



Prosodylab

# The interaction between focus and phrasing in Mandarin high-flat and falling tones

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## Introduction

Theories in sentence prosody have different views about if focus and phrasing are orthogonal in acoustic manifestations

- **The non-orthogonal view**
  - ToBI<sup>1</sup> scheme predicts that the phrasing in the post-focal domain will be neutralized
- **The orthogonal view**
  - PENTA<sup>2</sup> model assumes that communicative functions including focus and phrasing are all encoded in parallel

Recent findings of post-focal phrasing

- **English:** post-focal phrasing is maintained<sup>3-4</sup>, and limited interactions among focus, phrasing and speech act<sup>4</sup>.
- **German:** post-focal phrasing is maintained, but the F0 range is compressed<sup>5</sup>

### Research Questions:

Whether the post-focal phrasing is neutralized in Mandarin Chinese (a tonal language)? Does lexical tone play a role in the interaction of focus and phrasing manifestations?

## Method

### Variables and levels

- Phrasing: Left branching, right branching
- Focus: A, B, C, Wide
- Tone: T1 (high-flat), T4 (falling)

**Materials:** A or B and C (coordinated names<sup>4</sup>)

(1) (Zhang1Ge1 or Gao1Ge1) and Fang1Ge1 → Left, A, T1

(2) Xia4Ge1 or (Dai4Ge1 and Luo4Ge1) → Right, B, T4

Bi-syllabic name formation: Last name + Ge1, Ge1 is an honorific

**Participants:** 17 (8M 9F)

**Trials:** 2 (Phrasing) \* 4 (Focus) \* 2 (Tone) \* 4 rep = 64

## Data Analysis

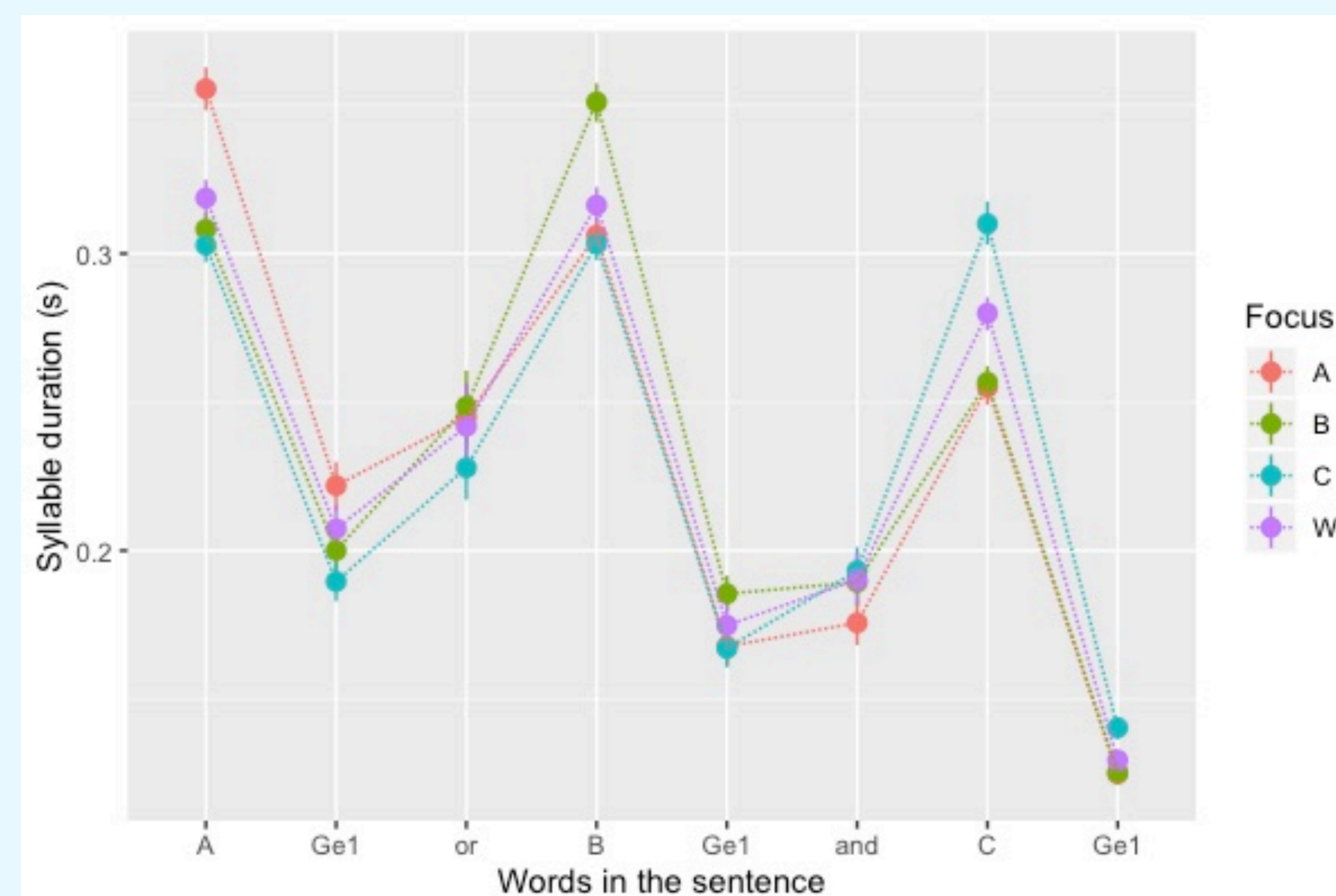
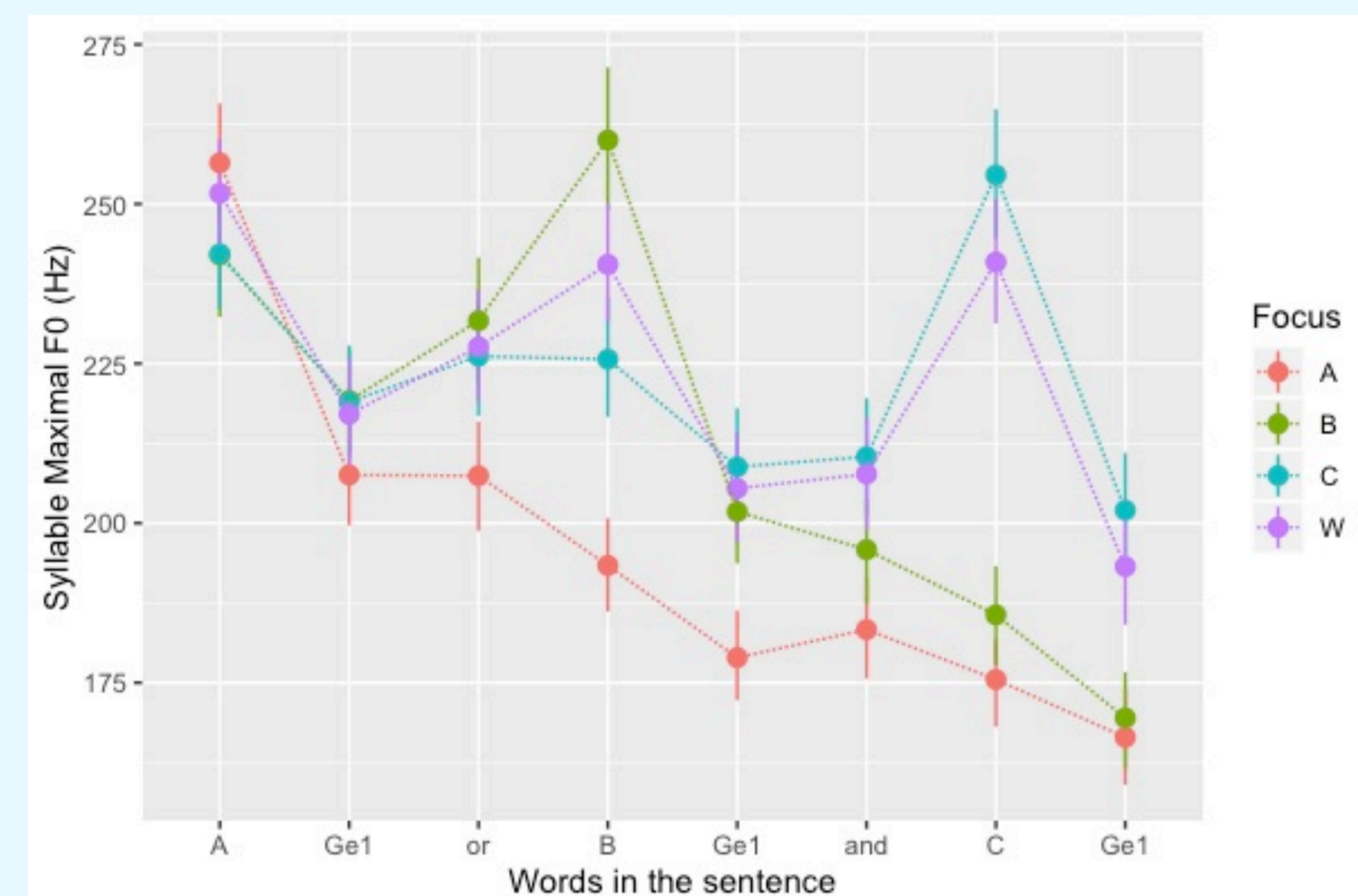
### Features

- Investigated syllables: the last name and honorific Ge1:
- Acoustic features:
  - Maximum F0
  - Duration

### Statistics: Linear mixed-effect models

- Predictors: focus condition, boundary condition, tone type, and interaction terms
- Response: maximal F0 / duration
- Data: last name / Ge1

## Results



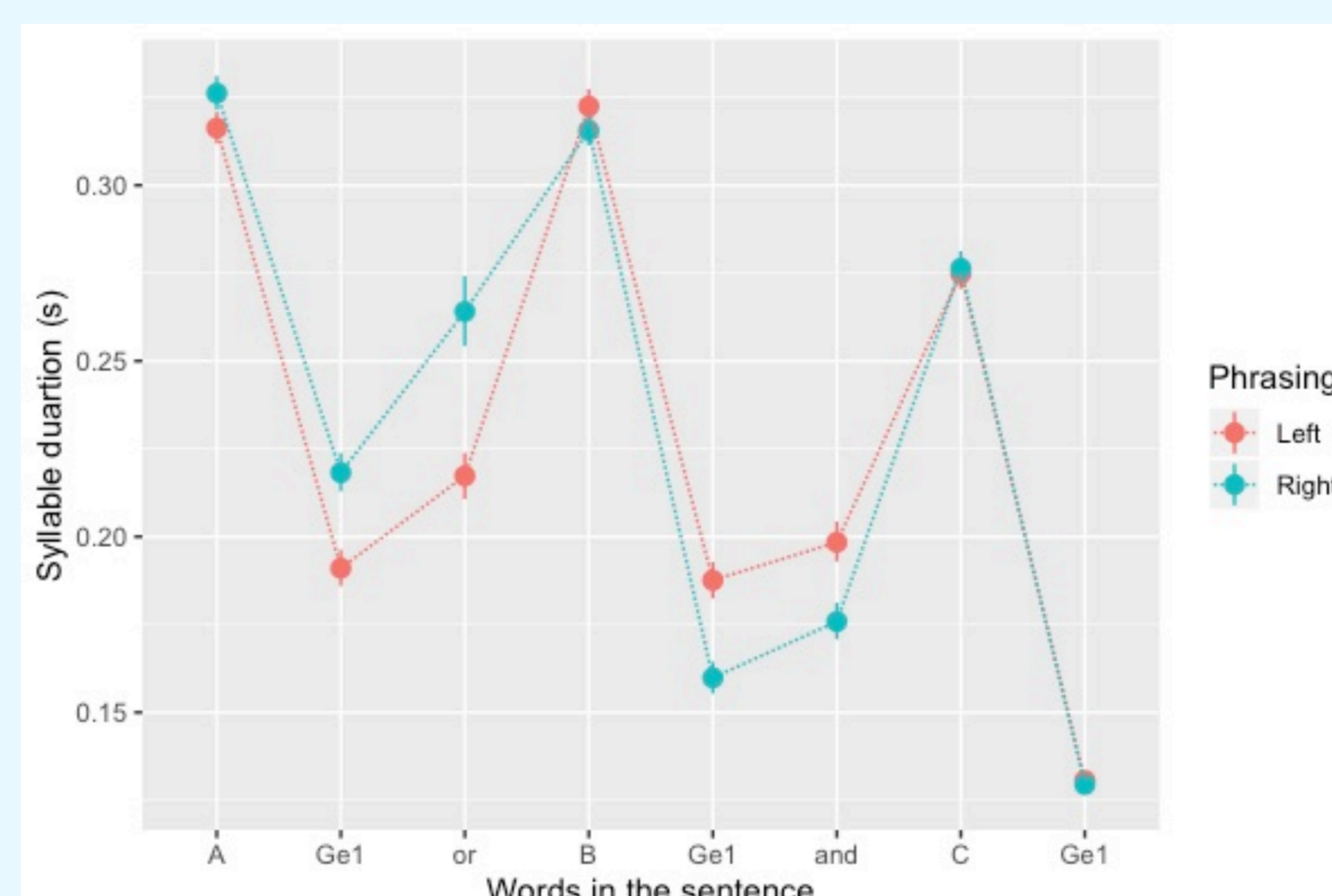
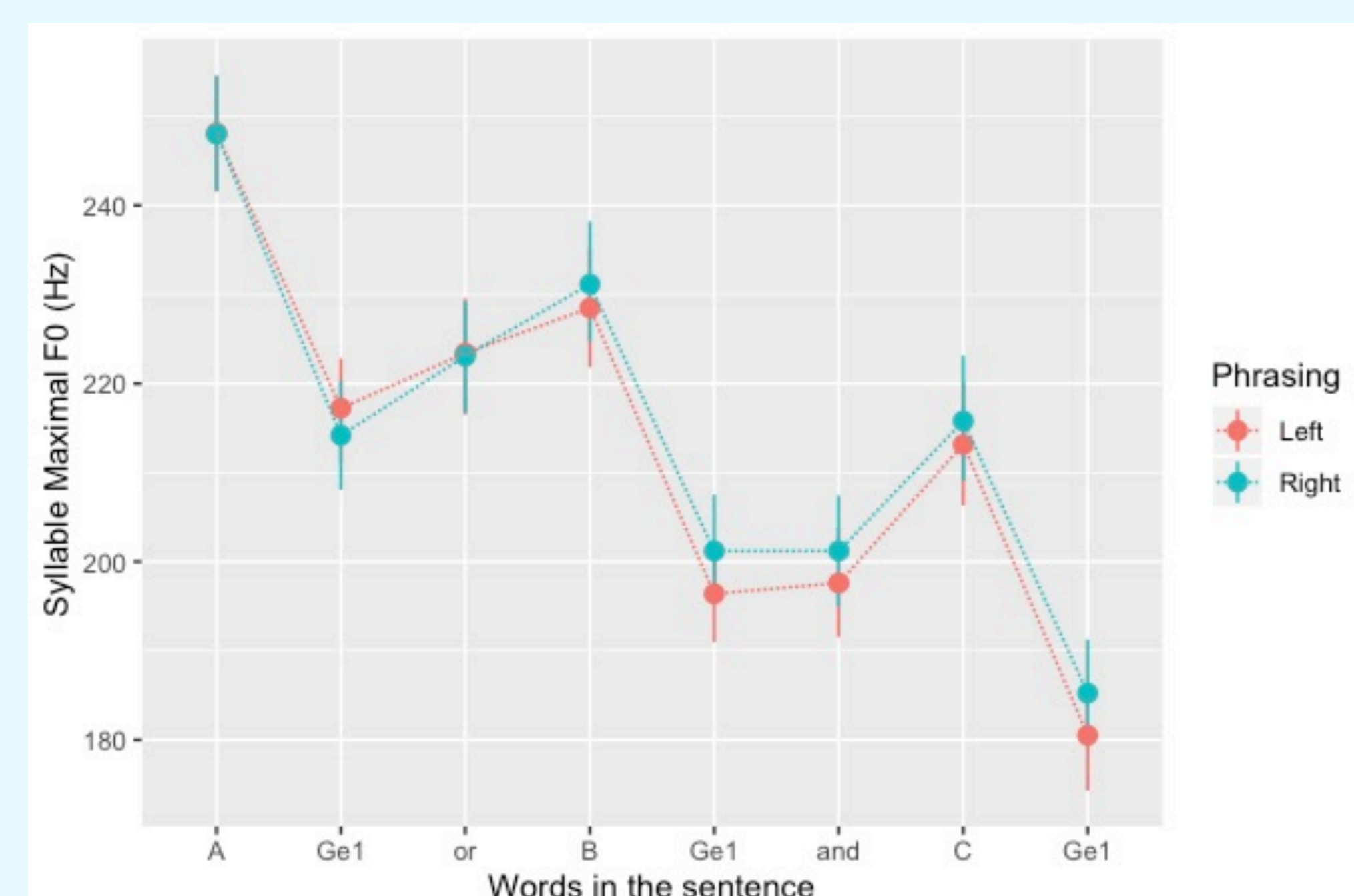
### Focus effects

- Last names: higher max F0, longer dur
- Honorifics: longer duration

### Phrasing effects

- Last names: longer duration
- Honorifics: lower Max f0, longer dur

(The above two effects can be observed in the four empirical plots on the left)



### Interaction bet focus and phrasing

- The interaction was only found to be significant on the duration of the honorifics.

### Tone effects

- No independent effect on the max F0 or duration
- But tones interact with phrasing or focus\*phrasing in the durations of both last names and honorifics

## Discussion

The post-focal phrasing is not entirely neutralized in Mandarin. Compared to English, where no interaction was observed, Mandarin shows a greater interaction effect of focus and phrasing. The precise realization of tones are affected by whether the syllables carrying them are focused and whether they are phrase-final or not.

## References

1. Beckman, M.E., and Ayers, G. 1997. "Guidelines for ToBI Labelling." The OSU Research Foundation 3:30.
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5. Kügler, Frank, and Caroline Féry. 2017. "Postfocal Downstep in German." *Language and Speech* 60(2):260-88.