

# The Pragmatics of Characters' Mental Perspectives in Pronominal Reference Resolution

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# What factors influence pronoun resolution?

- Discourse prominence (order-of-mention/grammatical role ranking, topichood...)
- Lexical-level effects (verb-driven implicit causality, consequentiality...)
- Coherence relations (narrative purpose of sentences/clauses)
- ...what about pragmatics? (e.g., Winograd, 1972; Hobbs, 1979, Hobbs et al. 1993)

# Pragmatics: Perspective taking during reading

- Readers keep track of narrative perspectives  
(e.g., Clark & Carlson, 1982; Gerrig et al, 2000, 2001; Harris, 2021)
- Perspective cues seem to influence pronoun resolution (e.g., Kaiser, 2015):
  - a. Mary looked woefully at Elizabeth. She was sick.
  - b. Mary looked woefully at Elizabeth<sub>x</sub>. **Poor girl**; she<sub>x</sub> was sick.
- Cases involving situational reasoning are challenging for computational models (Levesque et al., 2012; Sakaguchi et al. 2021)

# Current study: Reasoning about characters' knowledge/belief states

Sophia<sub>x</sub> told Amanda that she<sub>x</sub> likes learning new languages.

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Sophia<sub>x</sub> **told** Amanda **that** she<sub>x</sub> likes learning new languages.

Sophia **asked** Amanda<sub>y</sub> **if** she<sub>y</sub> likes learning new languages.

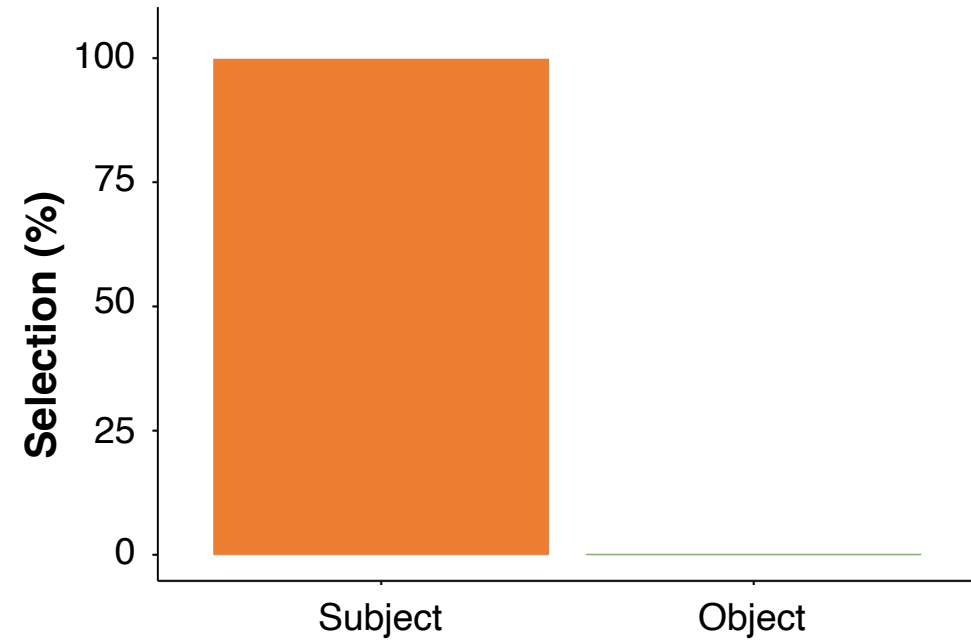
*cf.* Smyth, 1995; see also Brown-Schmidt et al., 2008

# **Experiment 1:** Subject Pronoun Judgment Task

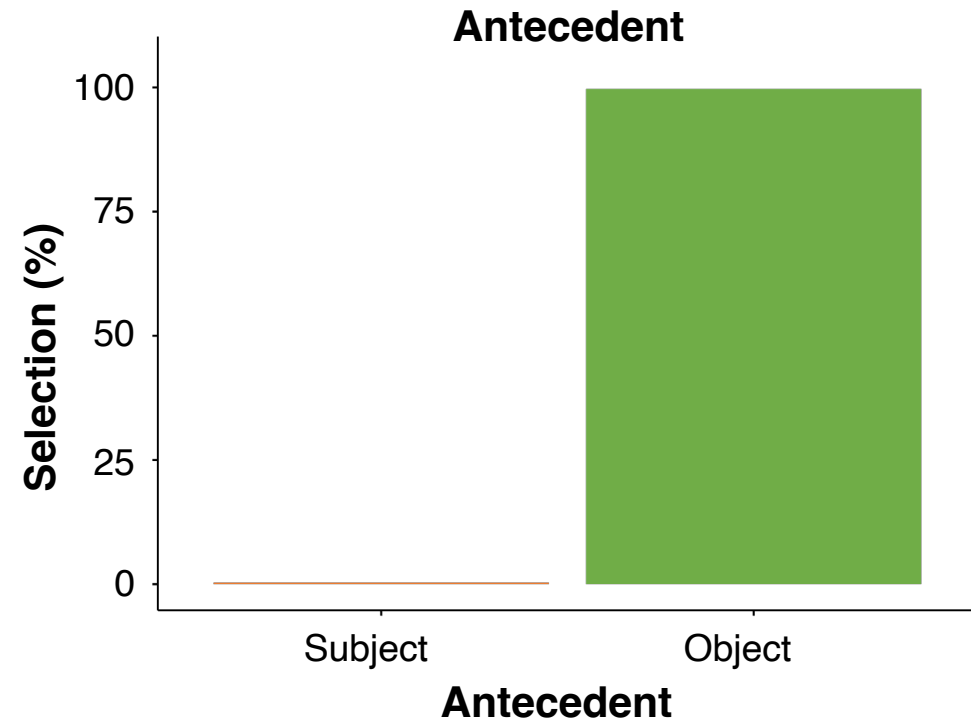
# Experimental manipulation

- (i) Sophia **told** Amanda **that** she likes learning new languages.
- (ii) Sophia **asked** Amanda **if** she likes learning new languages.

Sophia told Amanda that she likes learning new languages.



Sophia asked Amanda if she likes learning new languages.



$n = 54$ ,  $M_{age} = 34.54$  years

24 critical trials, 24 filler trials



# Findings

- Judgments reflect extremely robust effect of perspective taking
- No attentional bias favouring subject antecedent

# What about object pronouns?

so far, **subject** pronoun:

Sophia told Amanda that **she** likes learning new languages.

version with **object** pronoun:

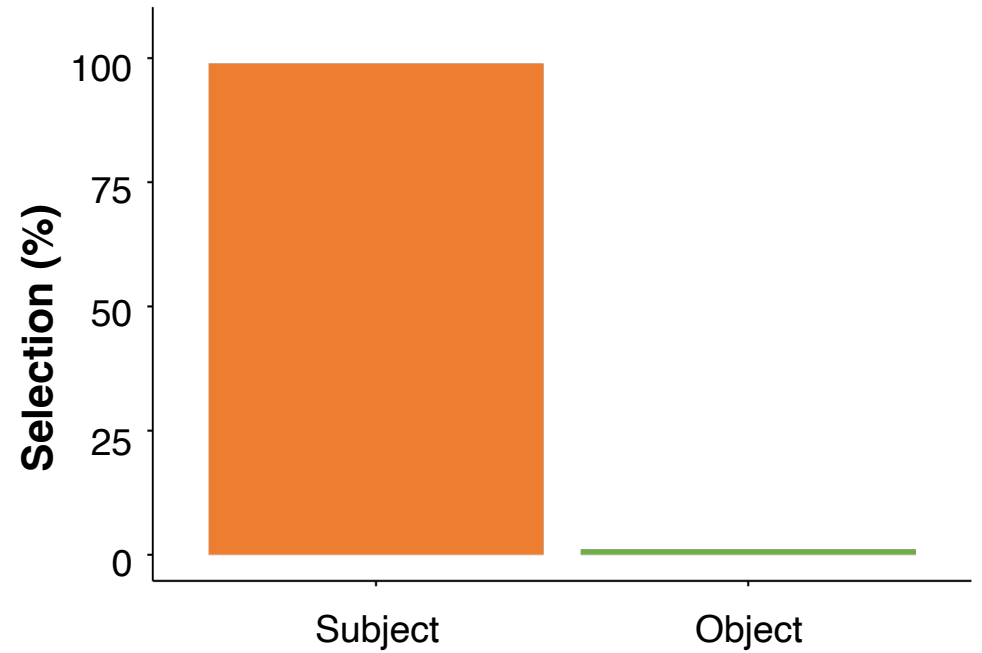
Nina told Mary that modern art interests **her** more than classics.

# Experiment 2: Object Pronoun Judgment Task

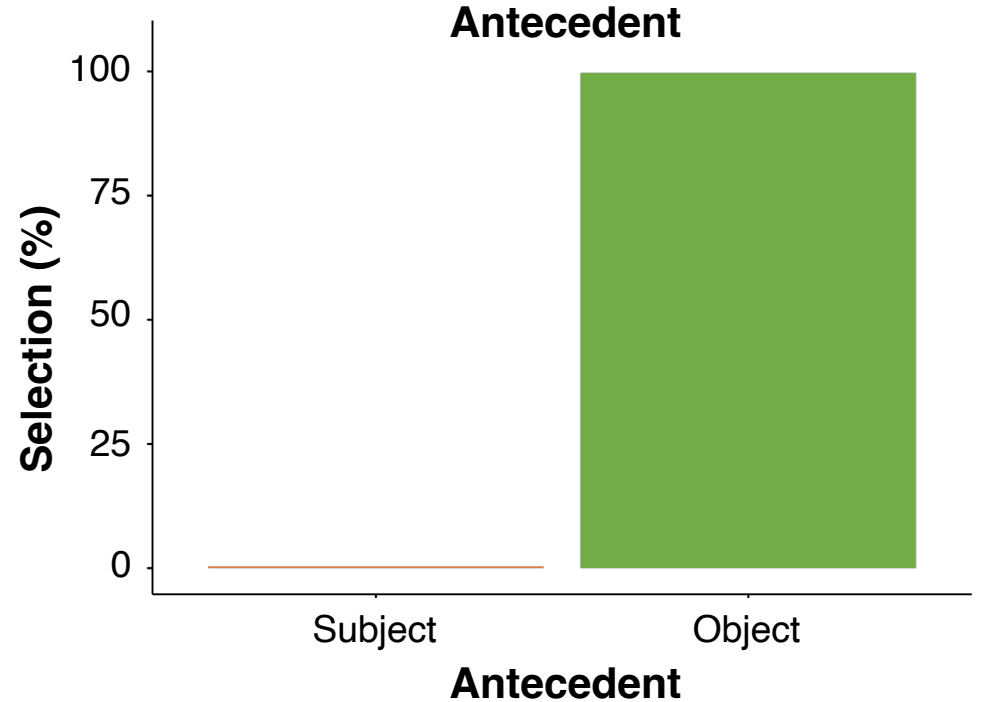
# Experimental manipulation

- (i) Nina **told** Mary **that** modern art interests her more than classics.
- (ii) Nina **asked** Mary **if** modern art interests her more than classics.

Nina told Mary that modern art interests her more than classics.



Nina asked Mary if modern art interests her more than classics.



$n = 54$ ,  $M_{age} = 33.83$  years

24 critical trials, 24 filler trials

# Interim Discussion

Judgment tasks with ambiguous pronouns:

- showed very robust effect of perspective taking for both subject and object pronouns!
- no effect of order-of-mention/grammatical role ranking
- highlights the role of perspective reasoning in pronoun resolution

(see also Smyth, 1995; Kaiser et al., 2009; Kaiser, 2015)

# What information are readers using?

- Pragmatics, commonsense reasoning about character knowledge?
- Superficial cues, like stored verb-driven frames?

*NP*<sub>1</sub> told *NP*<sub>2</sub> [that] ... *PRONOUN*<sub>1</sub> ...

*NP*<sub>1</sub> asked *NP*<sub>2</sub> [if] ... *PRONOUN*<sub>2</sub> ...

Molly asked Hana if she had enough cash to buy a sandwich.



Molly asked Hana<sub>y</sub> if she<sub>y</sub> had enough cash to buy a sandwich.

Molly, who is unfamiliar with Japanese currency, was talking to her  
tour guide, Hana.

Molly asked Hana if she had enough cash to buy a sandwich.

Molly, who is unfamiliar with Japanese currency, was talking to her  
tour guide, Hana.

Molly<sub>x</sub> asked Hana if she<sub>x</sub> had enough cash to buy a sandwich.

# Experiment 3: Contextual Judgment Task

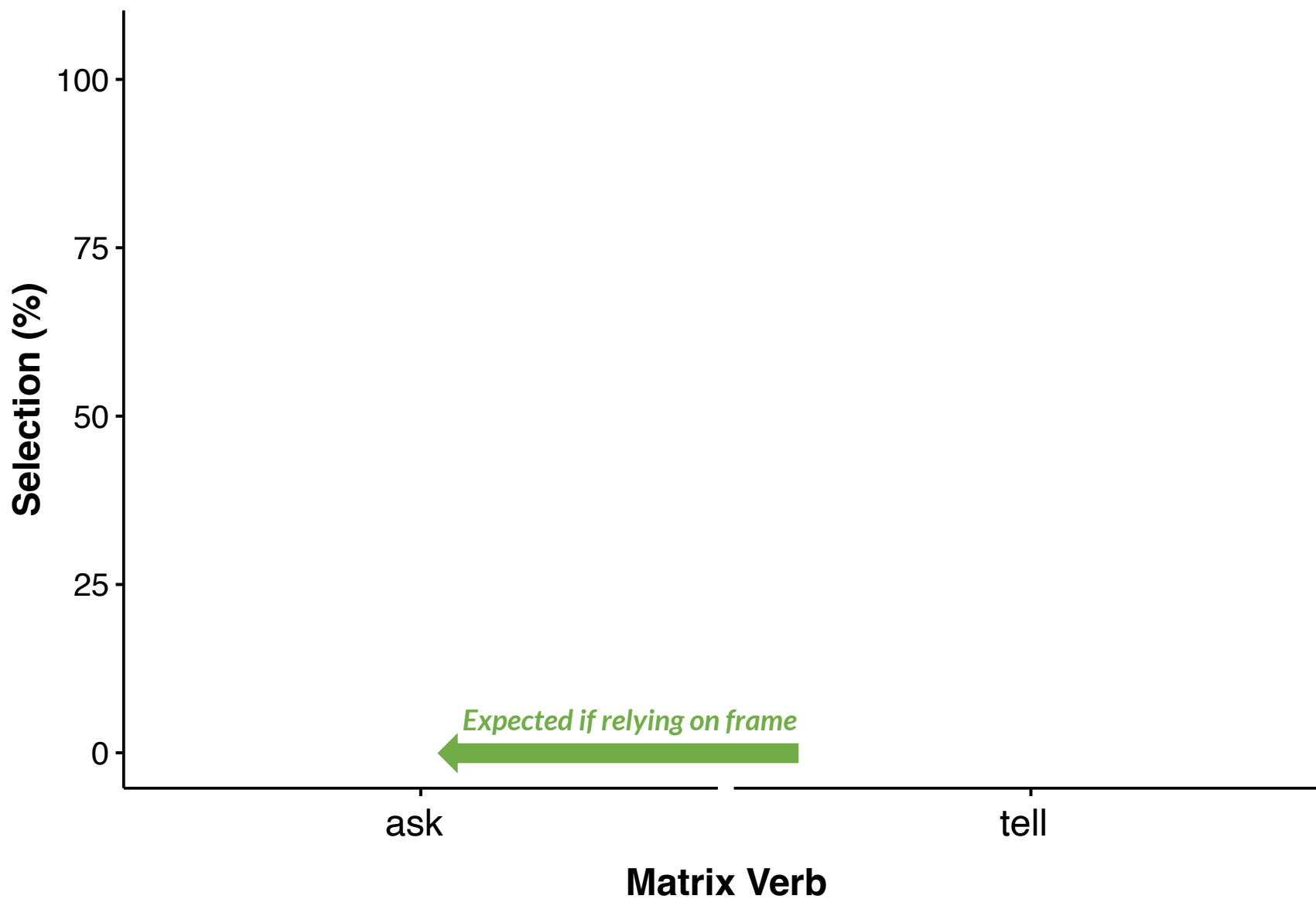
## **Ask:**

Molly, who is unfamiliar with Japanese currency, was talking to her tour guide, Hana.  
Molly asked Hana if she had enough cash to buy a sandwich.

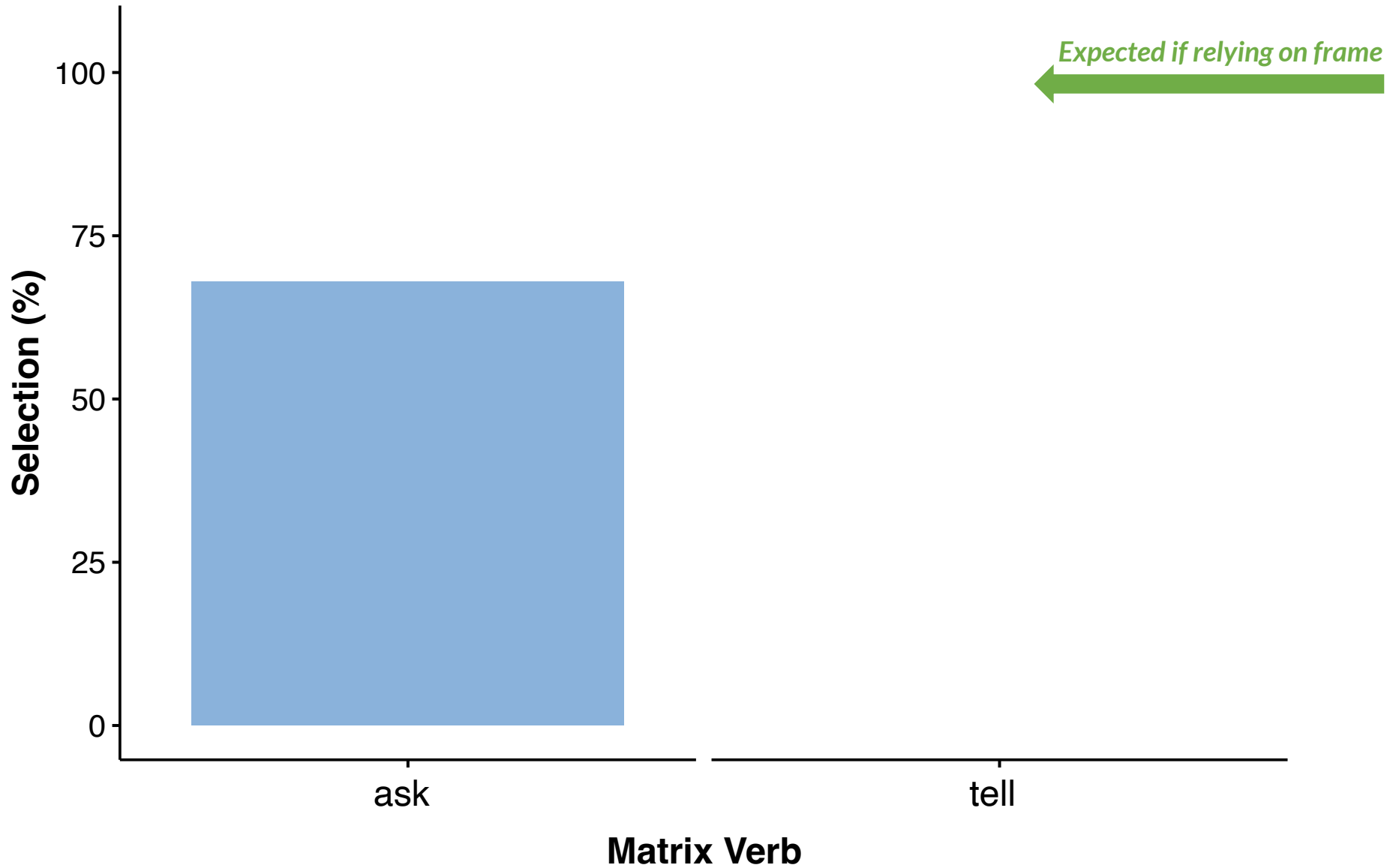
## **Tell:**

Molly, a tour guide, was talking to Hana, who is unfamiliar with Japanese currency.  
Molly told Hana that she had enough cash to buy a sandwich.

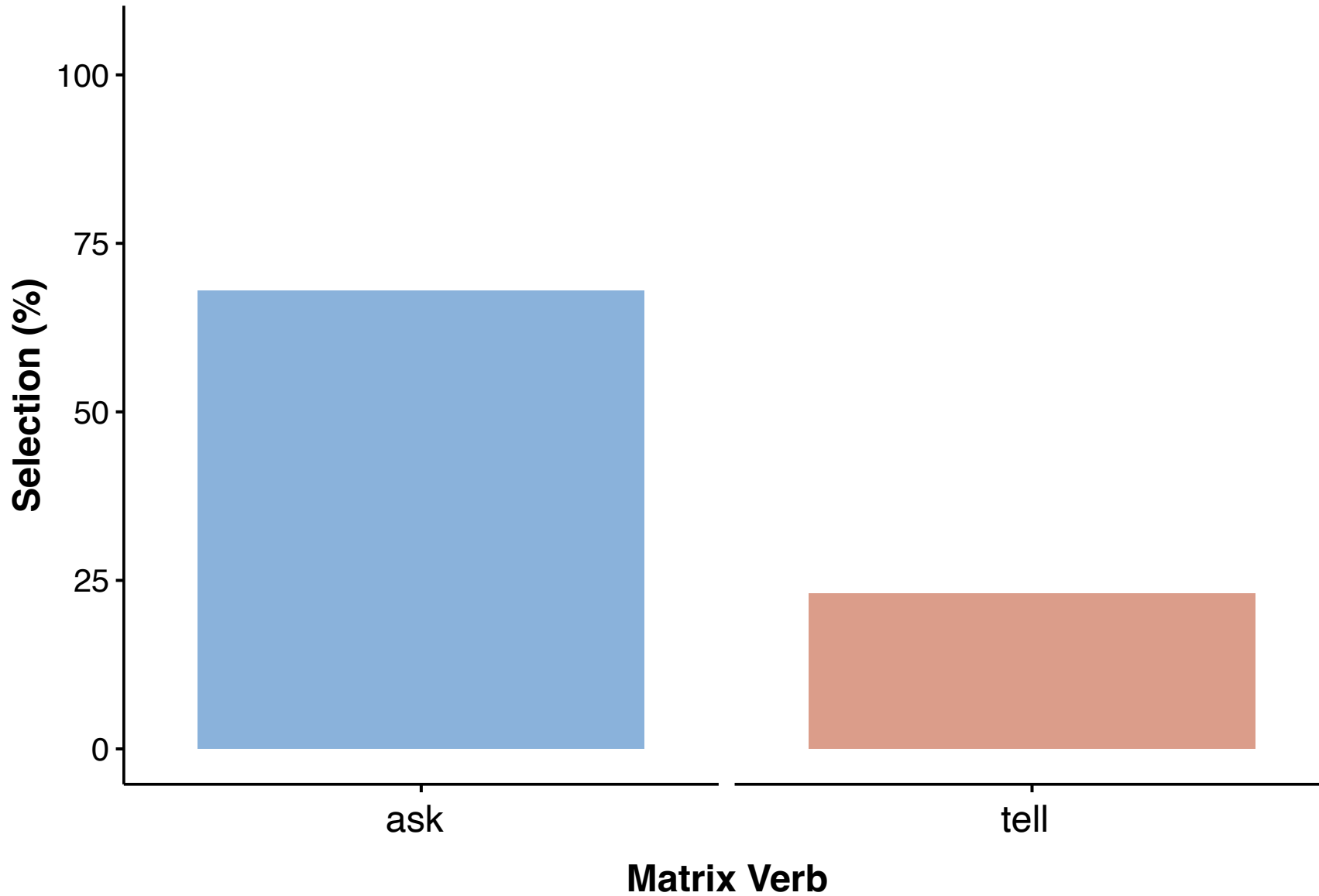
# Subject antecedent selections (with context sentences)



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# Subject antecedent selections (with context sentences)





# Conclusion:

- Pronoun resolution incorporates **robust perspective-taking** that involves commonsense reasoning
- Experiment 3 (contextual judgment task):  
Findings **not** based on stored verb-driven constructions

# Thank you!



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