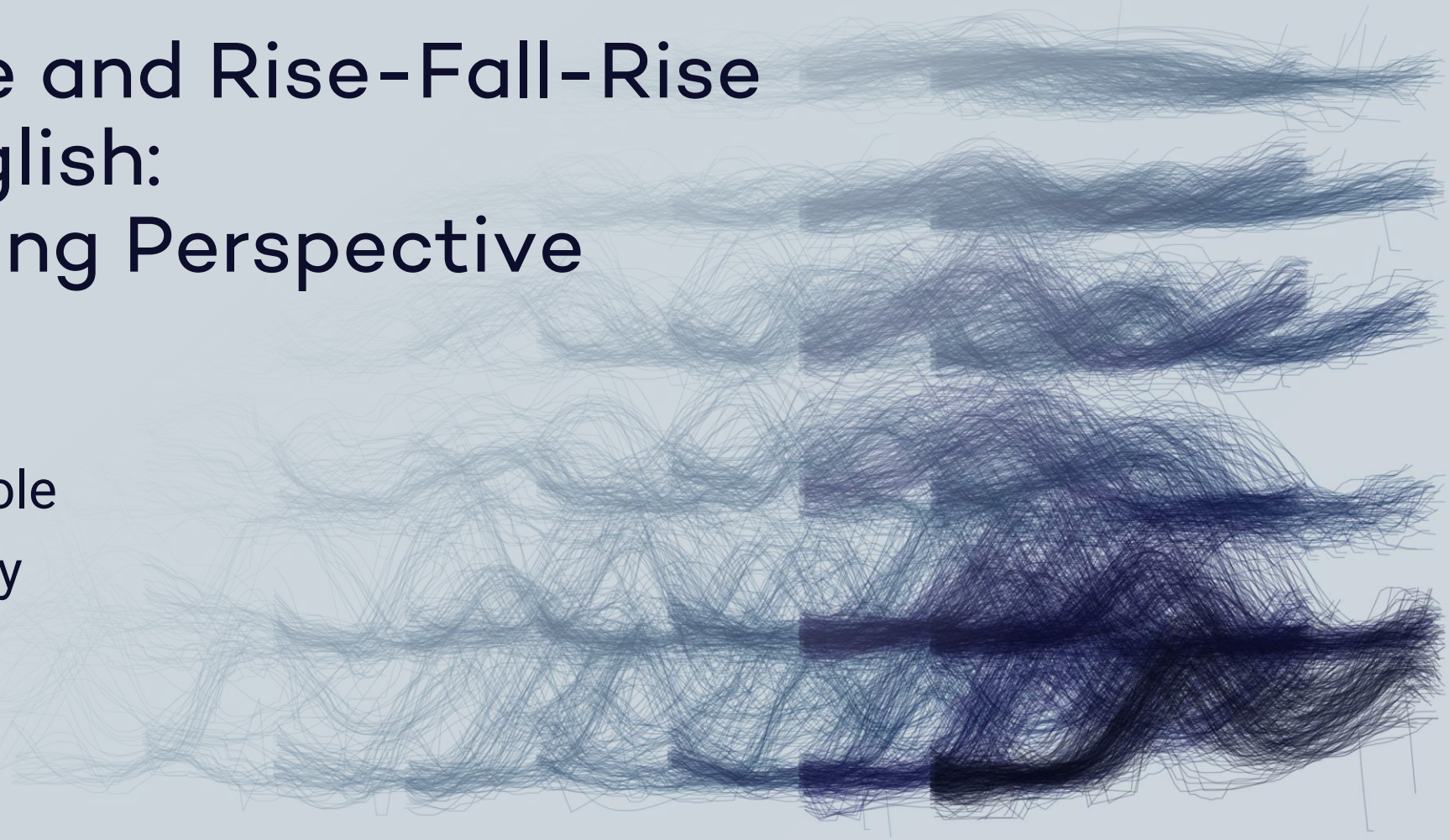
Scalar Inference and Rise-Fall-Rise in American English: Towards a Priming Perspective



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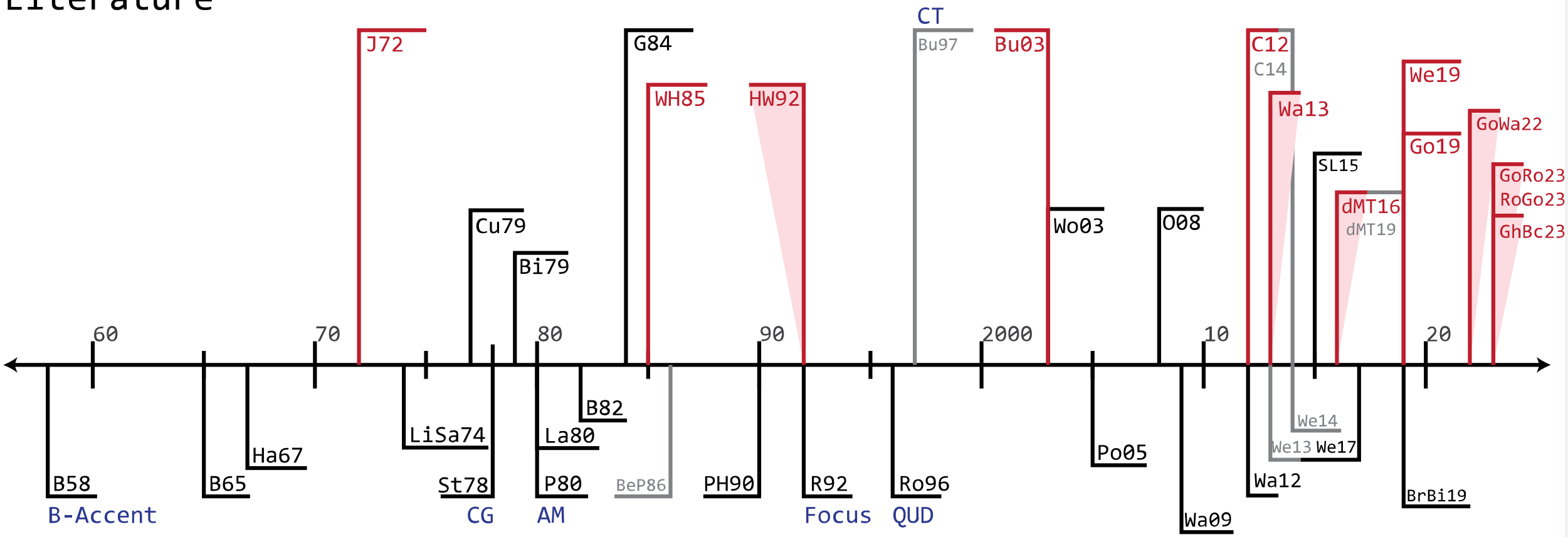
Rise-Fall-Rise Literature



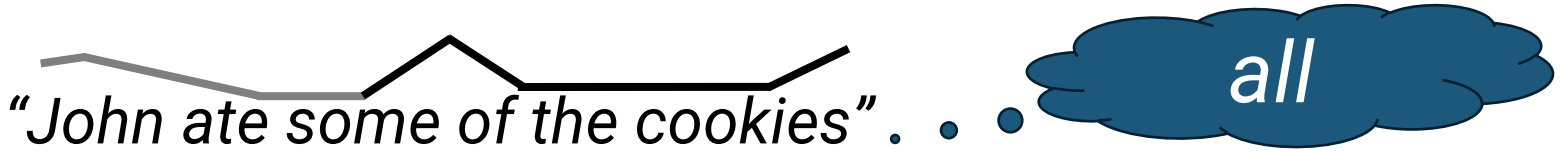
Adjacent Literature

[B]olinger, [J]ackendoff, [G]ussenhoven, [P]ierrehumbert, [Cu]tler
[H]irschberg, [Be]ckman, [W]ard, [R]ooth, [Ro]berts, [Bu]ring
[Wo]lter, [Po]tts, [O]shima, [Wa]gner, [C]onstant, [We]stera, [Ha]lliday
[S]chloder & [L]ascarides, [de M]arneffe & [T]onhauser, [Bi]ng
[Go]ebel, [Br]aun & [Bi]ezma, [La]dd, [Li]berman & [Sa]g, [St]alnaker
[Ro]nai, [G]ood[h]ue & [B]u[c]cola

Notable Work | Important Work
Related Work | Experimental Work

The general themes of rise-fall-rise

Has <u>something to do</u> with “higher alternatives”



Uncertainty

Disputability

Strategy

Cue to belief

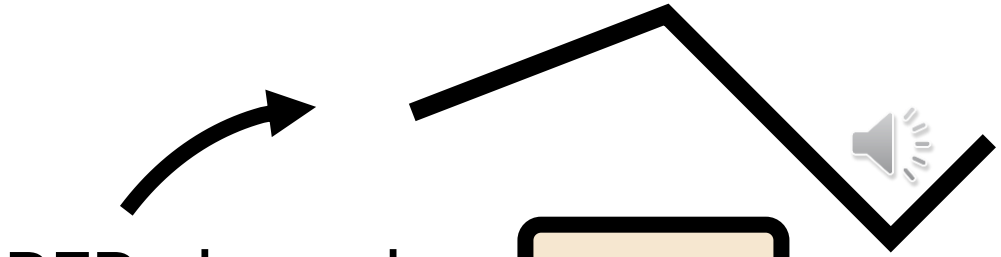
Partial Answer

Focus operator

Contrastive Topic

But what is rise-fall-rise?

What is rise-fall-rise?



RFR-shaped too!

H*

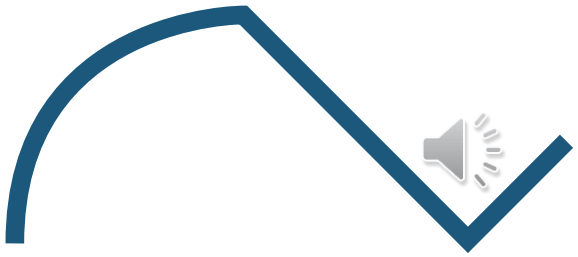
In AM terms: *Usually* an L*+H pitch accent with a fall-rise edge tone configuration

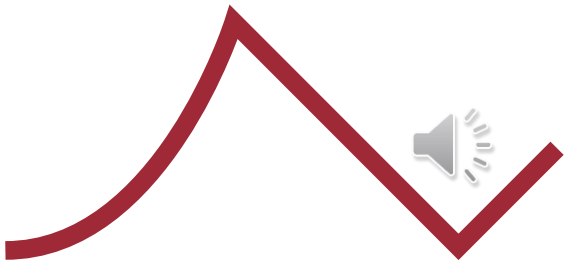
L+H*

L*+H

L–

H%

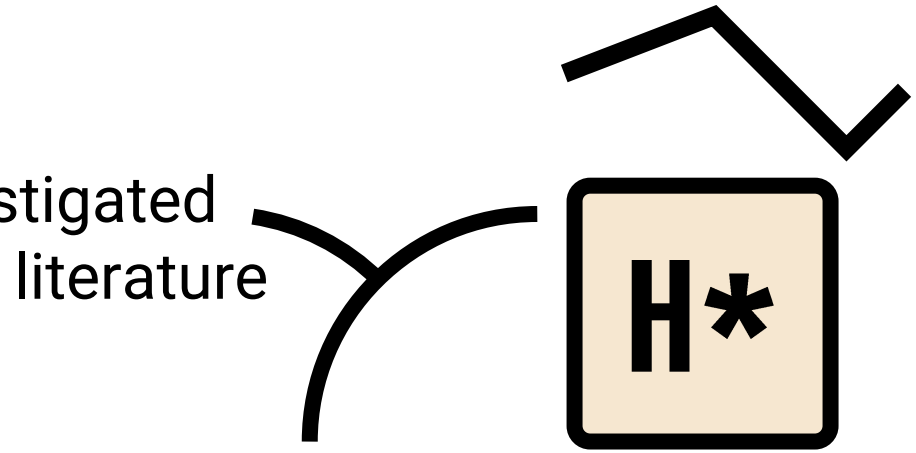




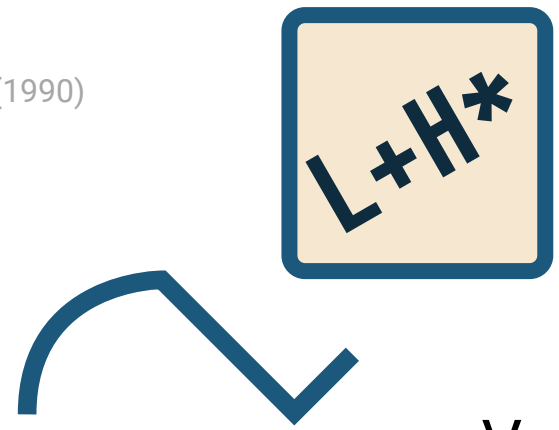
Pierrehumbert (1980)
Ward and Hirschberg (1985)
Beckman and Pierrehumbert (1986)

How do these pitch accents contrast?

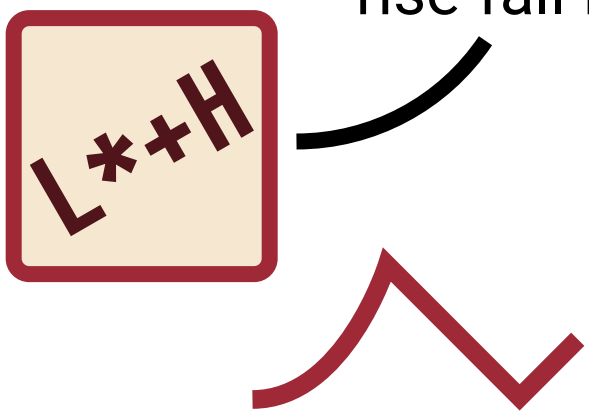
Frequently investigated
in prosodic focus literature

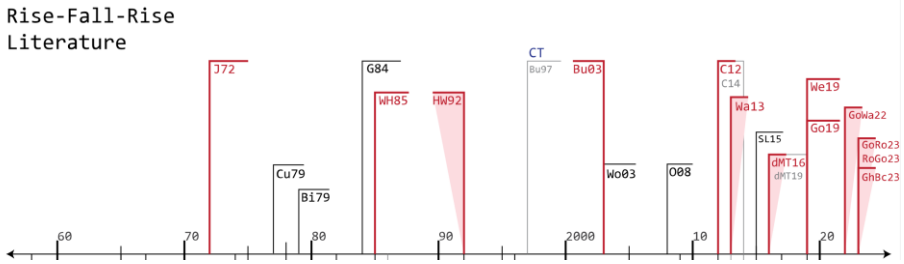


Selkirk (1984)
Rooth (1985)
Pierrehumbert and Hirschberg (1990)
Ito and Speer (2008)
Braun and Tagliapietra (2010)
Husband and Ferreira (2016)
Tonhauser (2017) i.a.
Gotzner and Spalek (2019) i.a.
Sostarics and Cole (2023)
c.f. Watson et al. (2008)



Varied usage in
rise-fall-rise literature





Only really appears in
rise-fall-rise literature

c.f. Prominence literature:
Im et al. (2018, 2023)
Roettger et al. (2019)

c.f. L*+H in German:
Baumann and Rohr (2019) i.a.
Braun and Biezma (2019)
Einfeldt and Braun (2021)
Zahner-Ritter et al. (2022)

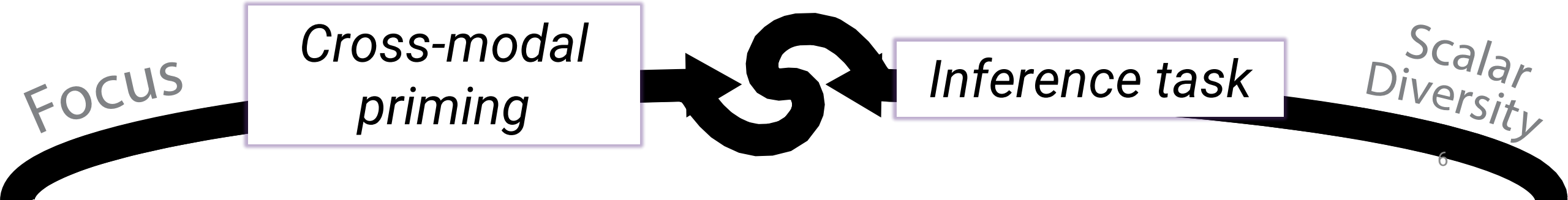
High-level questions

Is there something special about rise-fall-rise, or about L*+H?

Is there a specific RFR? Or would any RFR-shaped tune be fine?

What kinds of methods can we use to look at higher alternatives?

Let's exploit adjectival lexical scales in…

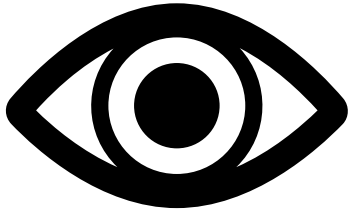


Cross-Modal Lexical Decision

Prime

…cold…

Target



FREEZING

Is it a word?

YES NO

The more activated the target is, the faster the response

What factors affect the activation status of the target?

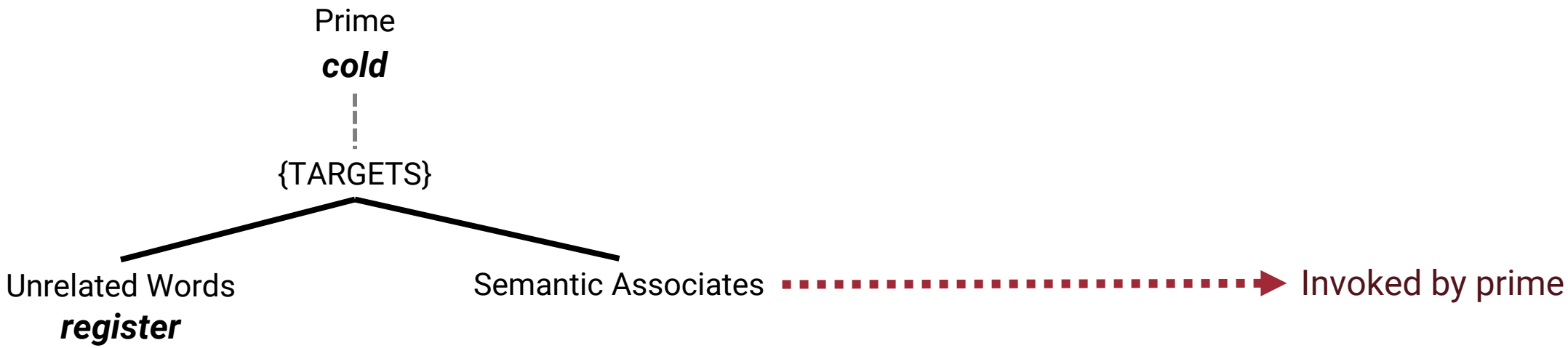
(1) The relation between the prime and the target

(2) The prosody used with the auditory prime

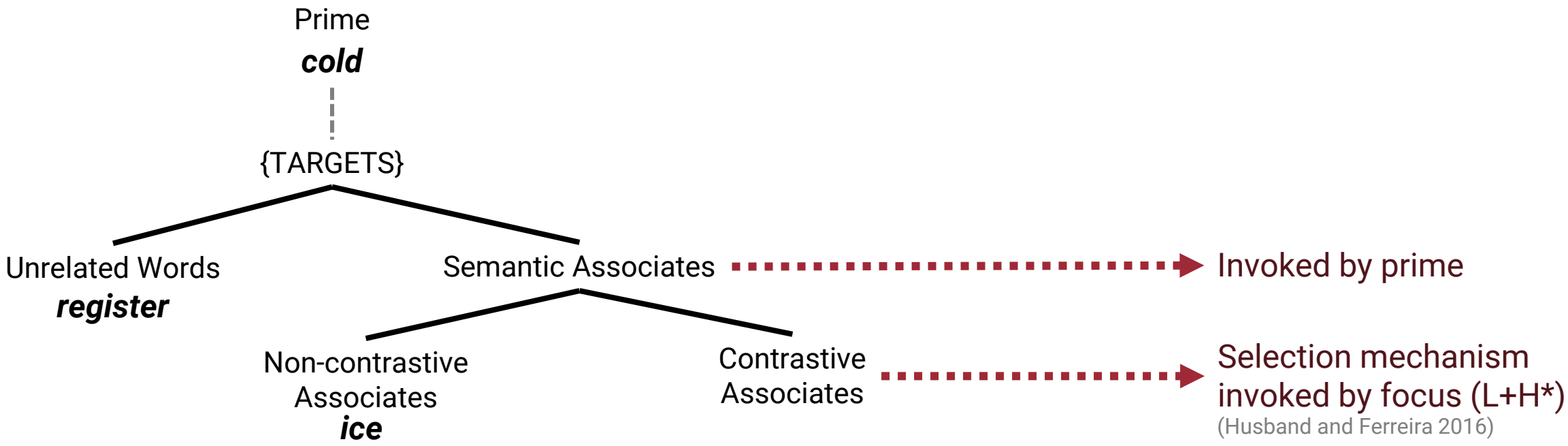
Braun and Tagliapietra (2010)
Husband and Ferreira (2016)
Yap et al. (2015) i.a.

Relations in the target set

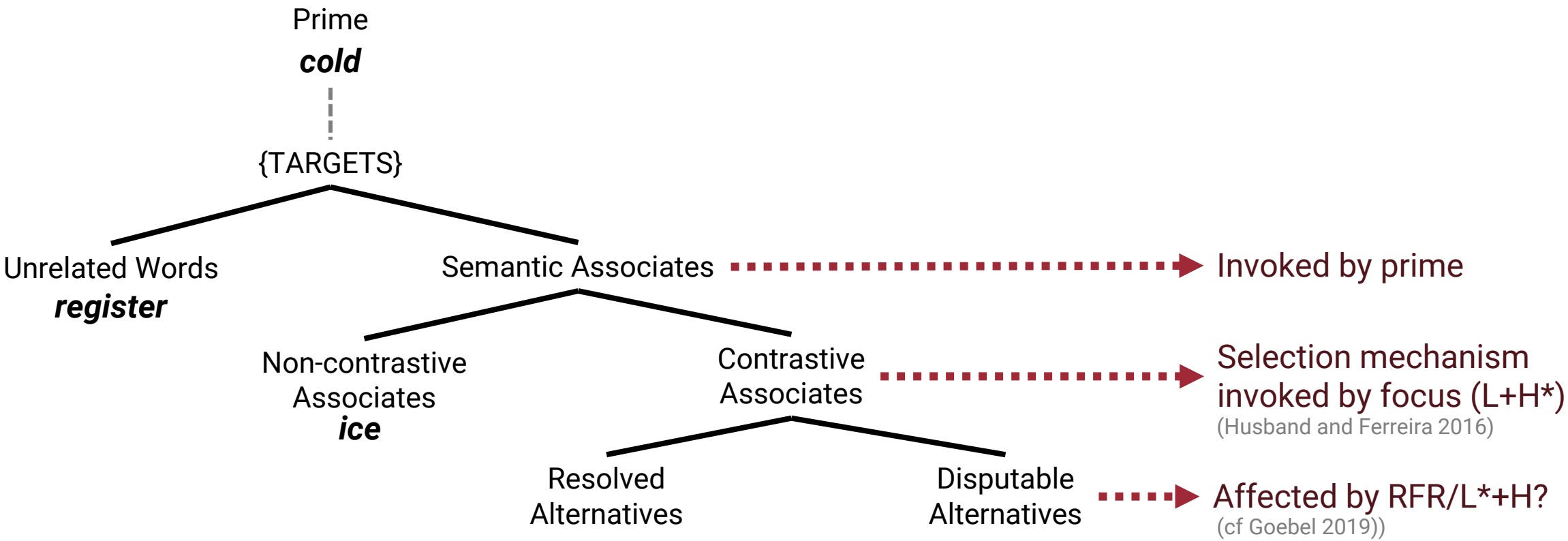
Relations in the target set



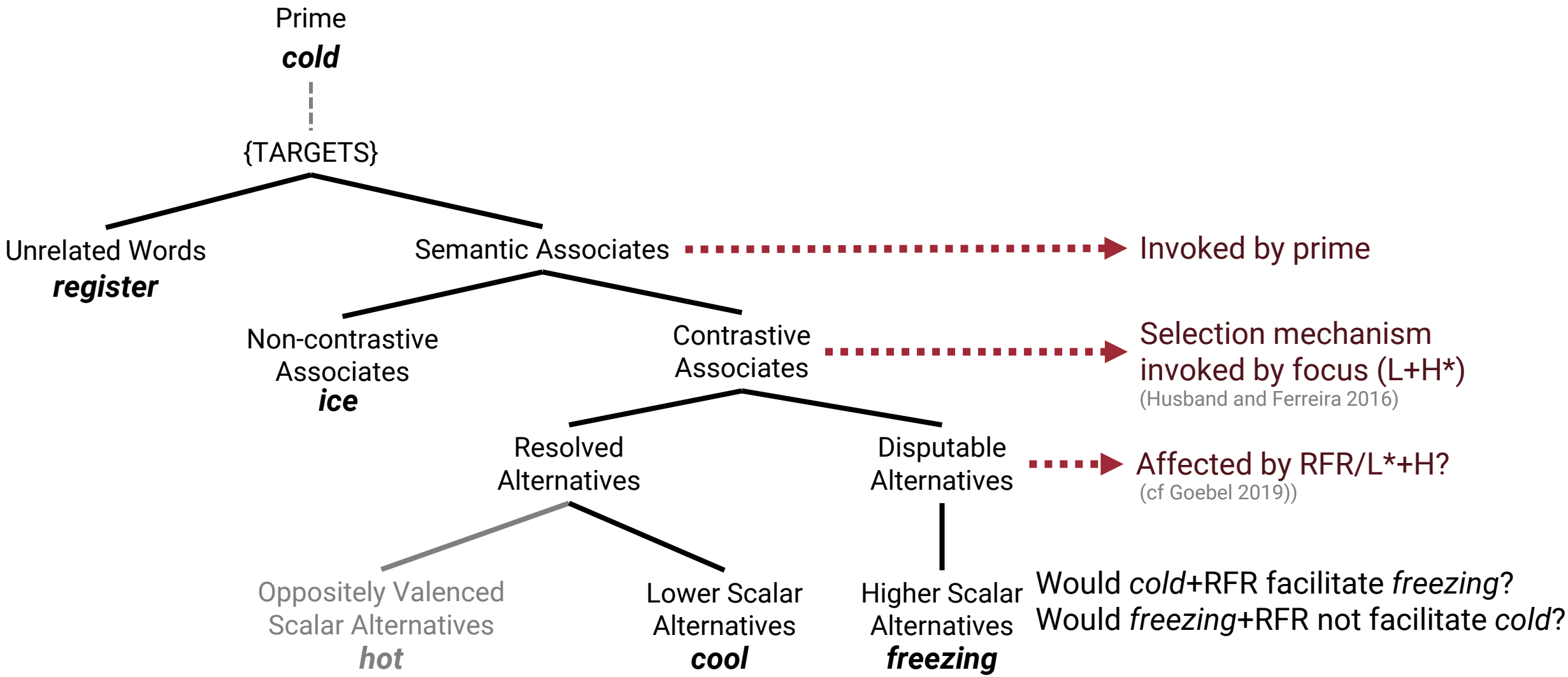
Relations in the target set



Relations in the target set



Relations in the target set



Scalar Inference task

Jane ate some of the cookies →some, *but not all* of the cookies

- <some, all> comprise a lexical scale (Horn 1972)
- Likelihood of SI-enriched interpretations varies → *scalar diversity*
  (van Tiel et al. 2016, Gotzner et al. 2018, Ronai 2022)

What pragmatic factors encourage SI-enriched interpretations?

QUD matters
(Ronai & Xiang 2021)

Prosody matters
(de Marneffe & Tonhauser 2019, Ronai & Goebel 2023)

Does the office feel freezing?

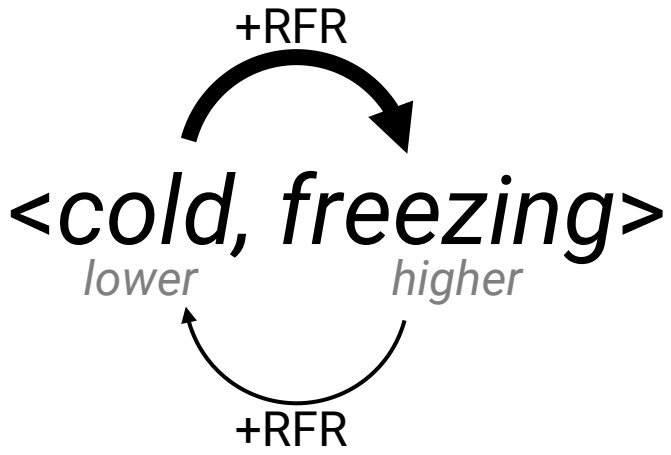
The office feels cold.

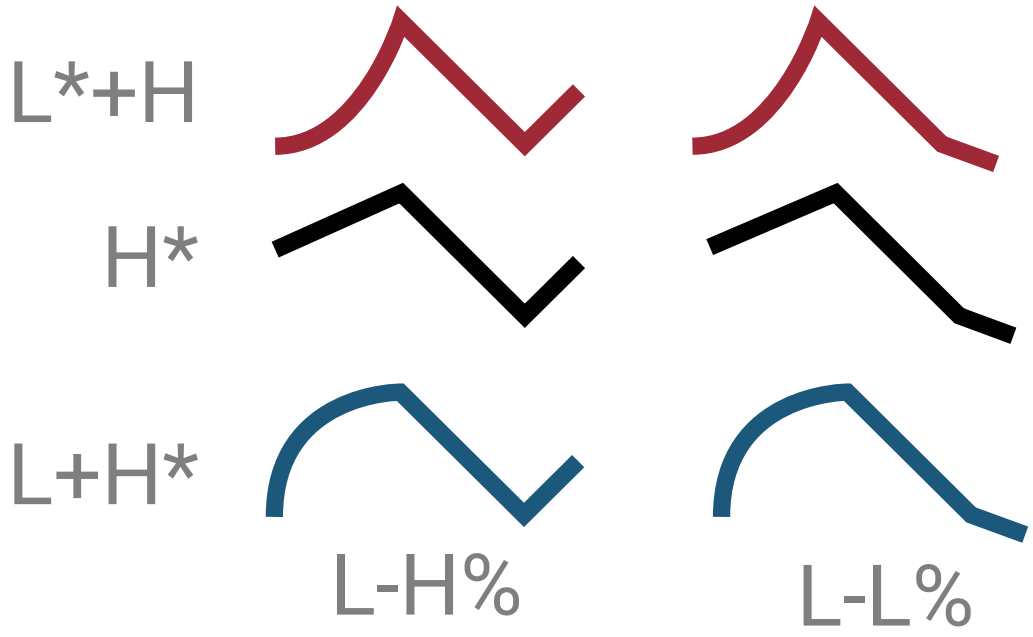
Would you conclude the office does not feel freezing?

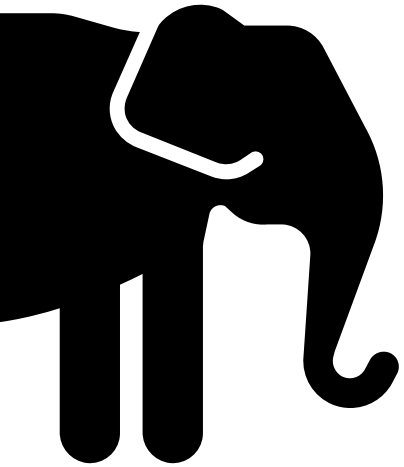
(Yes) No

A general prediction

If RFR is all about the *higher* alternatives, then there should be some asymmetry in how it affects *lower* alternatives







The design is unwieldy… but not unfeasible

Methodological challenges

Meaning Side

- Many items for lexical decision and scalar diversity
- Need to make the task conditions comparable
- Need to write controlled contexts for all the items
- Do the contexts make sense?

Sound Side

- Need recordings of all materials!
- Recordings should be characteristic of the tunes
- Constrain the amount of phonetic variation
- Resynthesis doesn’t always work perfectly

Norming Study for Contexts

Prior work: *Does the office feel freezing? The office feels cold.*

- But if we want to probe *freezing* we can't say it directly!

Mary: Did someone leave a window open in the office overnight?
John: The office feels cold

Are *these* indirect answers acceptable enough to use?

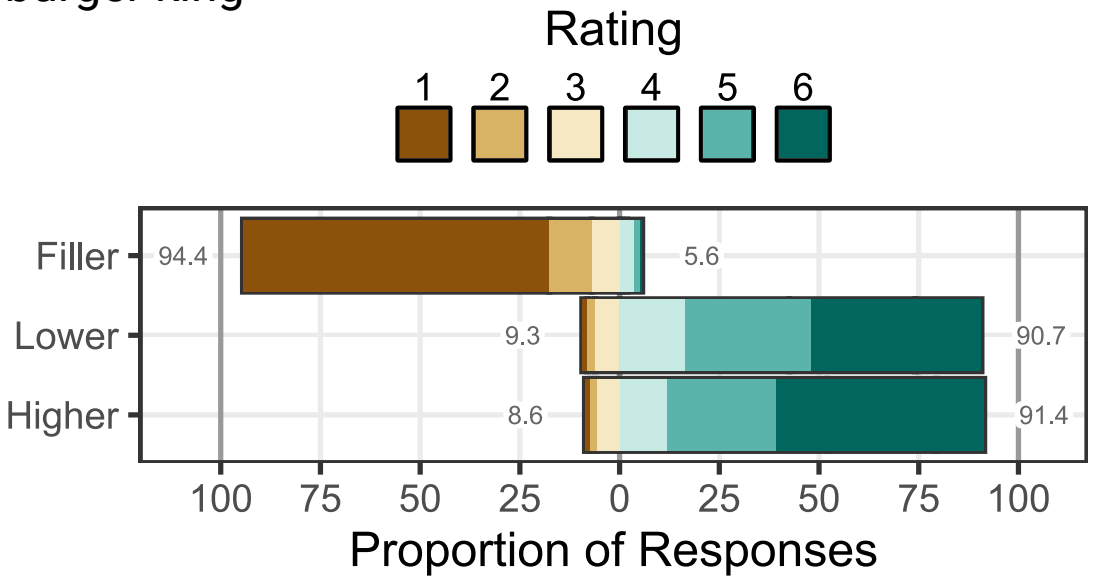
Do we still find scalar diversity with these indirect answers?

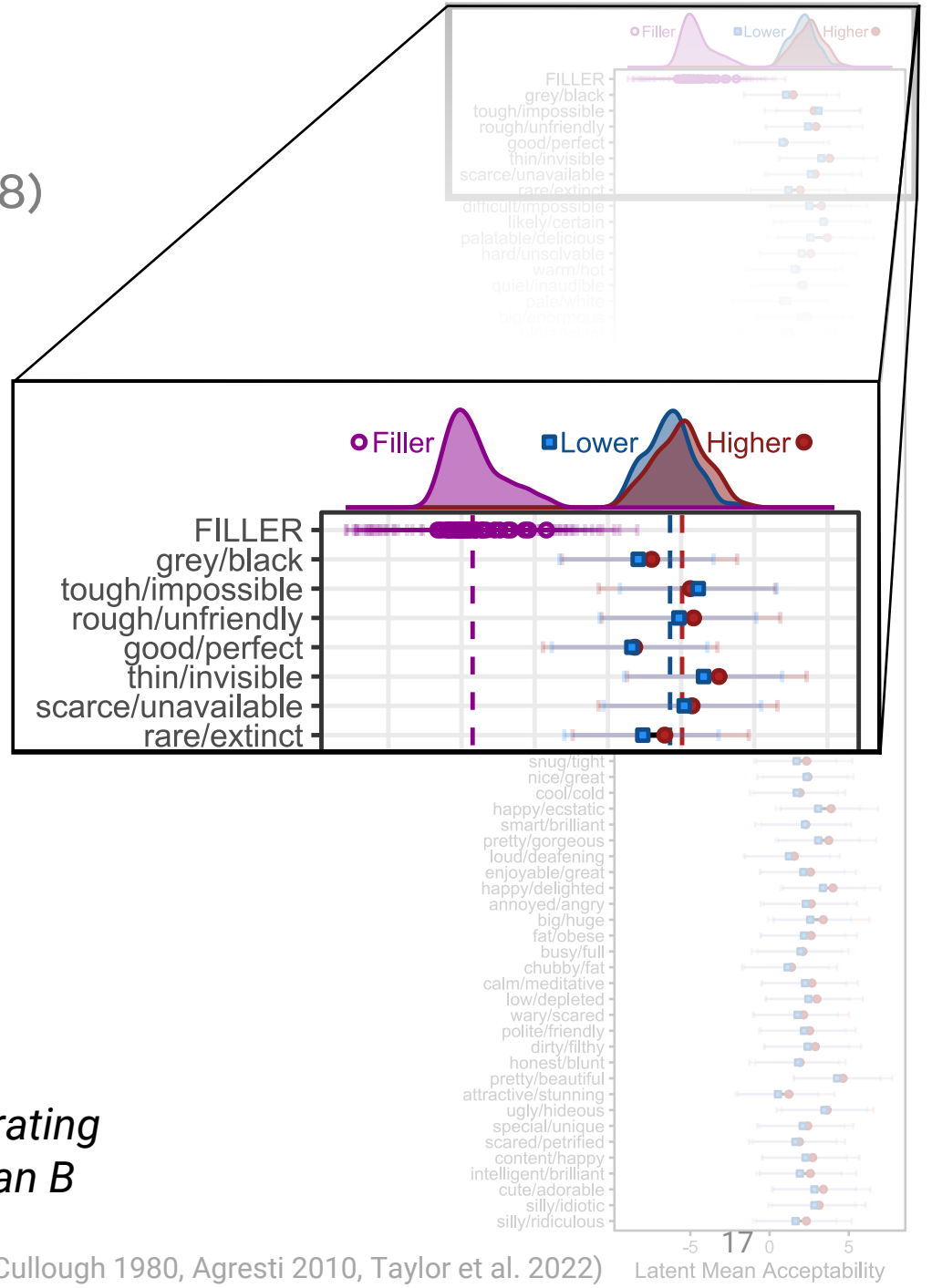
Acceptability results (n=48)

Mary: Did you do the extra readings for class?
John: There used to be a burger king

<

Mary: Did someone leave a window open in the office overnight?
John: The office feels cold/freezing





($\hat{\beta}_{Filler-Critical}$=-6.14, 95% CI [-7.15,-5.18])

($\hat{\beta}_{Low-High}$=-0.37, 95% CI [-0.57,-0.19])

$-\hat{\beta}_{A-B}$: *Odds of a higher rating are lower for A than B*

(see McCullough 1980, Agresti 2010, Taylor et al. 2022)

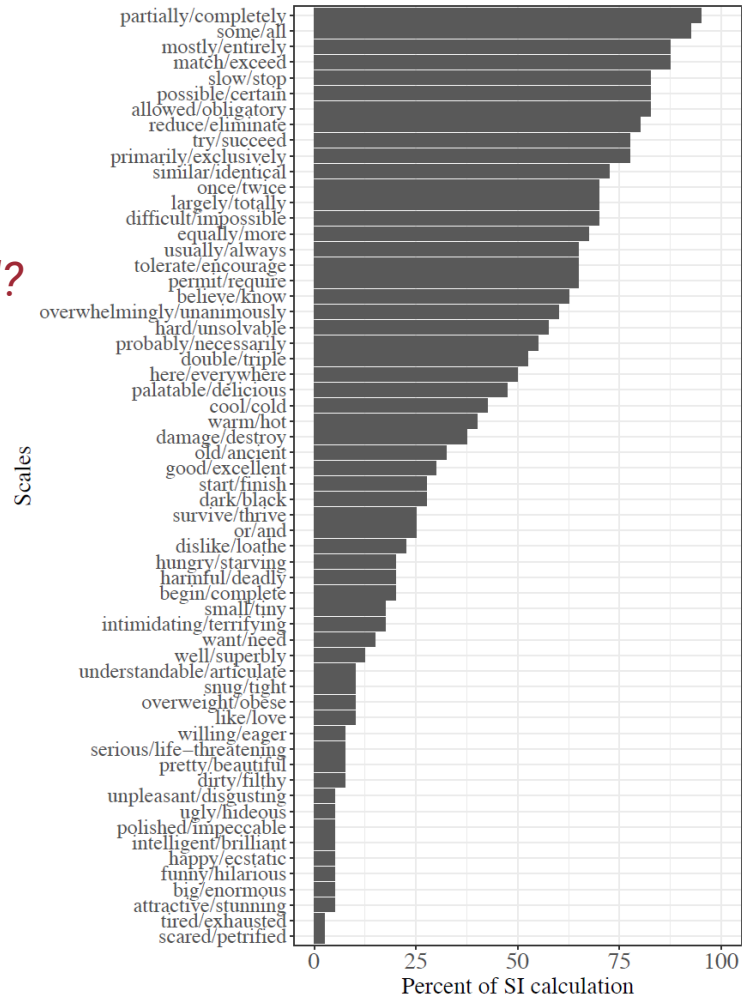
SI Results for 72 scales

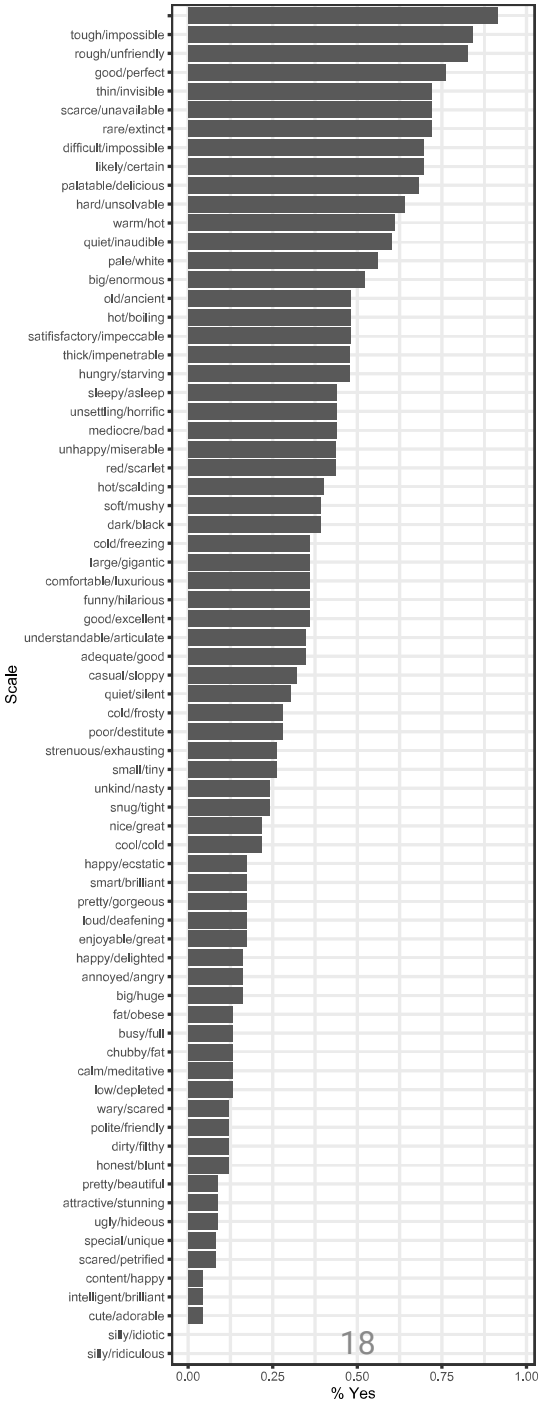
Mary: Did someone leave a window open in the office overnight?
John: The office feels cold/freezing

Would you conclude the office does not feel freezing?
Would you conclude the office does not merely feel cold?

We do find variation among adjectival scales

Based on norming results, we retain 65 scales





Ronai and Xiang (2022)
**not all of these are adjectives*

Scope of the Recordings

Did someone leave a window open in the office overnight?

The office feels cold

The office feels freezing

65 scales that need…

A question

x2 *A lower/higher answer*

x6 *Each of our target tunes*

780

Challenges of Recording

We *could* record once and resynthesize to 6 new tunes…

- But then we don't get any non-F0 cues that co-occur with the tunes

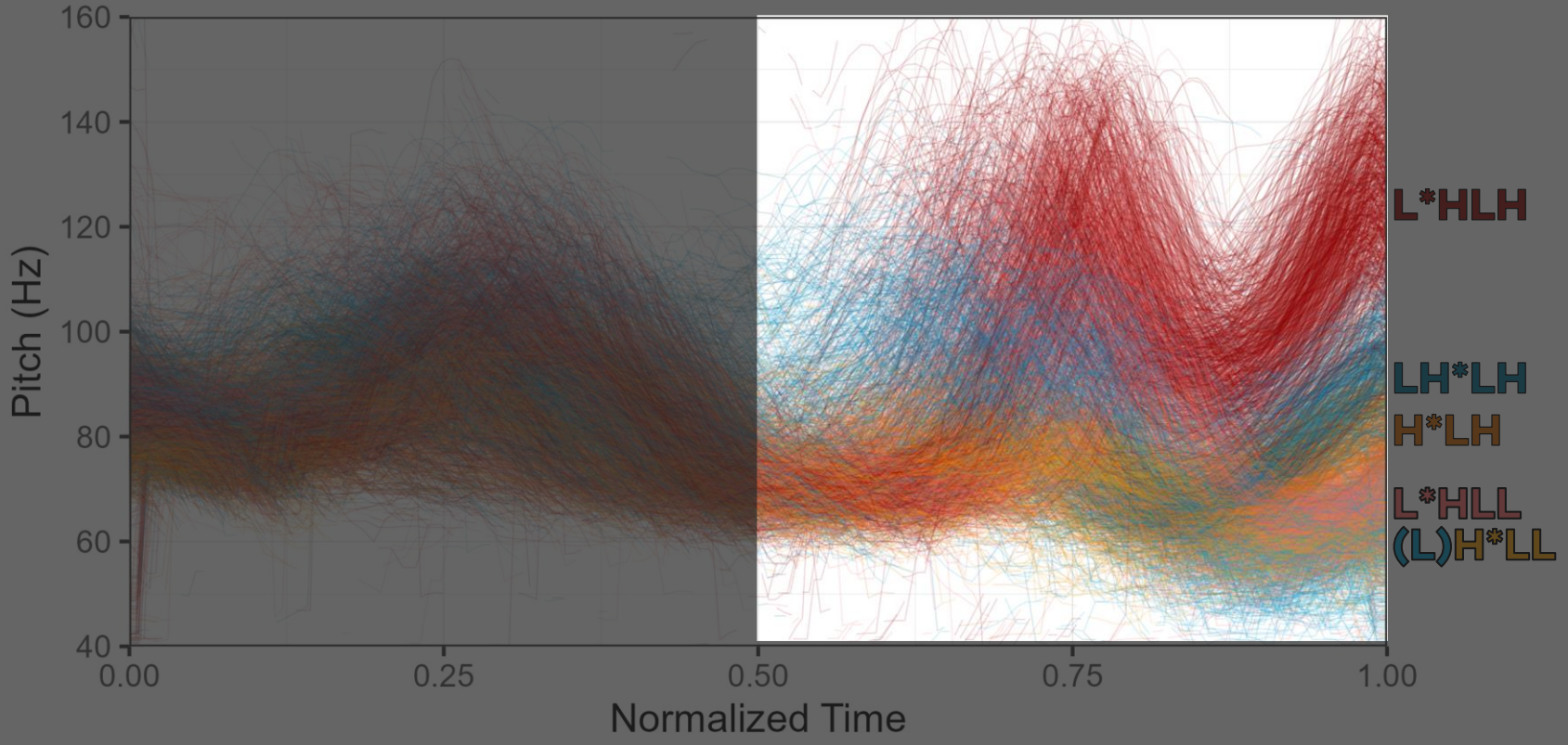
We *could* record all sentences with all 6 tunes and move on…

- But there *will* be variation, how can we understand and constrain it?

We can standardize our recordings with resynthesis…

- But resynthesis is fickle: some recordings just don't work well 
- What parameters do we even use?

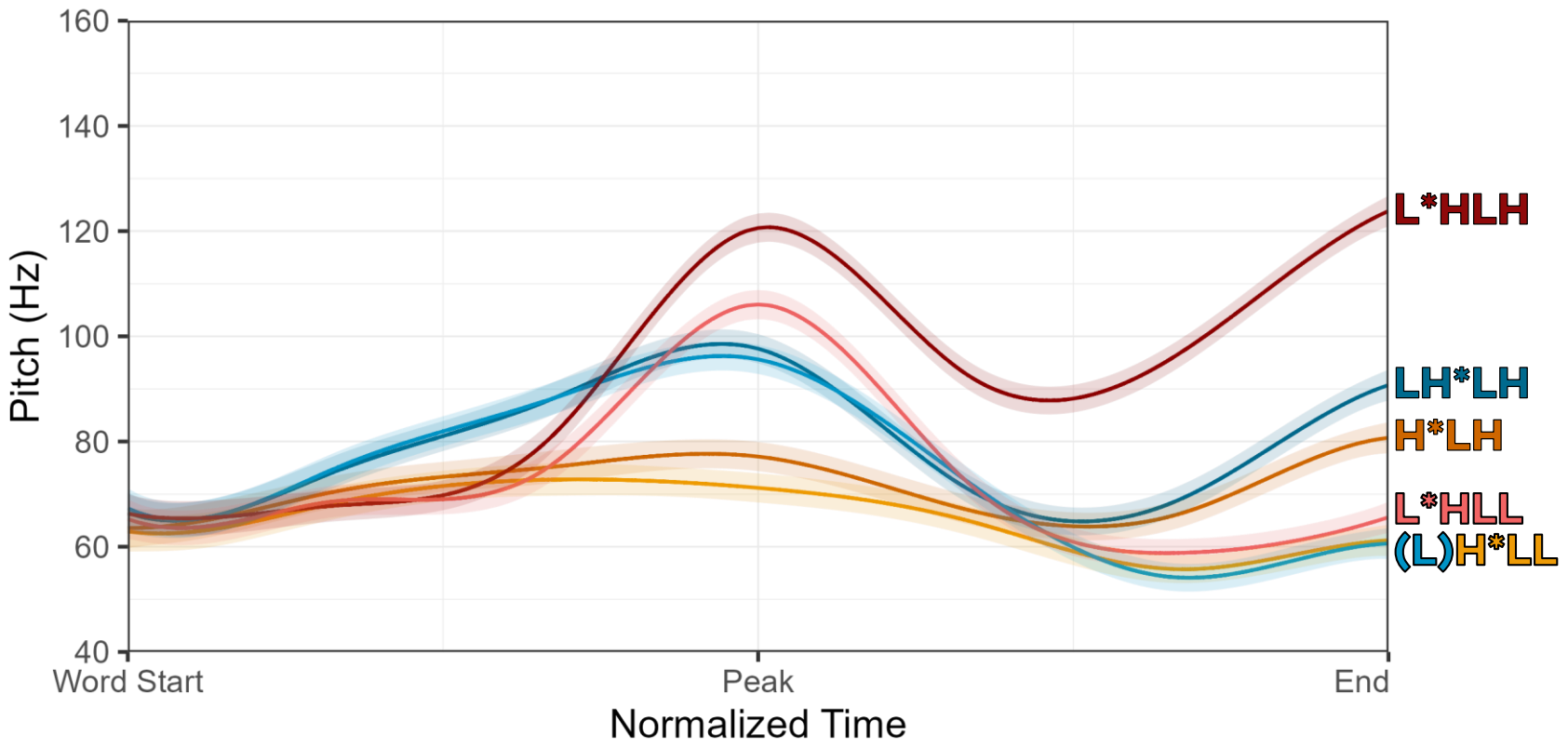
Many takes of 780 utterances



3980 recordings of 130 sentences with 6 different tunes

How can we tame this variation?

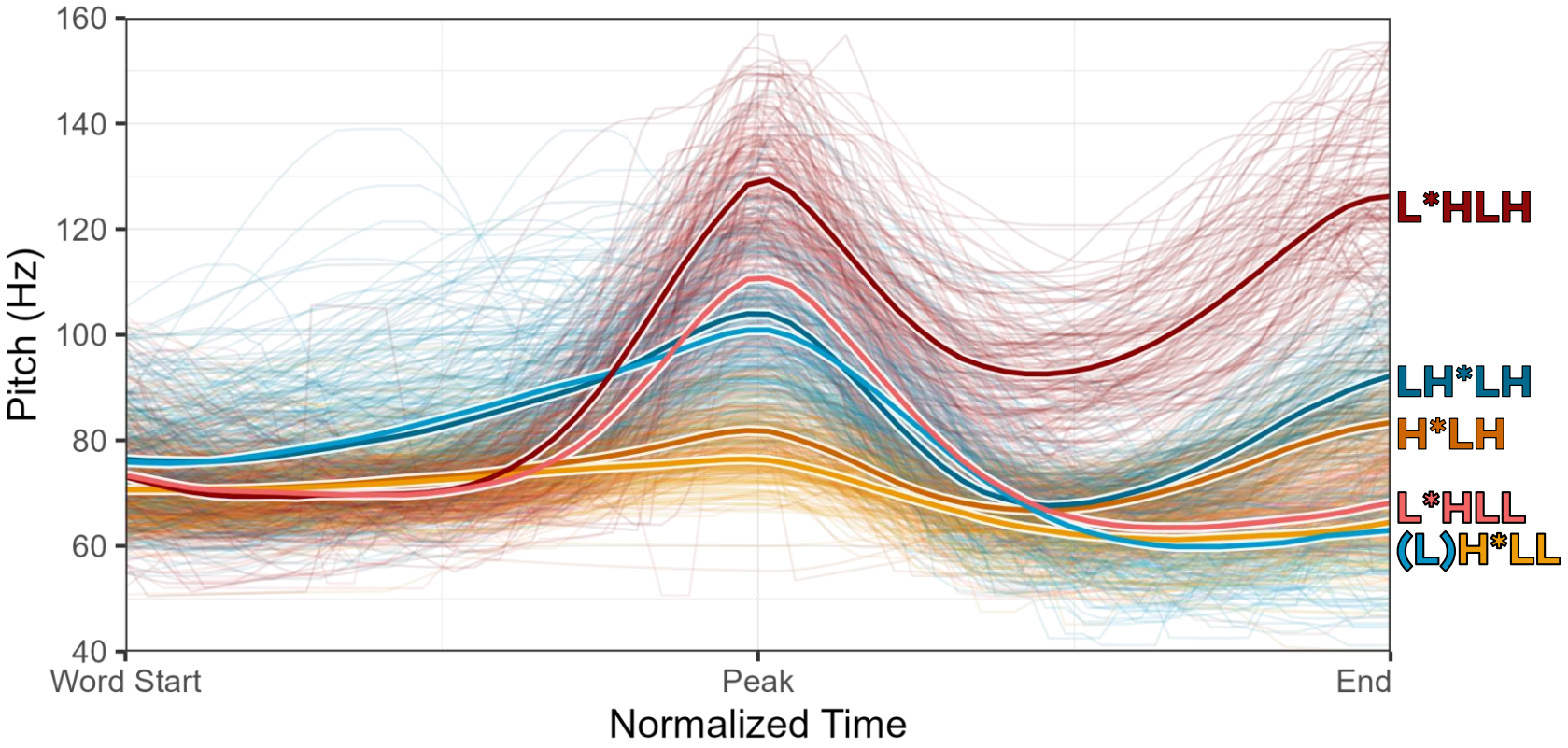
Nuclear Region GAMM Modeling



Modeling the shape of the onglide to the peak and the offglide to the end

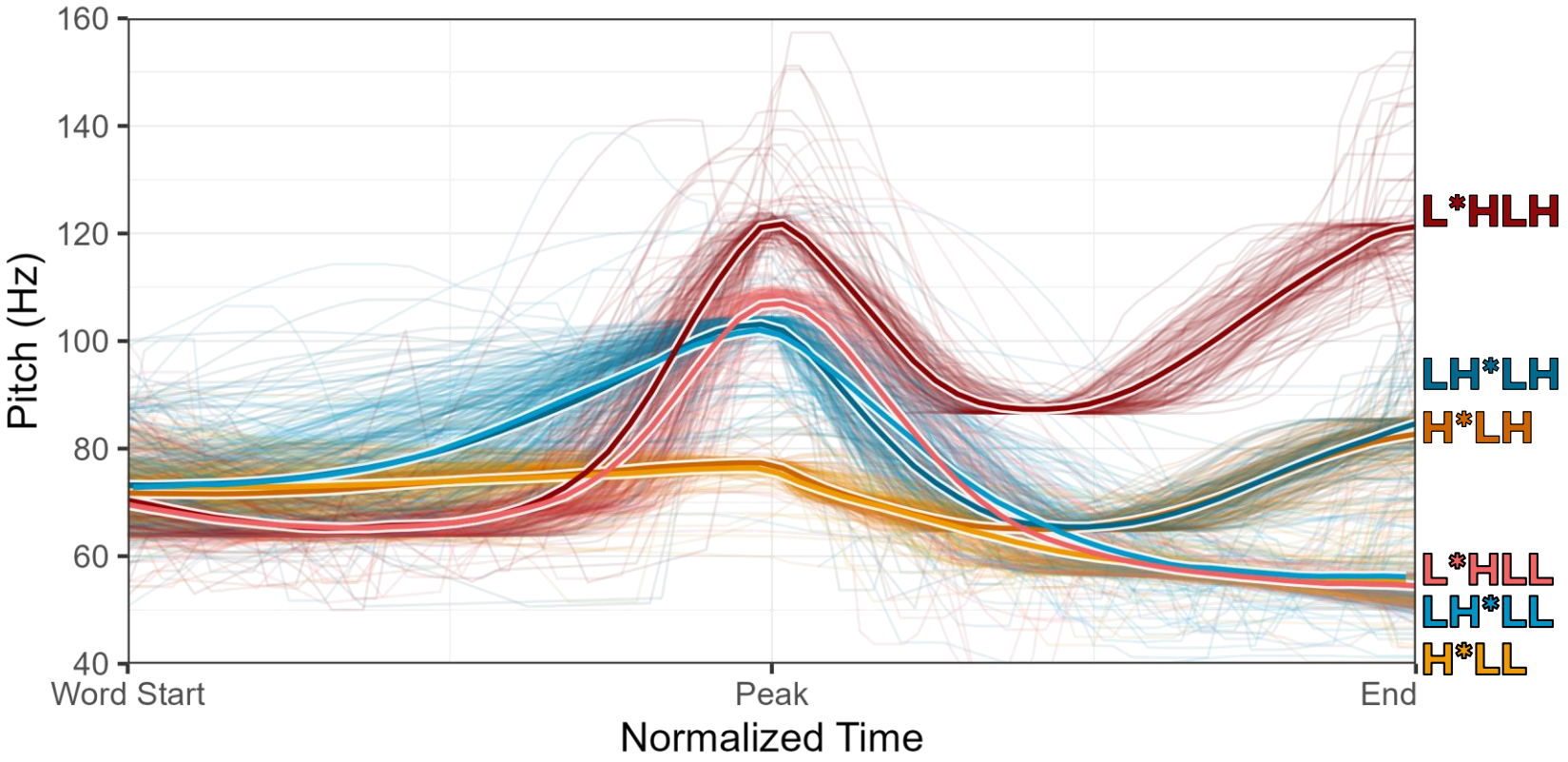
Peak alignment is important but modeled separately

Final 780 “Best” Recordings



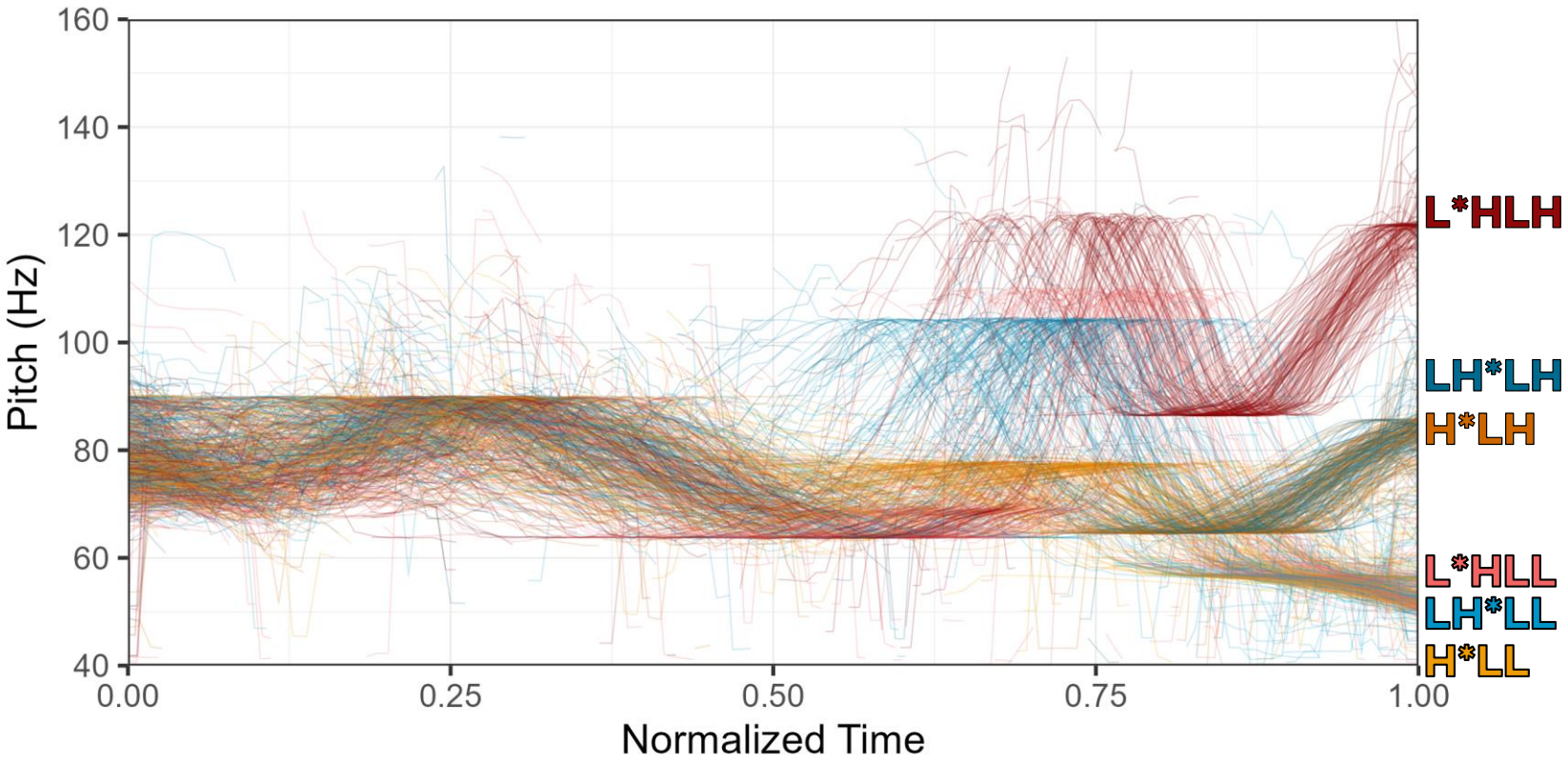
“Best” based on resynthesizing all tokens and picking the one that was most natural

Final 780 Resynthesized contours



We've tamed much of the variation!

Prenuclear region was not forgotten!

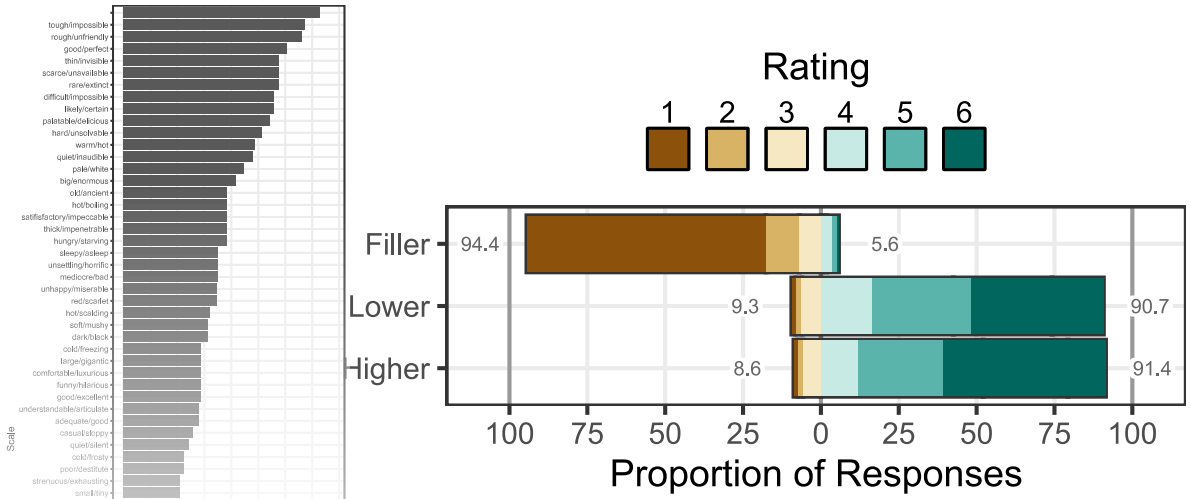


Prenuclear peak height is normalized across utterances

Revisiting our challenges

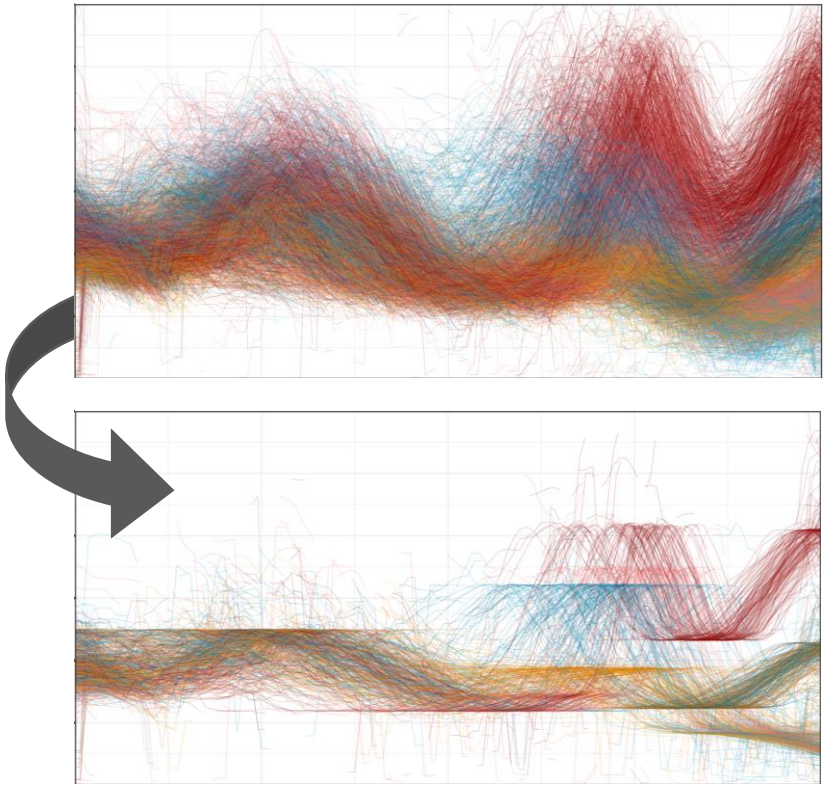
Meaning Side

How can we control and norm our written contexts?



Sound Side

How can we understand and constrain phonetic variation?



Take homes

We’re combining two lines of work in psycholinguistics to learn about contrasts between pitch accents and RFR-shaped tunes

Trying to do work on intonational meaning has substantial methodological challenges on both the sound and meaning side

The scope of writing and recording the materials is massive, but we can constrain variation while still respecting it

Acknowledgments

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…for support, feedback, stimuli help, and experiment assistance

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