

Structure-sensitive pronoun processing even in the absence of Principle B effects

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Principle B of Binding Theory asserts that a pronoun cannot corefer with an antecedent in its local clause [4]. Previous studies have reported conflicting results regarding whether English speakers use Principle B to filter the interpretation of pronouns in real-time comprehension. While [5, 6, 11] have argued that only non-local antecedents are retrieved initially, [2] found that local antecedents can also be considered in early processing. In this study, we investigate this issue in Vietnamese, where coreference between a pronoun and a local referential antecedent is permitted (1). We ask whether structural constraints guide early pronoun resolution processes in this language, despite the lack of clear Principle B effects. We considered two possibilities:

(i) Free access to all antecedents: Vietnamese speakers could consider all grammatically licit antecedents immediately in real-time processing. They may retrieve any feature-matching antecedent, regardless of its syntactic position, as predicted by a cue-based retrieval mechanism in a content-addressable memory system [10].

(ii) Restricted antecedent search: Alternatively, Vietnamese speakers might still use structural cues to guide retrieval, and be biased away from local antecedents even without categorical Principle B effects. For instance, pronouns typically refer to the most prominent discourse referent, which is commonly the highest subject of a sentence [1, 8]. Since non-local antecedents in [2, 6] take this position, they may be more easily retrieved [see 8].

Crucially, (i) predicts that it would take longer to process a pronoun only when no antecedent matches the pronoun's features compared to any sentence in which at least one antecedent does. That is, there would be no difference between the non-local and the local antecedents, as long as they match the pronoun's features. Meanwhile, (ii) predicts that comprehenders would encounter processing difficulty only when the non-local antecedent mismatches the pronoun's features. Feature-matching local antecedents would not reduce processing difficulty, since they would not be considered initially.

We tested these predictions in an online self-paced reading experiment ($n_{\text{participant}} = 80$, $n_{\text{item}} = 36$) on Ixex Farm [6]. We manipulated two factors: (i) the syntactic position of a referent relative to the pronoun and (ii) the feature match between a referent and the pronoun. We used honorificity to investigate the latter [9], since all Vietnamese pronouns are marked with honorific status (either HONORIFIC or SUBHONORIFIC), but not with gender. All referents had unambiguous classifiers specifying their honorificity features. We crossed [NON-LOCAL / LOCAL] with [MATCH / MISMATCH] in a 2×2 design, as in [2, 5; Table 1]. Mean RTs are in Figure 1, with linear mixed effects results in Table 2 and pairwise contrasts in Table 3. The data suggest three key results:

(i) A preference for non-local antecedents: Participants were immediately sensitive to an honorificity mismatch with non-local antecedents. RTs were shorter when the non-local antecedent matched the pronoun than when it did not, replicating previous work [2, 5, 6, 11].

(ii) A bias against local antecedents: RTs were slowed for a feature-matched local antecedent even when the non-local antecedent was unavailable. **NON-LOCAL MISMATCH, LOCAL MATCH** was significantly slower than **NON-LOCAL MATCH, LOCAL MISMATCH**, but was not reliably faster than **NON-LOCAL MISMATCH, LOCAL MISMATCH** in immediate spillover regions [5].

(iii) Competition for multiple matching antecedents: When both antecedents matched, processing times were slowed. This multiple match effect may reflect competition to determine a single antecedent for the pronoun. This led to additional processing time observed in the **NON-LOCAL MATCH, LOCAL MATCH** condition, contrasting with the significantly shorter RTs in the **NON-LOCAL MATCH, LOCAL MISMATCH** condition, replicating the findings in [2].

In sum, even though Vietnamese does not display robust Principle B effects, the pattern of RTs observed in this study replicates [2] closely. Our data suggest that despite the lack of Principle B effects, Vietnamese speakers still prefer non-local antecedents, showing a similar structural bias in processing to that observed in English.

(1) *Thằng nhân viên đó bầu cho nó.*
 SUB person worker that vote for SUB
 'That employee-SUB voted for him-SUB.'

nó = *thằng nhân viên đó*
 him-SUB = that employee-SUB

Table 1: Experimental conditions and sample materials.

NON-LOCAL	LOCAL	SENTENCES
Match	Match	<i>Thằng Tâm nói là thằng nhân viên đó bầu cho nó.</i> SUB Tam say that SUB person worker that vote for SUB
Match	Mismatch	<i>Ông Tâm nói là thằng nhân viên đó bầu cho ông.</i> HON Tam say that SUB person worker that vote for HON
Mismatch	Match	<i>Ông Tâm nói là thằng nhân viên đó bầu cho nó.</i> HON Tam say that SUB person worker that vote for SUB
Mismatch	Mismatch	<i>Thằng Tâm nói là thằng nhân viên đó bầu cho ông.</i> SUB Tam say that SUB person worker that vote for HON

trong cuộc họp sáng nay.
 in session meeting morning this

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

Figure 1: Mean RTs (in ms) by condition and region. Error bars represent standard error by participants, corrected for between-participant variance [3].

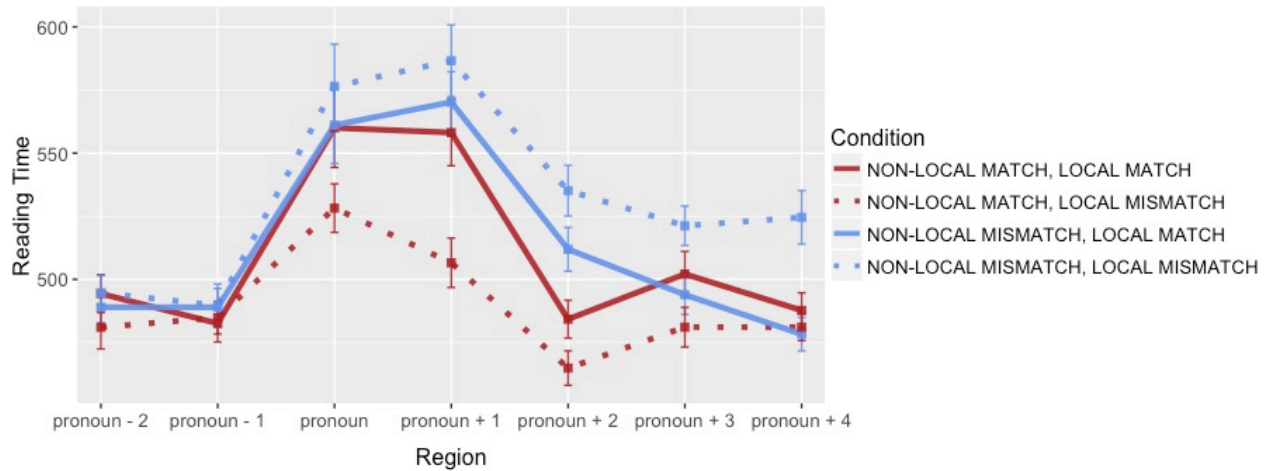


Table 2: Maximal linear mixed effects model fit to log-transformed RTs. Significant effects are boldfaced.

Fixed Effects	$t_{pronoun}$	$t_{pronoun+1}$	$t_{pronoun+2}$	$t_{pronoun+3}$
NON-LOCAL	-1.23	-4.02	-5.15	-2.96
LOCAL	0.89	0.96	0.55	-0.74
NON-LOCAL × LOCAL	1.40	2.58	2.01	2.29

Table 3: Relevant pairwise comparisons. Significant contrasts are boldfaced.

Contrasts	t_{pro+1}	t_{pro+2}	t_{pro+3}
NON-LOCAL MISMATCH, LOCAL MISMATCH – NON-LOCAL MISMATCH, LOCAL MATCH	0.95	1.06	2.22
NON-LOCAL MISMATCH, LOCAL MISMATCH – NON-LOCAL MATCH, LOCAL MATCH	1.89	3.29	2.62
NON-LOCAL MISMATCH, LOCAL MISMATCH – NON-LOCAL MATCH, LOCAL MISMATCH	4.66	5.05	3.67
NON-LOCAL MISMATCH, LOCAL MATCH – NON-LOCAL MATCH, LOCAL MISMATCH	3.36	4.05	1.56
NON-LOCAL MATCH, LOCAL MATCH – NON-LOCAL MATCH, LOCAL MISMATCH	2.41	1.83	1.25

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