Mandarin Relative Clauses in the Maze: Expectations over Memory

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Mandarin Relative Clauses and Processing

	Examples
Subject Relatives (SRs)	[邀請了 男孩] 幾次 的 [女孩] 認識 王老師 yaoqing-le nanhai ji-ci de nuhai renshi Wang laoshi invite-Asp boy several Rel girl know Teacher Wang "The girl who invited the boy several times last month knows teacher Wang."
Object Relatives (ORs)	[男孩 邀請了] 幾次 的 [女孩] 認識 王老師 nanhai yaoqing-le ji-ci de nuhai renshi Wang laoshi boy invite-Asp several Rel girl know Teacher Wang "The girl who the boy invited several times last month knows teacher Wang."

There are two main theories for relative clause processing, expectation-based and memory-based. Different from other languages such as English, Mandarin relative clauses yields different predictions from these two theories.

	Expectation	Memory
Predictions	advantage for subject relative clauses (SRs) because they are more frequent	advantage for object relative clauses (ORs) because the distance between the head noun and the gap is shorter

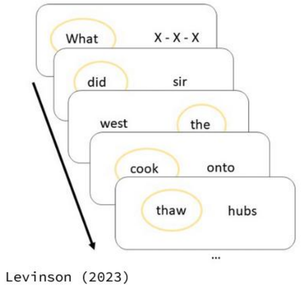
Jäger et al. (2015) found an SR advantage in self-paced reading and eye-tracking, supporting the expectation theory. The results from these methods, however, revealed effects at and after the head noun that were not predicted by expectation- or memory-based accounts.

Current Study

1. Does evidence from the highly incremental maze task support the findings in support of expectation-based accounts of Mandarin relative clause processing from Jäger et al (2015)?
2. Can it provide new insight into the specific regions triggering processing costs?

Maze Task & Methods

- Highly **incremental**, focalized task. No spillover, greater power. (Forster et al. 2009)
- US-based simplified-Mandarin-reading participants raised in China age 15+ completed an online PCIbex-based (Zehr and Schwarz 2018) Maze task with Multilingual A-maze (Levinson et al 2023) alternatives (inspired by A-maze, Boyce et al. 2020)
- 2 batches of alternatives, 56/38 participants
- Stimuli: 32 quadruplets, 2x2 design crossing modification type and RC type, adapted from Jäger et al.'s eye-tracking study. Split into 4 counterbalanced lists with 64 fillers.
- Also completed Lextale vocabulary task and BLP survey



Levinson (2023)

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Stimuli

Subject Modifier (SM)

OR

那個 [上個月] [男孩 邀請了] 幾次 的 [女孩] 認識 王老師
Nage shanggeyue nanhai yaoqing-le ji-ci de nuhai renshi Wang laoshi
Det-CL last month boy invite-Asp several Rel girl know Teacher Wang
因為 上過 她的 課
Yinwei shang-guo ta-de ke
Because attend-Asp her class
"The girl who the boy invited several times last month knows teacher Wang because [she] has attended her class."

SR

那個 [上個月] [邀請了 男孩] 幾次 的 [女孩] 認識 王老師
Nage shanggeyue yaoqing-le nanhai ji-ci de nuhai renshi Wang laoshi
Det-CL last month invite-Asp boy several Rel girl know Teacher Wang
因為 上過 她的 課
Yinwei shang-guot a-de ke
Because attend-Asp her class
"The girl who invited the boy several times last month knows teacher Wang because [she] has attended her class."

Object Modifier (OM)

OR

王老師 認識 那個 [上個月] [男孩 邀請了] 幾次 的 [女孩]
Wang laoshi renshi nage shanggeyue nanhai yaoqing-le ji-ci de nuhai
Teacher Wang know that last month boy invited several REL girl
因為 教過 她的 課
yinwei jiao-guo ta-de ke
Because teach-Asp her class
"Teacher Wang knows the girl who the boy invited several times last month because [she] has taught her class."

SR

王老師 認識 那個 [上個月] [邀請了 男孩] 幾次 的 [女孩]
Wang laoshi renshi nage shanggeyue yaoqing-le nanhai ji-ci de nuhai
Teacher Wang know that last month invited boy several REL girl
因為 教過 她的 課
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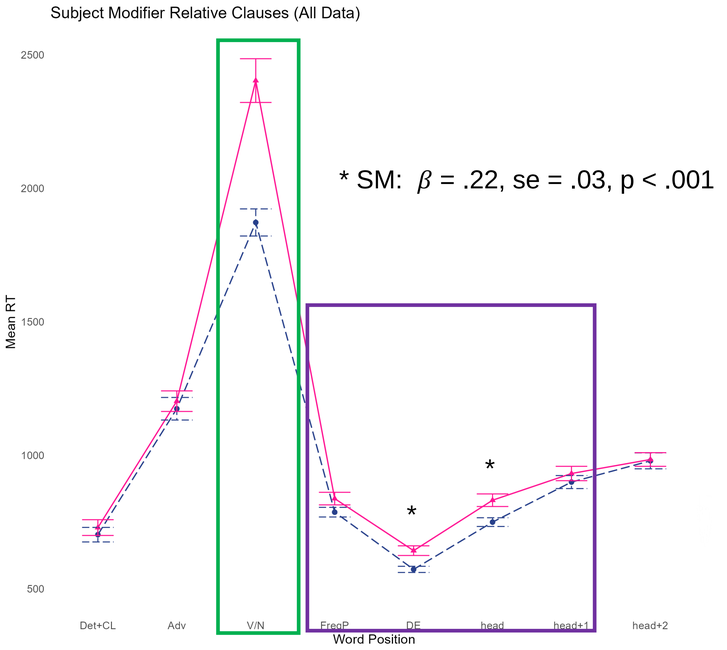
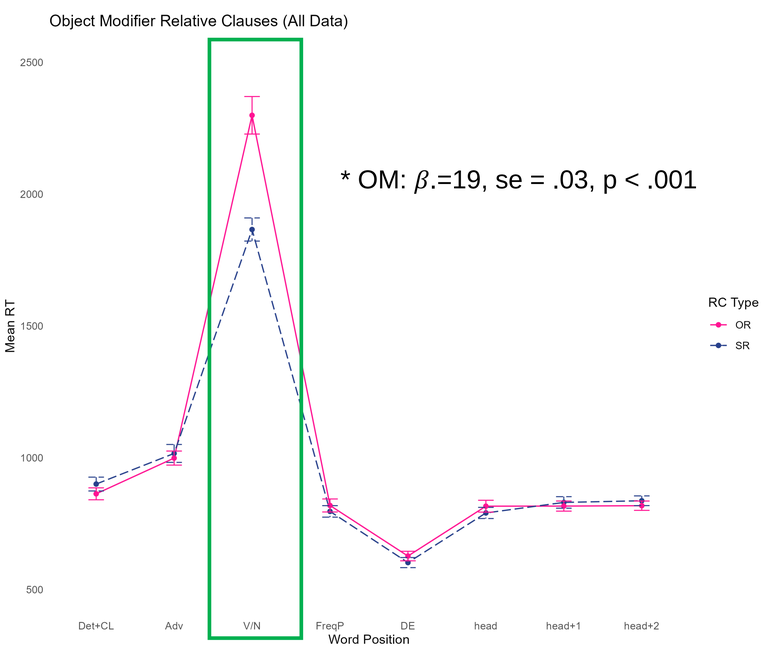
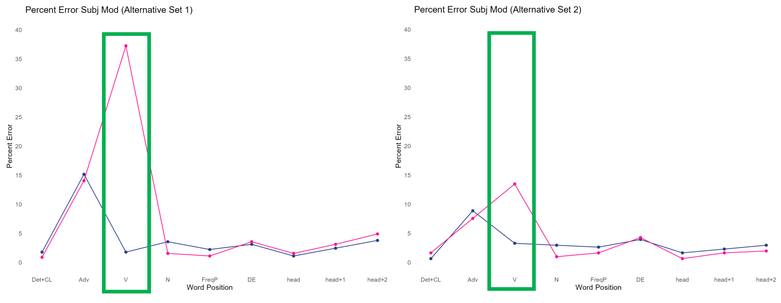
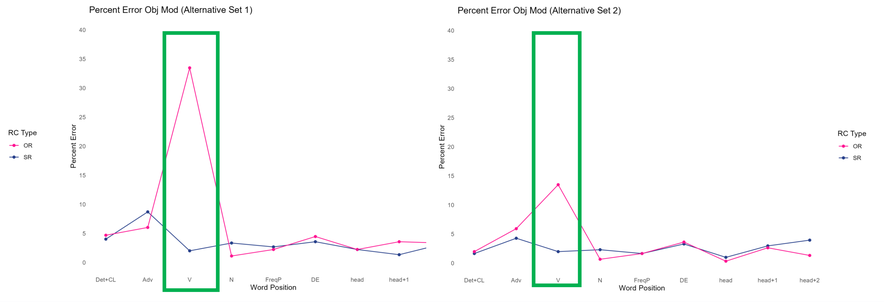
Results









- LME models fit on log-transformed RTs testing for main effects of RC type, Modification type and their interaction.
- Model comparison showed no sign. diff. for batches (LRT > .1).
- RTs at the **disambiguating region** were summed to match across RC types. A main effect of RC type (**SR advantage**) was significant in this region (β = .21, se = .02, p < .001)
- Nested models also showed significant effects of RC type (**SR advantage**) within SM and OM conditions.

Discussion & Conclusion

- The **post-RC regions** suggest an SR advantage specific to subject-modifier RCs starts at the FreqP and fades at the head noun, in contrast with the later effect (starting at the head) found in other tasks by Jäger et al. (2015).
- These results support the expectation-based account for Mandarin RCs, but do not support their proposal that integration of the head itself might be a source of late expectation-based effects.