

# Sonority, order, and overlap in Georgian syllable onsets

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## What is a syllable?

### How does the syllable emerge in space and time?

#### Space: sonority & order

- Abstract property of speech sounds
- No well-established articulatory correlates
- Vowel > glide > liquid > nasal > fricative > stop (adapted from Parker 2011)
- A sonority-based account of the syllable: syllables have local sonority minima at the edges and a maximum at the nucleus

#### Time: overlap

- Language-specific
- Also affected by:
  - Voicing status of cluster members (Bombien and Hoole 2013)
  - Order of place of articulation (Chitoran et al. 2002, Kühnert et al. 2006, Son et al. 2007)
  - Manner (Bombien et al. 2013)

#### in Georgian

- Minimal restrictions on onset size and shape
- No nucleic consonants
- No phonemic schwa and no vowel reduction
- Back-to-front clusters are less overlapped than front-to-back clusters (Chitoran et al. 2002)
- C-center effect found in CC and CCC clusters (Goldstein et al. 2007)

## Hypotheses

1. Back-to-front clusters will be less overlapped than front-to-back clusters.
2. Sonority rises will be more overlapped than plateaus, which will be more overlapped than falls  
Sonority rises will be less affected by changes in order than plateaus and falls
3. "The sonority hierarchy can best be understood in its relationship to articulatory timing," Chitoran (2016)

## Experimental design

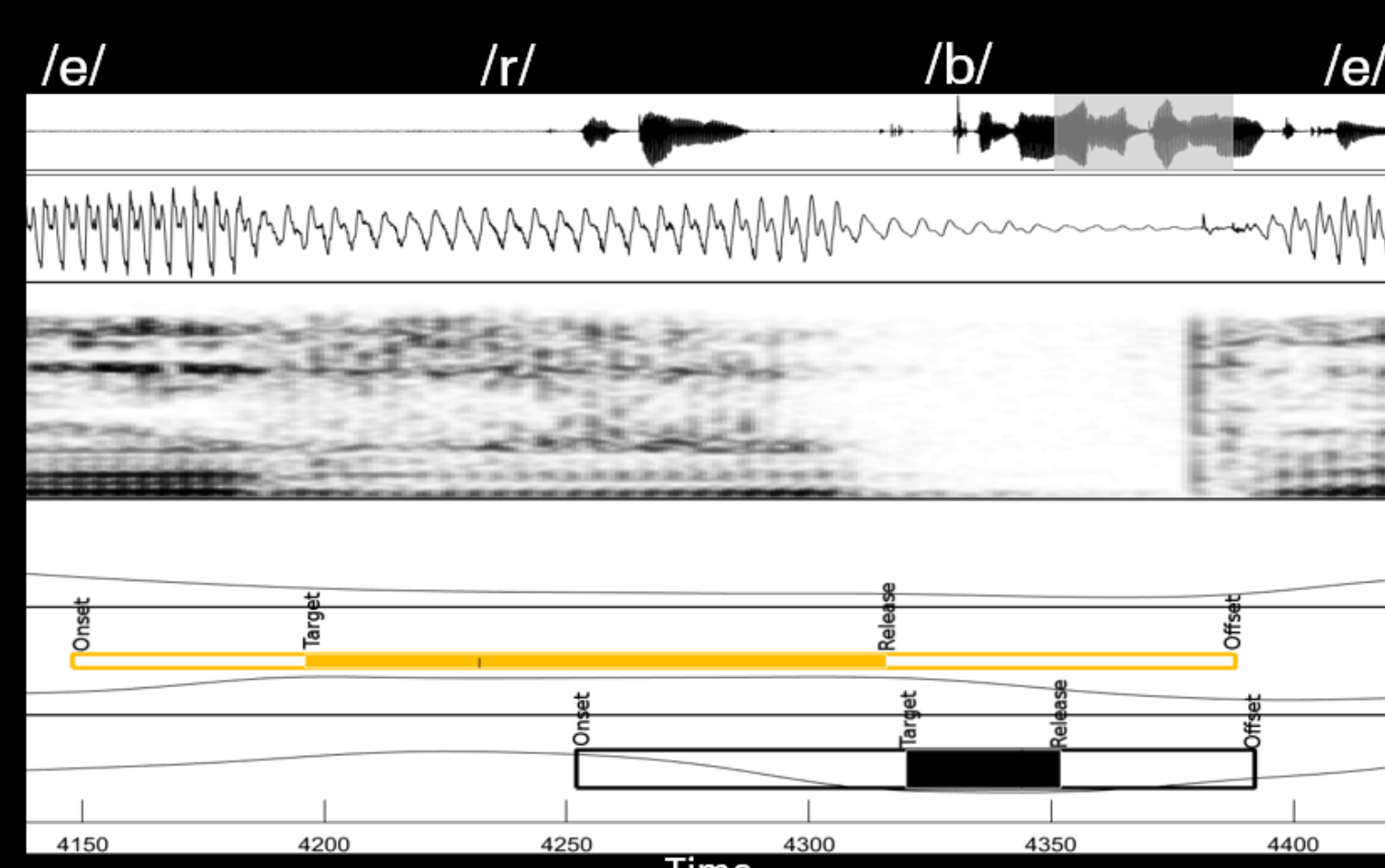
	Front to back	Back to front
<b>Sonority rise</b>	bregi 'mound' bneli 'darkness' bneda 'epilepsy' blepi 'bluff' mlode 'waiting'	tmaze 'hair.in' dmanisi 'Dmanisi (town)' grevi 'gift' glexi 'peasant'
<b>Sonority plateau</b>	ixama 'poison' bgera 'sound' ptila 'hair lock' mnaxe 'see me'	xjavs 'shut off' gdeba 'lie about' tbeba 'warm up/warming'
<b>Sonority fall</b>	mtaze 'mountain.in' mdare 'worthless' rgeba 'benefitting'	rbena 'running (n)' lbeba 'softening (n)' lmba 'feeling sadness'

Target words were produced eight times (seven times by Speaker 2) each in a frame sentence:

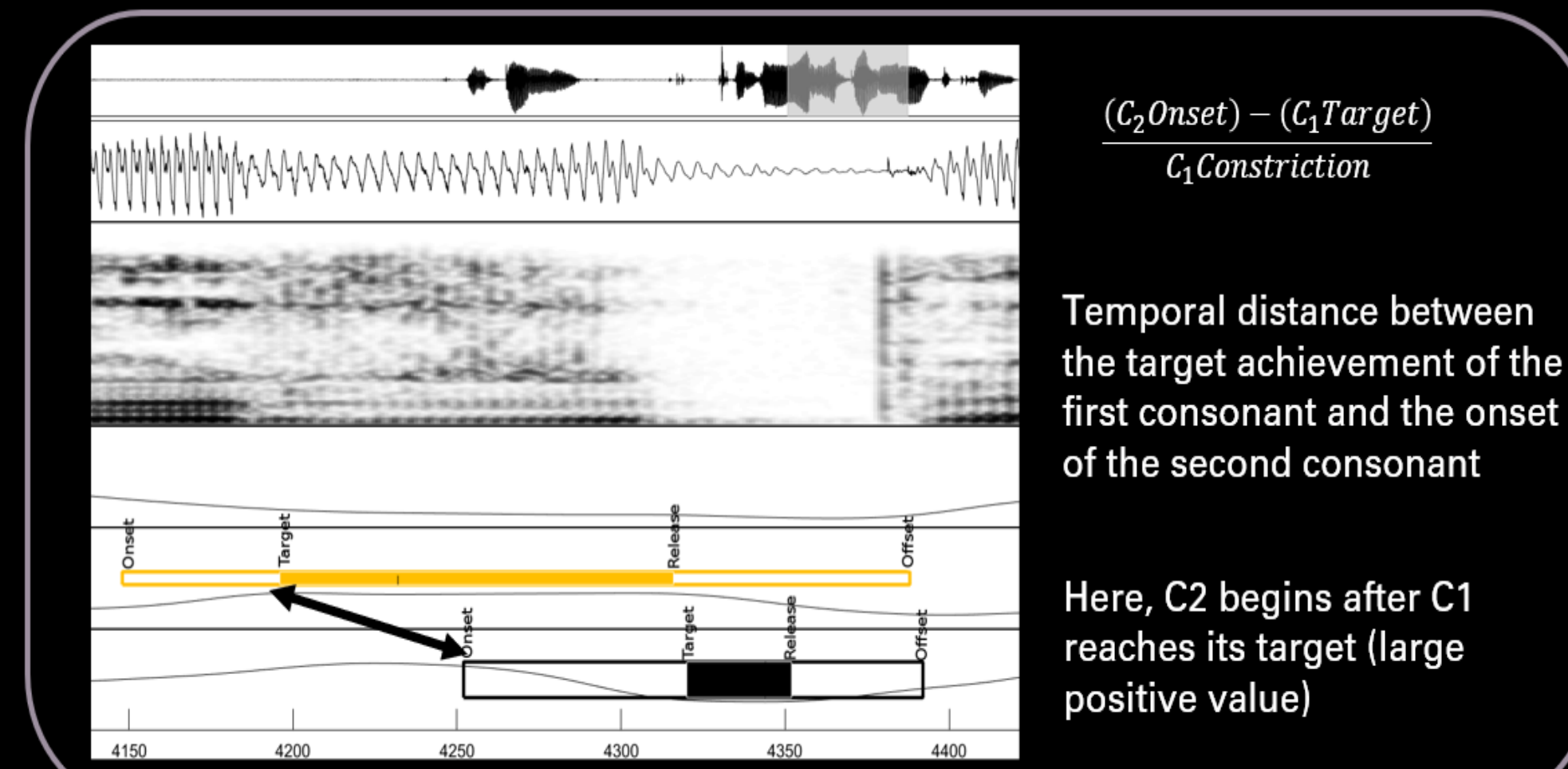
*k'idev* \_\_\_ *vtkvi* ('I said \_\_\_ again') [Speaker 1]

*kalma* \_\_\_ *momts'era* ('The woman wrote \_\_\_ to me') [Speakers 2&3]

Total of 472 tokens

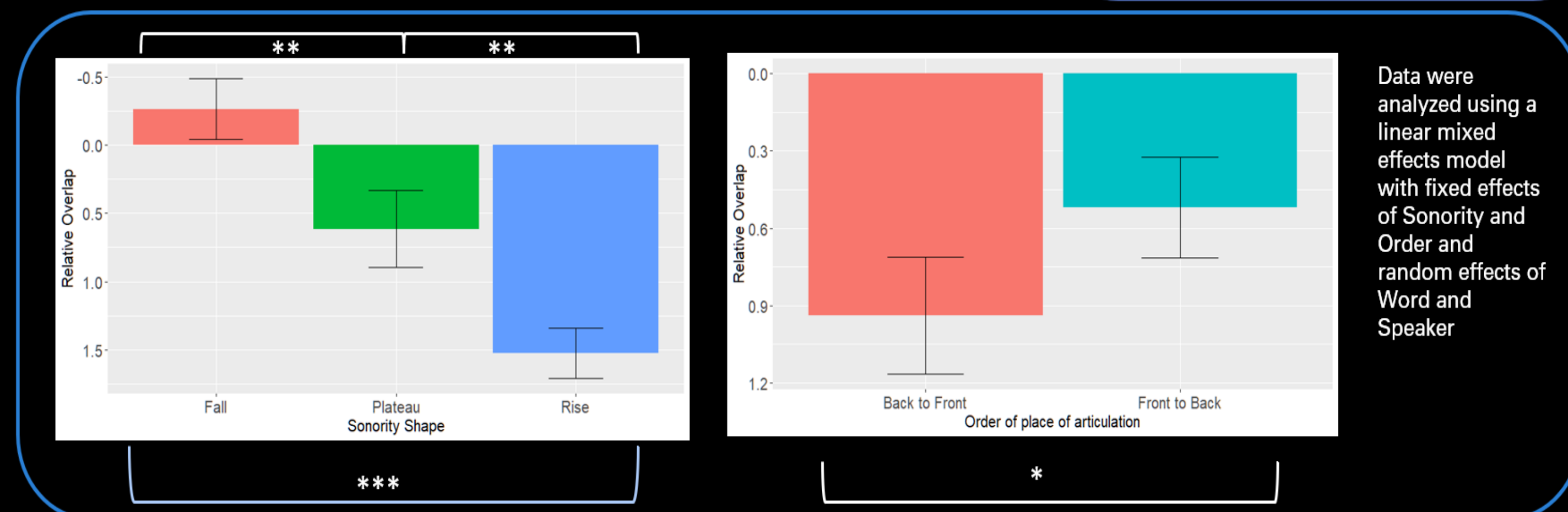


## Relative overlap

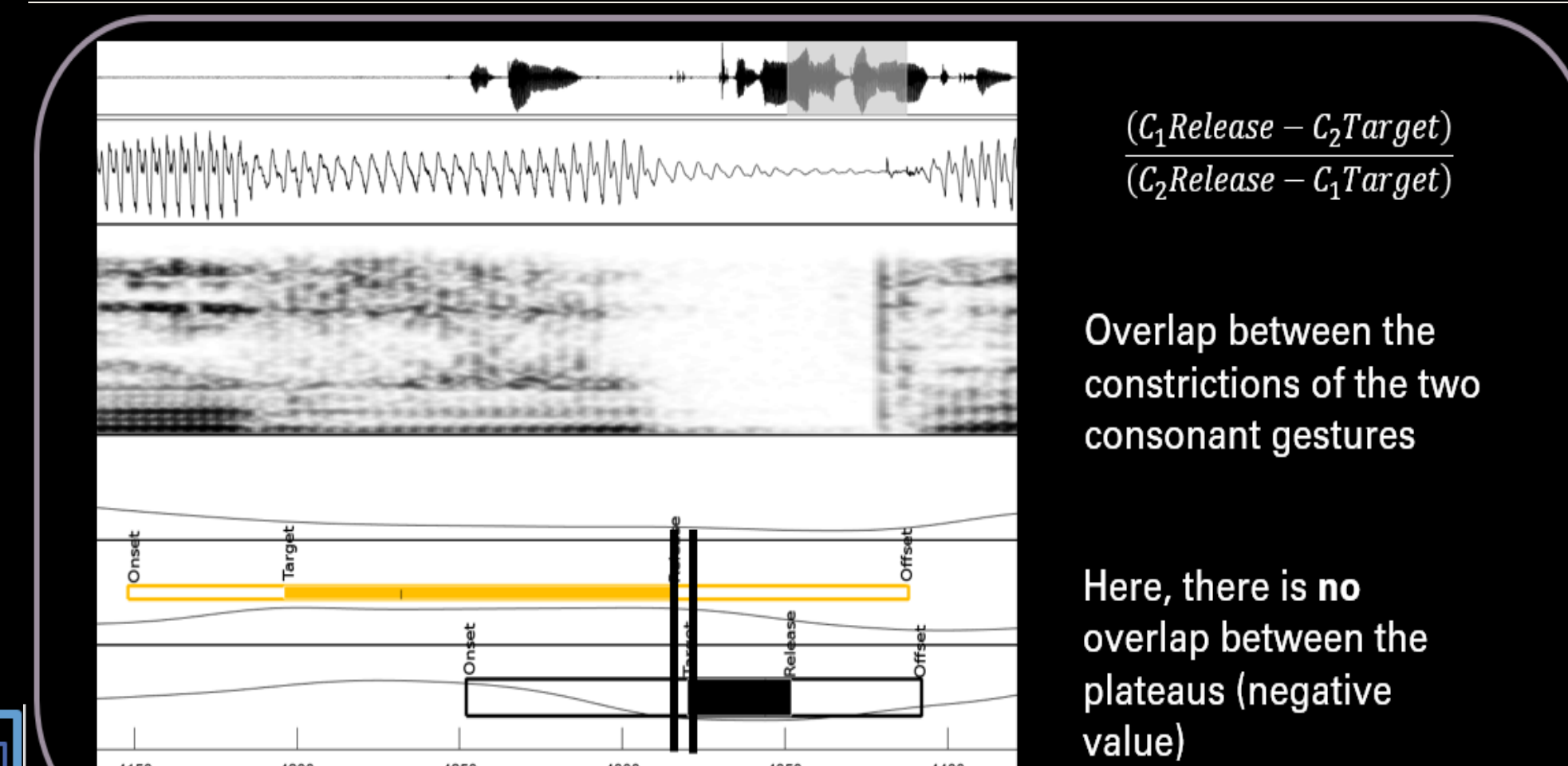


#### Key Takeaways

1. Sonority falls are the **most overlapped**
2. Sonority rises are the **least overlapped**
3. Order effect previously found for Georgian stop-stop clusters (Chitoran et al. 2002) is replicated and extended to other kinds of clusters

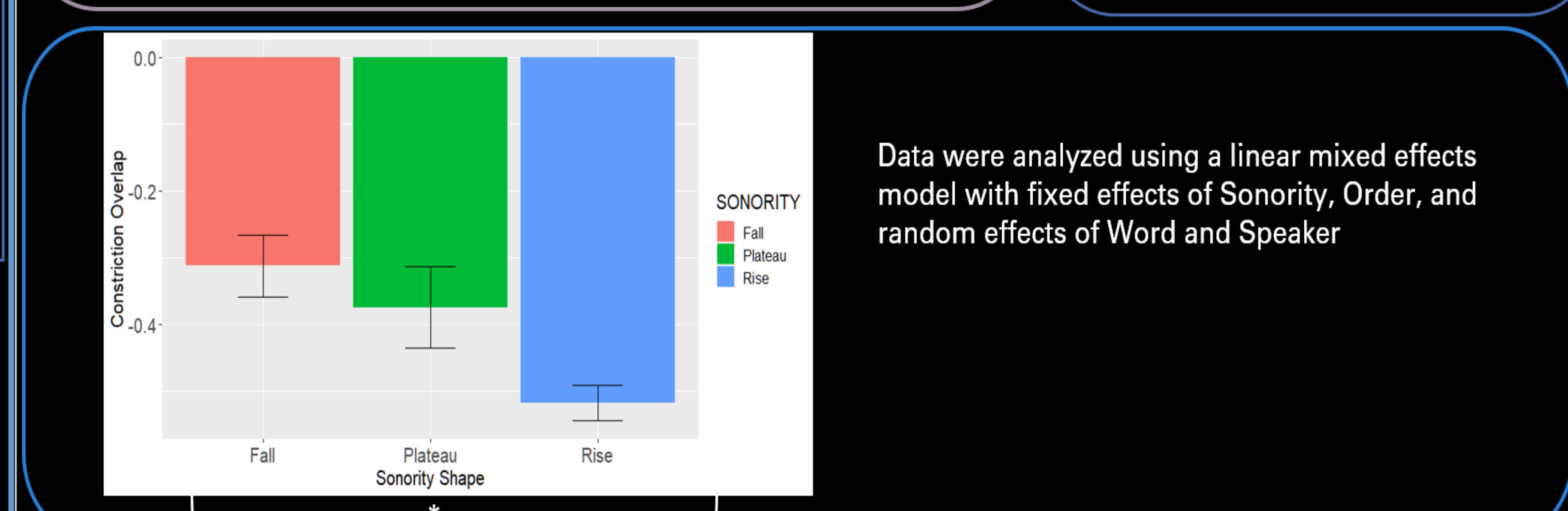


## Constriction overlap



#### Key Takeaways

1. Rises have significantly more constriction lag than falls
2. All clusters have constriction lag
3. This is a language-specific (and language-wide) setting!



## Discussion and conclusions

**H1.** Back-to-front clusters are less overlapped than front-to-back clusters.

Replicates findings from Chitoran (2002) on Georgian stop-stop clusters, and extends them to a wider range of clusters

**H2.** Sonority rises are the least overlapped, while sonority falls are the most

- Space and time are related!
- Spatially unusual clusters (falls) are more closely timed
- Rises allow intrusive vocoids; falls do not

**H3.** We find support for the hypothesis put forward in Chitoran 2016 that the sonority hierarchy can best be understood through articulatory overlap

These two measures of overlap together explain how Georgian maintains its phonotactic system

Constriction lag ensures perceptibility of both cluster members

High relative overlap in sonority falls ensures a tautosyllabic parse of potentially dispreferred onsets

## References and acknowledgements

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