Relative influences of information structure and utterance-final position on the prosodic implementation of nuclear pitch accents

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INTRODUCTION

Information structure (IS) has been argued to constrain prosodic realization, particularly in the nuclear position of a prosodic phrase.

Information structure: relation between information in a sentence and the knowledge state of the participants in the discourse

Nuclear accent: right-most accented word in an intonational phrase

Our mother sang a lovely MELody.

As the rightmost accented word, nuclear accents will frequently coincide with utterance-final position.

Both information status and utterance-final position conveyed via prosodic realization.

Several studies have indicated a probabilistic relation between IS and the realization of nuclear pitch accents, but there is limited evidence regarding:

- Levels of IS beyond focus conditions
- Individual variation (limited # of speakers)
- American English
- How utterance-final position and information status interact in the prosodic signal

Goal: Investigate the relative weighting of information status and utterance-final position in the acoustic-phonetic correlates of *nuclear* prominence in utterance-final and non-final positions

SUMMARY

Information structure* *probabilistically* modulates nuclear prominence**

Information structure overtly influences nuclear prominence** *more* in non-final position than utterance-final position

Creaky voice strongly signals utterance finality and *givenness*, especially in utterance-final position, while modal voice signals *newness*

*consistent effects of givenness and contrastive focus on prominence
**pitch accent type, duration, relative amplitude, % voiced

METHODS

EXPERIMENT 1: FINAL POSITION

32 participants (23 F, 9 M)
20 sets of mini-stories (3 sentences each), 4 IS levels

Context sentence 1: Our sister Jamie spent all day Saturday in the kitchen.
Context sentence 2 (sets IS condition):

Given	She knew it would take hours to make the marmalade.
Accessible	She especially enjoyed making homemade preserves.
New	She likes to make everything from scratch.
Contrastive	Our father loved the strawberry jam.

Target sentence: Our nana loved the marmalade.
σ $\acute{\sigma}\sigma$ $\acute{\sigma}$ $\acute{\sigma}\sigma\sigma$
det N V det N

4 blocks alternating between neutral and lively productions (affect)
Each participant received only one IS per story in the experiment
IS-story pairings counterbalanced every 4 participants

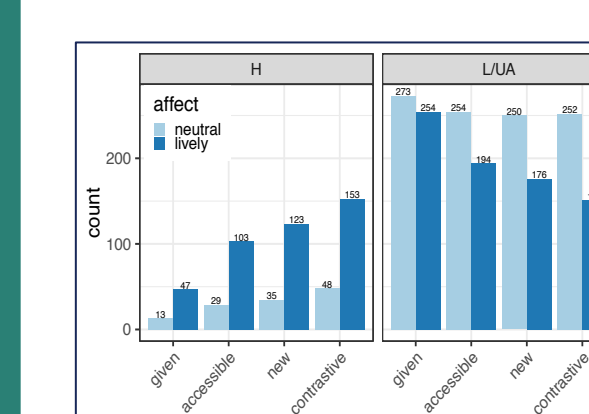### EXPERIMENT 2: NON-FINAL POSITION

Changes from Experiment 1:
32 participants (16 F, 16 M)
Updated mini-stories

Context sentence 1: Our sister Jamie spent all day Saturday in the kitchen.
Context sentence 2 (sets IS condition):

Given	She said that she knew it would take hours to make the marmalade.
Accessible	She said that she especially enjoyed making homemade preserves.
New	She said that she likes to make everything from scratch.
Contrastive	She said that our dad loved the strawberry jam, but

Target sentence: Our nana loved the marmalade she made.

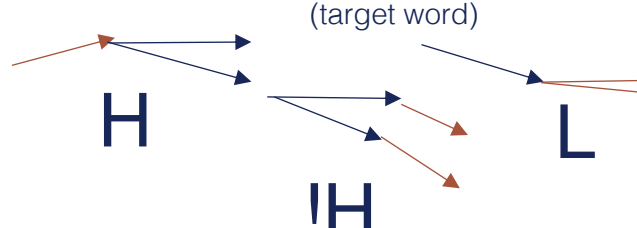Experiment 1: FINAL position   Experiment 2: NON-FINAL position
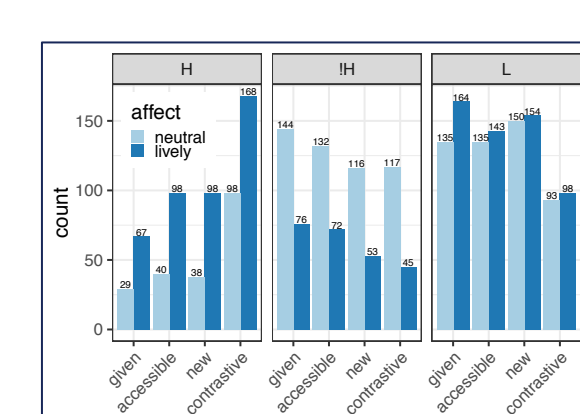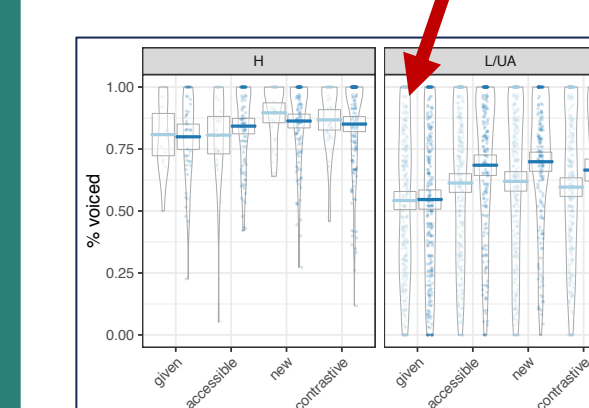

Pitch accent category
Final position: ToBI labeled and collapsed into H and L/UA categories

Non-final position: automatically categorized using max f0 in verb, max f0 in target word, and offset f0 in target word

H and !H categories in Exp 2 collapsed for combined analysis

Percent voicing within the *trochee*
Intervals of modal and creaky voice also labeled in experiment 1 (high degree of creaky voice)

affect
■ neutral
■ lively

Trochee relative intensity
RMS intensity of critical word trochee relativized to RMS intensity of subject word

Trochee duration
Measures were extracted from the trochee instead of the entire word to bias against utterance-final lengthening and weakening and allow any IS effects to emerge

RESULTS

measure ~ condition X affect X position (X pitch accent) + (1 + condition* + affect* | participant) + (1 | word)
*By-participant random slope of condition excluded in relative intensity analysis
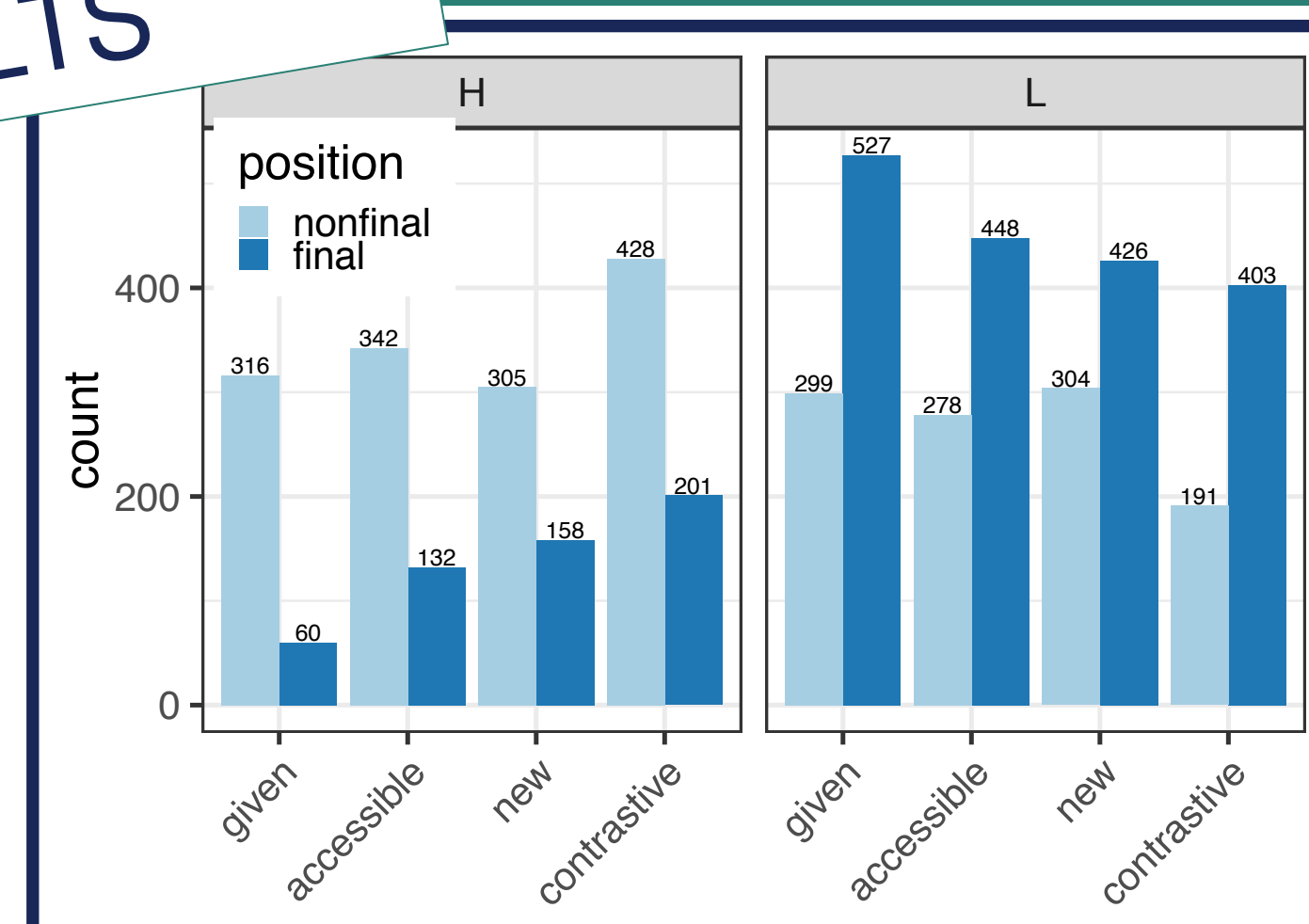
Pitch accent (H vs L)

Given less likely to be H
Contrastive more likely to be H
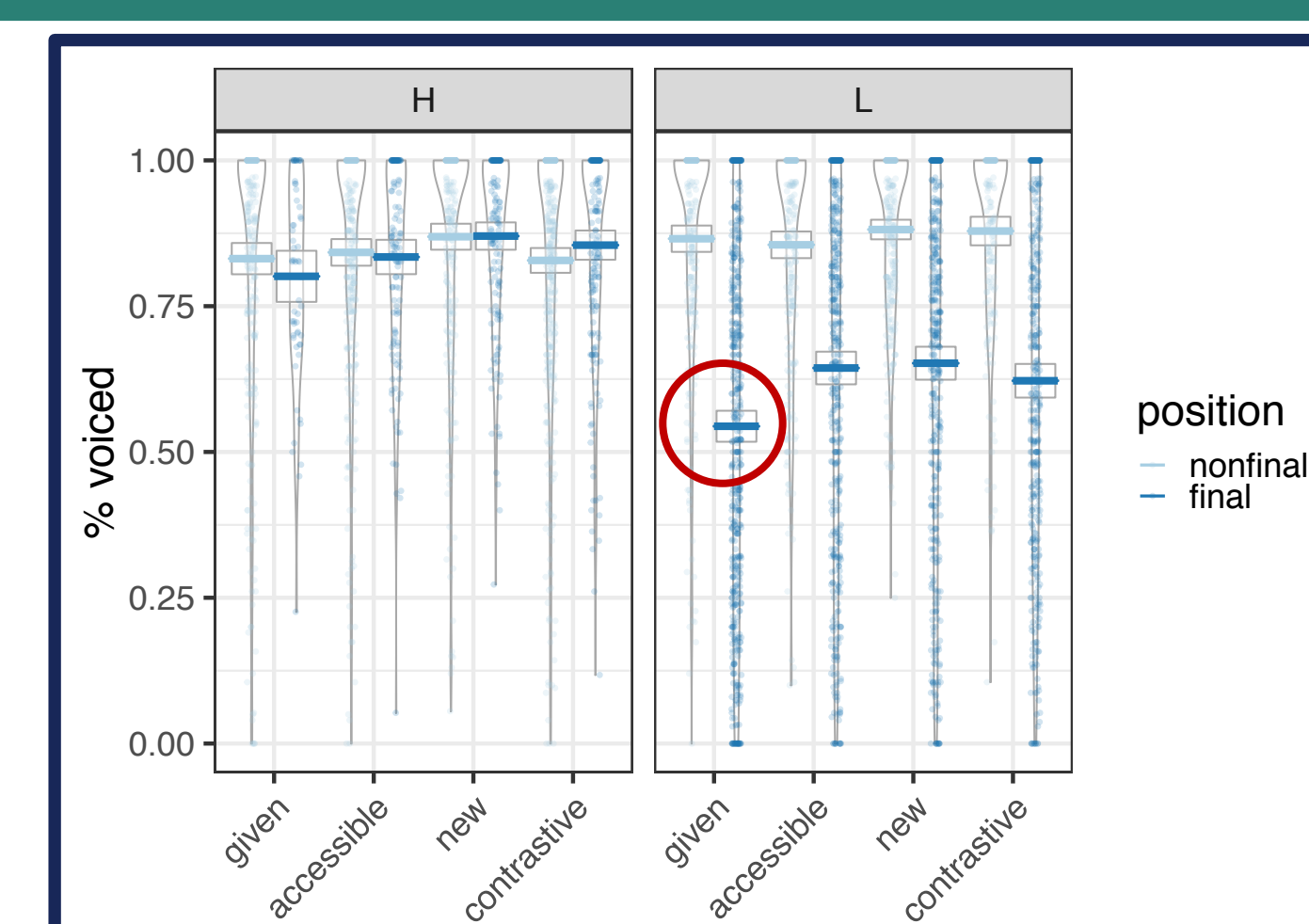Lively more likely to be H
Given and lively less likely to be H

Non-final tokens more likely to receive an H accent
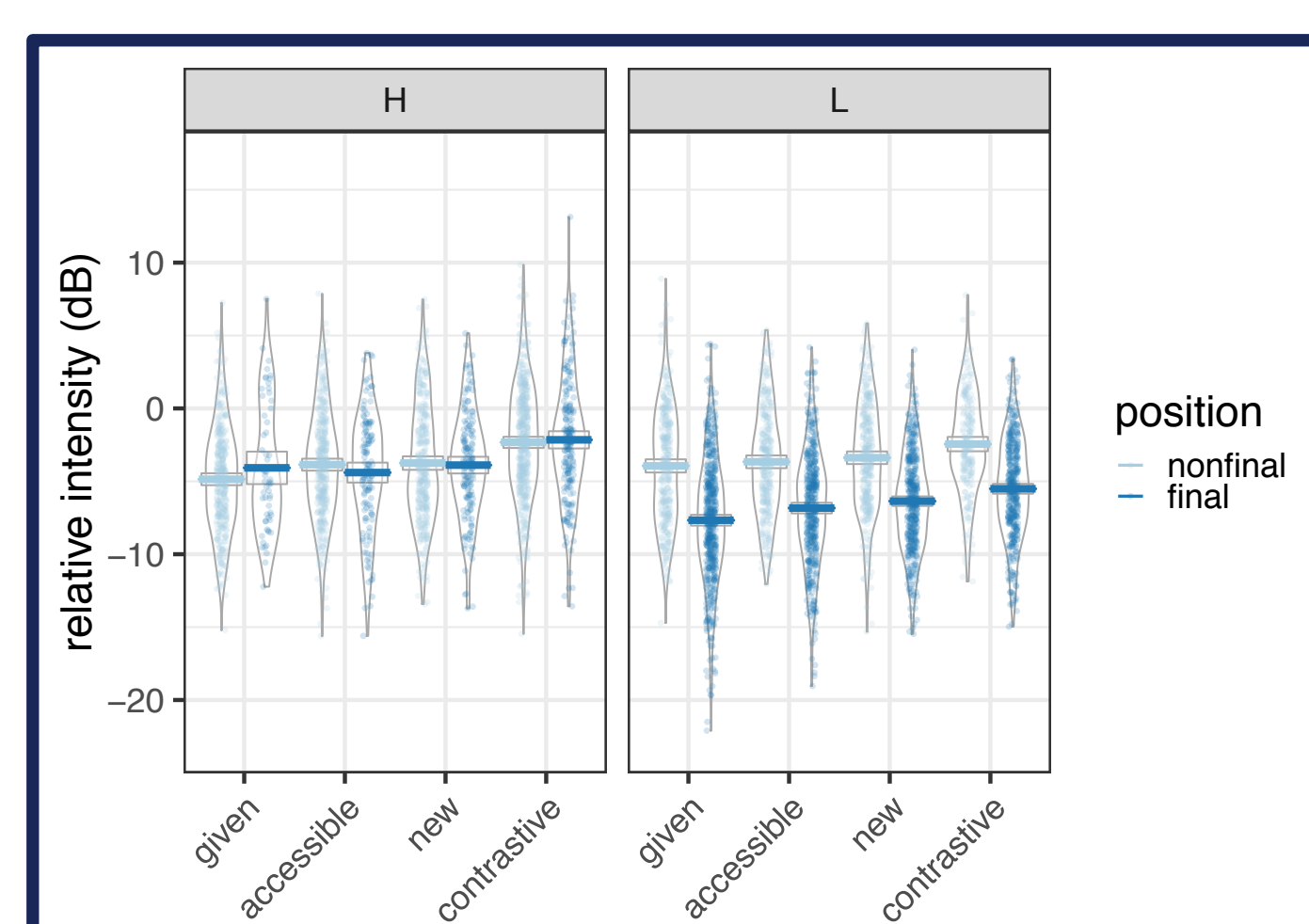
Relative intensity

Given weaker
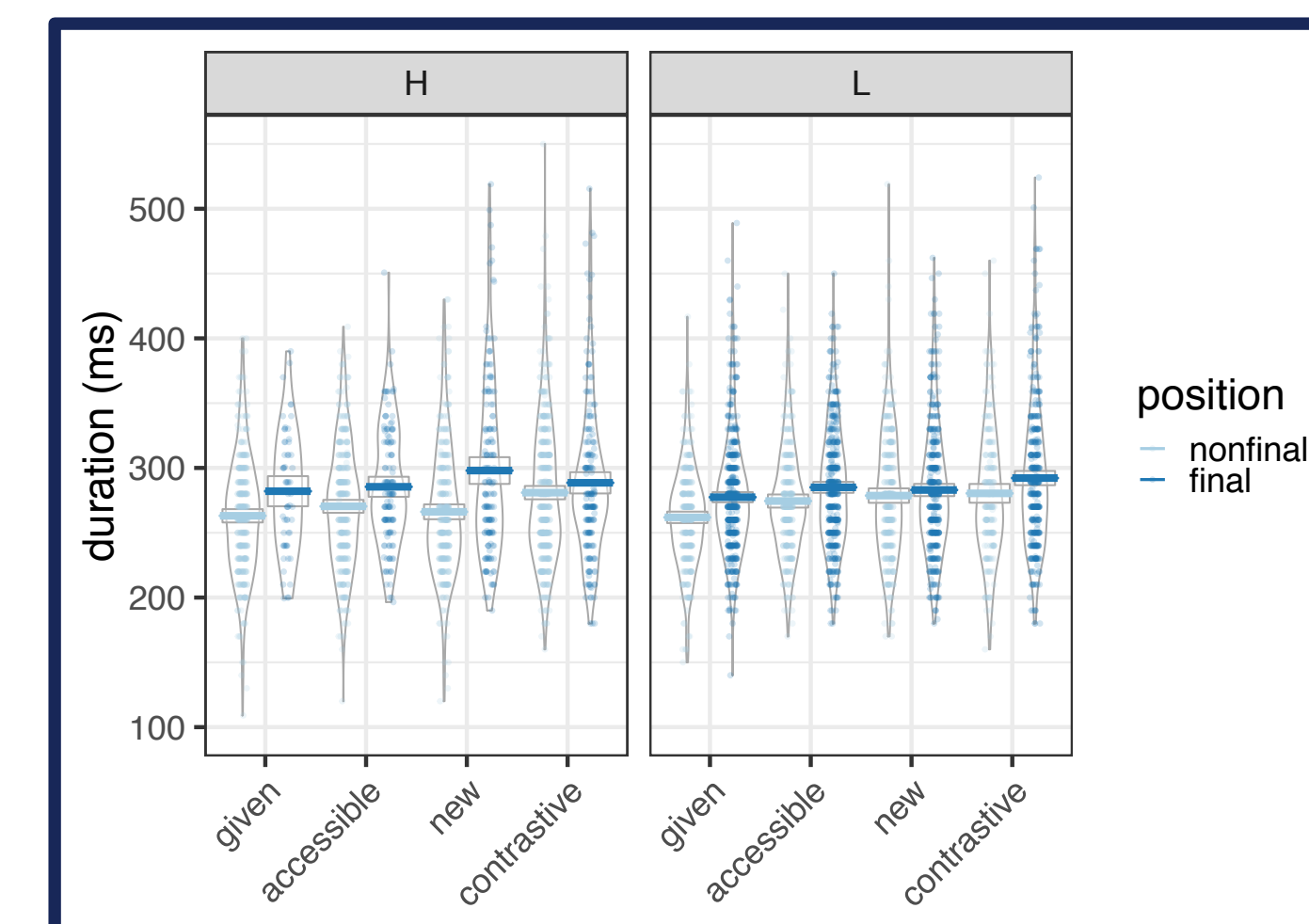Contrastive stronger
Lively stronger
H stronger

Utterance-final tokens weaker

Percent voiced

Given less voicing
New more voicing
Lively more voicing
H more voicing

Large effect of utterance-final position
Speakers even more likely to creak in final position when information was previously mentioned (given)

Duration

Given shorter
Contrastive longer
Lively longer

Utterance-final tokens longer

Comparisons all made relative to the average measure   *Reporting significant effects of interest*