

# L1 TONAL LEARNERS MAY USE UNEXPECTED ABSTRACT KNOWLEDGE TO ACQUIRE L2 LEXICAL STRESS

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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)

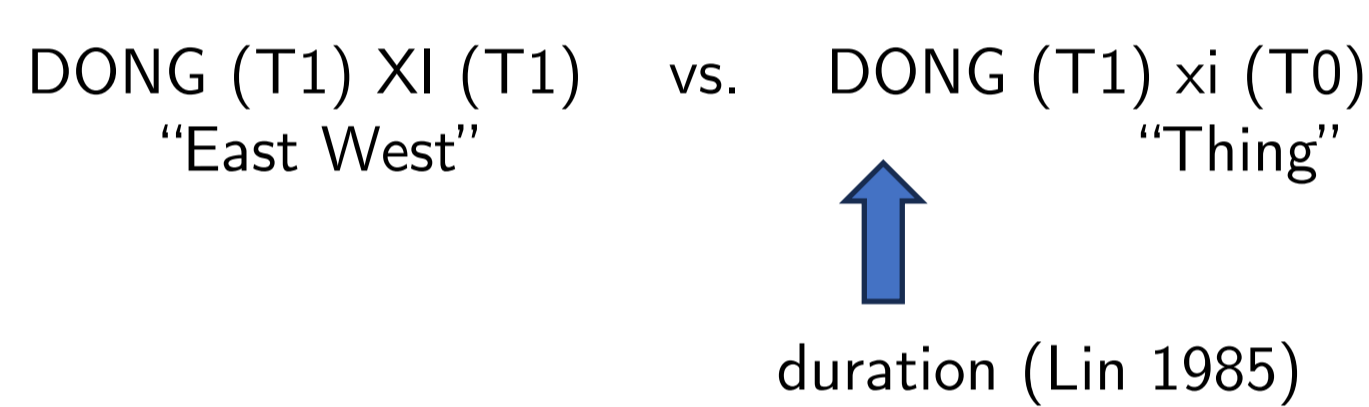
a. Heavy final syllable → final stress  
*jornál, carnavál* 'newspaper', 'carnival'

b. Light final syllable → penult stress (PU)  
*caválo, planáto* 'horse', 'plateau'

Weight matters most in final position

- Mandarin stress (L1)? (Qu 2013)

a) Weight is not sensitive to syllable shape (Duanmu 2007), but heavy syllables have longer duration



b) 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

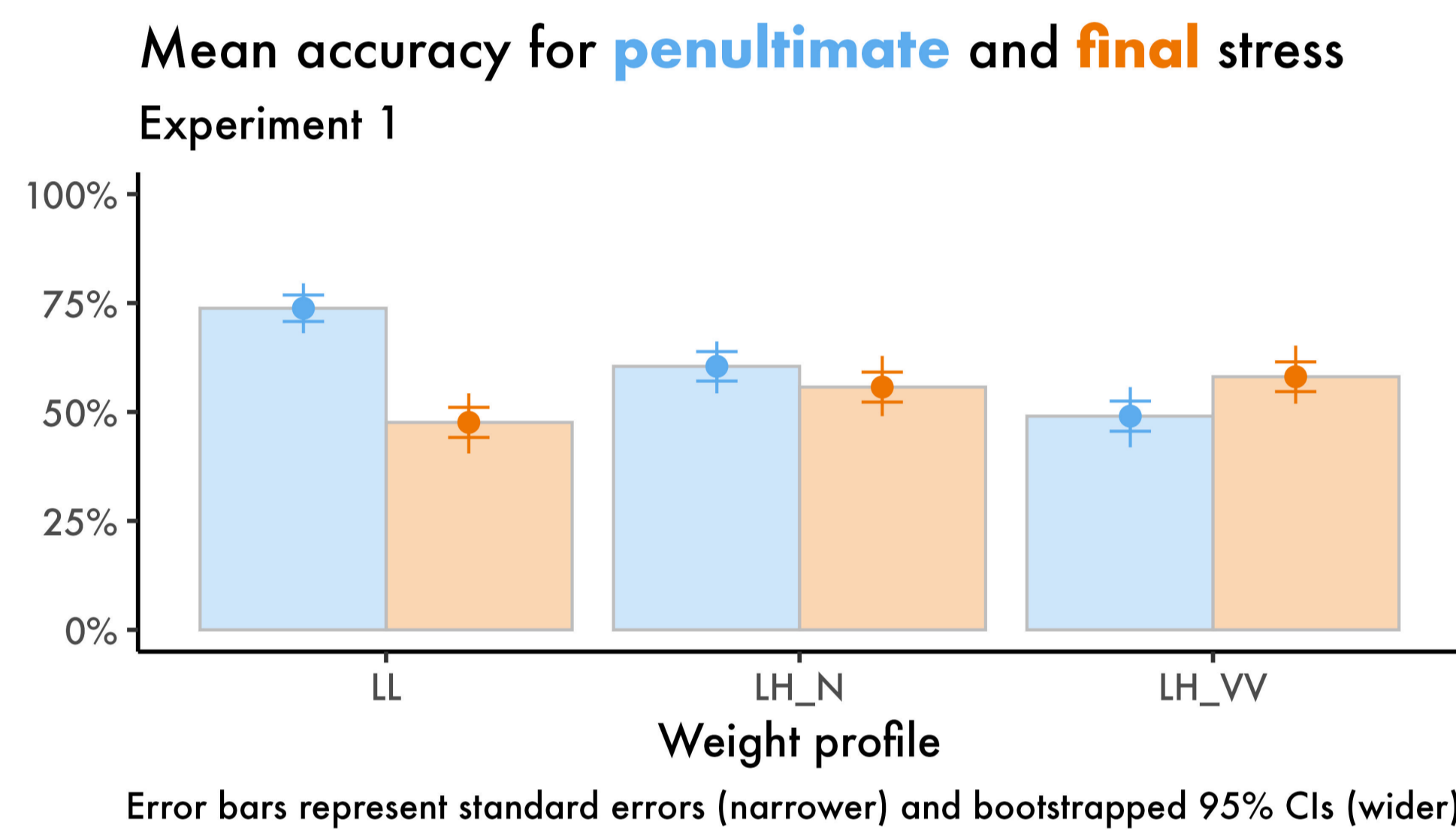
请选择刚听到的单词中，哪个音节是重读音节（大写字母表示重读）。  
请按“A”键选择左侧的选项，按“L”键选择右侧的选项，按“空格键”如果你不清楚。  
Please indicate which option contains the stressed syllable (uppercase) that you just heard.  
Press "A" for the option on the left, "L" for the option on the right and "Space" if you are not sure.

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
	<b>harder</b>	<b>easier</b>

## RESULTS



## STATS

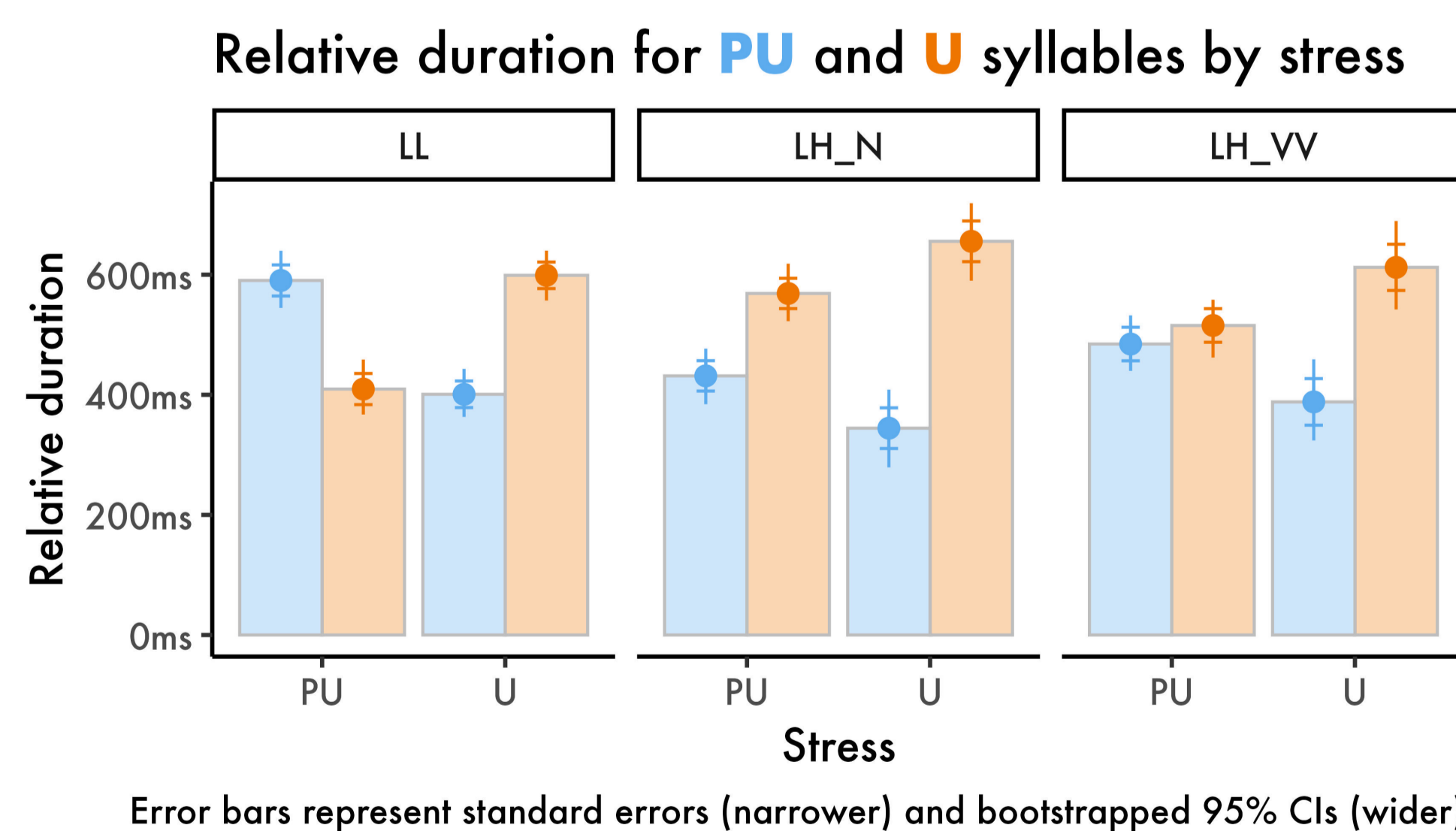
Bayesian mixed-effects regression:  
Correct ~ stress location \* weight + (stress location \* weight | participant) + (stress | item)

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

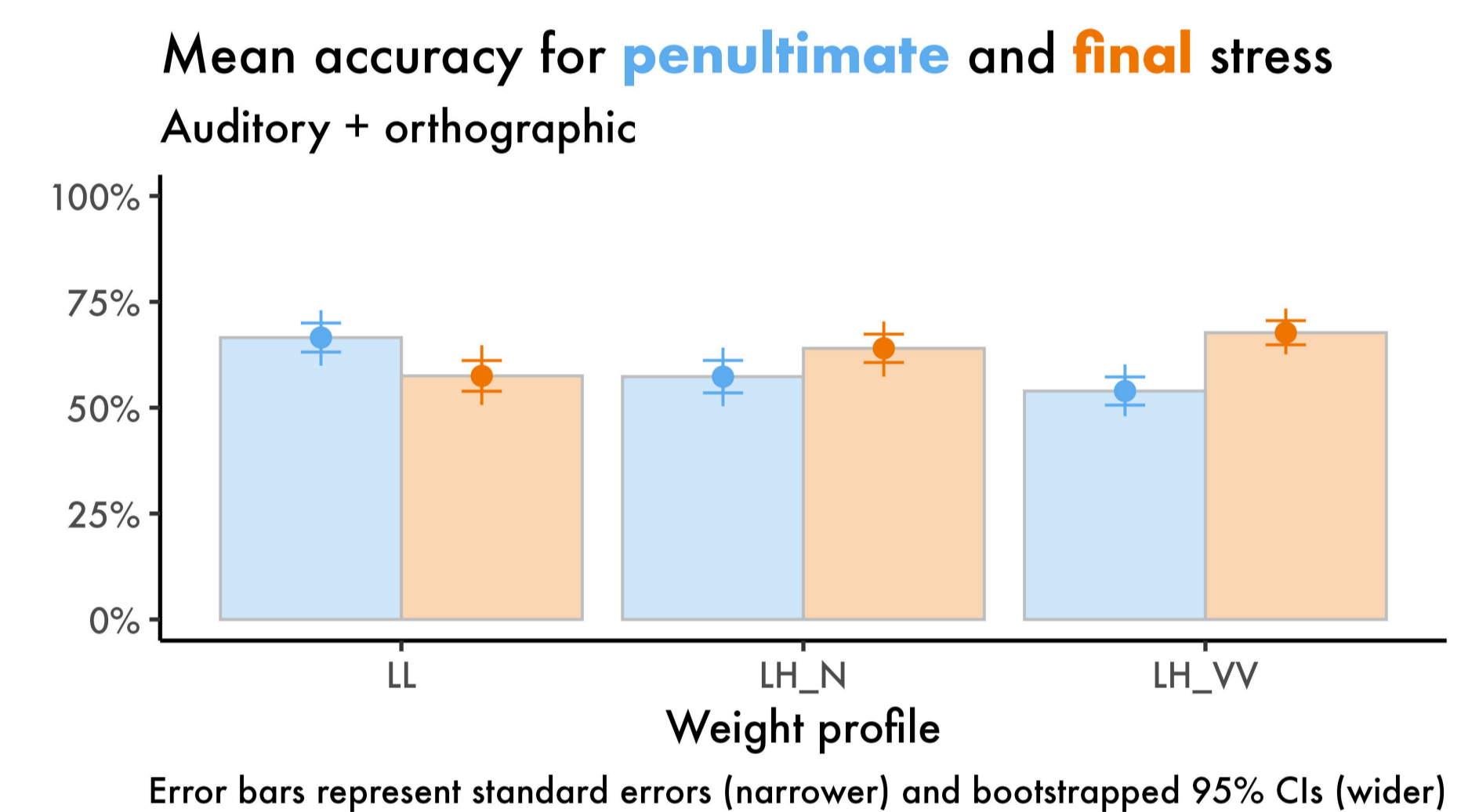
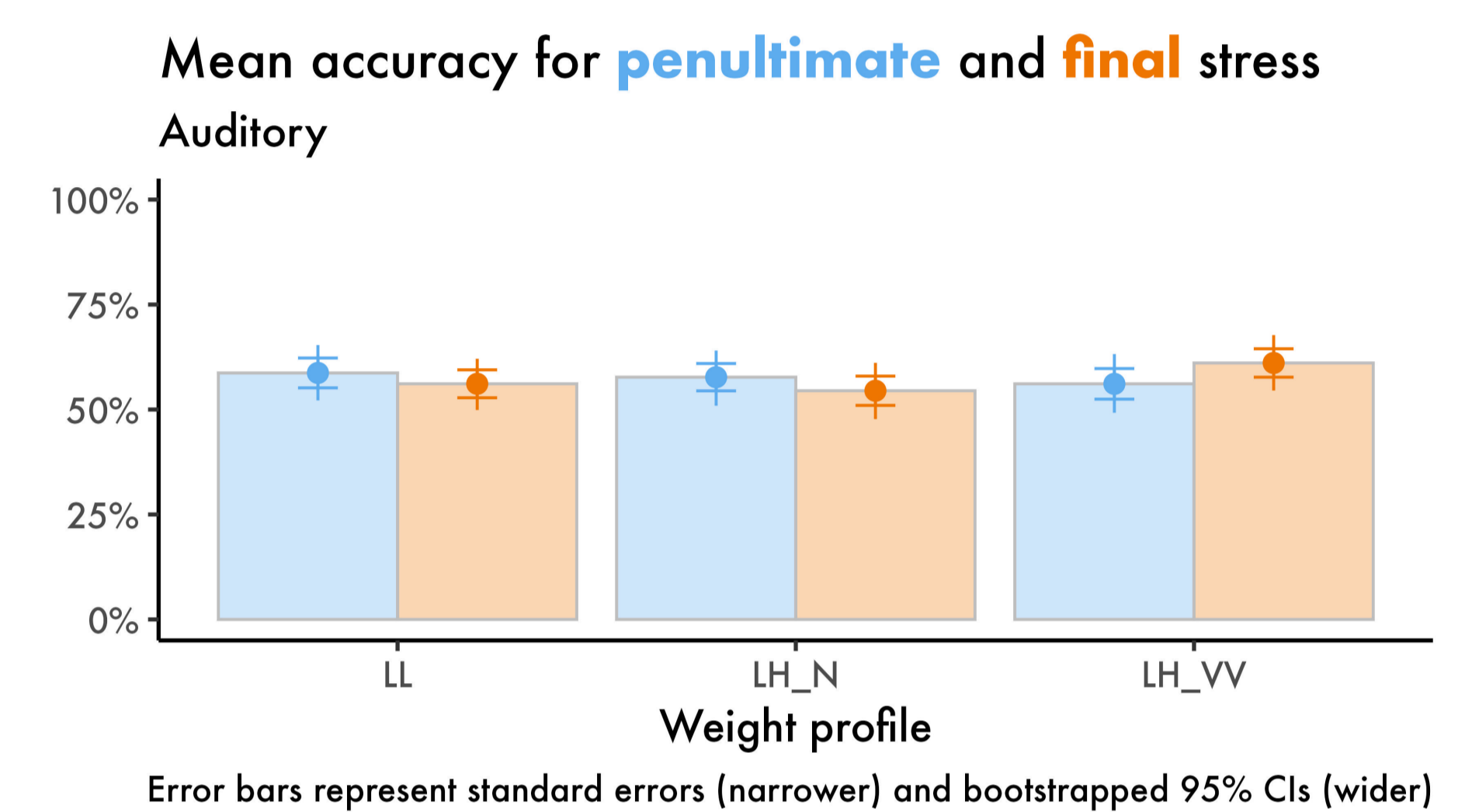


- Could results be driven by orthography (Ruiz 2002)?

## 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



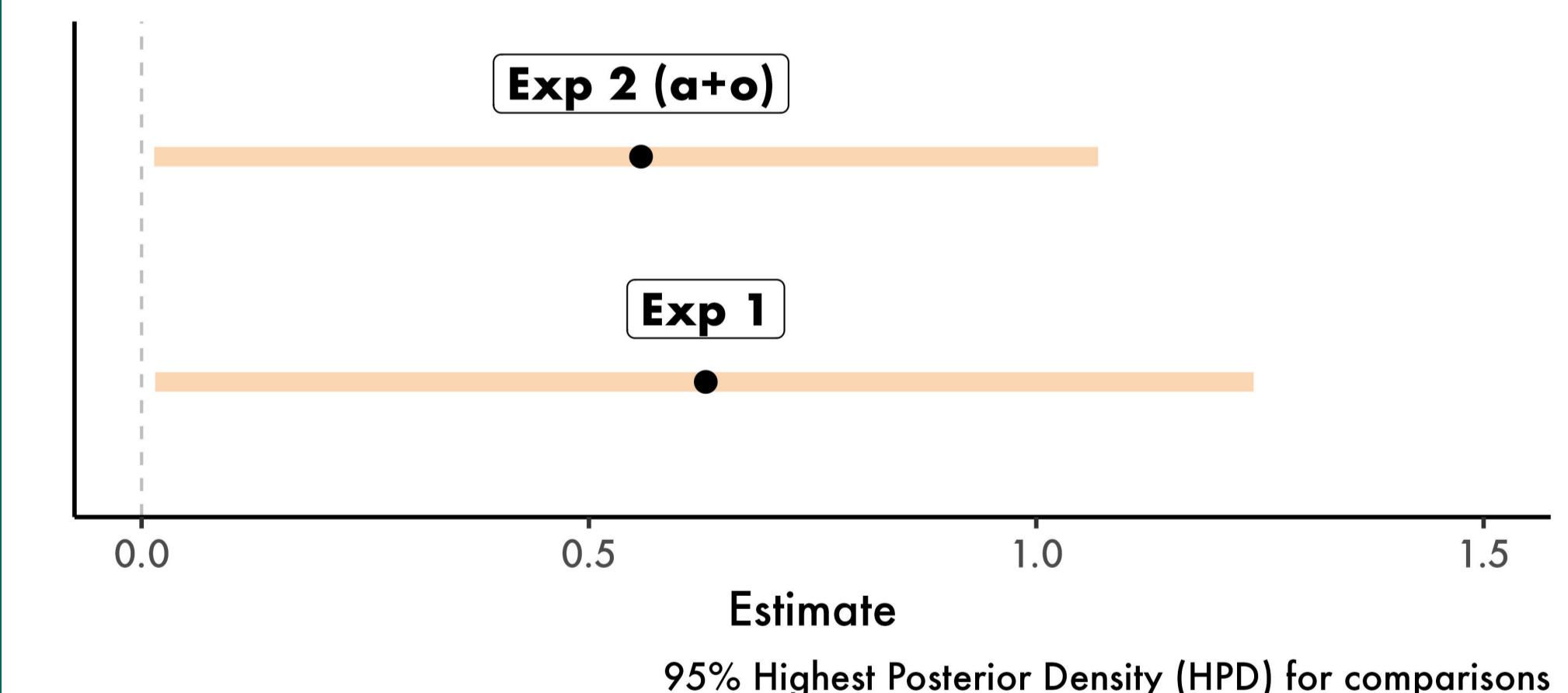
## STATS

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?

