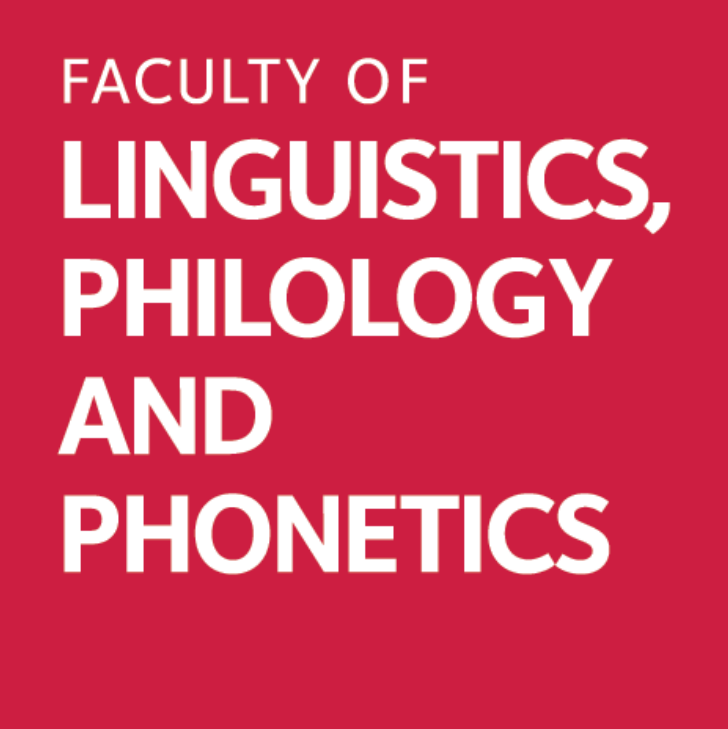# Discourse expectations are sensitive to the Right Frontier Constraint

Runyi Yao, Daniel Altshuler and E. Matthew Husband (Faculty of Linguistics, Philology and Phonetics, University of Oxford)

FACULTY OF
LINGUISTICS, PHILOLOGY AND PHONETICS

Discourse Expectations

- When processing discourse, comprehenders use contextual cues incrementally to **predict** relationships between the current and the upcoming discourse units (i.e., **coherence relations**):
- **Implicit causality (IC) verbs** elicit expectations for upcoming Explanation relations [1][2]:
  - ❖ E.g., *Jenny praised the guy who made lots of money for the company.* ⤳ 'praised the guy because he made lots of money'
- When IC-driven discourse expectations are not immediately fulfilled, they can be **maintained** across at least one intervening discourse unit [2]:
  - ❖ E.g., *Jenny praised_IC/saw_nonIC the guy who is from Maryland because…*

Research Question

- Is the maintenance of IC-driven discourse expectations **constrained** by discourse properties, such as the **Right Frontier Constraint (RFC)**?
  - ❖ The expectation requires the Explanation to be **attached** to the clause containing IC verbs.

Right Frontier Constraint

- The RFC is a constraint on **discourse attachment** and anaphora resolution [3][4].
- It is a key component of the **Segmented Discourse Representation Theory (SDRT)** framework [5].
  - ❖ In the SDRT framework, coherent discourse is structured by **coordinating** and **subordinating** relations [6].

- **RFC**: new utterances can only be attached to **the right frontier of the existing discourse structure** [5].
  - ❖ Consider: [π1] John dropped his car for repairs.
    [π2] Then he got a rental.
    [π3] **It** had a broken fuel pump. [7]

✓ it ⤳ the rental   ✗ it ⤳ John's car

- While the RFC is well integrated into a theory of discourse coherence, few studies have investigated its role in **online discourse processing** [8].

Discussions

- IC-driven expectations are sensitive to the RFC:
  - ❖ The RFC rapidly shapes how readers anticipate and structure discourse in real time.
  - ❖ The RFC has psychological reality.
- What happened in the **IC-coordinating** condition?
  - ❖ If comprehenders still tried to establish an Explanation relation between the cause and the IC event, we expected to see a **penalty** for the **RFC violation**.
  - ❖ However, we didn't observe any slowdown in this condition.
  - ❖ Future studies may investigate whether violating the RFC will lead to a measurable processing cost.
- We also observed some **individual variation** related to **age**:
  - ❖ The facilitation effect in the IC-subordinating condition appears to be significantly larger for younger comprehenders.
  - ❖ Could this be due to an interaction with working memory?

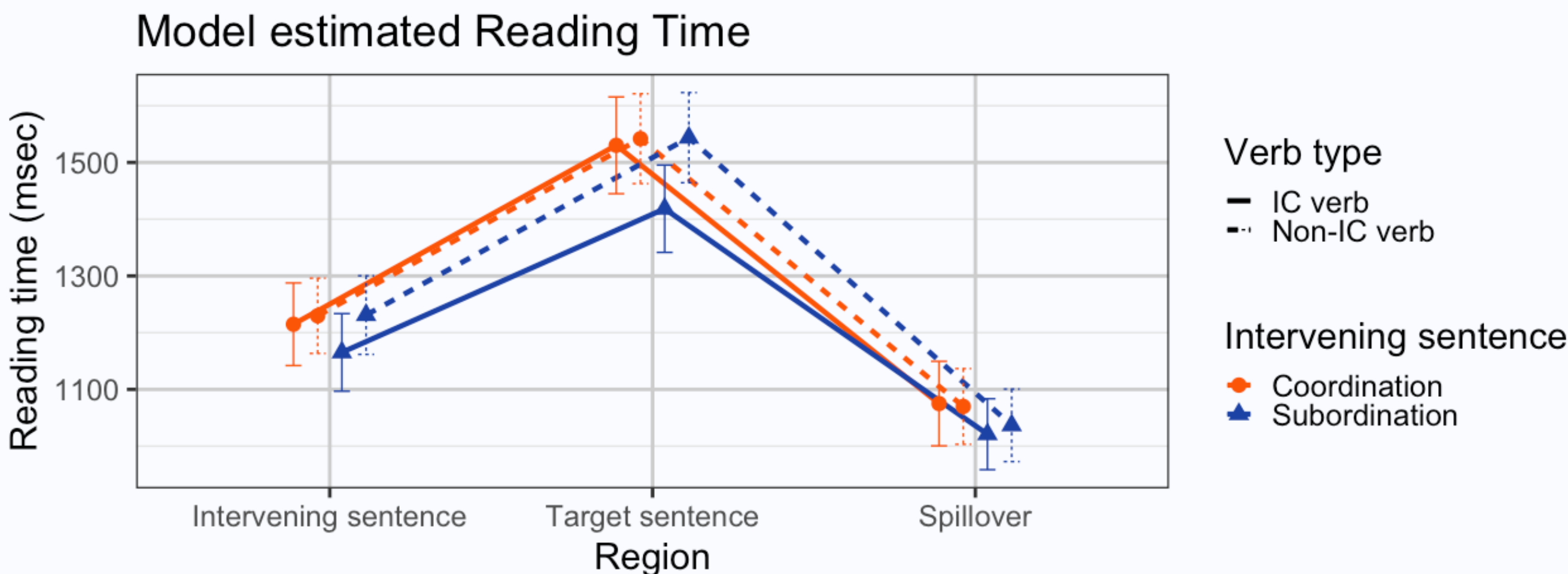## Experiment

Self-paced Reading (N = 65)
- Sentence-by-sentence; Prolific-recruited participants.
- 36 experimental items + 36 filler items; manipulating **Verb type** (IC, non-IC) and **Intervening sentence** (subordinating, coordinating)
- A **norming study** (N=30) using a likelihood judgment task confirmed that intervening sentences do not fulfill IC-driven expectations.
- Prediction: IC-driven will be held across a Subordinating intervening unit but blocked by a Coordinating intervening unit, leading to **faster** processing in the **IC-subordinating** condition.

Intro		Bill manages many international employees.
IC	Subordinating	This morning he *fired* Jenny. Jenny is Austrian.
IC	Coordinating	This morning he *fired* Jenny. Jenny then walked into her office.
Non-IC	Subordinating	This morning he *talked to* Jenny. Jenny is Austrian.
Non-IC	Coordinating	This morning he *talked to* Jenny. Jenny then walked into her office.
Target sentence		She had been embezzling money for years.
Wrap-up		It was big news for everyone.

	Est	SE	t	p
Verb Type	-68.5	23.7	-2.89	.005 **
Intervening Sentence	-55.0	30.3	-1.81	.077 .
Interaction	-113.6	51.5	-2.20	.034*
Contrast: IC – NonIC				
	Est	SE	t	p
Coordinating	-11.7	34.6	-0.33	.74
Subordinating	-125.3	35.4	-3.54	.0015**

Result:
- The IC-driven expectations only **facilitated** processing when the intervening unit was **Subordinating**.
- No significant effects were observed on either the intervening sentence or the spillover sentence.

Model estimated Reading Time

Key Takeaways

- The RFC is not just a theoretical constraint — It shapes real-time language processing.
- Long-distance discourse-level expectations are constrained by the RFC.
  - ❖ Structural constraints matter in discourse processing.
- Future works can further investigate whether RFC violations incur a direct processing cost.

Reference

[1] Rohde, H., Levy, R., & Kehler, A. (2011). *Cognition*, 118(3), 339–358. [2] Hoek, J., Rohde, H., Evers-Vermeul, J., & Sanders, T. (2021). *Cognition*, 210, 104581. [3] Polanyi, L. (1988). *Journal of pragmatics*. [4] Webber, B. (1988). 26th annual meeting of the association for computational linguistics. [5] Asher, N. & Lascarides, A. (2003). *Cambridge University Press*. [6] Asher, N & Vieu, L. (2005). *Lingua*. [7] Altshuler, D., & Truswell, R. (2022). *Oxford University Press*. [8] Sasaki, K. M. (2021). PhD dissertation UCSC.