

# Testing for processing advantages of linguistic effects of focus in L1 and L2

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# PROSODY

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## boundary

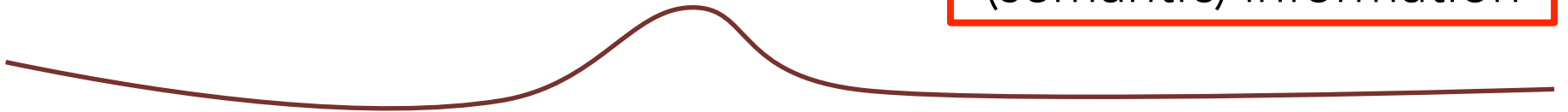
*I saw the man | with a telescope*

*I saw | the man with a telescope*

Resolution of  
(syntactic) ambiguity

## accentuation

Retrieval of important  
(semantic) information



*The man on the [CORNER]<sub>Focus</sub> was wearing the blue hat.*

*Which man* was wearing the blue hat?

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# PROSODIC PROCESSING TO SEMANTIC SALIENCE

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- evoking contextual alternatives of a focussed word
- guiding listeners to *new* informative parts of the discourse (as opposed to *given* information)
- leading listeners' attention to where the accent would fall in the sentence (i.e. focus)

*plastic* languages:  
English, Dutch, German  
accent-focus

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# FOCUS MARKING ACROSS LANGUAGES

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## Speech production

## Speech perception

- Prosodic variation
- Other linguistic markings:
  - Word order
  - Morphology
  - Focus particles

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# RESEARCH QUESTION

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Does prosody equally assist  
focus processing  
across languages ?

Language-specific

and/or

Universal

English, Dutch (Akker & Cutler 2003)

Mandarin Chinese (Ho Kwan Ip & Cutler 2017)

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# TALK PLAN

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Study 1: prosodic processing in native listening

- A phoneme-detection study on Sepedi

Study 2: prosodic processing in non-native listening

- A phoneme-detection study on Sepedi listeners of L2 English (Black South African English, BISAfE)

# STUDY 1

Prosodic processing in native listening:

A phoneme-detection study on Sepedi

# PROSODIC PROCESSING IN ENGLISH

Listeners entrain to predict where the accent will fall in an utterance (i.e. on the most important word).




*The man on the CORNER was wearing the blue hat.*



# PROSODIC PROCESSING IN ENGLISH

## Phoneme-detection task

Phoneme specification



Press the button as soon as you hear the sound 'k'

Context question

*Which man was wearing the blue hat?*



Target Sentence

*The man on the [k]orner was wearing the blue hat*



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# PROSODIC PROCESSING IN ENGLISH

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**question-induced** effect: quicker phoneme detection in focussed word than in unfocussed word.

*The man on the corner was wearing the blue hat*

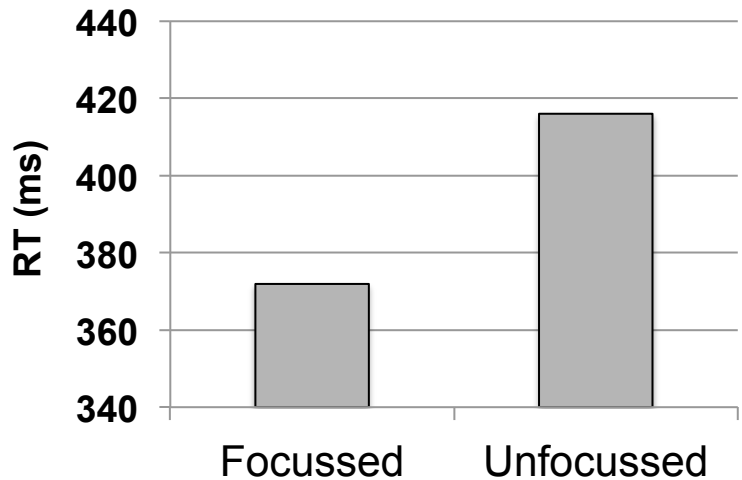
1. *Which man was wearing the blue hat?* focussed
2. *Which hat was the man on the corner wearing?* unfocussed

**predicted-accent** effect: quicker phoneme detection in accented word than in unaccented word.

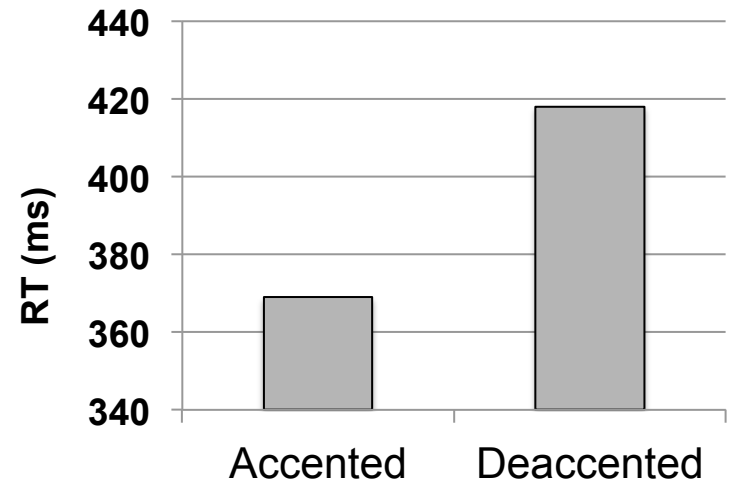
1. *The man on the **CORNER** was wearing the blue hat* accented
2. *The man on the **corner** was wearing the **BLUE** hat* unaccented

*The man on the **corner** was wearing the blue hat*

# PROSODIC PROCESSING IN ENGLISH

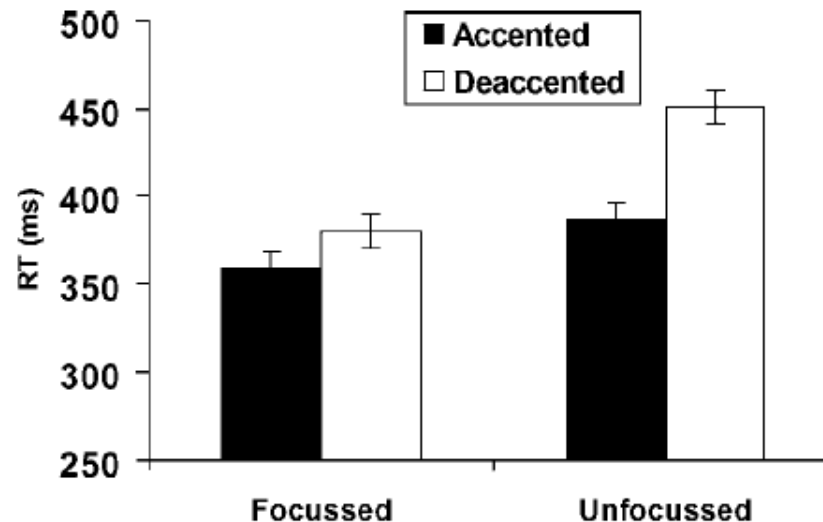


question-induced effect



predicted-accent effect

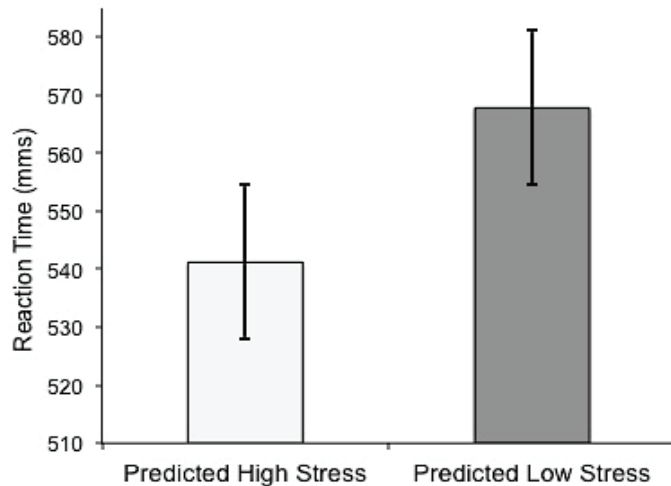
(semantic) focus processing = accentual processing



Similar results  
also for Dutch

# PROSODIC PROCESSING IN MANDARIN CHINESE

- Like English and Dutch, focussed words are expressed via expansion of F0 range.
- As a tone language: the use of pitch for lexical identity may take precedence over the use of pitch cues to salience (Pierrehumbert 1999)



a universal strategy  
in listeners'  
prefocus entrainment  
to prosody

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# LANGUAGES WITH « NO PROSODIC MARKING OF FOCUS »

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- Wolof (Robert & Rialland 2001)
- Hausa (Hartmann & Zimmermann 2007)
- Yucatec Maya (Gussenhoven & Teeuw 2008)
- Sepedi (Bantu) (Zerbian 2007)

Ke-néá malómé malékêre.  
ISTSG-give uncle sweets

“I give the [uncle]<sub>F</sub> sweets.”



“I give the uncle [sweets]<sub>F</sub>.”



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# SEPEDI: EXPRESSION OF FOCUS

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- Prosodic marking
  - PRODUCTION: no systematic differences in F0 and duration for contrastive focus vs. broad focus (baseline condition).
  - PERCEPTION: no interpretable acoustic cues to contrastive focus vs. broad focus.
- Syntactic operations: inversions or *clefting*

# SEPEDI: HYPOTHESES

Processing advantages of focus  
as modulated by prosody?

Language-specific view

Universalistic view

## Phoneme-detection task

Phoneme specification

Press the button as  
soon as you hear the  
sound 'k'

Context question

*Which man was wearing the blue hat?*



Target Sentence

*The man on the [k]orner was wearing the blue hat*



# A PHONEME DETECTION STUDY

## Materials

- 24 experimental sentences

O apeela malome wa go khuma nama ya go tura mosegare.

SM3SG cook\_for 1.uncle POSS1 AGR15 rich 9.meat POSS9 AGR15 expensive afternoon

*She cooks expensive meat for the rich uncle in the afternoon.*



C



NC

- 2 question contexts (focussed vs. unfocussed)  
x 2 prosodic contexts (conducive vs. non-conducive)  
x 2 target positions (early vs. late)
- Target phonemes: /t'/-/th/-/p'/-/ph/-/k'/-/kh/
- 24 fillers
  - differing in phoneme type and position



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# METHODS

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## Participants

- 46 Sepedi native speakers (age av.: 21- $SD=2.9$ )

# METHODS

## Procedure

- 46 Sepedi native speakers (age av.: 21- $SD=2.9$ )
- *E-prime* software
  - RTs: the timing interval between the beginning of the sentence and the onset of the target-bearing word.

# METHODS

## Linear mixed effects models (R software)

- Accuracy

➤ Button press ~ question\*prosody\*targetpos+ (\*|speaker)+ (\*|item), data=Sepedi\_acc, family=binomial

No main effect and no interaction

# METHODS

## Linear mixed effects models (R software)

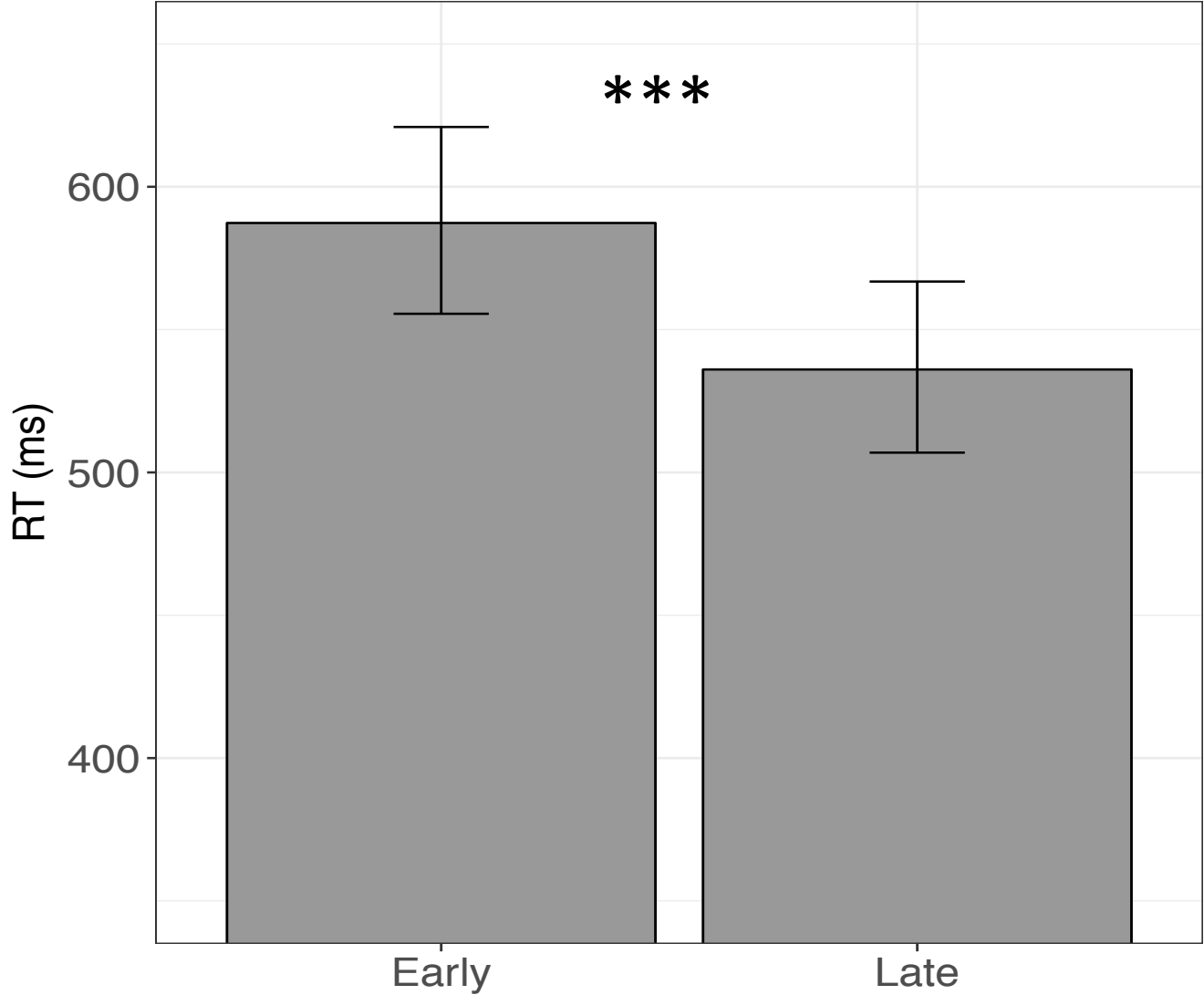
- Accuracy

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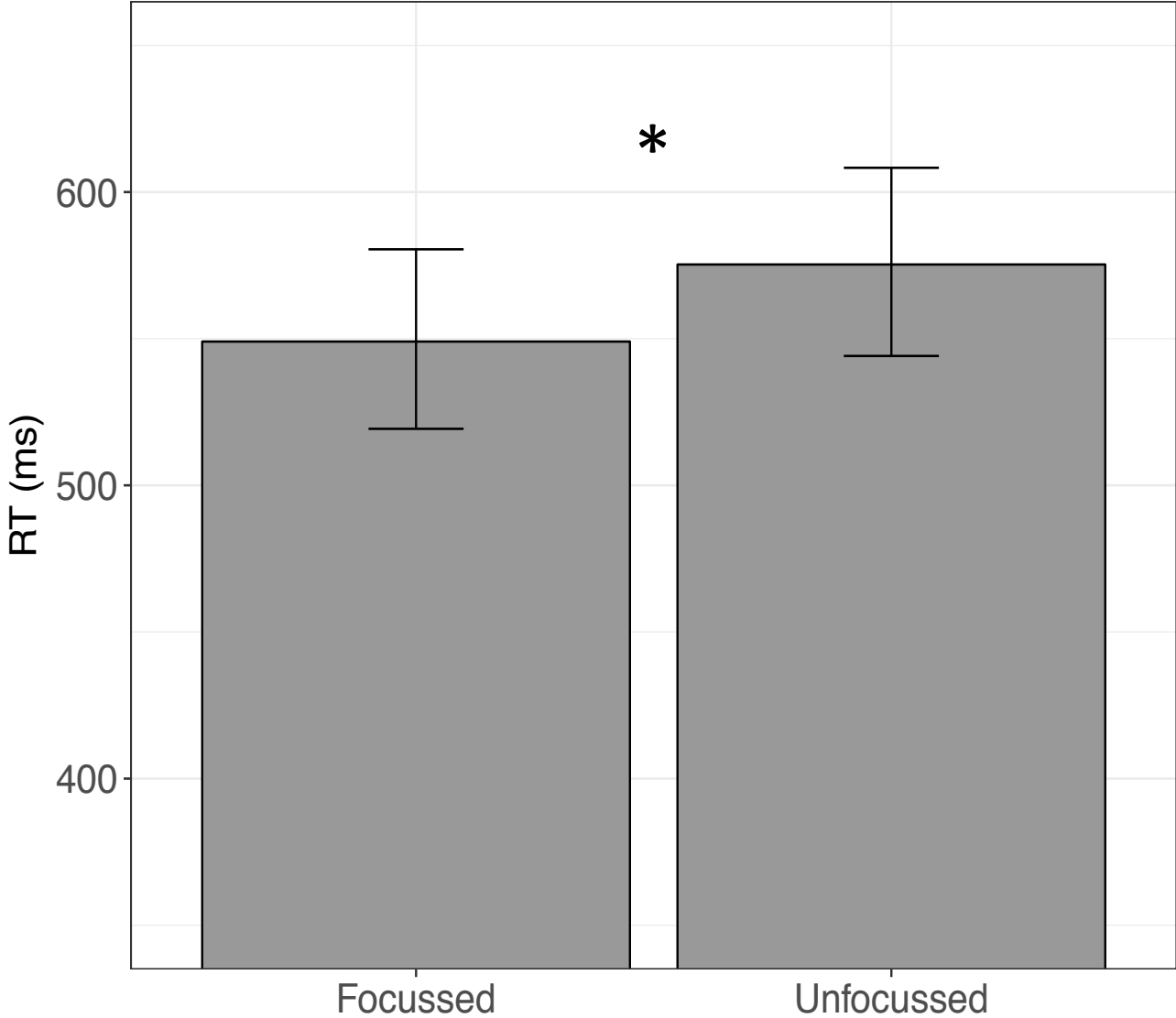
- RTs

➤ `Lmer = RTs ~ question*prosody*targetpos+ (*|speaker)+(*|item), data=Sepedi_reactimes`

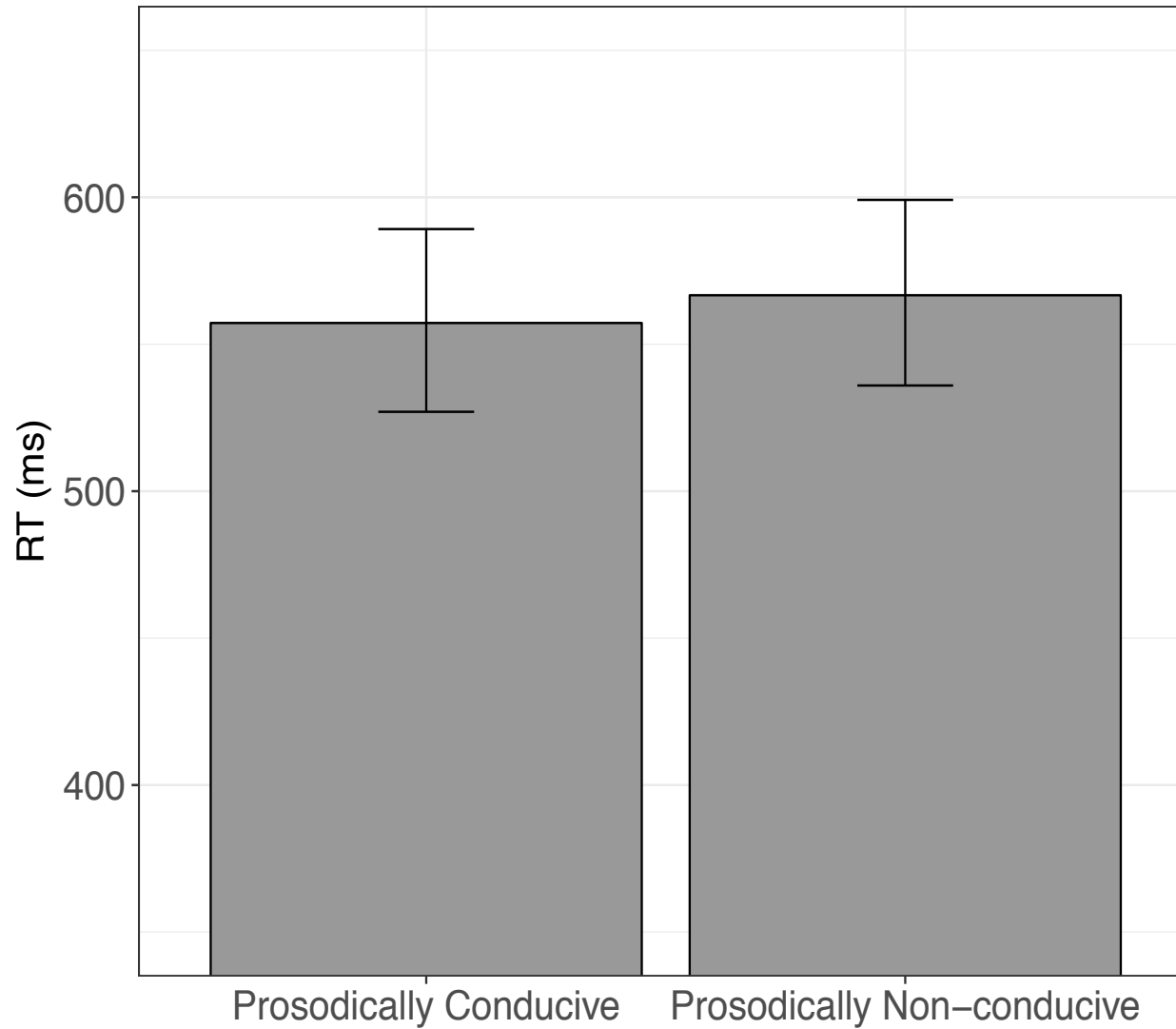
# RESULTS: TARGET POSITION



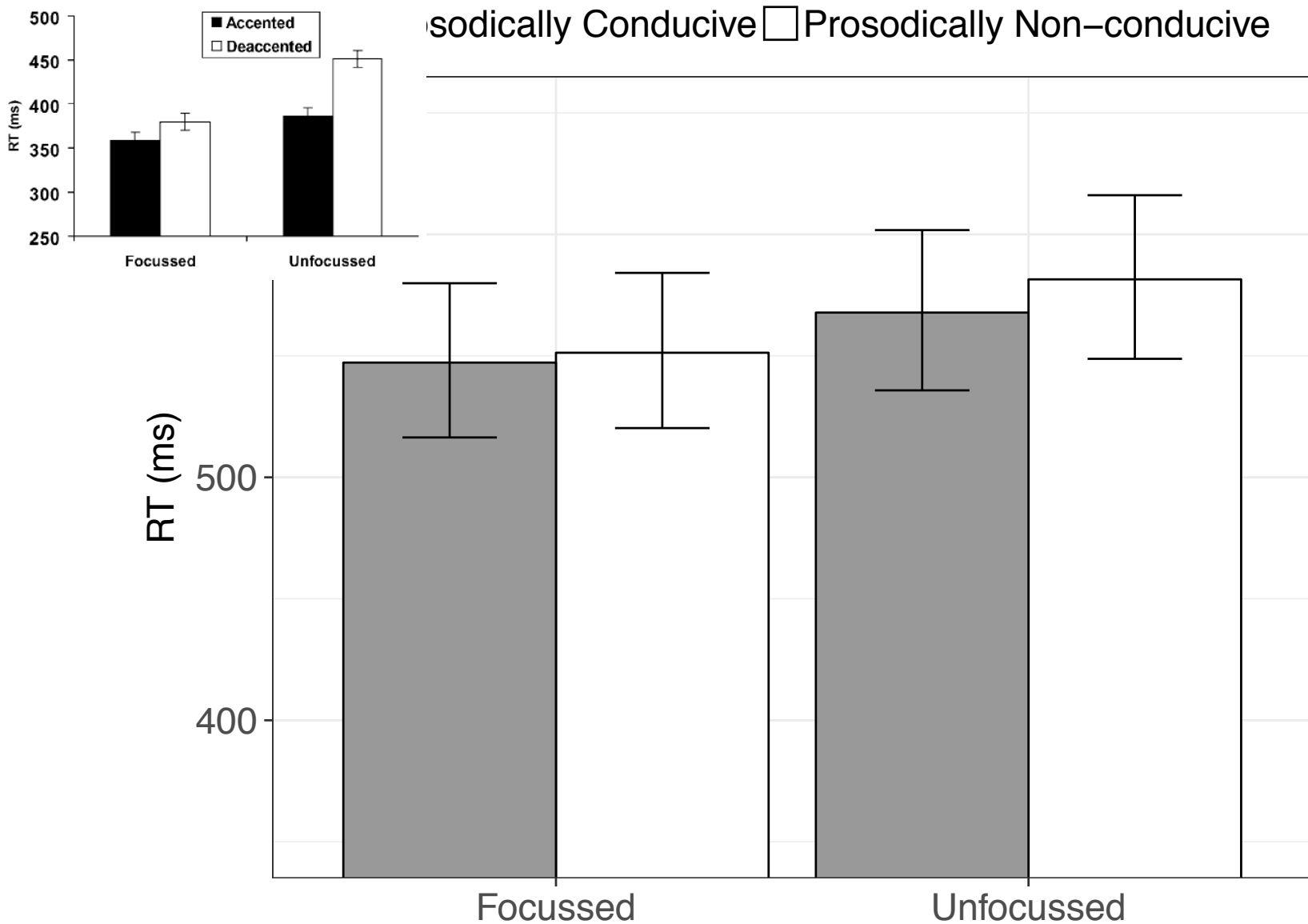
# RESULTS: QUESTION CONTEXT



# RESULTS: PROSODIC CONTEXT



# RESULTS: QUESTION CONTEXT\*PROSODIC CONTEXT





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# DISCUSSION & CONCLUSIONS

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- Question-induced effect ✓
  - a strategy available in all language despite differences in discourse organization (Dimroth & Narasimhan 2012)
- Prosody-induced effect ✗
- Interaction ✗ ⇒ Language-specific hypothesis
  - In line with what found in previous studies on speech production and perception in Sepedi.

if prosody does not serve focus meaning in production, listeners do not exploit prosody for semantic salience in perception processing.

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# DISCUSSION & CONCLUSIONS

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- Acoustic analyses
  - a raised pitch before the target bearing-word in 1/3 of the cases=> no speediness of RTs.
- Why differences between Chinese and Sepedi?
  - In Chinese: Greater F0 range expansion before the accented word.
  - In Sepedi: the suprasegmental processing space may be used for tone perception? (Pierrehumbert 1999).
- Outlook
  - Testing roles of F0 for tone and intonation
  - Benefitting from other focus marking strategies (e.g., word order) as found for Korean (Kember, Choi & Cutler 2016)

# STUDY 2

Prosodic processing in non-native listening:

A phoneme-detection study  
on Sepedi listeners of English

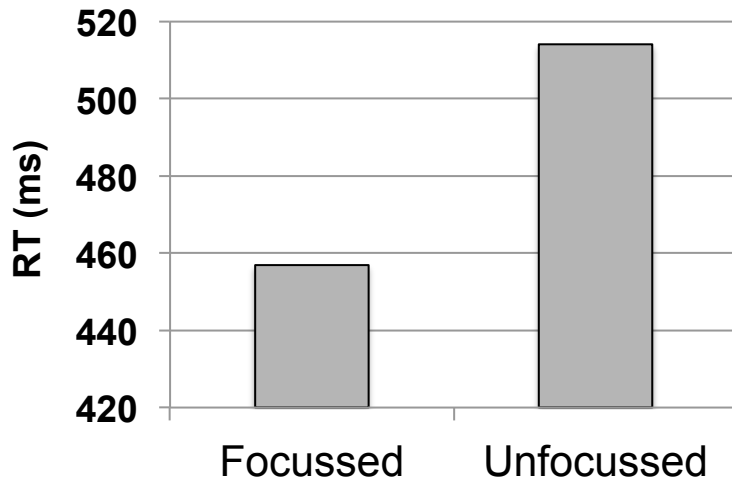
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# PROSODIC FOCUS PROCESSING IN NON-NATIVE LISTENING

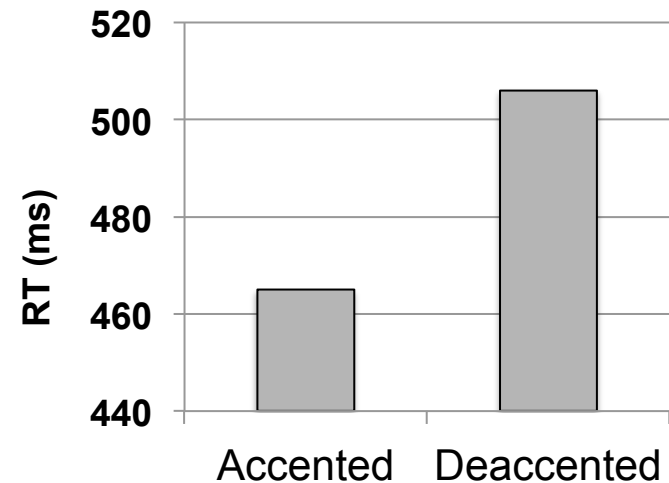
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- Difficulty in mapping accents to semantics (e.g., Akker & Cutler 2003; Braun & Tagliapietra 2011)
  - Do Dutch listeners of English show a processing of focus and accent in their L2 that is parallel to their L1?

# PROSODIC PROCESSING: DUTCH LISTENERS OF ENGLISH

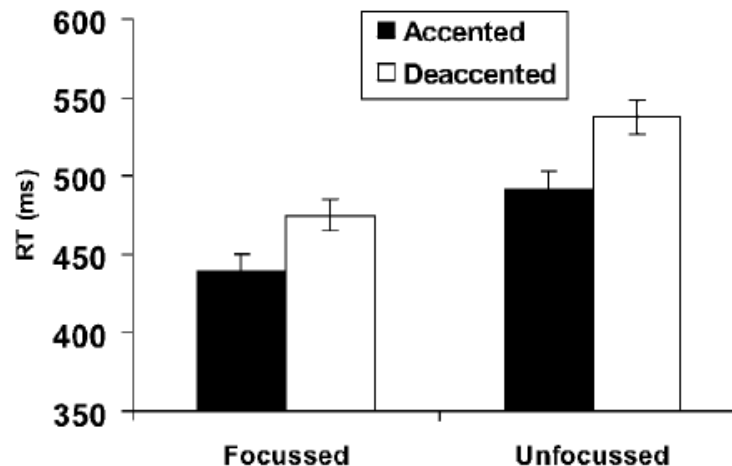


question-induced effect



predicted-accent effect

accent processing | (semantic) focus processing



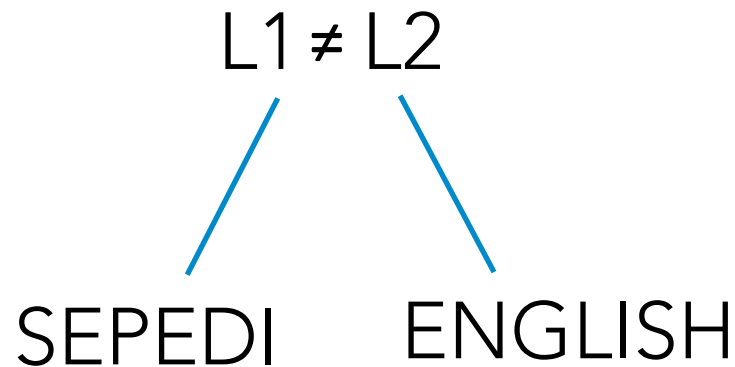
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# OUR STUDY

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Prosodic processing to semantics  
in two unrelated languages?

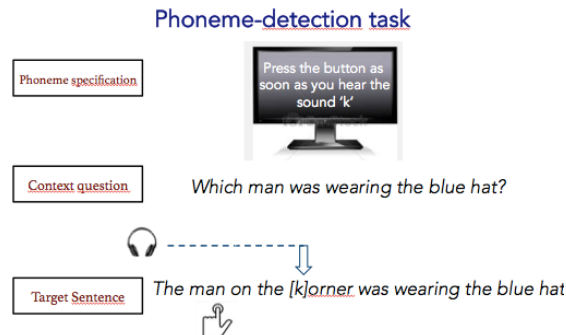
Prosodic focus marking



(Black South African English)

# PREDICTIONS

- use of prosody to semantic cues ❌
  - *transfer* in processing (Braun and Tagliapietra 2011)
  - difficulty in the expression and in the semantic interpretation of intonational differences signalling focus (Zerbian 2015)
- use of prosody to semantic cues ✅
  - *experience*: L2 suprasegmentals that are relatively distinct from L1 suprasegmentals can be acquired successfully, i.e. being subject to experience effects (Gut 2003; Trofimovich & Baker 2006)



# A PHONEME DETECTION STUDY

- 24 experimental sentences (from Akker and Cutler 2003)

*The man on the **c**orner was wearing the **b**lue hat*

- 2 question contexts (focussed vs. unfocussed)  
x 2 prosodic contexts (accented vs. non-accented)  
x 2 target positions (early vs. late)
- Target phonemes: /k/-/b/-/d/
- 24 fillers
  - differing in phoneme type and position



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# METHODS

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## Participants

- 41 Black South African English sp. (age av.: 20.5- $SD=1.5$ )
  - exposed to and had tuition in English already since their primary education.

# METHODS

## Procedure

- 41 Black South African English sp. (age av.: 20.5- $SD=1.5$ )
  - exposed to and had tuition in English already since their primary education.
- *E-prime* software
  - RTs: the timing interval between the beginning of the sentence and the onset of the target-bearing word.

# METHODS

## Linear mixed effects models (R software)

- Accuracy

➤ Button press ~ question\*prosody\*targetpos+ (\*|speaker)+ (\*|item), data=BISAFE\_acc, family=binomial

No main effect and no interaction

# METHODS

## Linear mixed effects models (R software)

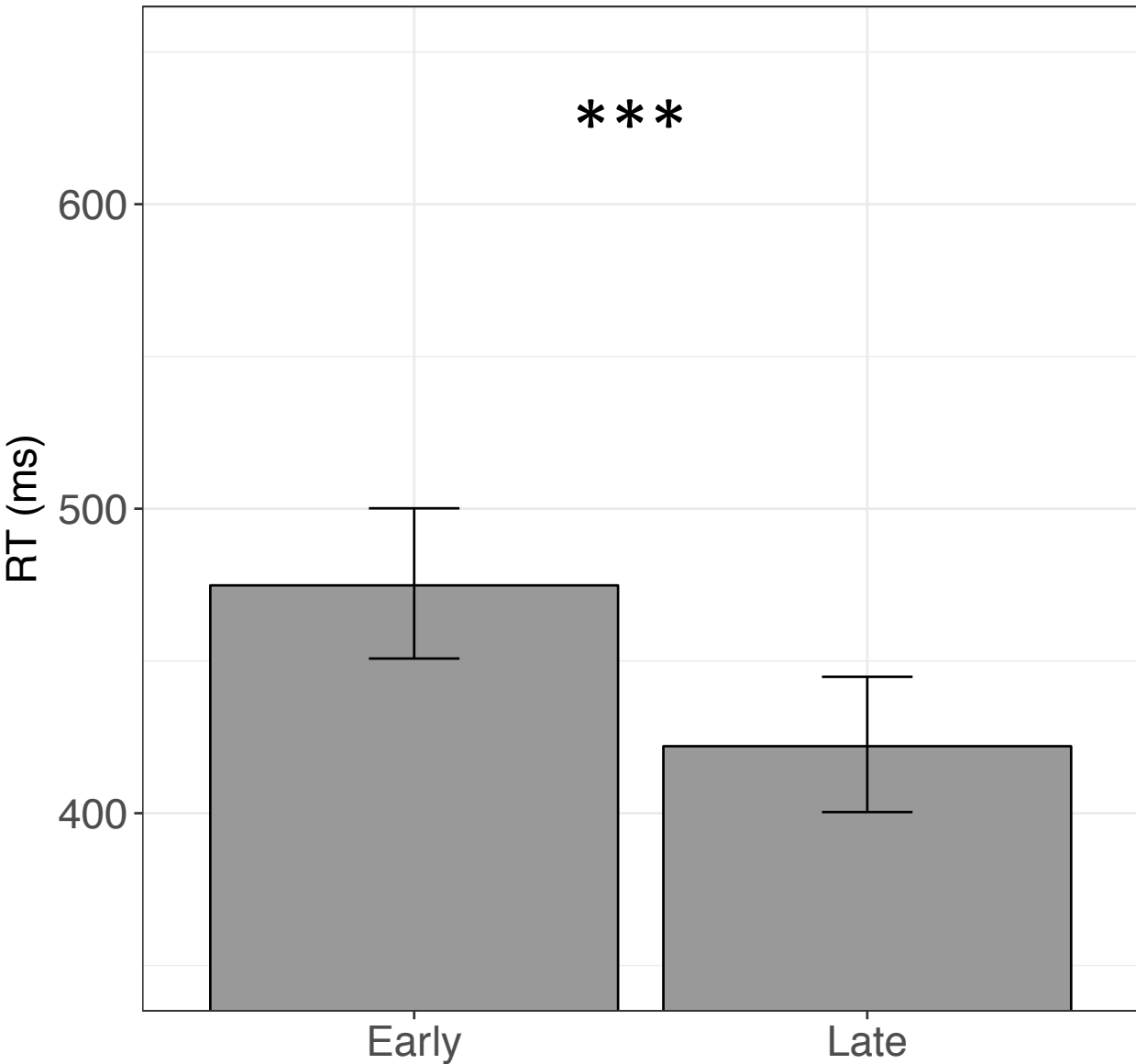
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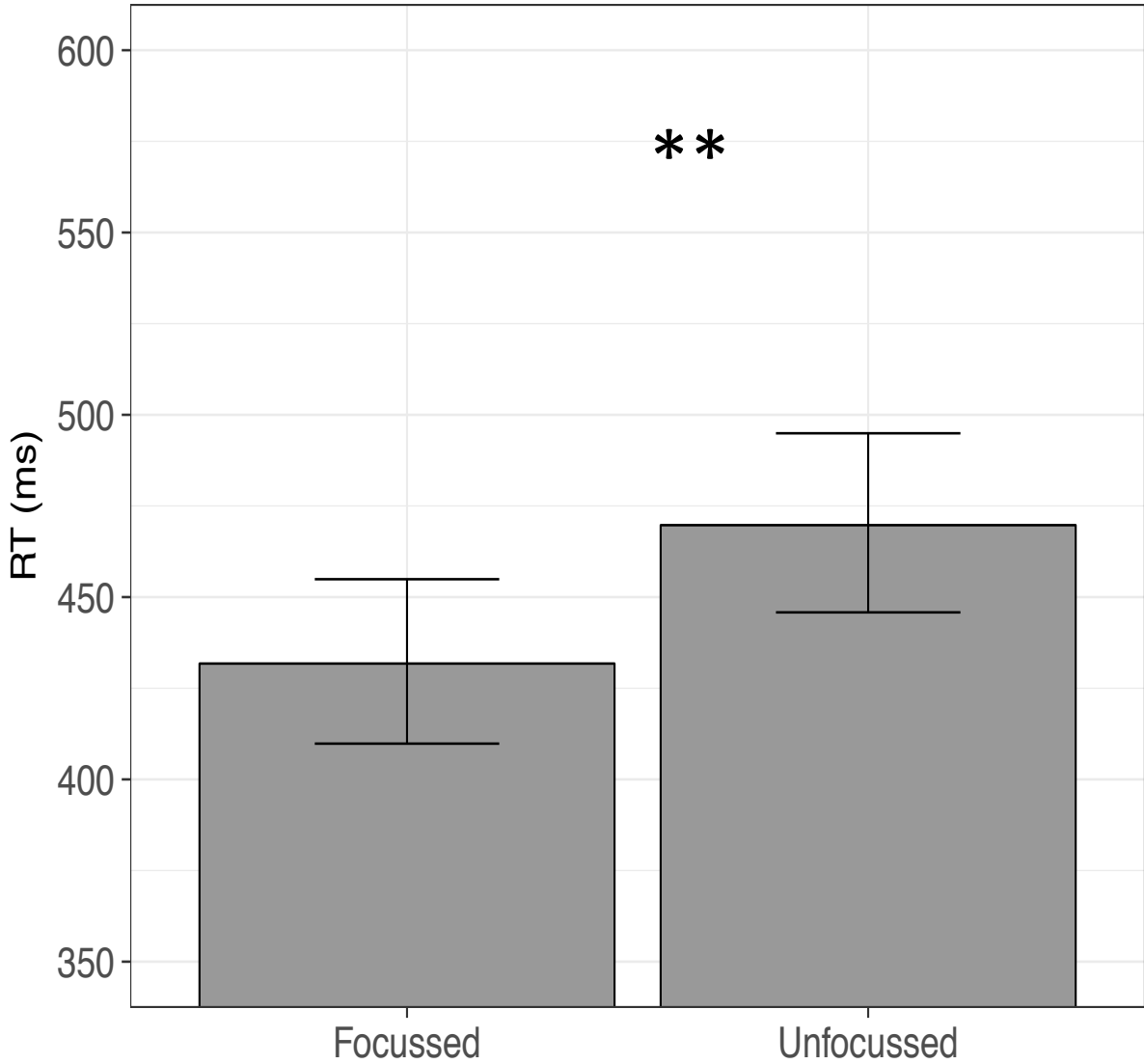
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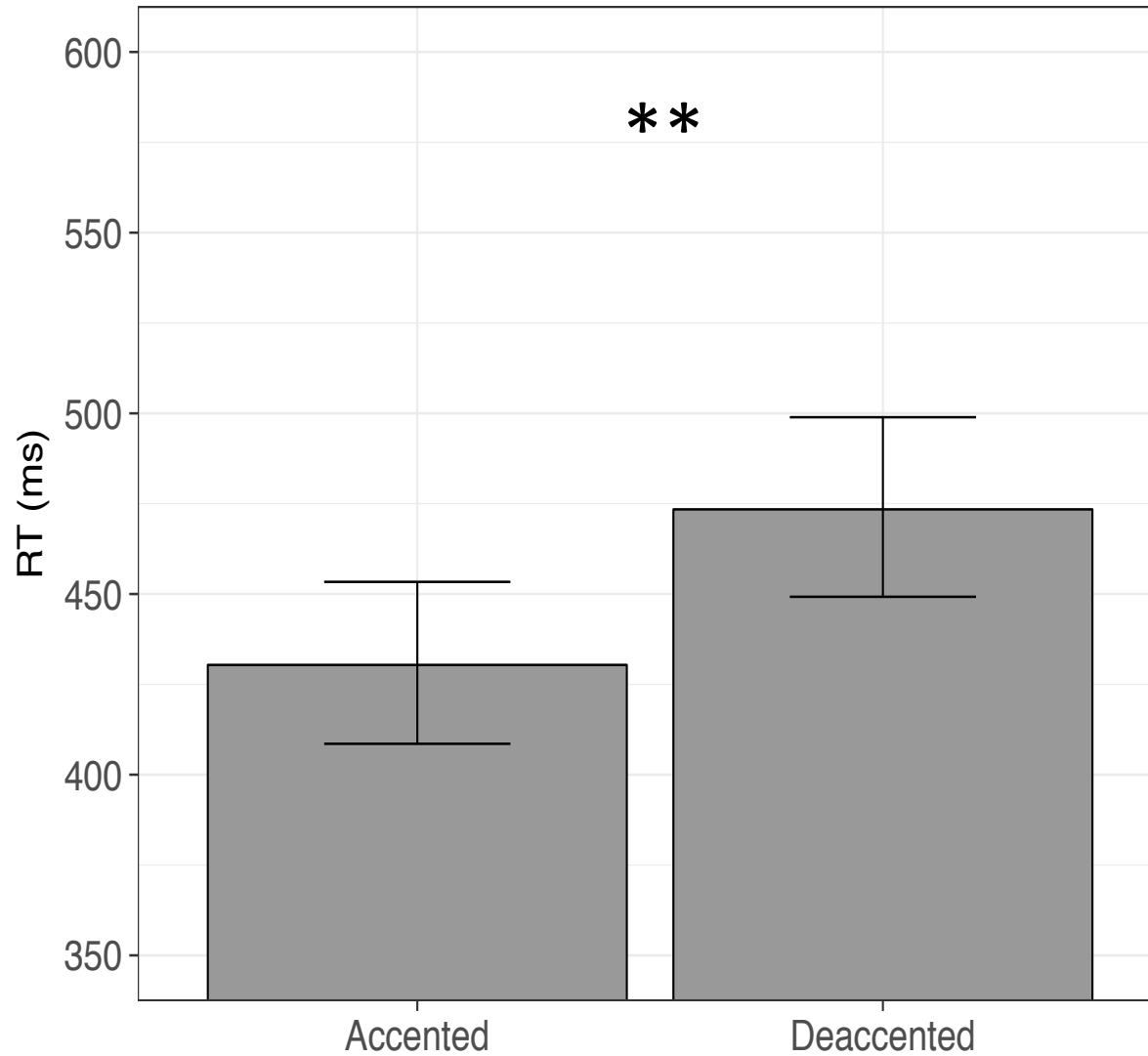
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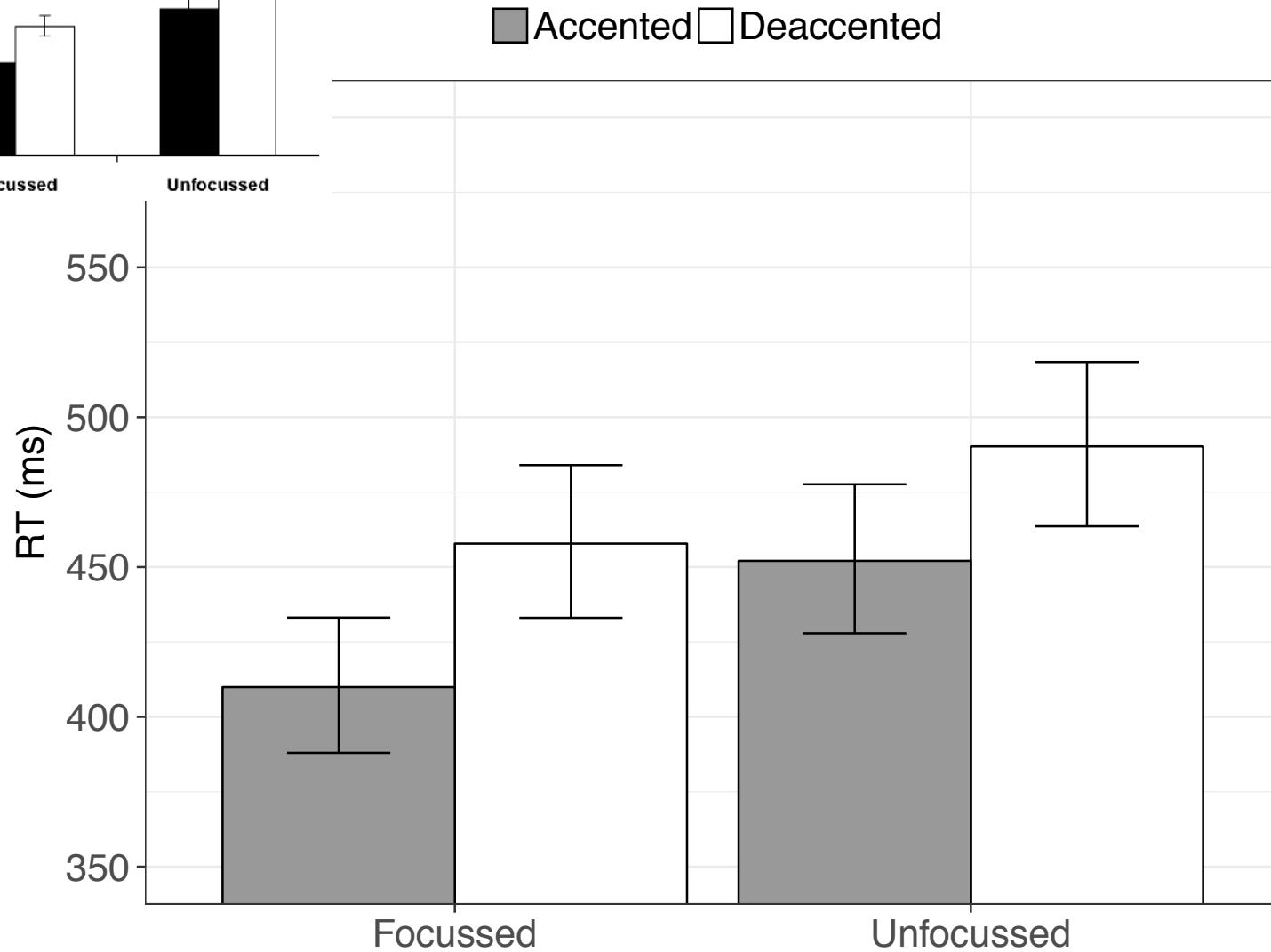
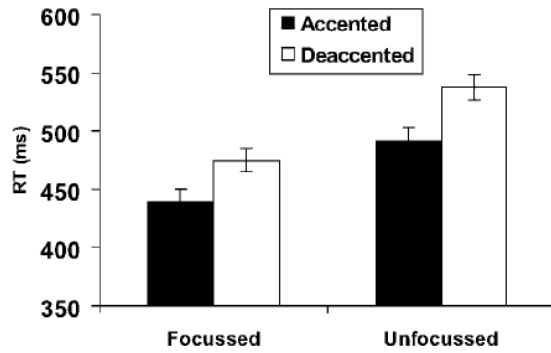
# RESULTS: QUESTION CONTEXT



# RESULTS: PROSODIC CONTEXT



# RESULTS: QUESTION CONTEXT\*PROSODIC CONTEXT





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# DISCUSSION & CONCLUSIONS

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- Question-induced effect ✓
  - Prior cognitive knowledge of the basic principles of discourse structure (Hendricks 2000).
- Predicted-accent effect ✓ ~~TRANSFER HYPOTHESIS~~
  - Not in line with previous offline tasks in BISAFE listening

Despite an L1 and L2 with dissimilar prosodic processing, non-native listeners learn to process the prosodic structure of their L2.

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# DISCUSSION & CONCLUSIONS

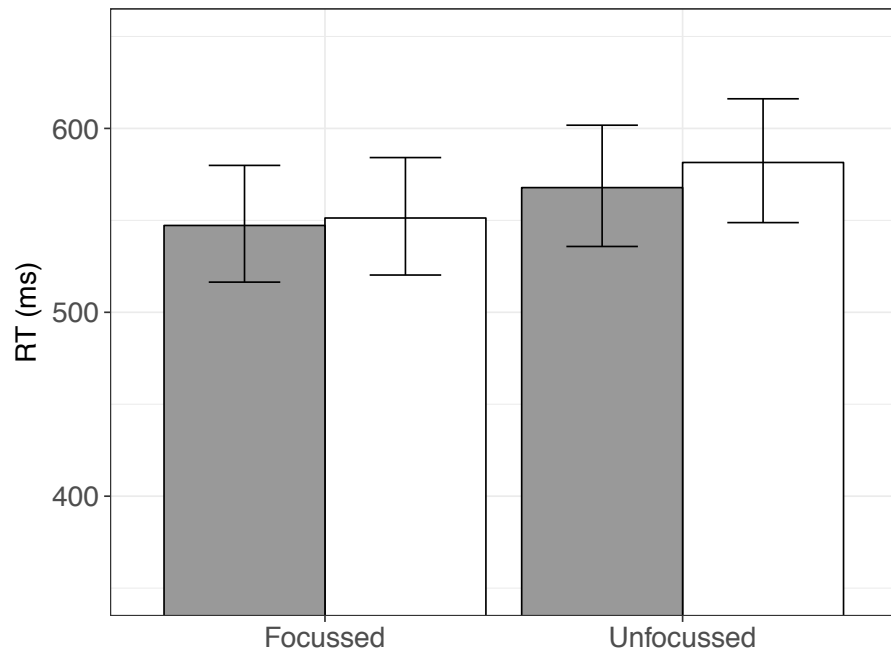
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- Interaction **X** ⇒ Just like for structurally similar L1-L2
  - limited efficiency
  - in the semantic evaluation of prosodic information
- parallel processing of semantic and prosodic information as a safer “communicative strategy” (cf. Cutler 2013)
- -
  - This strategy is language-independent.
  - A similar strategy is found in L2 production (Jilka 2000; Gut 2009)

# THANK YOU

SEPEDI

■ Prosodically Conducive □ Prosodically Non-conductive



BLACK SOUTH  
AFRICAN ENGLISH

■ Accented □ Deaccented

