Assessing Contrasts in Intonation Through Contrasts in Speaker Commitment

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Outline

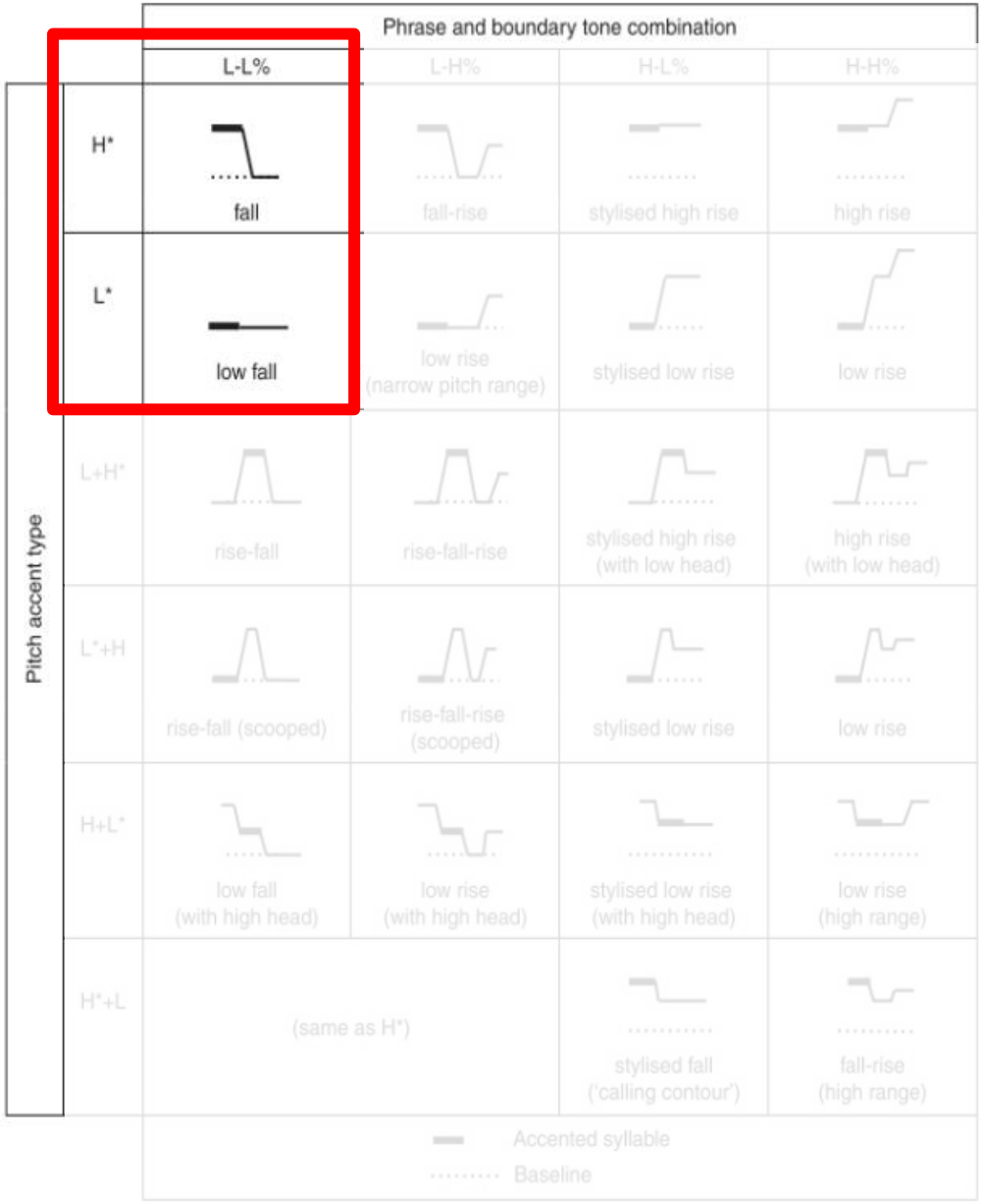
Background and Motivation

Current Experiment

Results

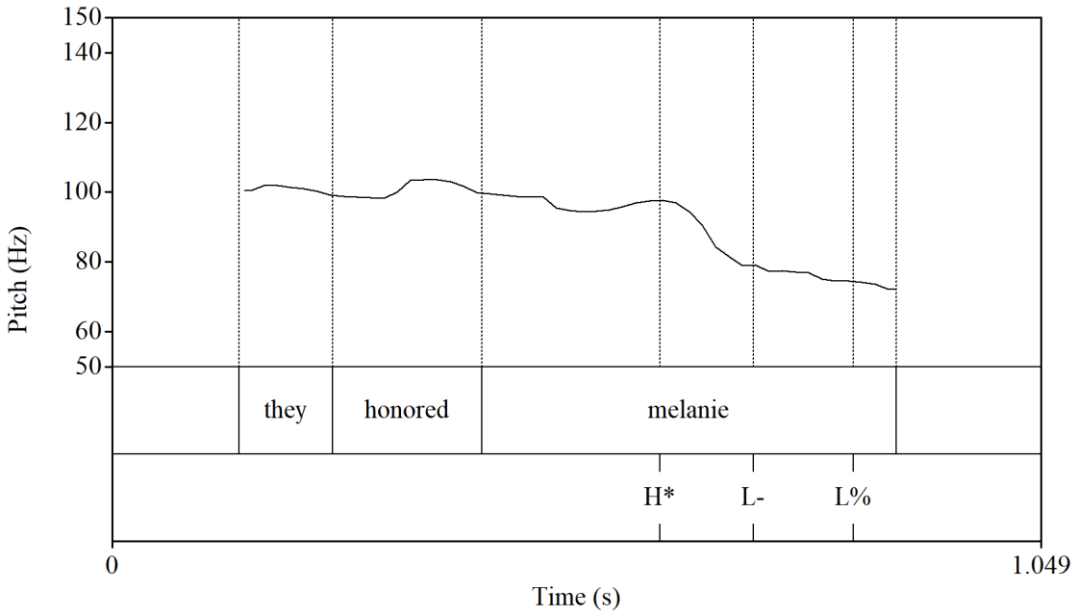
Conclusions

Background & Motivation

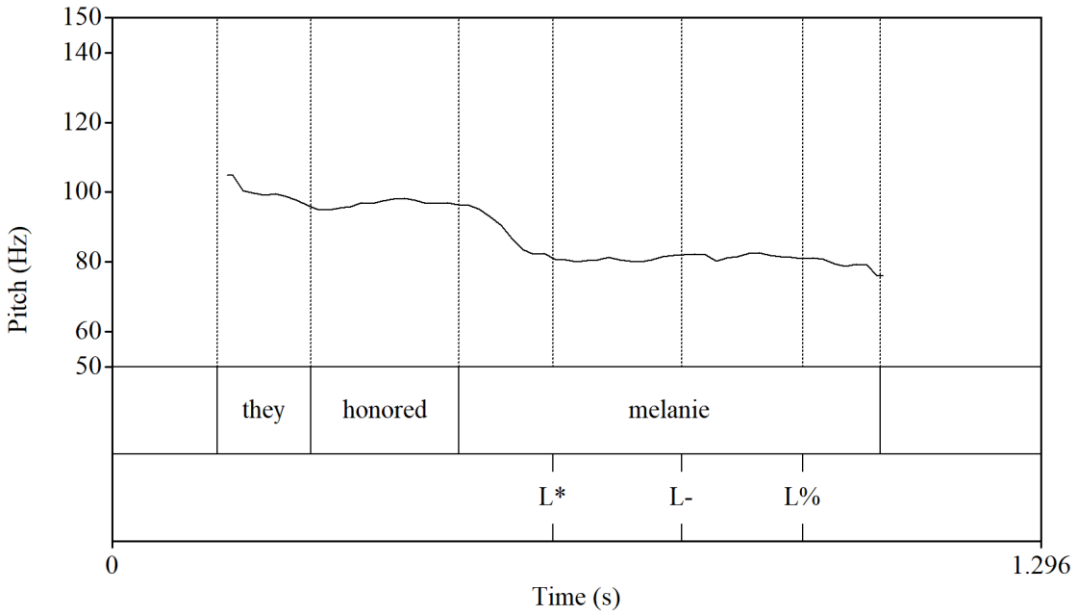


(Pierrehumbert 1980)
(Pierrehumbert and Beckman 1986)
(Pierrehumbert and Hirschberg 1990)
(Warren 2016)

H*	L-	L%

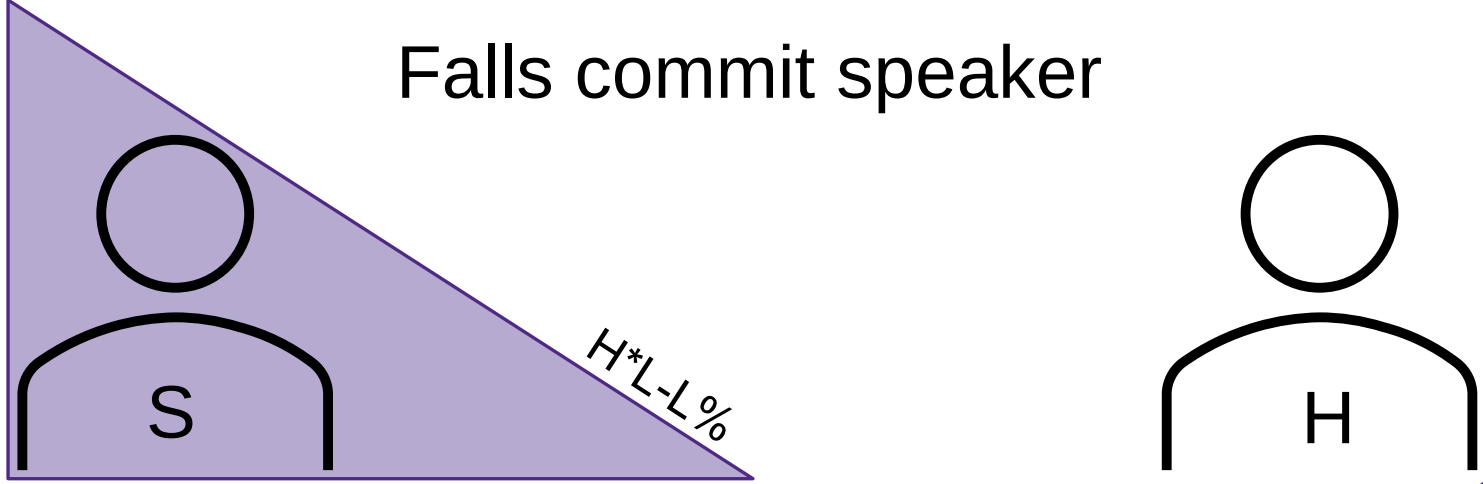

150
140
120
100
80
60
50
Pitch (Hz)
they
honored
melanie
H*
L-
L%
0
1.049
Time (s)

L*	L-	L%


150
140
120
100
80
60
50
Pitch (Hz)
they
honored
melanie
L*
L-
L%
0
1.296
Time (s)

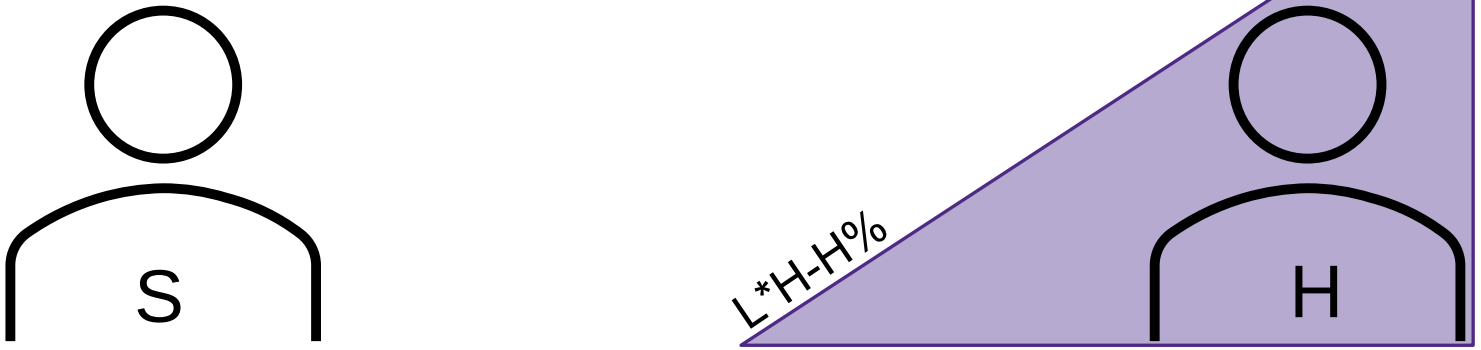
Falls commit speaker

(Krifka 2015)
(Farkas and Bruce 2010

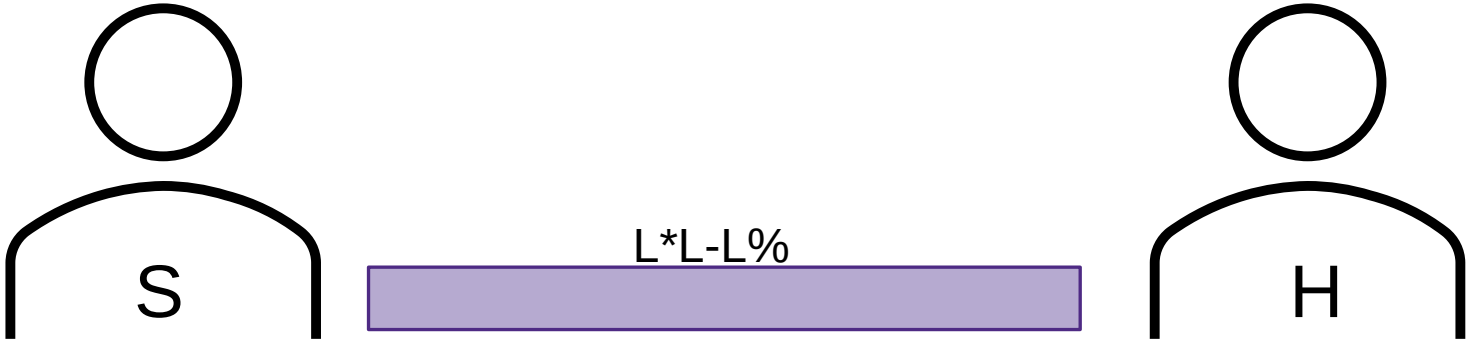


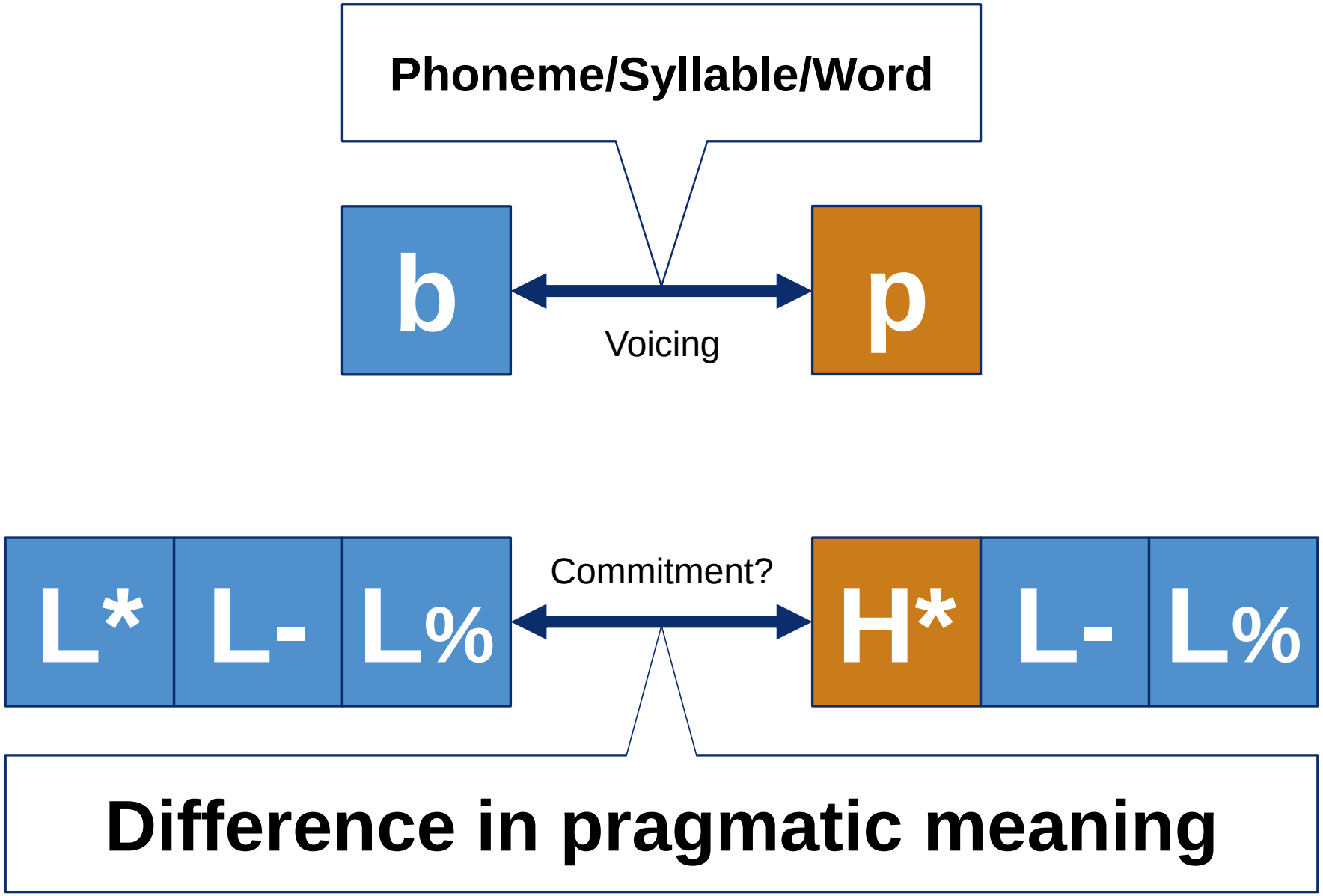
Rises commit hearer

(Rudin 2018)



Low & Flat withholds speaker commitment




Phoneme/Syllable/Word
b
Voicing
p
L*
L-
L%
Commitment?
H*
L-
L%
Difference in pragmatic meaning

Why withhold commitment to *p*?

Knows *p* will disappoint

Embarrassed about *p*

Believes *p* is abundantly obvious

Resigned to or reluctant about *p*

Unwilling to admit/commit to *p*

Does pitch co-vary with commitment?

What does that relationship look like?

Current Experiment

A volunteering context

Boss: I need one volunteer for this task, who will do it?

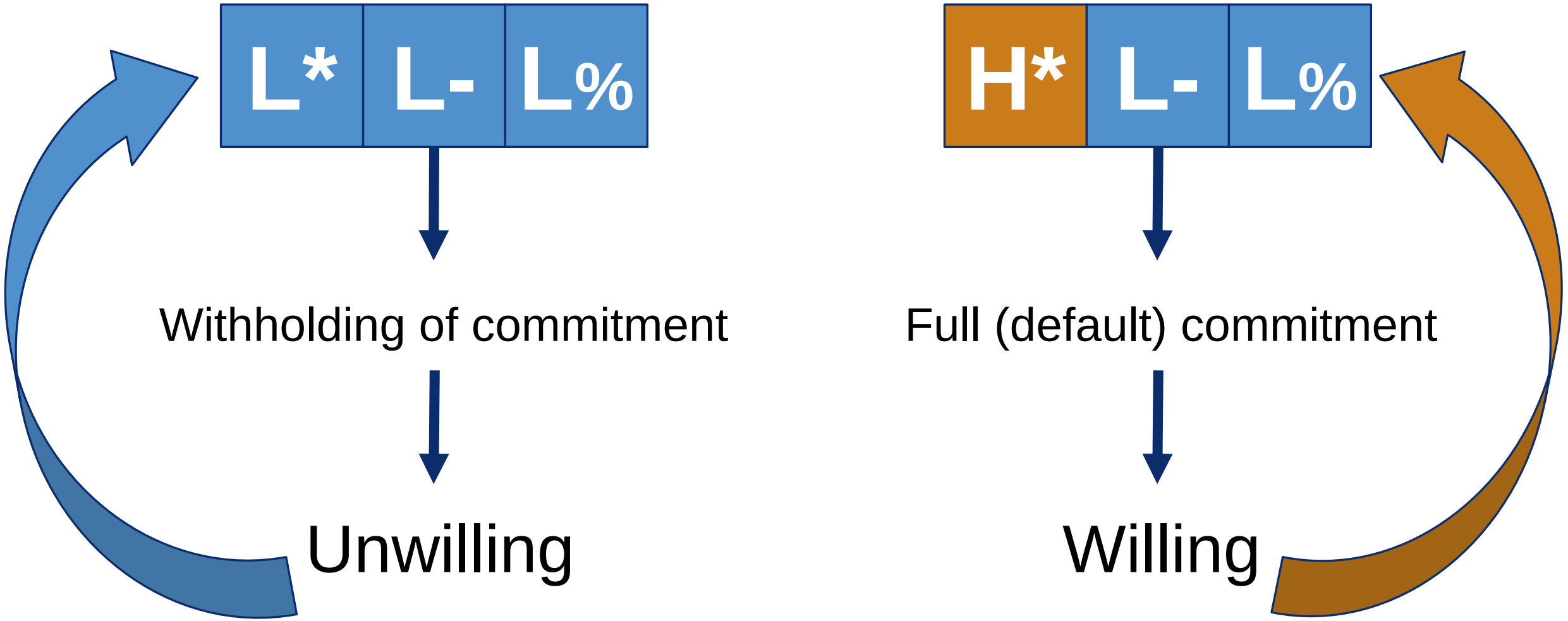
Alex: I will (LLL)
- ⇝ I'll do it if I have to
- ⇝ I'll do it but I don't want to
- ⇝ I'll do it but I'm not happy about it

} *unwilling*

B: Thanks, glad I can count on you

A: #Whoa, I never meant that I was committed to doing it!

A's withholding licenses an unwilling inference, but *does not absolve them*
- B may still hold A accountable for *p*


L*
L-
L%
Withholding of commitment
Unwilling
H*
L-
L%
Full (default) commitment
Willing

Experimental design

Task 1: Given an utterance, select if the speaker actually sounds **willing** or **unwilling**

Task 2: Give a rating of how confident you were in your selection

3 utterances that vary in terms of speaker commitment (Mazzarella et al. 2018)

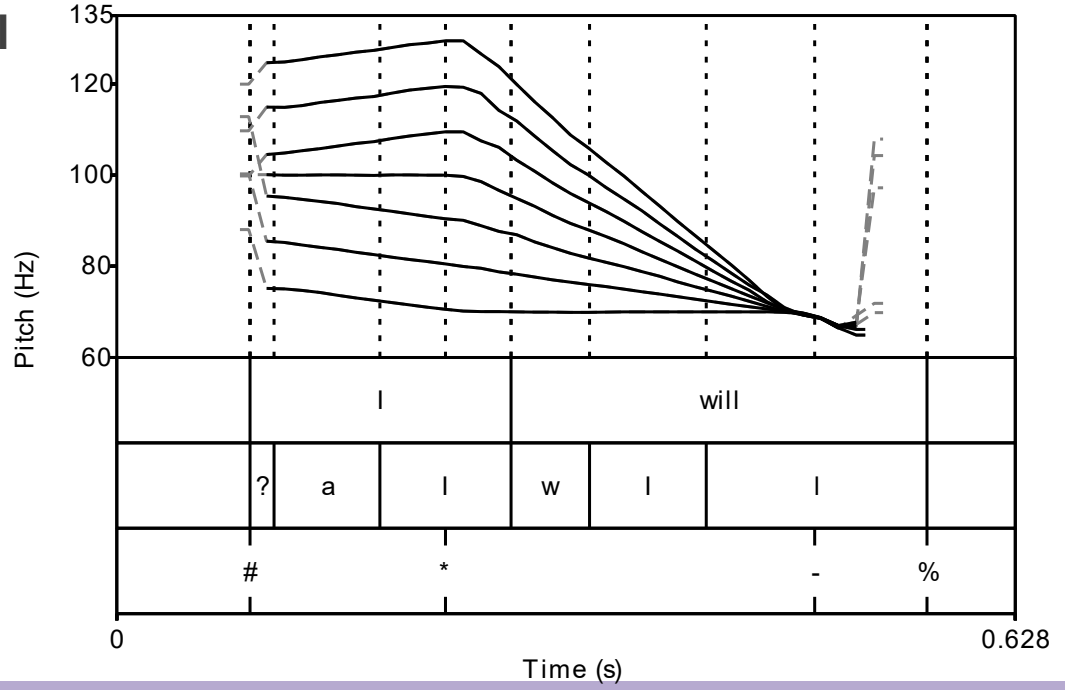
- **I will** > **I'm available** > **If no one else can do it, I will**
- Commissive > Implicature > Conditional

2 baseline recordings for each tune

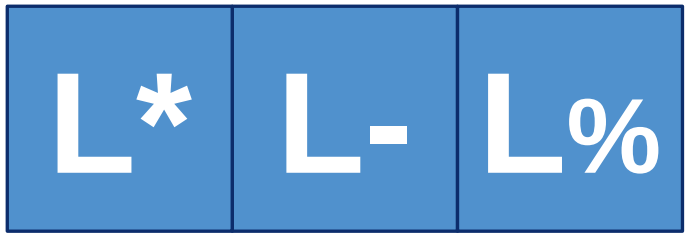
7-step continuum between L*L-L% and H*L-L%

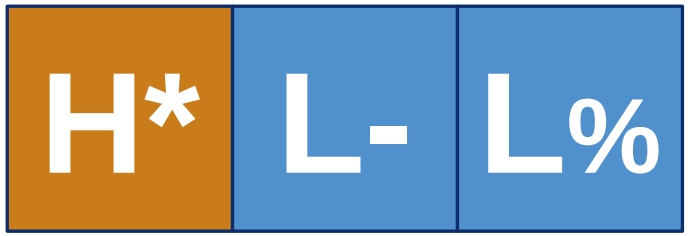
3 repetitions of each item

126 total trials

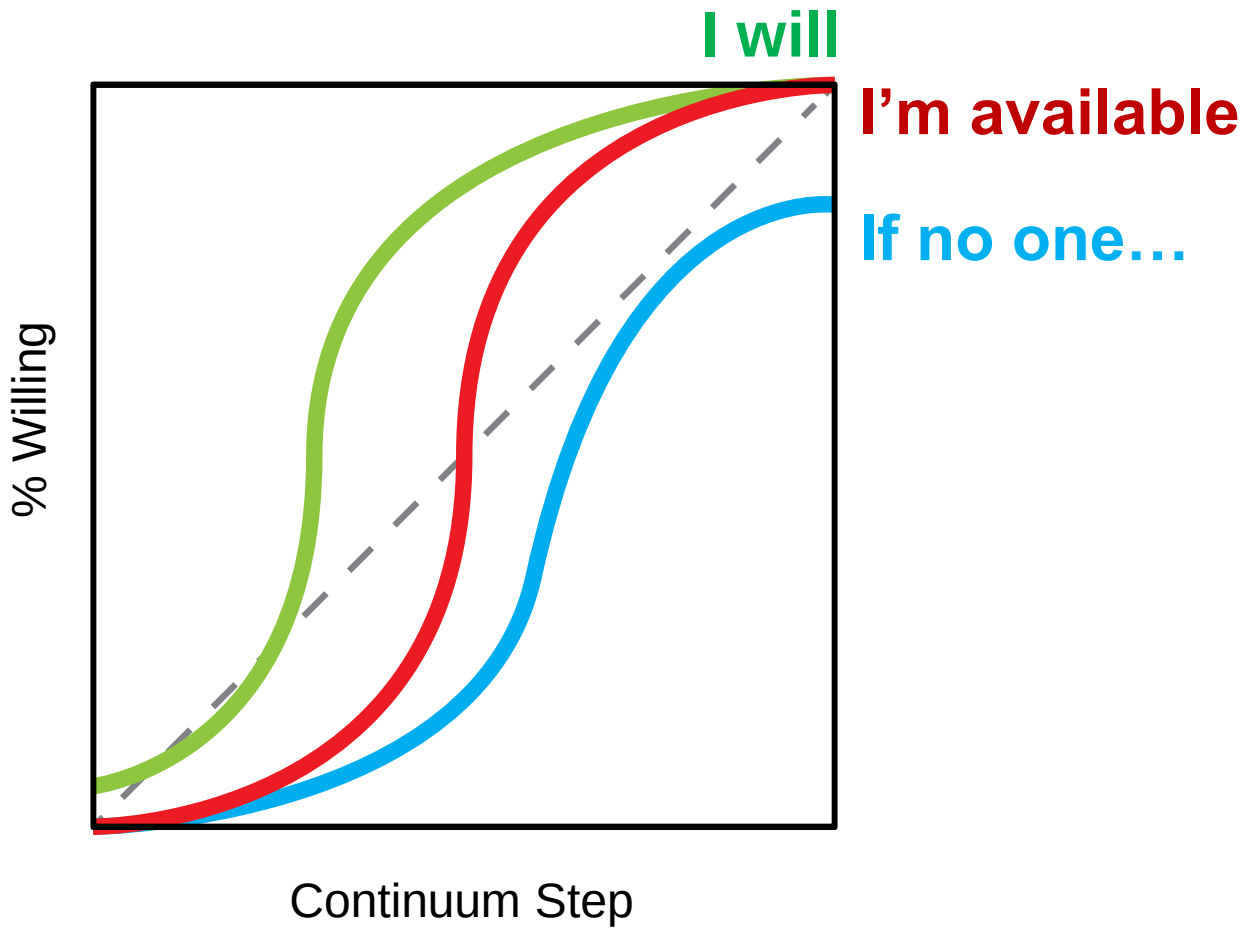


Stimuli Examples





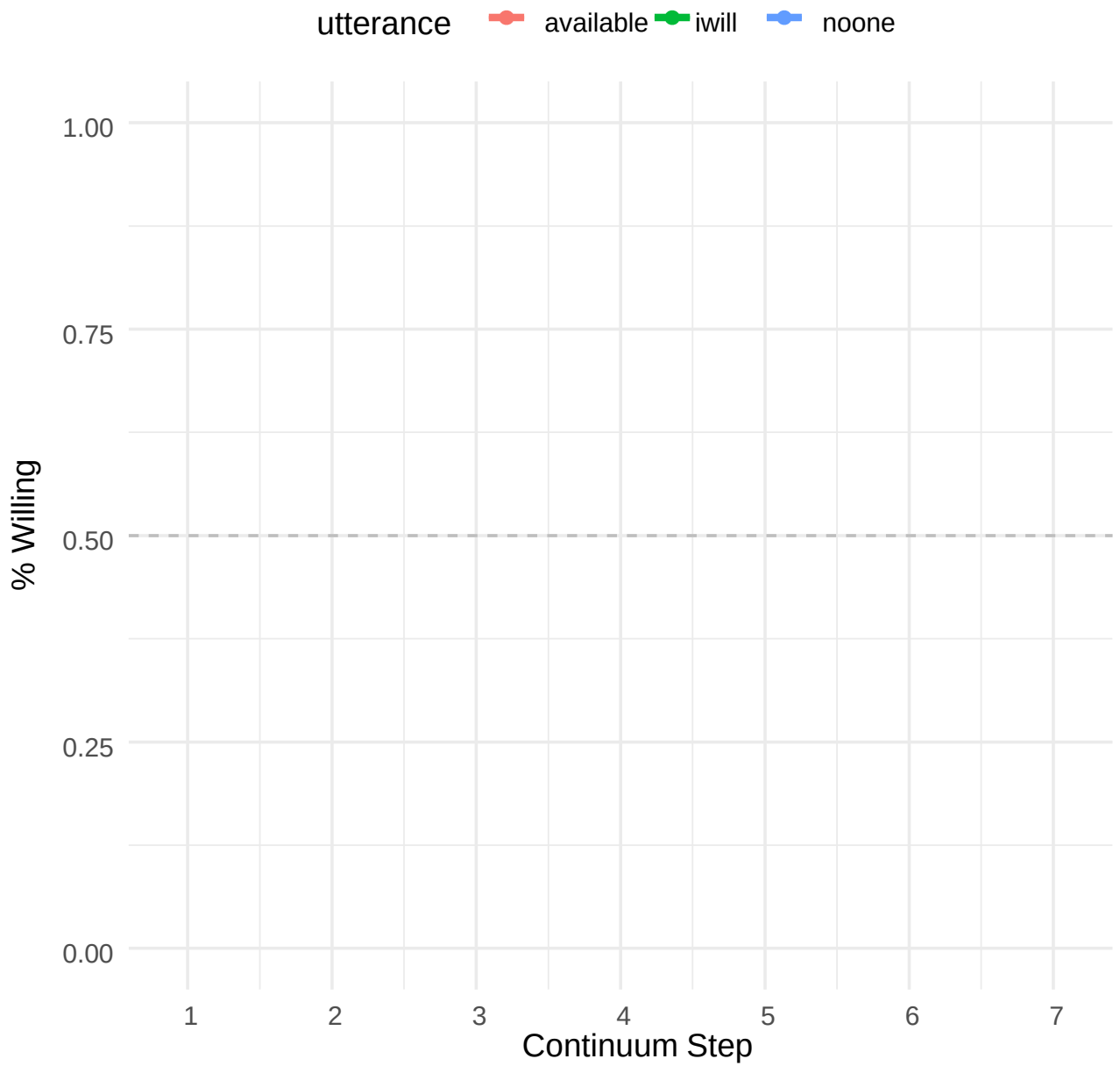
Predictions



Forced Choice Results

Aggregate Empirical Data

(n=80)



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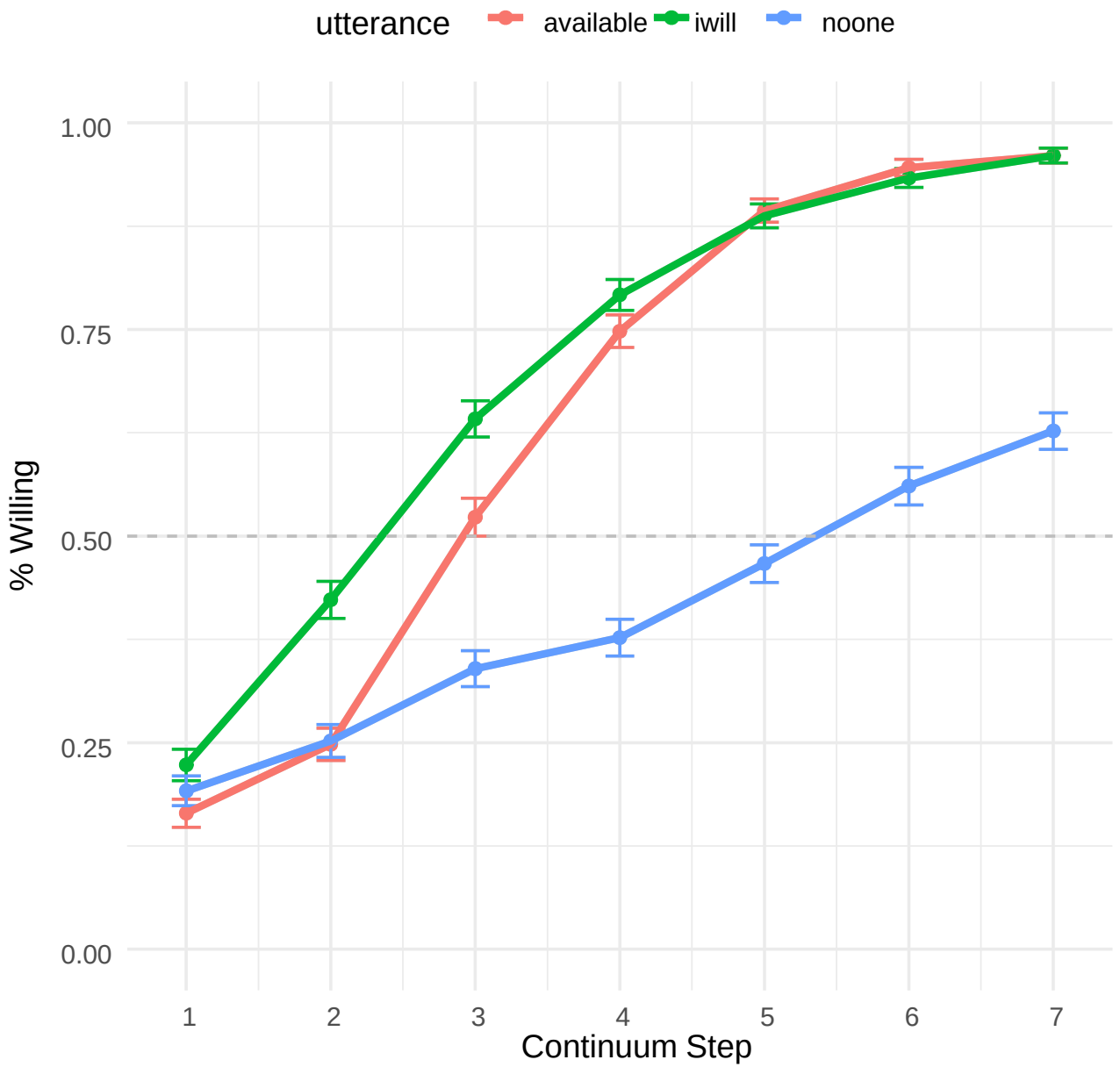
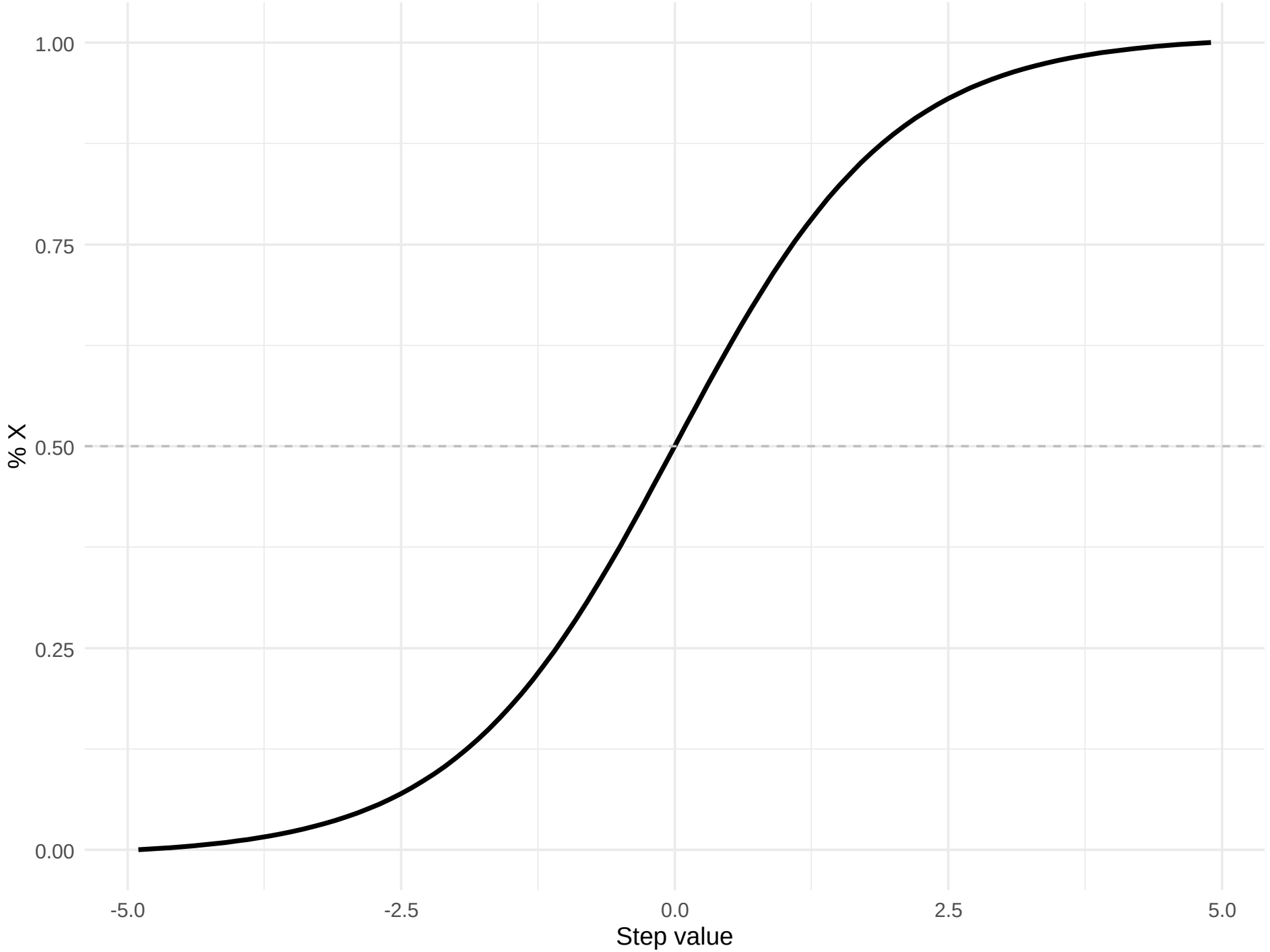
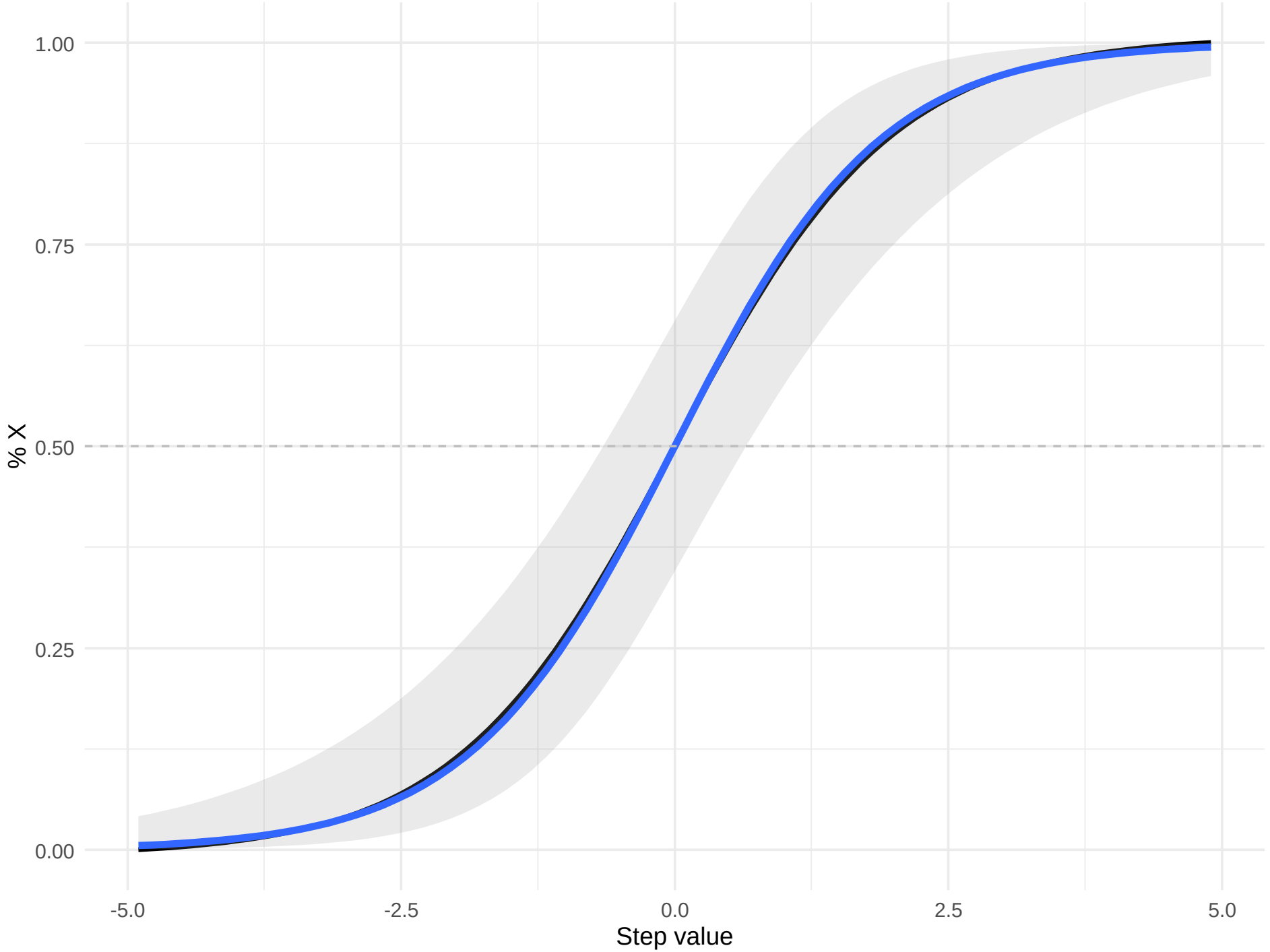
(n=80)




1.00
0.75
0.50
0.25
0.00
% X
-5.0
-2.5
0.0
2.5
5.0
Step value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0.50
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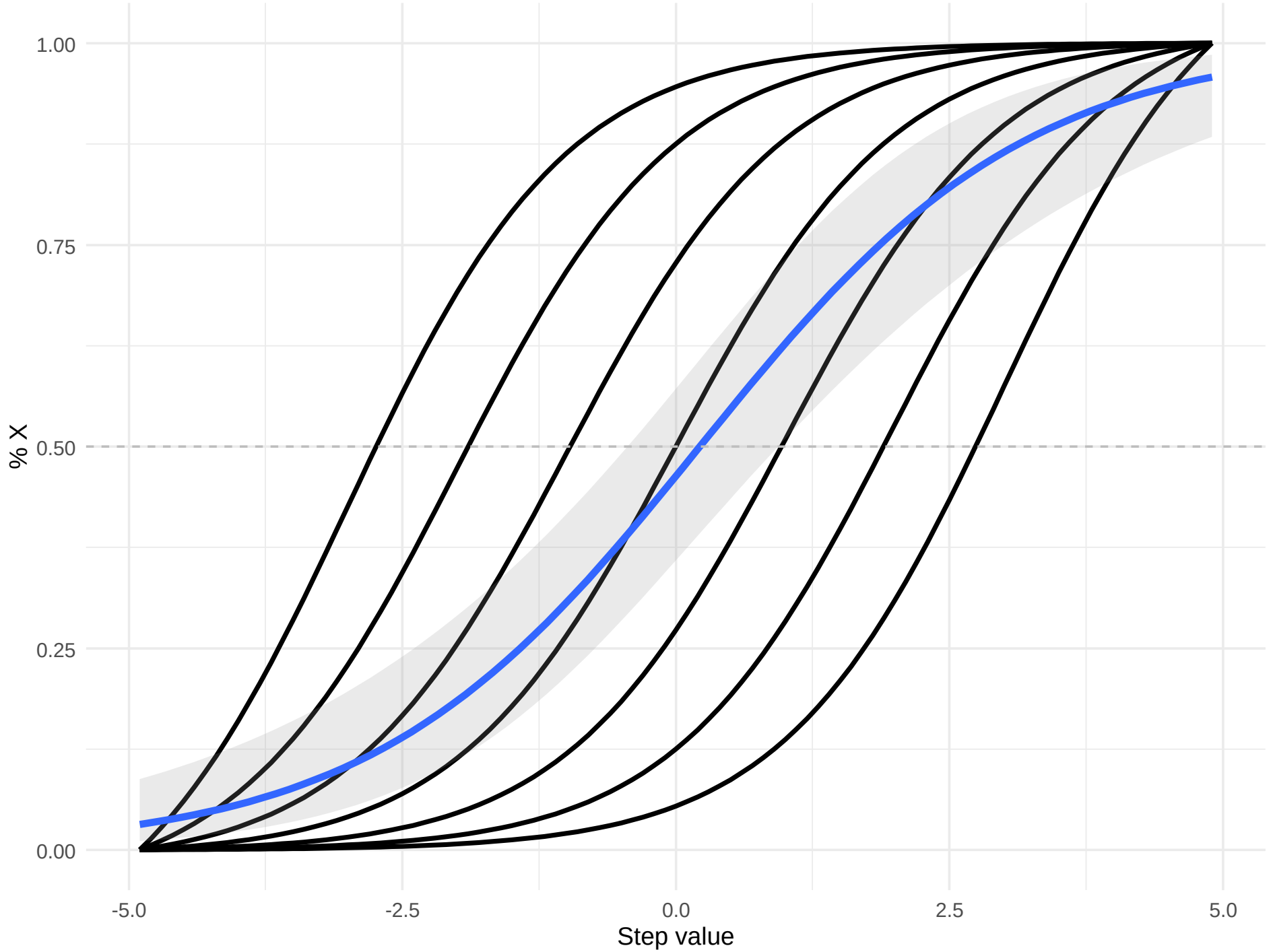
-5.0
-2.5
0.0
2.5
5.0
Step value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0.75
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0.25
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-5.0
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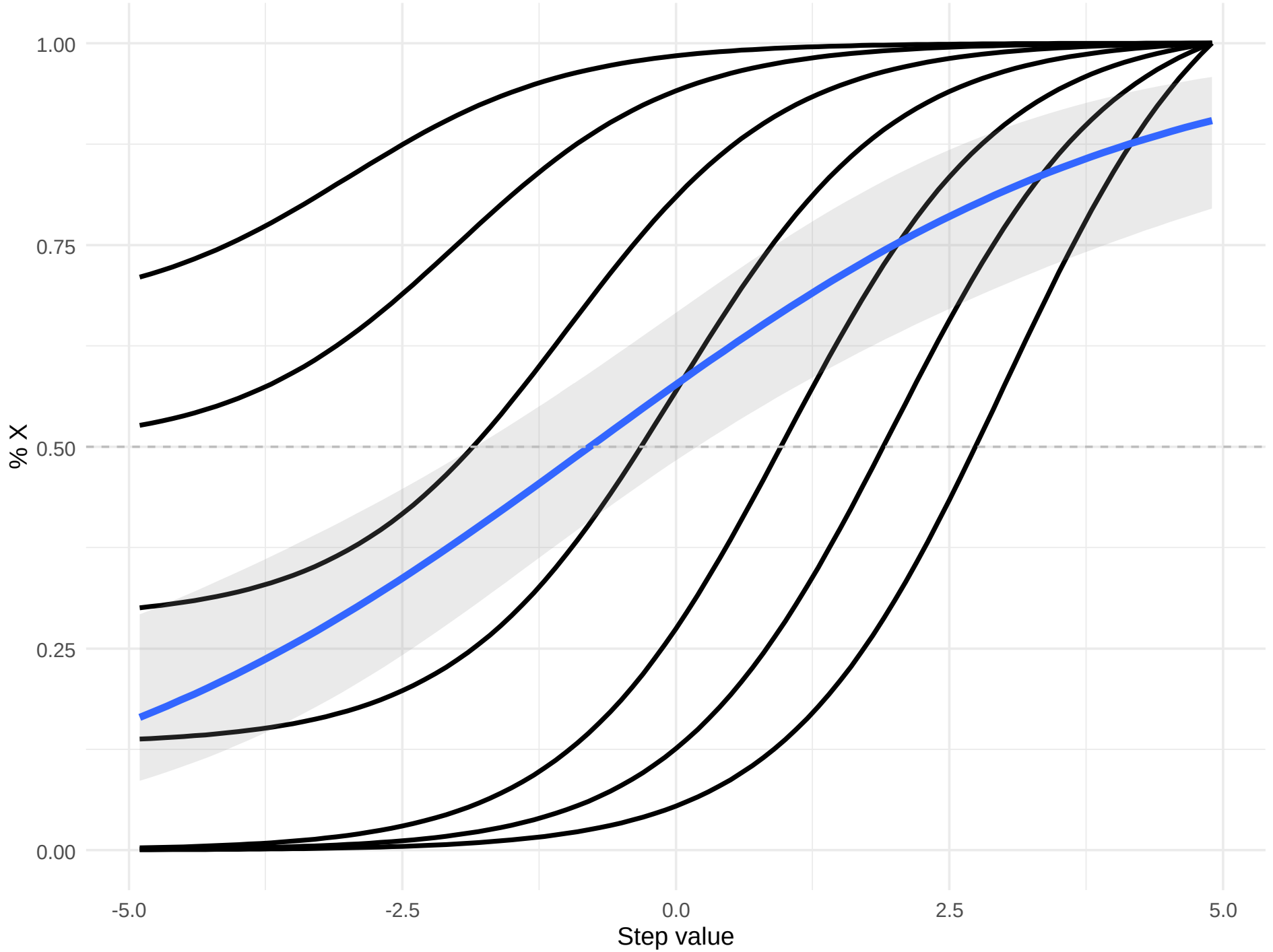
0.0
2.5
5.0
Step value


1.00
0.75
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0.25
0.00
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-5.0
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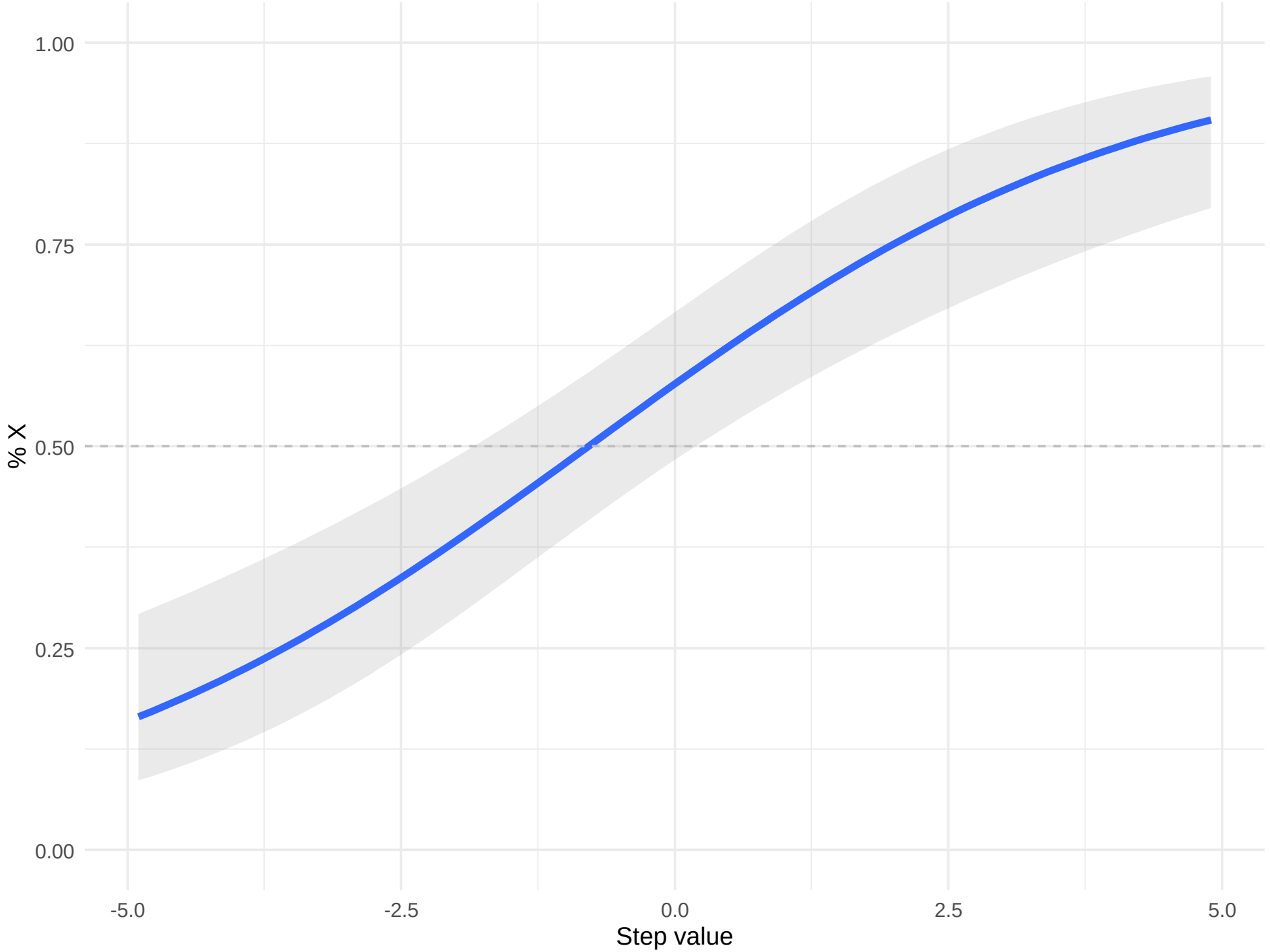
0.0
2.5
5.0
Step value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0.0
2.5
5.0
Step value

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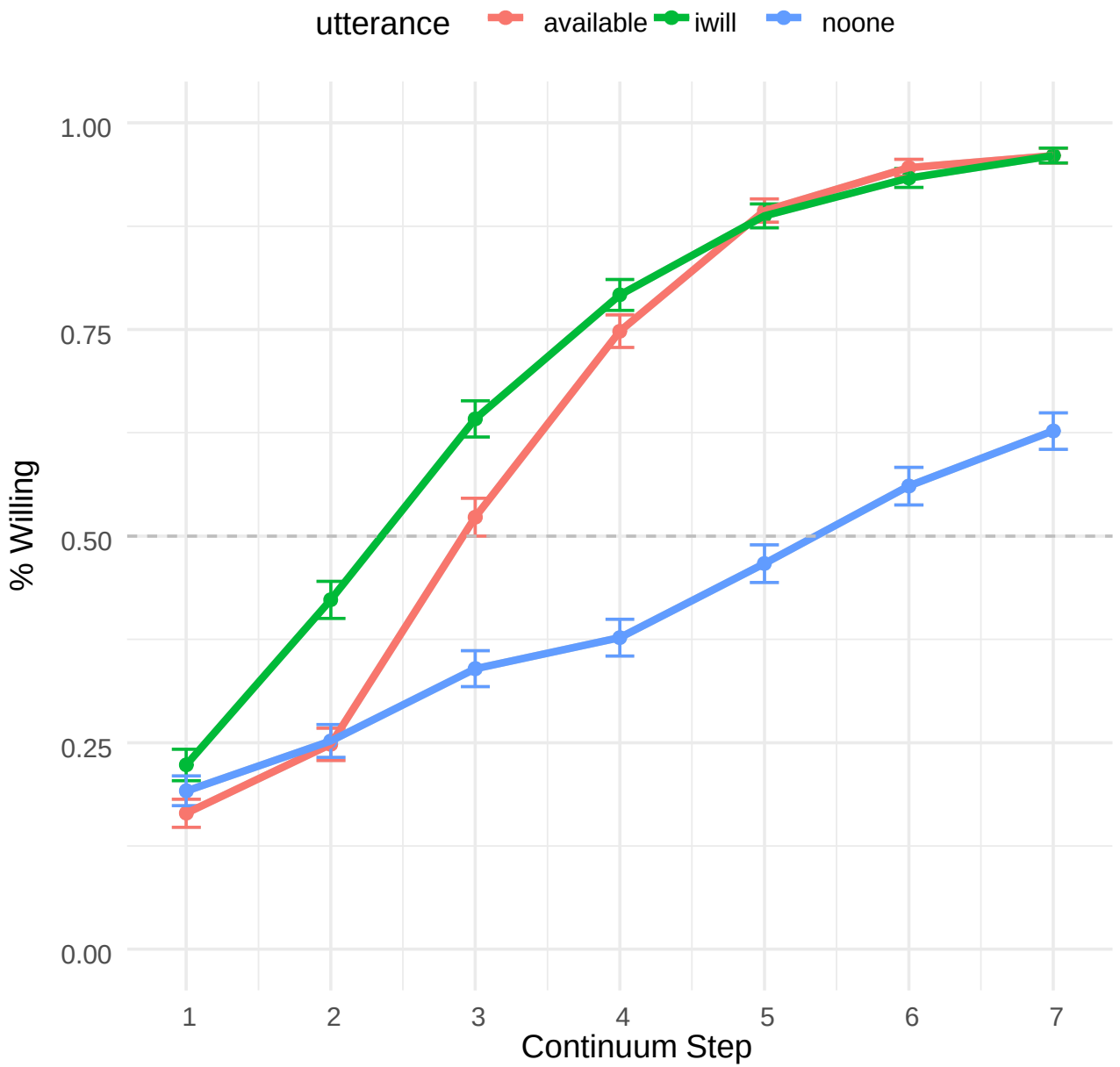
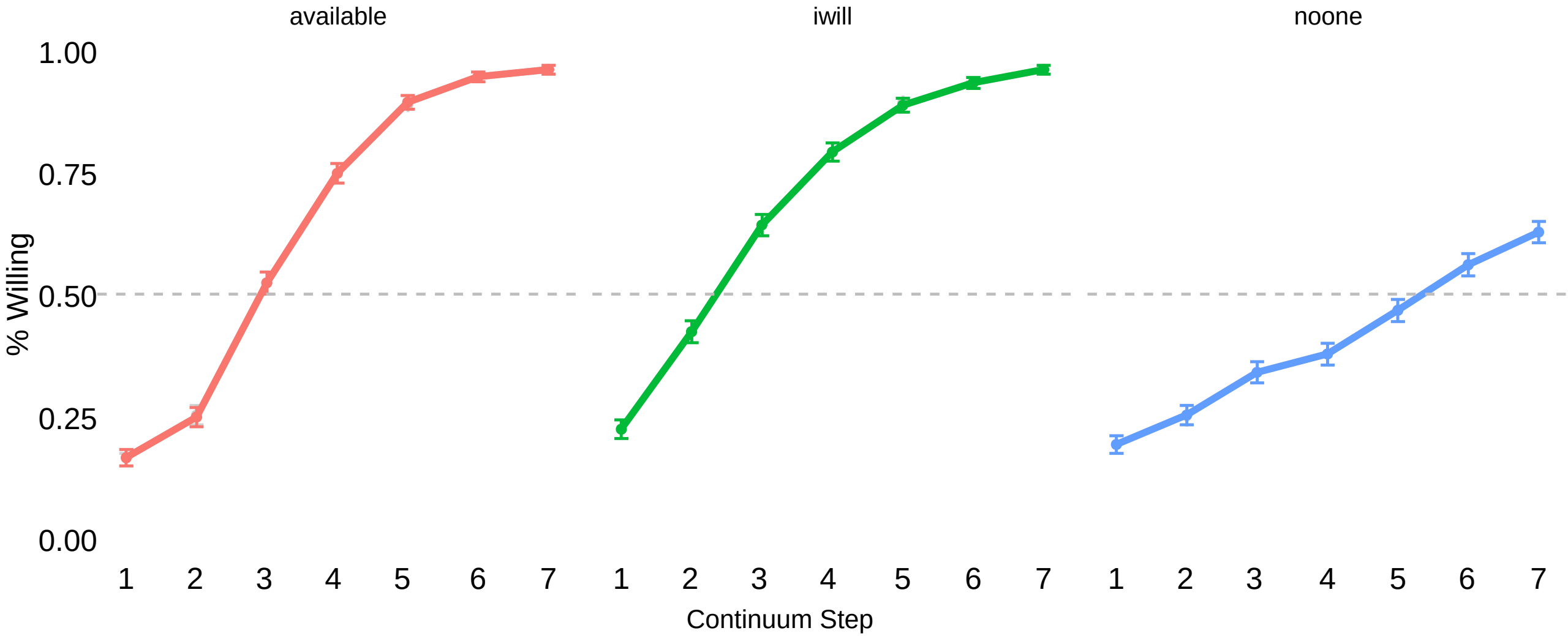
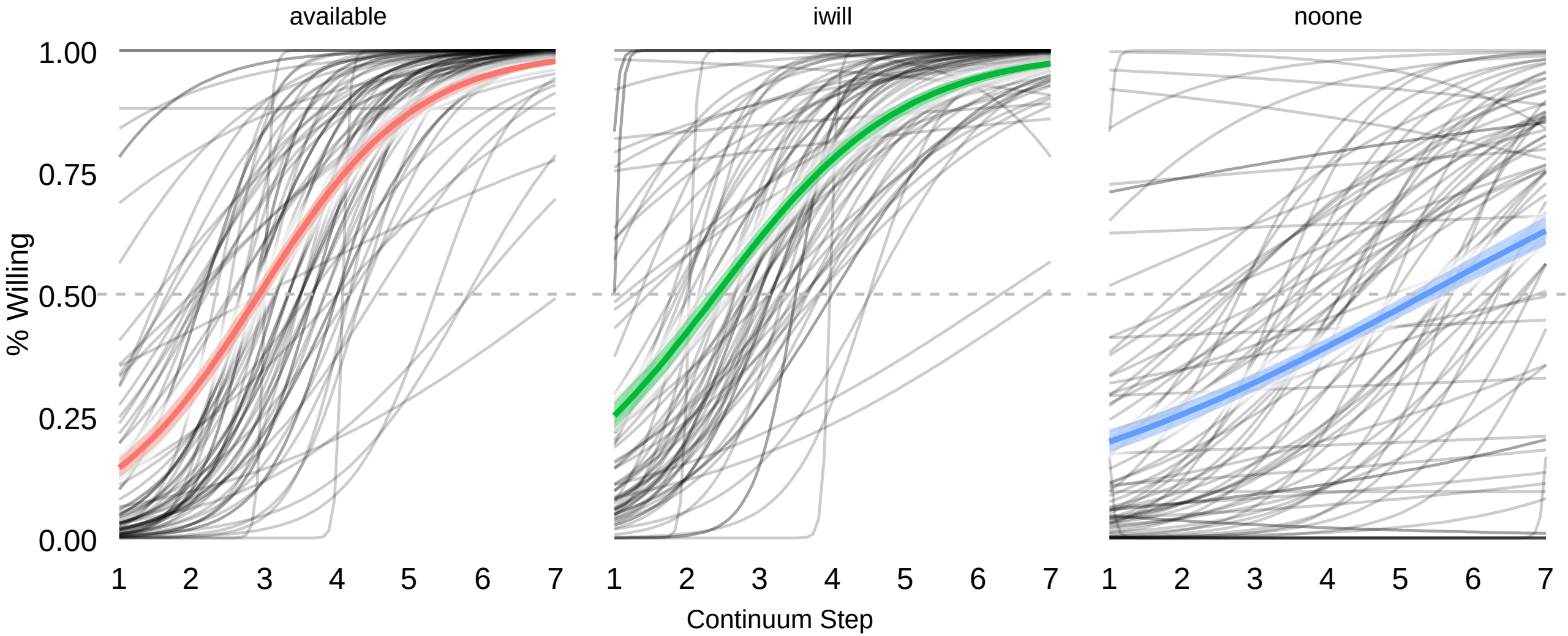


Aggregate Empirical Data



Individual Variation (Smoothed)



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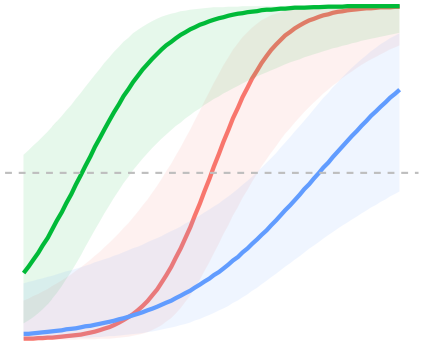

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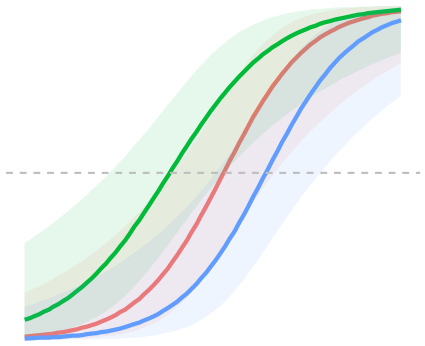

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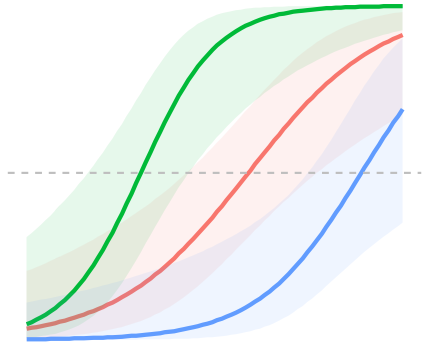

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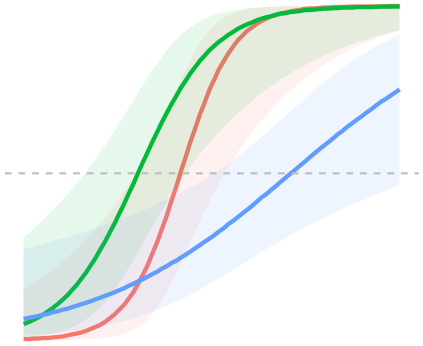

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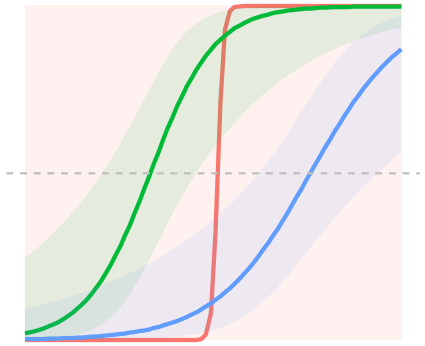

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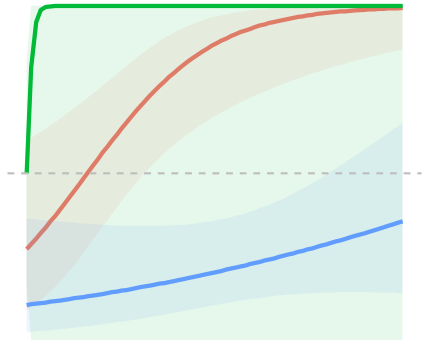
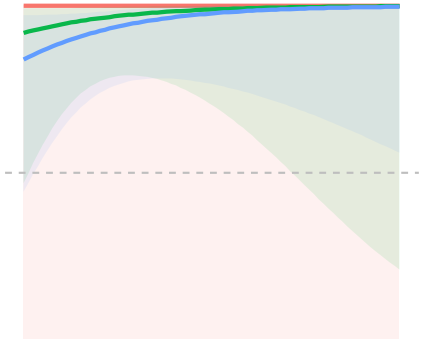


1



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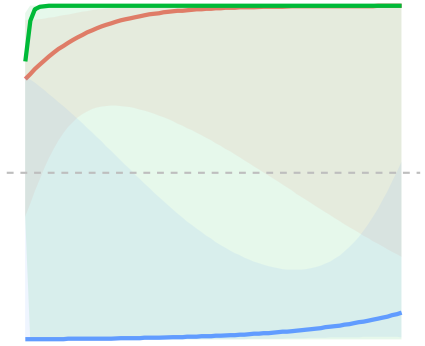

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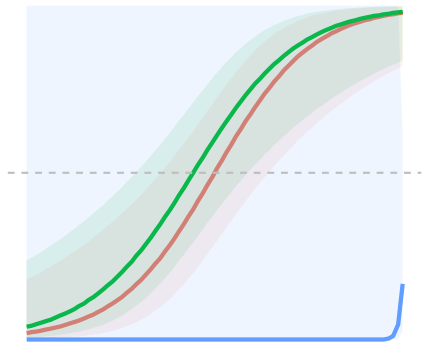
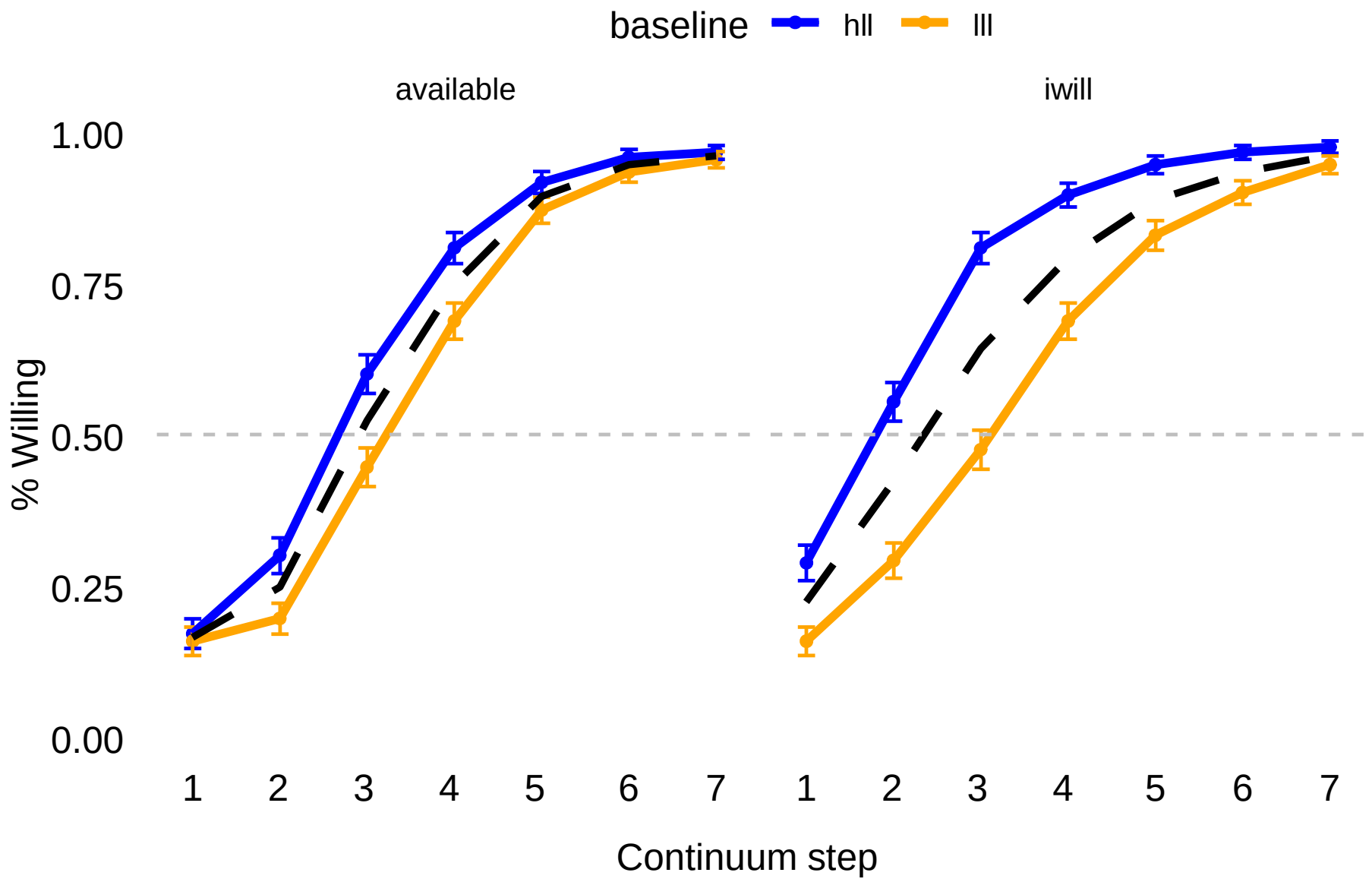


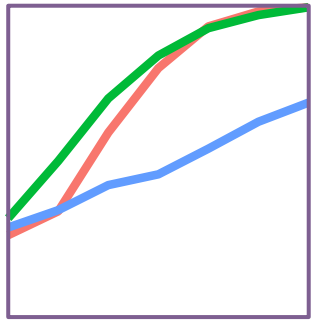
Aggregate Empirical Data by Baseline Recording



Interim Summary of Forced Choice Task

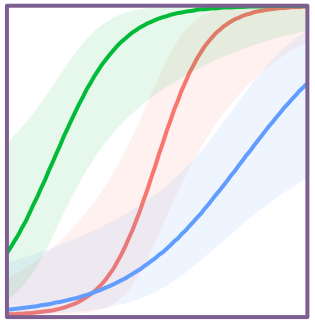
Aggregate

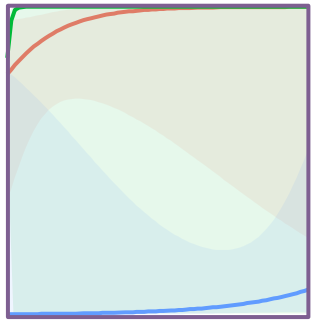
Predicted effect of pitch and utterance, but within-category behavior obfuscated



Individual

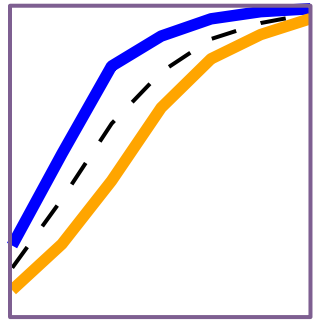
Better picture of potential within-category behavior
Exposes biases and participant strategies





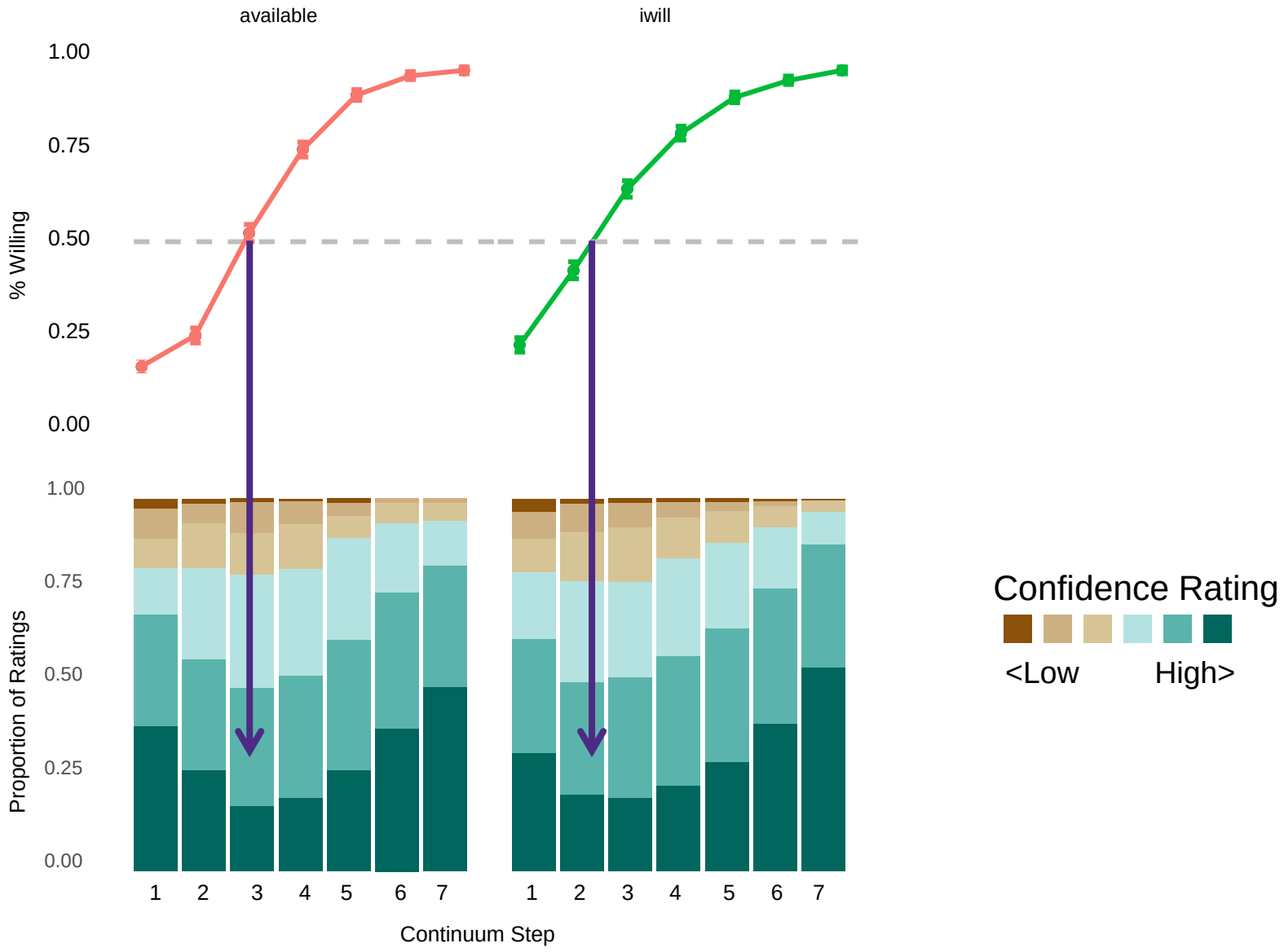
Signal

Other cues at play in perception of LLL & HLL



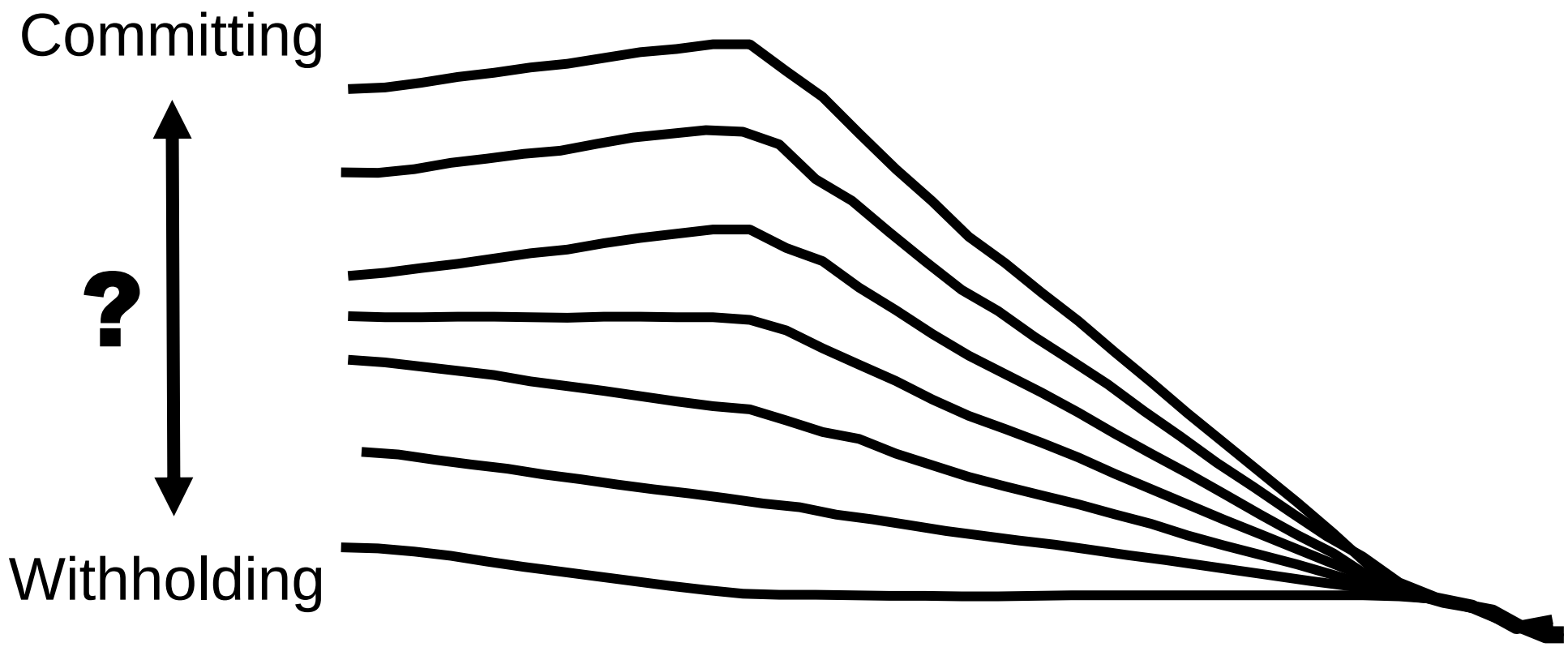
Confidence Rating Results

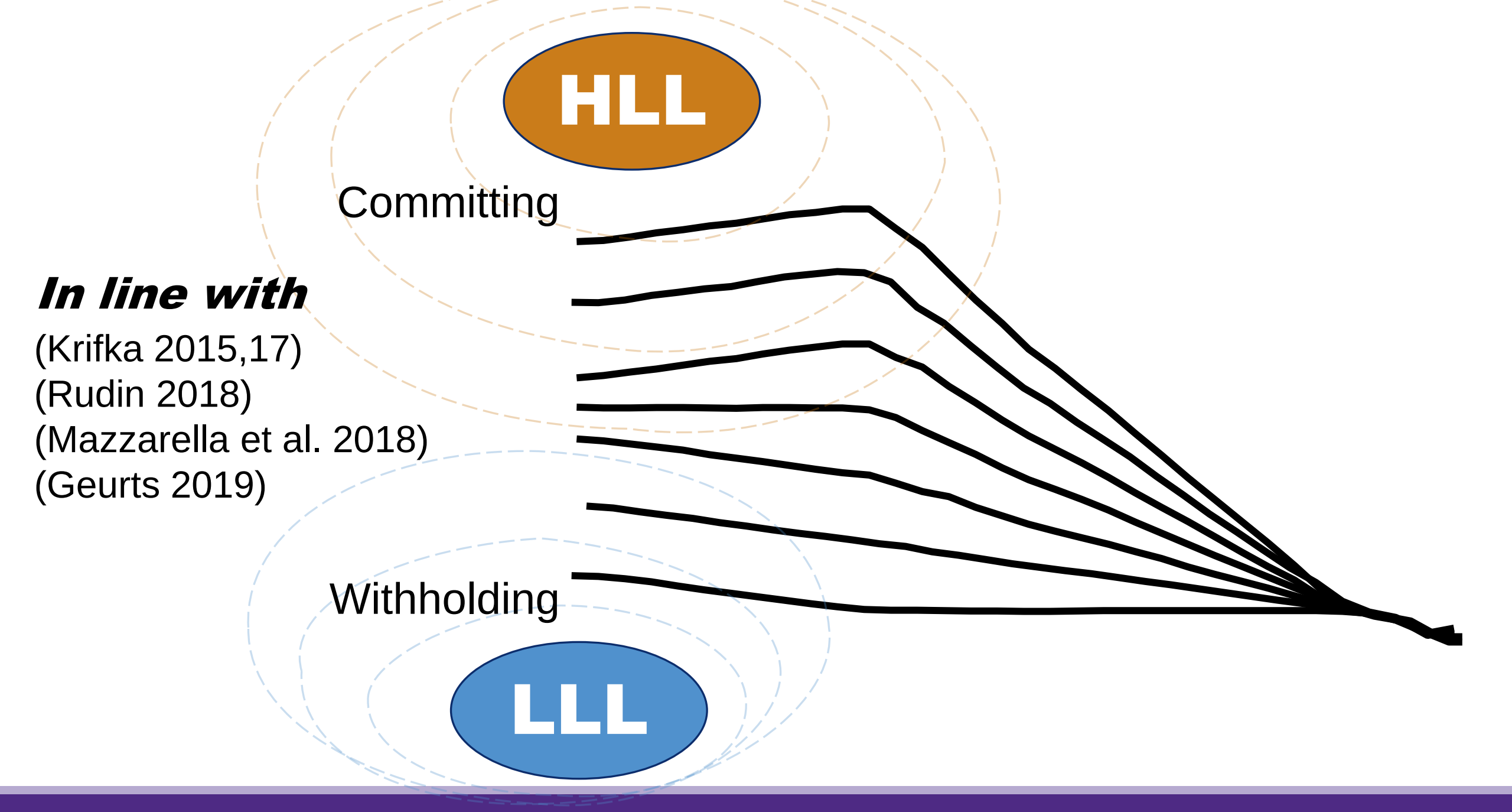
Aggregate Empirical Data



Does pitch co-vary with commitment?

What does that relationship look like?


Committing
?
Withholding



In line with

(Krifka 2015,17)
(Rudin 2018)
(Mazzarella et al. 2018)
(Geurts 2019)

The perception of intonational emphasis: continuous or categorical?

D. Robert Ladd and Rachel Morton*

Journal of Phonetics (1997) 25, 313–342

1997

Journal of Pho 13–342

The perceptio f intonational emphasis: continuous or categorical?

D. Robert Ladd and Rachel Morton*

“These results [...] are also at odds with the strongest prediction of the ‘gradience’ theory”

Does pitch co-vary with commitment?

Yes

Relationship between pitch and commitment as indexed by participants' inferences

Confidence

Confidence is greatest when tune aligns with expected inference

Individuals

Variation in how people utilize lexicosemantic & prosodic cues to commitment

What does that relationship look like?

Caveat

Paradigm cannot show *nuanced* mappings between pitch and meaning space

Tricky!

Evidence against the strongest gradient predictions

Acknowledgments

Chun Chang for building the online experiment

Members of ProSD Lab at Northwestern

Funding: NICO Data Science Initiative

IRB: STU00213825

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Evidence against the strongest gradient predictions

@t_sostarics tsostarics@u.northwestern.edu