

# STRUCTURE-SENSITIVE PRONOUN PROCESSING EVEN IN THE ABSENCE OF PRINCIPLE B EFFECTS

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## RESEARCH QUESTION

Do structural constraints guide pronoun resolution similarly across languages?

❖ In this study, we investigate the processing of object pronouns in Vietnamese, and compare it to English.

➤ **MAIN TAKEAWAY:** Even though Vietnamese speakers do not display Principle B effects, they still behave like English speakers in using structural constraints to guide the interpretation of object pronouns in online processing.

## WHY VIETNAMESE?

❖ Principle B of Binding Theory **prohibits** coreference between a pronoun and a subject in its local clause (Chomsky, 1981; Reinhart, 1983):

- (1) a. ✗ The employee<sup>1</sup> voted for him<sub>1</sub>.
- b. ✗ Every employee<sup>1</sup> voted for him<sub>1</sub>.

❖ The Vietnamese pronominal system works differently than English (Bui, 2019):

• Unlike English, Vietnamese **allows** pronouns to corefer with local subjects:

- (2) a. ✓ Thăng nhân viên đó<sub>1</sub> bầu cho nó<sub>1</sub>. *The employee<sup>1</sup> voted for him<sub>1</sub>.*

• However, there is still **Principle B** in Vietnamese:

- b. ✗ Mọi thành nhân viên<sup>1</sup> bầu cho nó<sub>1</sub>. *Every employee<sup>1</sup> voted for him<sub>1</sub>.*

➤ **QUESTION:** Do Vietnamese speakers deploy similar structural constraints against local subjects in processing, even though those constraints do not categorically rule out local subjects as referents?

## STRUCTURAL CONSTRAINTS IN ENGLISH

Badecker & Straub (2002):

Condition	Sentence
<b>MULTIPLE MATCH</b>	John thought that <b>Bill</b> owed <b>him</b> another chance to solve the problem.
<b>NON-LOCAL MATCH</b>	John thought that <b>Beth</b> owed <b>him</b> another chance to solve the problem.
<b>LOCAL MATCH</b>	Jane thought that <b>Bill</b> owed <b>him</b> another chance to solve the problem.
<b>NO MATCH</b>	Jane thought that <b>Beth</b> owed <b>him</b> another chance to solve the problem.

1. **Immediate sensitivity to feature mismatch**  
**NO MATCH** was read significantly slower than **NON-LOCAL MATCH**.
2. **Immediate sensitivity to structural constraints**  
**LOCAL MATCH** was read significantly slower than **NON-LOCAL MATCH**.
3. **Structural constraints do not block local antecedents in the initial retrieval**  
**MULTIPLE MATCH** was read significantly slower than **NON-LOCAL MATCH**.

## EXPERIMENTAL DESIGN

Adapting Badecker & Straub (2002) in 3 self-paced reading experiments:

- Each has 80 native Vietnamese speakers and 36 items intermixed with 51 fillers.
- Experiment 1 was conducted online, while Experiments 2 and 3 were administered in person at Ly Tu Trong College in Ho Chi Minh City, Vietnam.
- **Honorificity** was used to examine the feature mismatch effect (Kwon & Sturt, 2016), since all pronouns in Vietnamese are marked with honorific status (either HONORific or SUBhonorific), but not with gender.
- All referents had unambiguous classifiers specifying their honorificity.

## PREDICTIONS

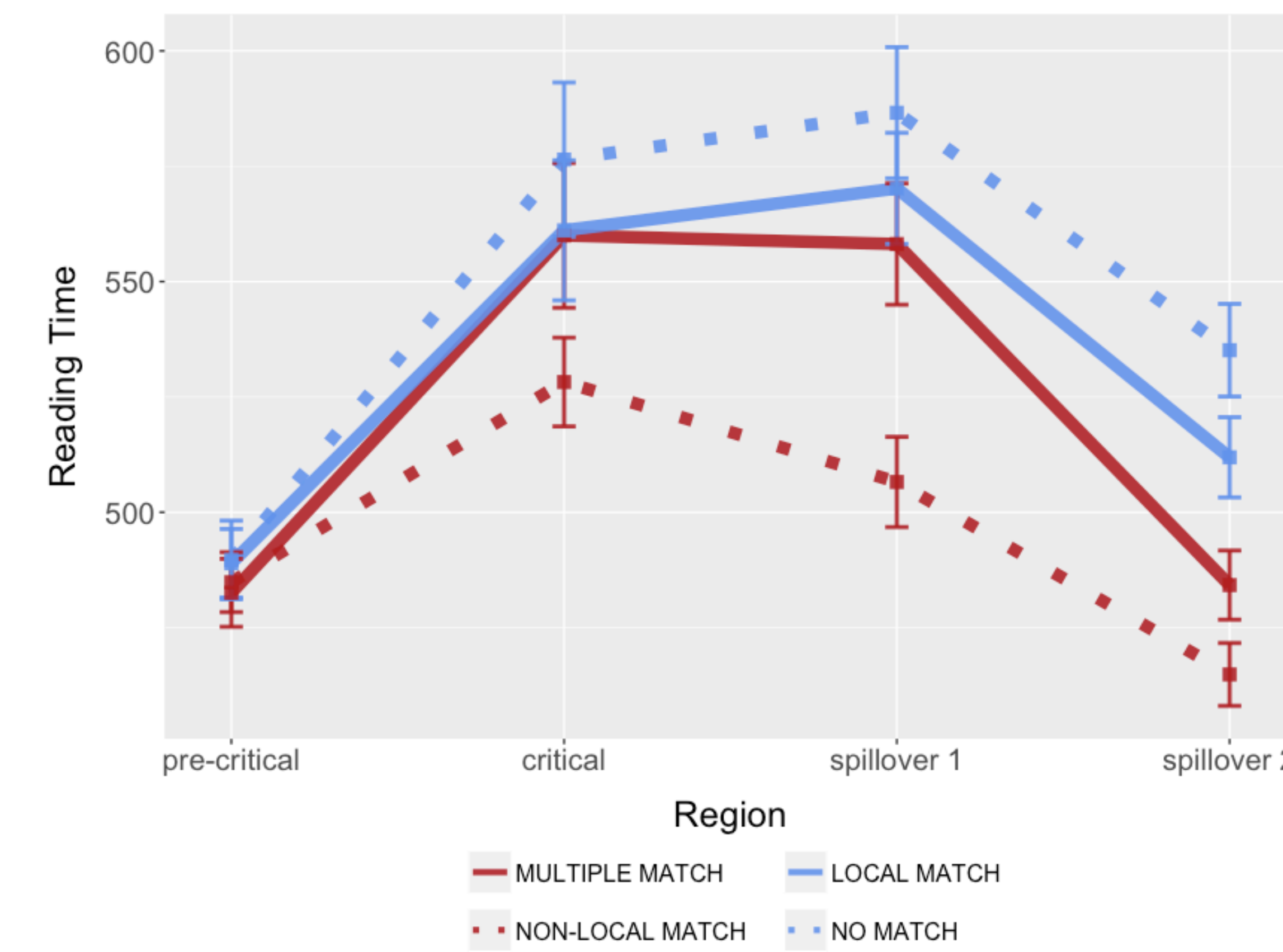
1. **If structural constraints against local subjects are applied:**
  - **MULTIPLE MATCH** effect: Competition from multiple matching subjects
  - **LOCAL MATCH** penalty: Difficulty in accessing local subjects
2. **If Vietnamese speakers can access all possible antecedents online:**
  - **NO MATCH** slowdown only: Difficulty in accessing mismatching subjects

## EXPERIMENT 1: LOCAL NP: COREFERENCE ALLOWED

Condition	Sentence
<b>MULTIPLE MATCH</b>	Thăng Tâm nói là <b>thằng nhân viên</b> đó bầu cho nó SUB Tam say that SUB person worker that vote for SUB
<b>NON-LOCAL MATCH</b>	Ông Tâm nói là <b>thằng nhân viên</b> đó bầu cho ông HON Tam say that SUB person worker that vote for HON
<b>LOCAL MATCH</b>	Ông Tâm nói là <b>thằng nhân viên</b> đó bầu cho nó HON Tam say that SUB person worker that vote for SUB
<b>NO MATCH</b>	Thăng Tâm nói là <b>thằng nhân viên</b> đó bầu cho ông SUB Tam say that SUB person worker that vote for HON

trong cuộc họp trưa nay.  
in session meeting noon this

Tam-{SUB/HON} said that **that employee-SUB** voted for **him-{SUB/HON}** in the meeting this noon.



Fixed Effects	Critical			Spillover 1			Spillover 2		
	$\beta$	SE	t	$\beta$	SE	t	$\beta$	SE	t
<b>NON-LOCAL</b>	-0.02	0.02	-1.23	-0.06	0.01	-4.02	-0.06	0.01	-5.15
<b>LOCAL</b>	0.02	0.02	0.89	0.02	0.02	0.96	0.01	0.01	0.55
<b>NON-LOCAL × LOCAL</b>	0.04	0.03	1.40	0.07	0.03	2.58	0.05	0.03	2.01

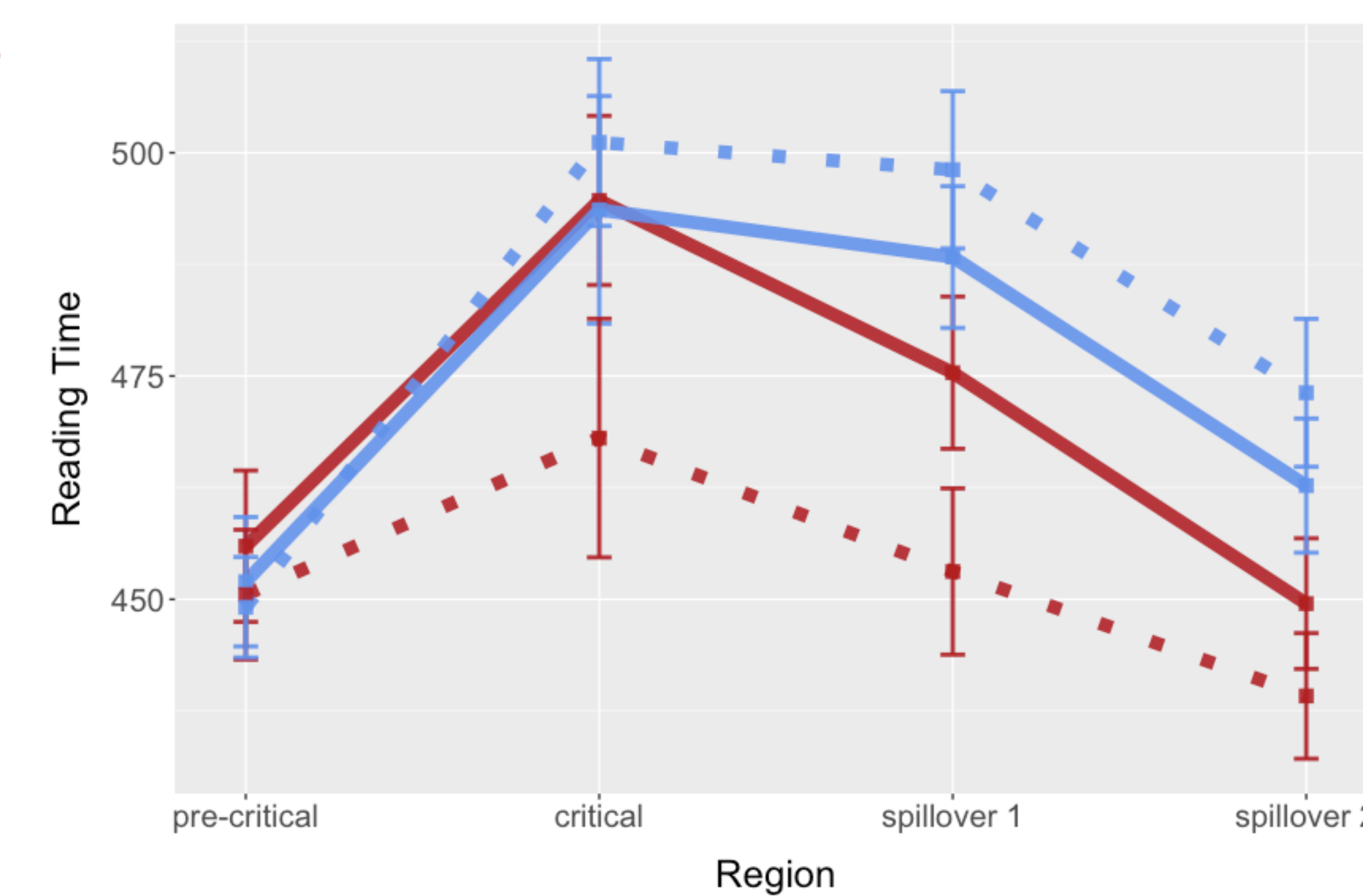
Prediction 1	✓
Prediction 2	✗

1. A preference for non-local antecedents:
2. A bias against local antecedents
3. Competition for multiple matching NPs

## EXPERIMENT 2: LOCAL NP: TOPICHOOD CONTROLLED

Condition	Sentence
	Chúng tôi rất vui khi PL 1 very happy when
<b>MULTIPLE MATCH</b>	Tam say that <b>that</b> SUB person worker that vote for SUB
<b>NON-LOCAL MATCH</b>	HON Tam say that <b>that</b> SUB person worker that vote for HON
<b>LOCAL MATCH</b>	HON Tam say that <b>that</b> SUB person worker that vote for SUB
<b>NO MATCH</b>	SUB Tam say that <b>that</b> SUB person worker that vote for HON

We were very happy when  
Tam-{SUB/HON} said that **that employee-SUB** voted for **him-{SUB/HON}** in the meeting this noon.



Fixed Effects	Critical			Spillover 1			Spillover 2		
	$\beta$	SE	t	$\beta$	SE	t	$\beta$	SE	t
<b>NON-LOCAL</b>	-0.02	0.02	-1.00	-0.04	0.02	-2.35	-0.04	0.02	-2.67
<b>LOCAL</b>	0.01	0.02	0.78	0.01	0.01	0.61	0.00	0.01	0.29
<b>NON-LOCAL × LOCAL</b>	0.05	0.03	1.62	0.04	0.03	1.24	0.04	0.03	1.42

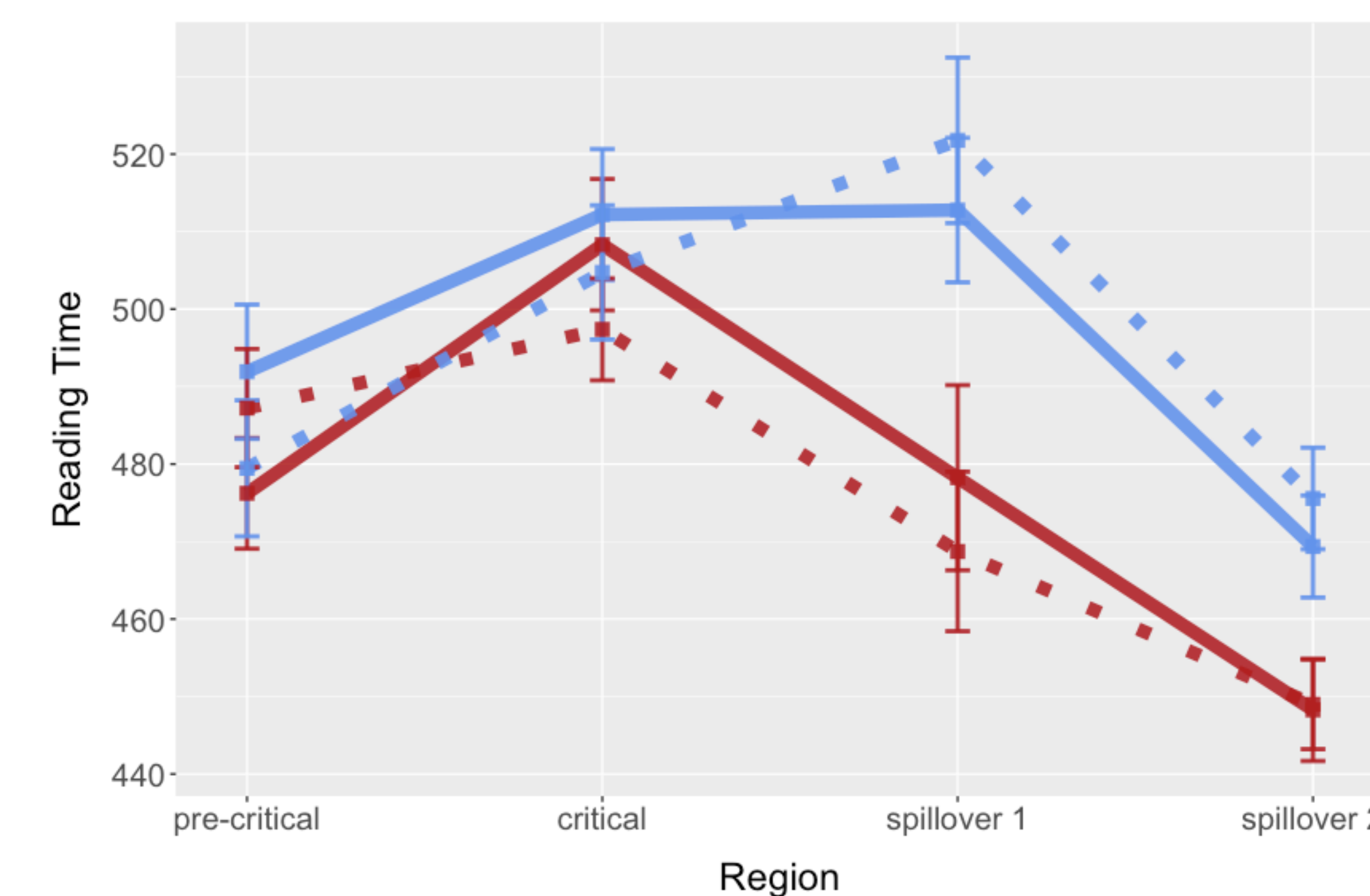
Prediction 1	✓
Prediction 2	✗

- ❖ **Replicating Experiment 1 results:**
  - Although coreference between a pronoun and a local antecedent is possible in Vietnamese, it is still not preferred.

## EXPERIMENT 3: LOCAL QP: BINDING PROHIBITED

Condition	Sentence
<b>MULTIPLE MATCH</b>	Thăng Tâm nói là <b>mọi</b> <b>thằng nhân viên</b> bầu cho nó SUB Tam say that every SUB person worker vote for SUB
<b>NON-LOCAL MATCH</b>	Ông Tâm nói là <b>mọi</b> <b>thằng nhân viên</b> bầu cho ông HON Tam say that every SUB person worker vote for HON
<b>LOCAL MATCH</b>	Ông Tâm nói là <b>mọi</b> <b>thằng nhân viên</b> bầu cho nó HON Tam say that every SUB person worker vote for SUB
<b>NO MATCH</b>	Thăng Tâm nói là <b>mọi</b> <b>thằng nhân viên</b> bầu cho ông SUB Tam say that every SUB person worker vote for HON

Tam-{SUB/HON} said that **every employee-SUB** voted for **him-{SUB/HON}** in the meeting this noon.



Fixed Effects	Critical			Spillover 1			Spillover 2		
	$\beta$	SE	t	$\beta$	SE	t	$\beta$	SE	t
<b>NON-LOCAL</b>	-0.02	0.02	-1.21	-0.08	0.03	-3.22	-0.06	0.02	-2.86
<b>LOCAL</b>	0.00	0.01	0.29	-0.00	0.02	-0.04	-0.01	0.01	-0.62
<b>NON-LOCAL × LOCAL</b>	0.02	0.03	0.84	0.02	0.03	0.72	0.01	0.02	0.57

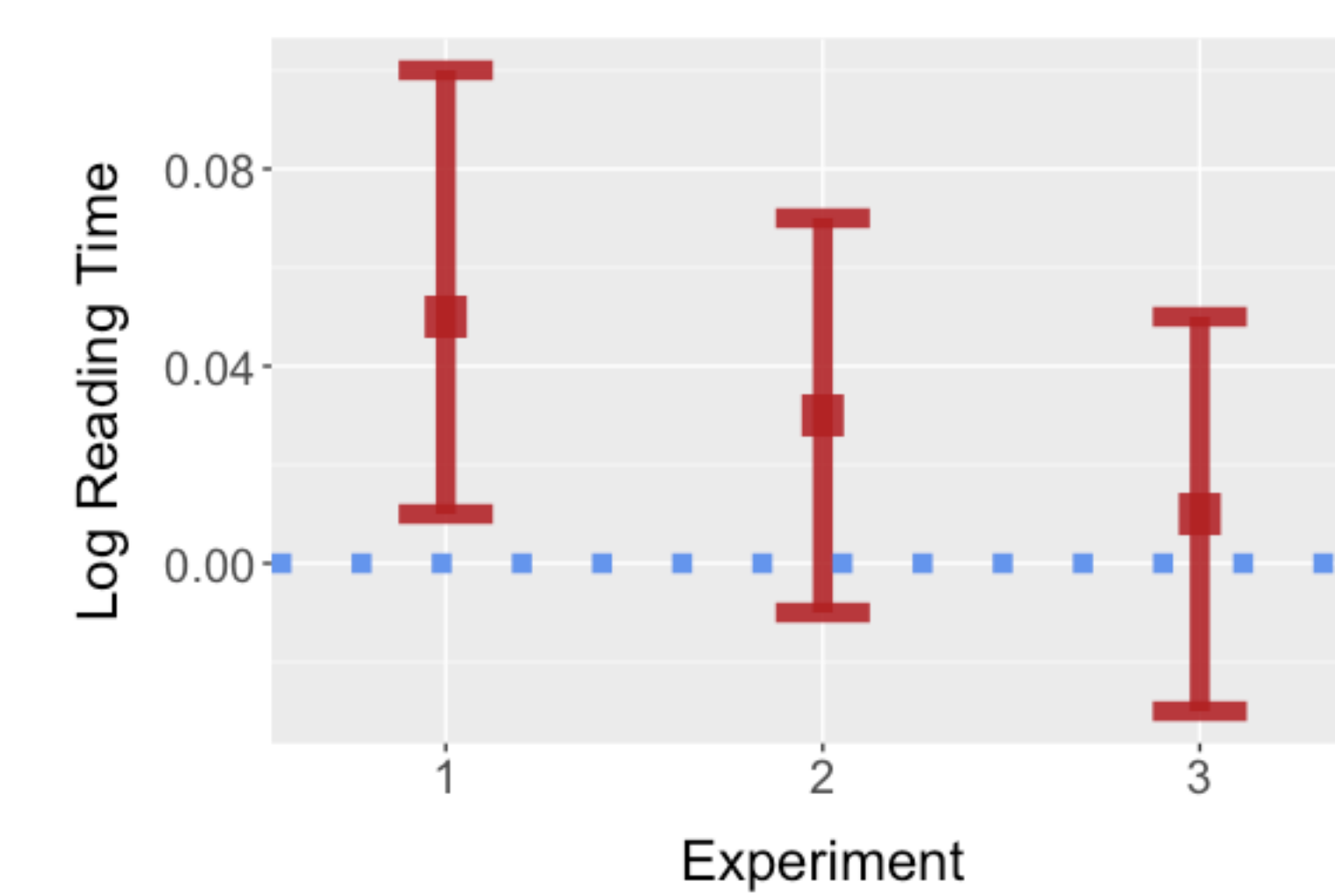
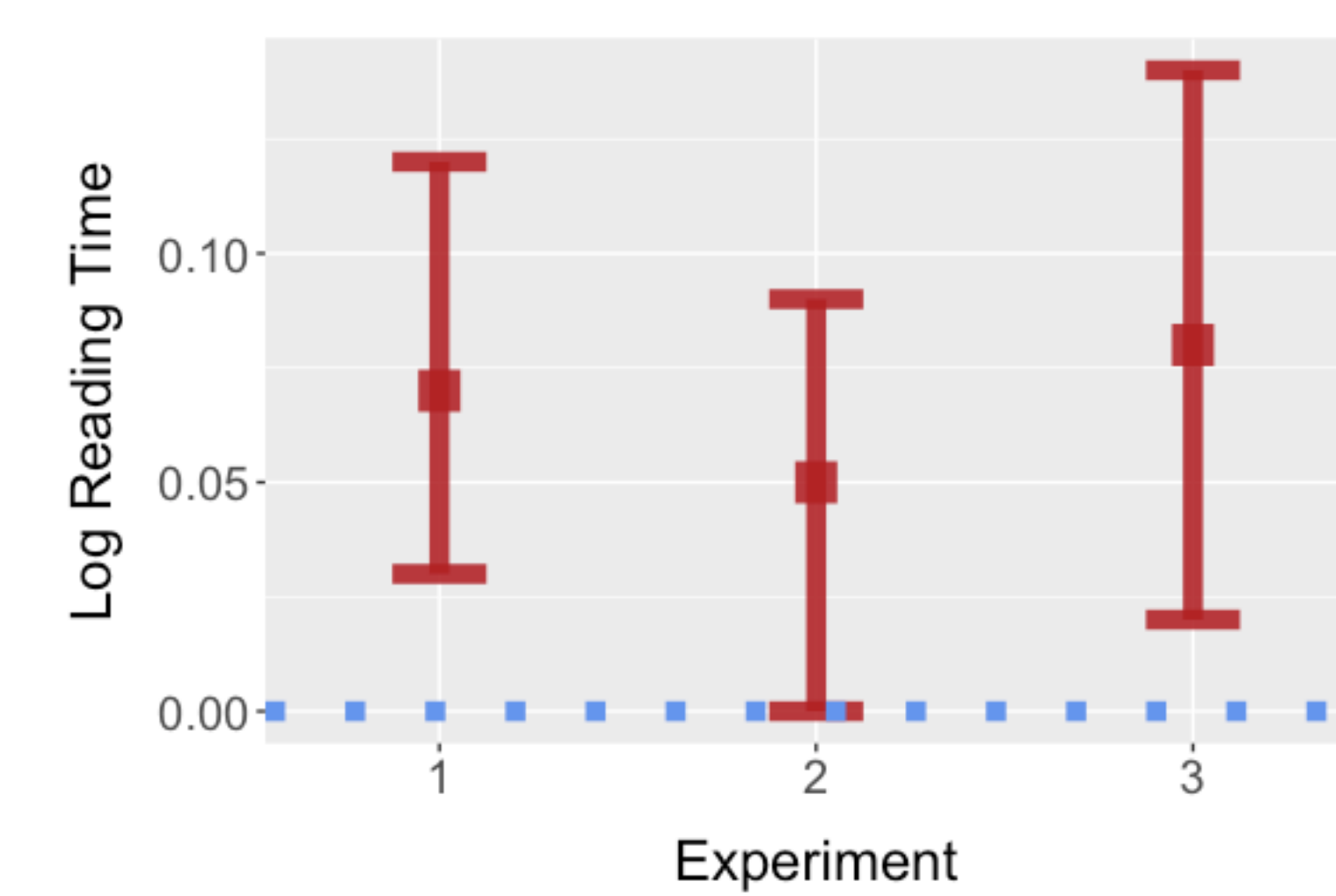
Prediction 1	✓
Prediction 2	✗

1. A robust grammaticality effect
2. No facilitative interference effect
3. No multiple match effect

## OFFLINE DATA

Condition	Sentence	Local Subject Selection
Local NP	Tam-SUB said that <b>that employee-SUB</b> voted for <b>him-SUB</b> in the meeting this noon.	22.22% (0.02)
Local QP	Tam-SUB said that <b>every employee-SUB</b> voted for <b>him-SUB</b> in the meeting this noon.	2.5% (0.01)

## CROSS-EXPERIMENTAL COMPARISONS



- Significant contrasts between **NON-LOCAL MATCH** and **LOCAL MATCH** across all 3 experiments
- Consistent **LOCAL MATCH** slowdowns
- Significant contrast between **NON-LOCAL MATCH** and **MULTIPLE MATCH** in Experiment 1, but not 2 and 3
- Competition diminishes with local QP

## CONCLUSIONS

1. We consistently saw **NO MATCH** slowdowns  
Vietnamese speakers are sensitive to honor match online.
2. We consistently saw **LOCAL MATCH** slowdowns  
Vietnamese speakers apply structural constraint against local subject, like English speakers.
3. We sometimes saw **MULTIPLE MATCH** slowdowns  
This seems to be clearest for NPs, but there is no clear evidence of competition with QPs.

❖ **QUESTION:** Why are Vietnamese speakers biased against reference to the local subject in processing, even though it is grammatically licensed?

➤ **One possibility:**

- Vietnamese speakers initially parse pronouns as bound variables in all cases, and apply Principle B.
- Coreferential interpretation of pronoun is available only at a delay, and with some difficulty.

## ACKNOWLEDGMENT

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