

# Task influences on lexical underspecification: Insights from the Maze and SPR

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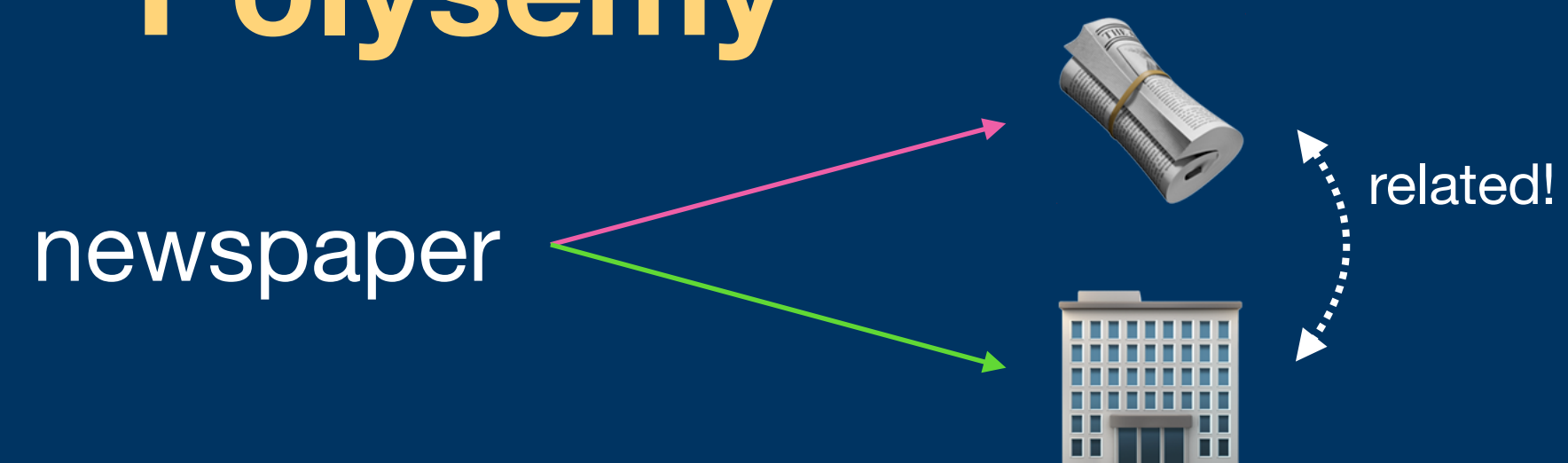
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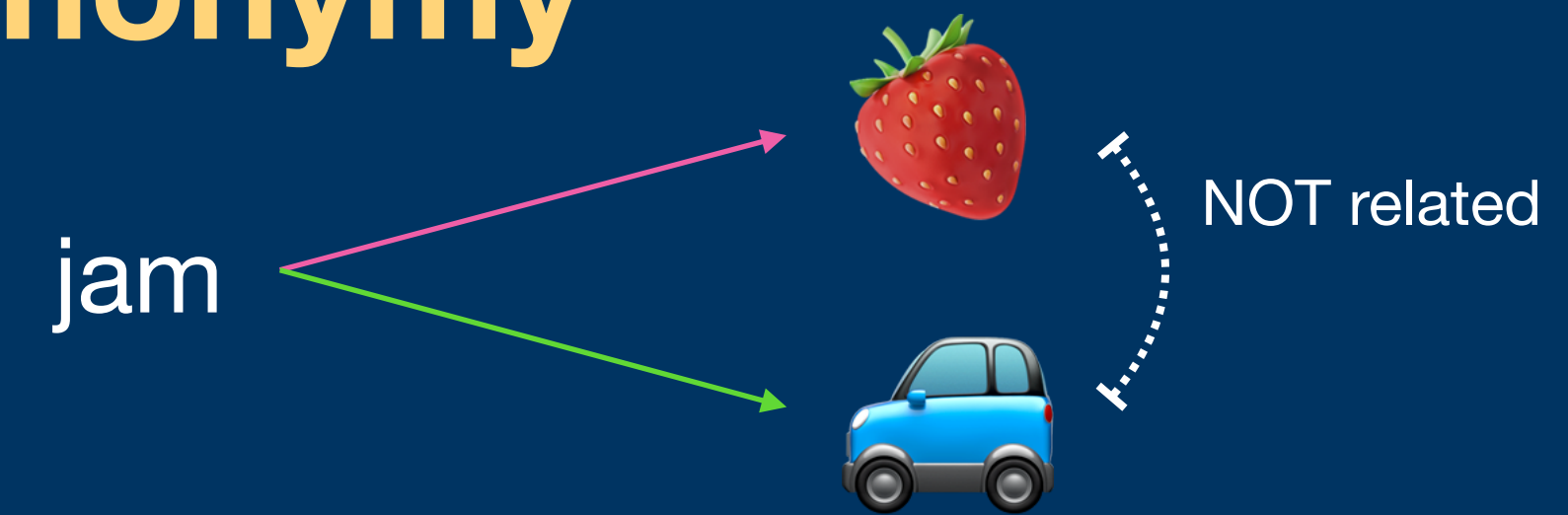
# Uncertainty in lexical meaning



## Polysemy



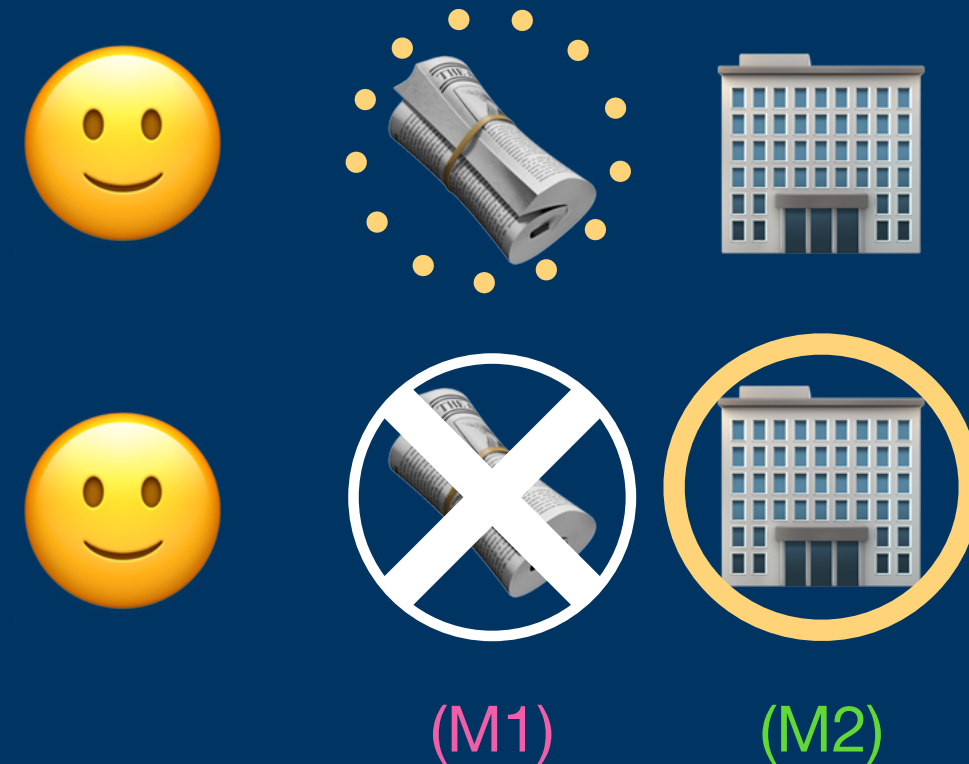
## Homonymy



# Underspecification

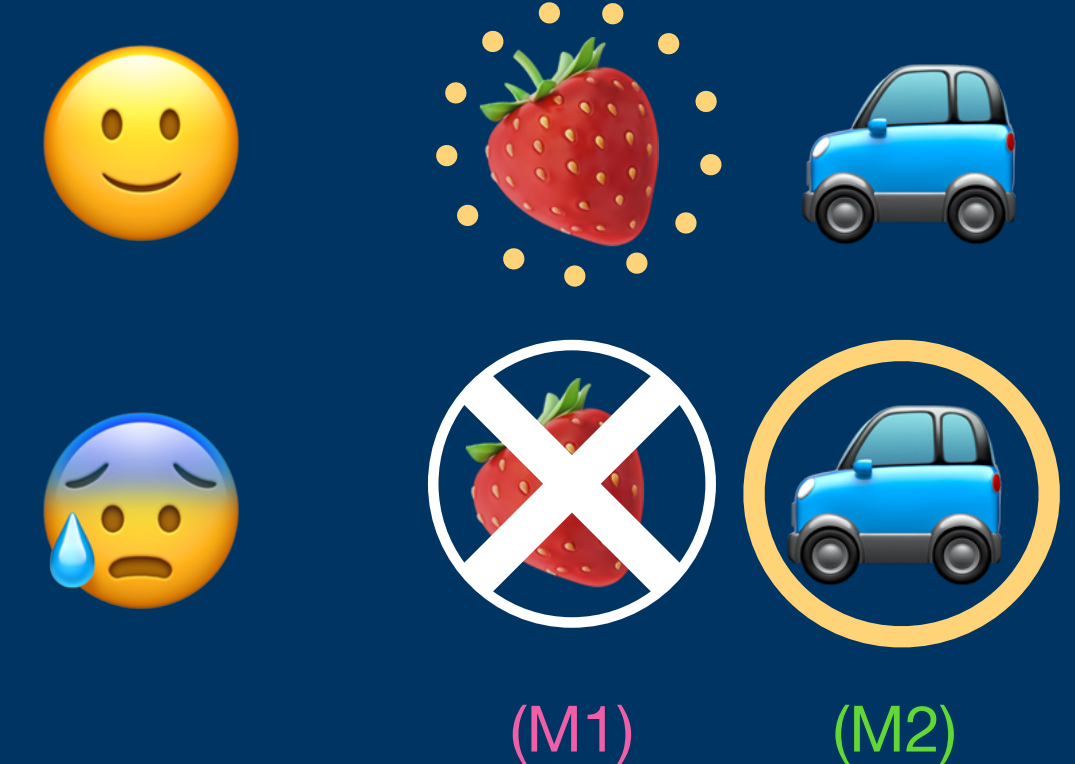
Unfortunately, the **newspaper** was destroyed...

after it lost its advertising profits.



Reportedly, the **jam** displeased Tom...

after it doubled his morning commute.



**Claim:** Full commitment to a particular meaning of a polyseme is delayed.

**Why?**

**Utility:** Because it's efficient when possible: prevents costly reanalysis.

**Necessity:** Because the processor cannot resolve polysemes without context.



**What happens when underspecification wouldn't be useful?**

# Enter the Maze

(Obviously, the referee had...)

WELFARE

DROPPED

(~40%)

The automatic G-Maze (Boyce et al. 2020) encourages **eager interpretation**.

- Representing semantic context necessary to pick the correct target

↳ **Underspecification is no longer useful.**

If underspecification is **utility-based** then we **won't** see it in the Maze.  
**necessary** **will**

Reanalysis costs for homonymy and polysemy.

**More reanalysis costs for homonymy.**

64 Latin-squared items (32 PoL, 32 HoM); 128 fillers;  $n = 24$  UCSC + 24 Prolific

# E1: No underspecification in the Maze

**M1, EARLY**

**M1, LATE**

**M2, EARLY**

**M2, LATE**

Unfortunately, after it was soaked with rain the **newspaper** was destroyed.

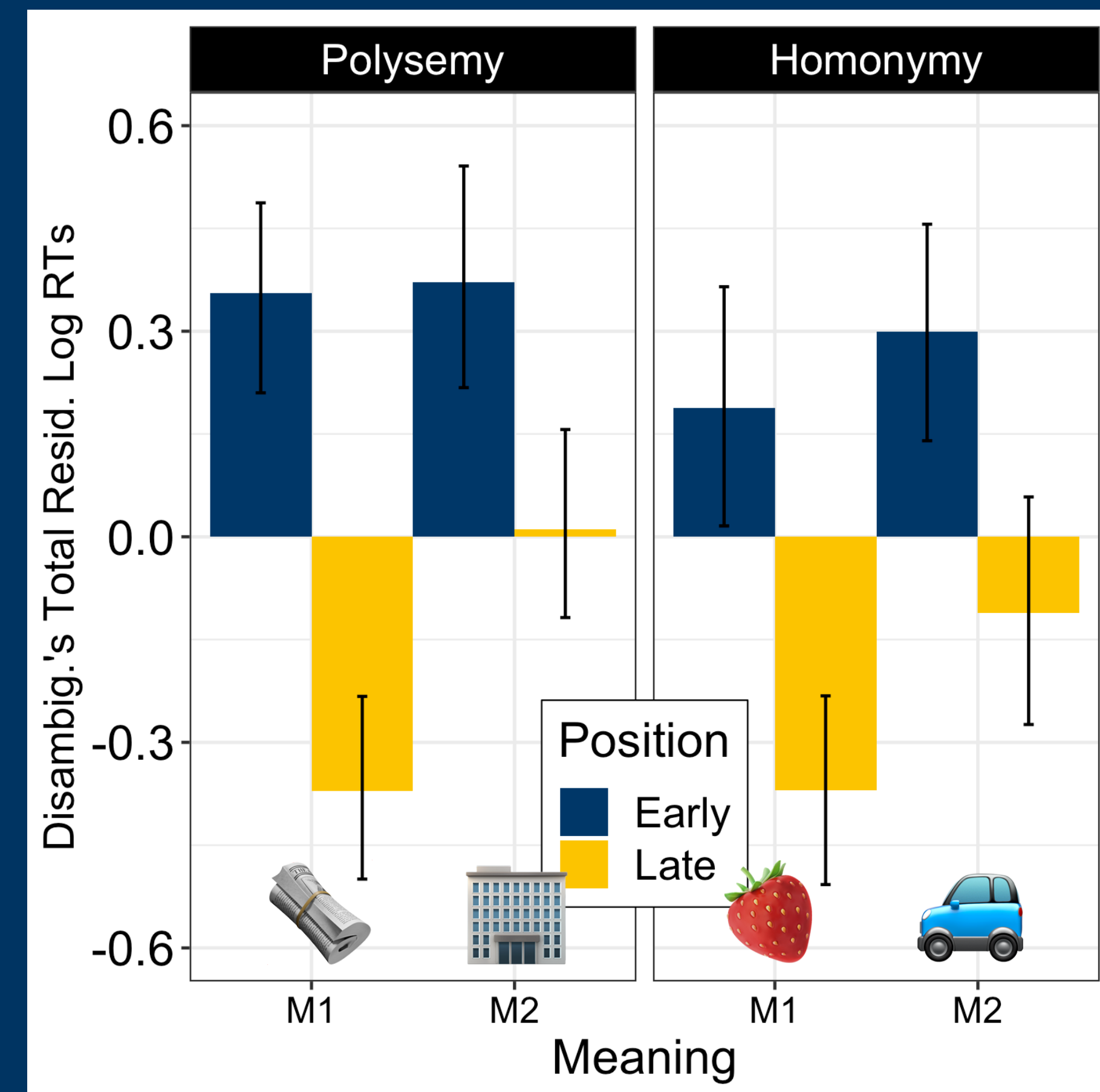
Unfortunately, the **newspaper** was destroyed after it was soaked with rain.

Unfortunately, after it lost its advertising profits the **newspaper** was destroyed.

Unfortunately, the **newspaper** was destroyed after it lost its advertising profits.

- POSITION: **LATE** read faster, presumably due to cataphora in **EARLY**
- POSITION X MEANING: Reduced for M2, apparent reanalysis costs
- No POS x POL/HOM (x M): no difference in reanalysis for POL v. HOM
- Replicated in error rates (not shown): No POL/HOM difference

↳ **No evidence for necessary underspecification in the Maze.**



Log RTs residualized over position and length, summed, analyzed via LMER fit in STAN, fixed effects treatment-coded. Effects reported if 95% credible interval excludes 0.



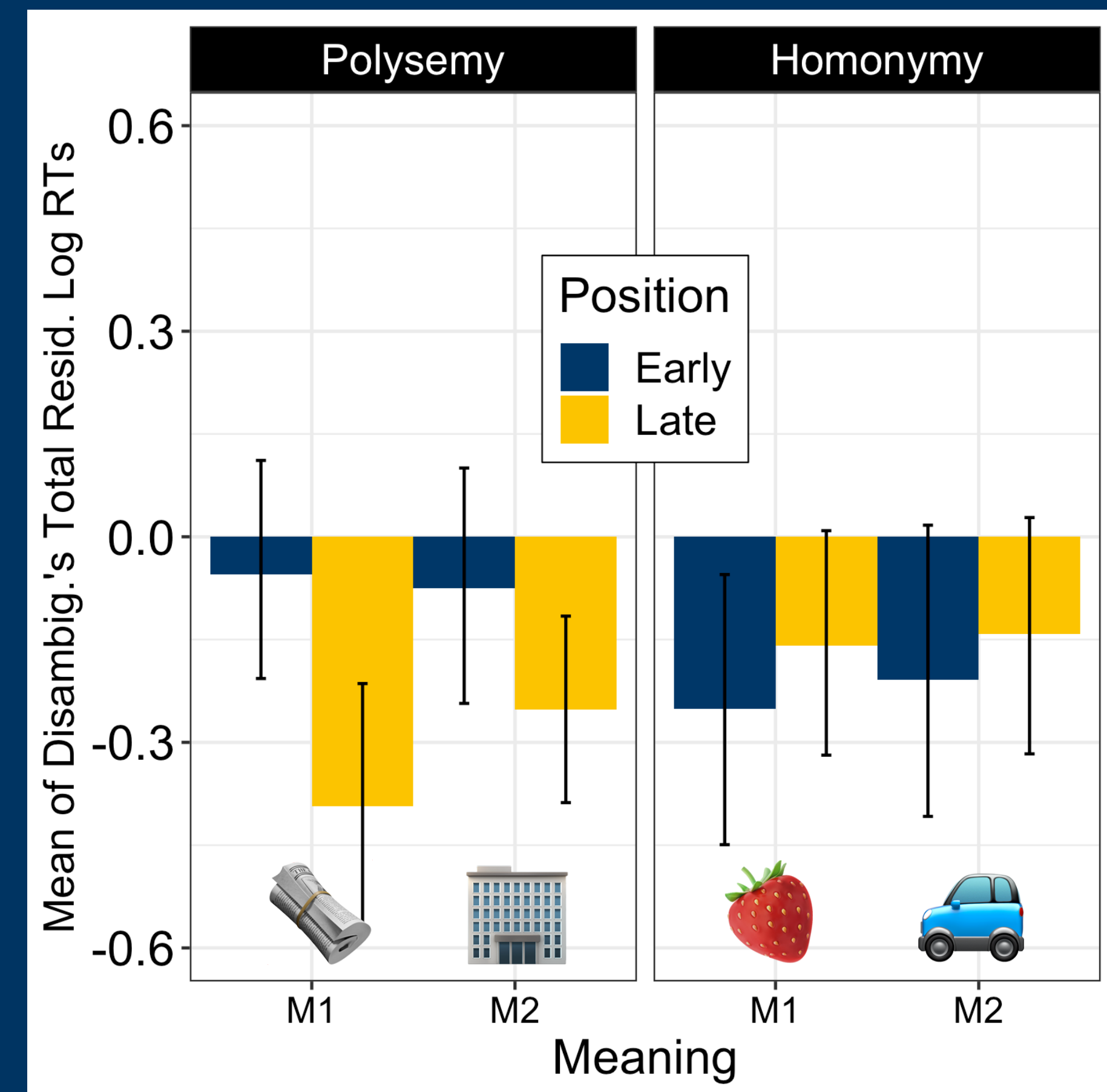
64 Latin-squared items (32 PoL, 32 HOM); 128 fillers;  $n = 24$  UCSC + 24 Prolific

## E2: Underspecification in SPR

<b>M1, EARLY</b>	Unfortunately, <u>after it was soaked with rain</u> the <b>newspaper</b> was destroyed.
<b>M1, LATE</b>	Unfortunately, the <b>newspaper</b> was destroyed <u>after it was soaked with rain</u> .
<b>M2, EARLY</b>	Unfortunately, <u>after it lost its advertising profits</u> the <b>newspaper</b> was destroyed.
<b>M2, LATE</b>	Unfortunately, the <b>newspaper</b> was destroyed <u>after it lost its advertising profits</u> .

SPR replication to ensure the Maze results are due to the task.

- POSITION: **LATE** read faster, again due to cataphora in **EARLY**
  - POSITION X POL/HOM: Crossover for HOM, **extra reanalysis costs**
- ↳ **E1 results can be attributed to a Maze-specific task effect.**



Log RTs residualized over position and length, summed, analyzed via LMER fit in STAN, fixed effects treatment-coded. Effects reported if 95% credible interval excludes 0.

# Upshots

Underspecification effects in polysemy are mediated by task demands.

- ↳ **Underspecification is optional and apparently strategic.**
- ↳ **Open questions remain: what makes it possible?**

The Maze task modulates strategies of incremental interpretation.

- ↳ **Shouldn't be used as a 1:1 replacement for eyetracking or SPR.**
- ↳ **BUT: a powerful tool for clarifying the source of behavior.\***



\* e.g. Sloggett, Van Handel, Sasaki, Duff, Rich, Orth, Anand, & Rysling (2020 CUNY Poster)