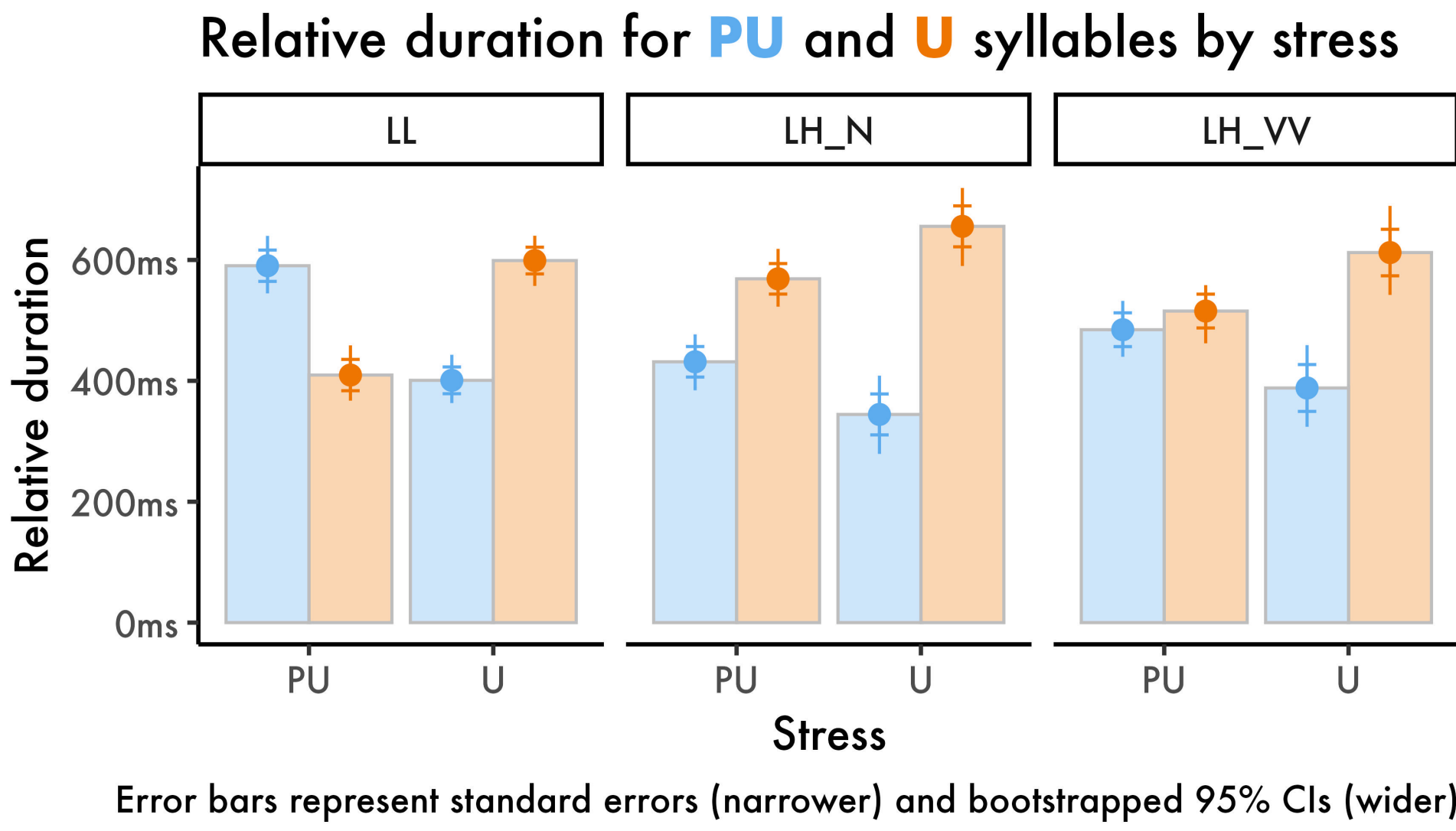
Bayesian mixed-effects regression:
Correct ~ stress location * weight + (stress location * weight | participant) + (stress | item)

Model estimates:

Parameter	$\hat{\beta}$	Est. Error	95% CrI
LH_VV:stressU	0.63	0.32	−0.01, 1.22
LL:stressU	−1.21	0.41	−2.05, −0.41

INTERIM DISCUSSION

- What could explain these results? Not the stimuli: acoustic analysis reveals no f0/duration/intensity/vowel quality patterns
- Duration: LH > LL, but not LH_VV > LH_N

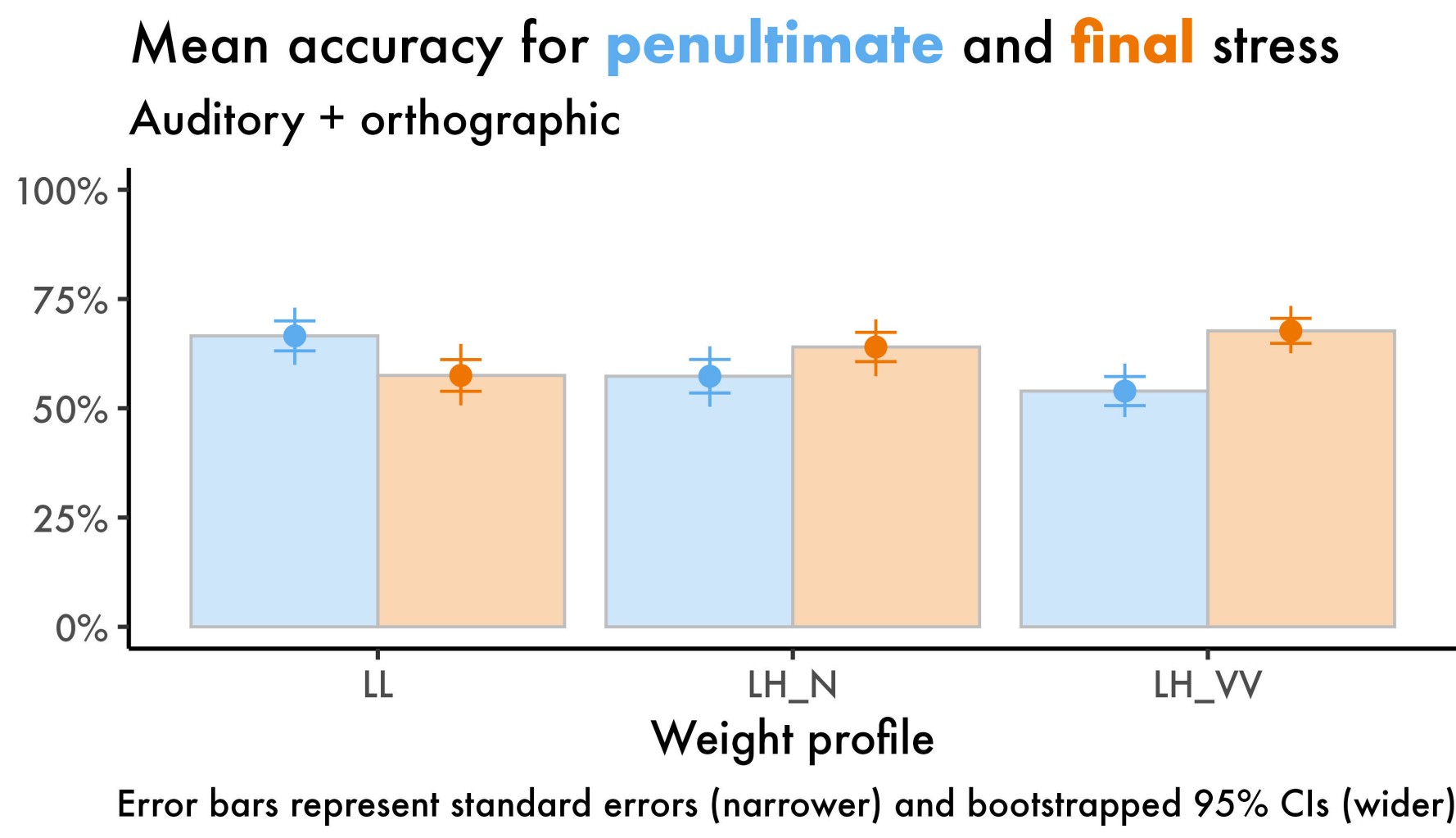
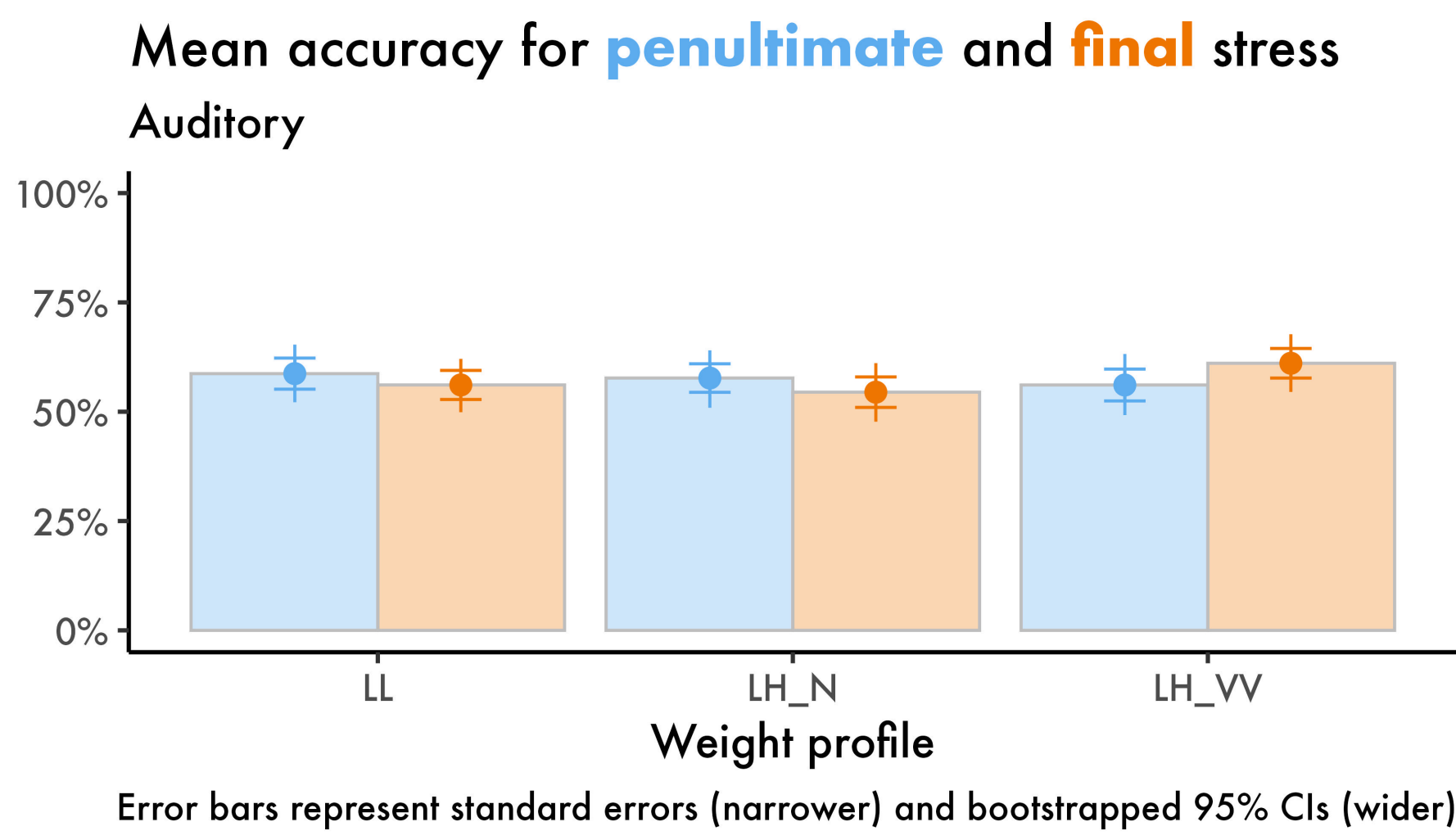


- Could results be driven by orthography (Ruiz 2002)?

EXPERIMENT 2

- Subjects: 95 L1 Mandarin with moderate English and no knowledge of Pt
- Task and Stimuli comparable to Exp 1
- Auditory vs. Auditory + Orth condition

RESULTS

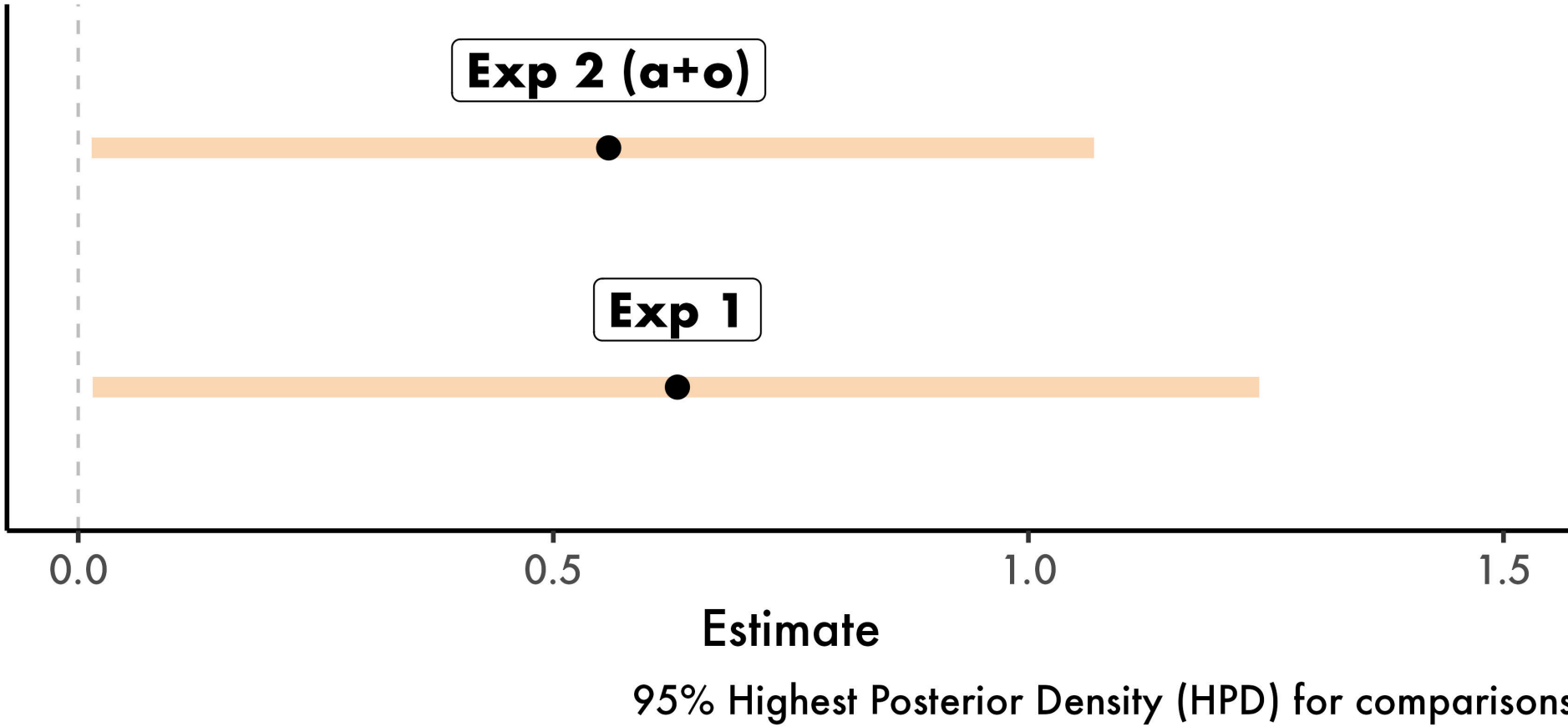


STATS

Model estimates:

Parameter	$\hat{\beta}$	Est. Error	95% CrI
LH_VV:stressU	0.56	0.27	0.02, 1.08
LL:stressU	−0.74	0.29	−1.32, −0.16

Reversal in stress identification accuracy
Interaction contrast across experiments: LH_VV vs. LH_N



GENERAL DISCUSSION

- Listeners seem to be using syllable weight to identify Portuguese stress (1 and 2).
- This is reflected in their identification accuracy (LH_VV > LH_N > LL) and seems to be driven by orthography (2).
- Gradient weight: innate or sonority-driven?