

Which alternatives matter? The role of QUD and speaker knowledge in conditionals

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Introduction

We investigate the role of contextual alternatives in the interpretation of conditional statements.

Conditional statements often convey meanings that extend beyond their literal content:

"If Mary mows the lawn, she will receive \$5."

$p \rightarrow q$ implies $\neg (r \rightarrow q)$ for any salient alternative condition r in opposition to p

This phenomenon, known as Conditional Perfection (CP) [1] occurs when conditionals like "if p , q " are interpreted as "if and only if p , q ", leading listeners to treat them as biconditionals.

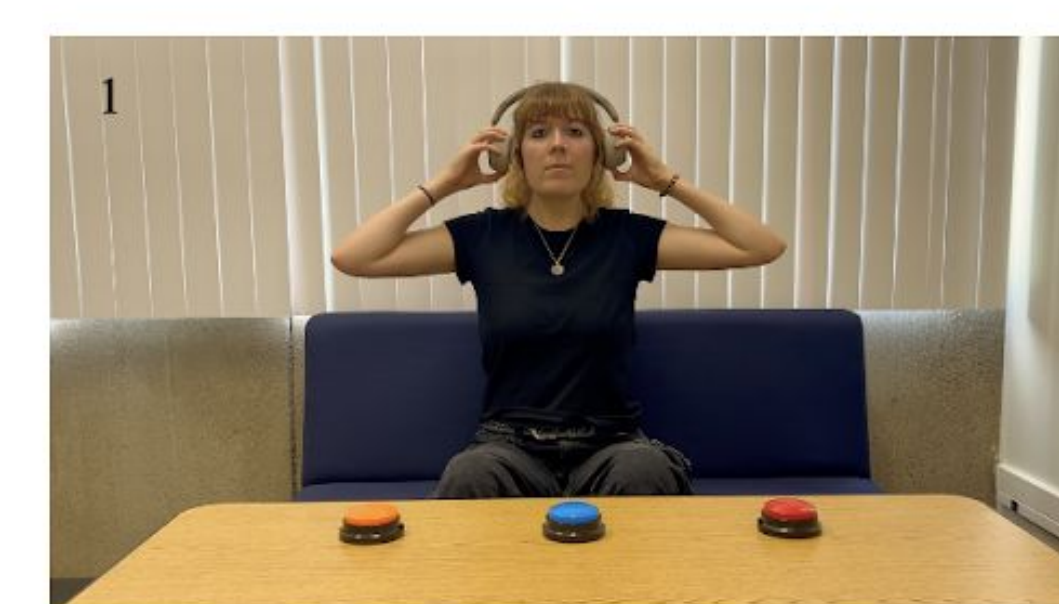
CP arises when the condition stated in the antecedent p is understood to exhaust the set of conditions sufficient for the consequent q [2].

Background

- CP is often treated as a type of pragmatic strengthening, either grounded in Gricean reasoning [3] or formal grammatical algorithms [4, 5]
- Quantity implicatures are shaped by:
 - (i) the contextually defined question under discussion (QUD), which can limit the domain of exhaustification thus blocking quantity implicatures [2, 6]
 - (ii) the knowledge-state of the speaker [7]
- CP arises in contexts where there is a knowledgeable speaker who is required to provide an exhaustive answer to the question "Under what conditions does q occur?" (vs "What happens if p ?") [2]
- QUD effects on conditional perfection have been tested, findings mixed (strong effect, Farr, 2011; little/no effect, Cariani & Rips 2023; Grusdt et al. 2023)
- Speaker knowledge effects on conditionals has never been tested (but see [8, 9, 10] for scalar implicatures)

Exp 1: The effect of QUD

98 Adults (Prolific), hosted on PClbex, naturalistic inference task, where participants made decisions based on how they interpreted the conditional statement.



Mary puts her headphones on.



Mary presses all three buttons and listens.

Another person asks one of the three questions:

Antecedent-focused: Which of these buttons will play a dog sound?

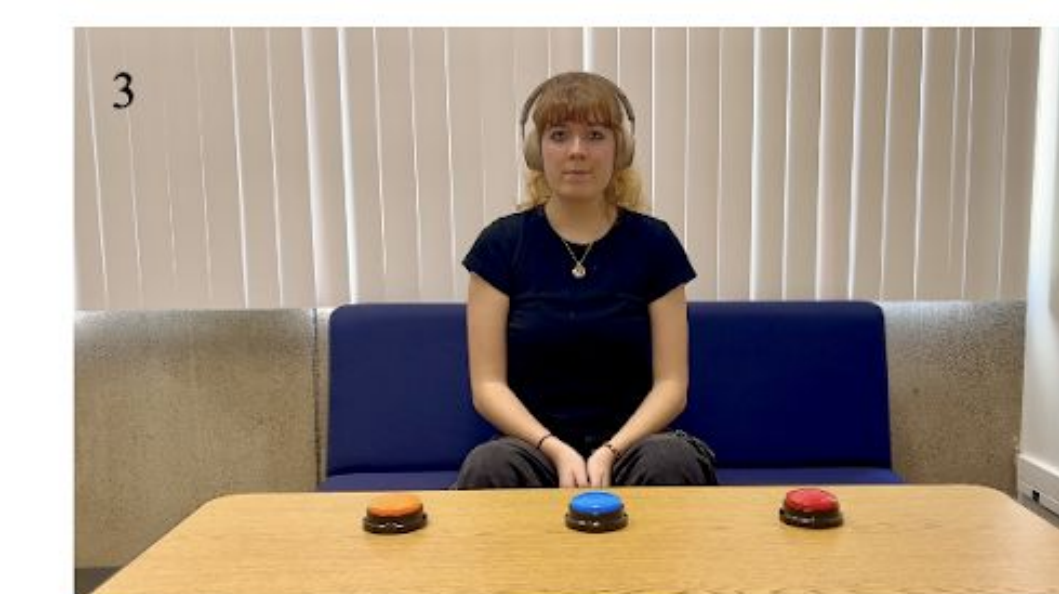
Consequent-focused: What will I hear if I press the blue button?

Neutral: What will I hear if I press the buttons?

Critical question: Do you think the orange button plays a dog sound?
(Yes / No / Can't tell)

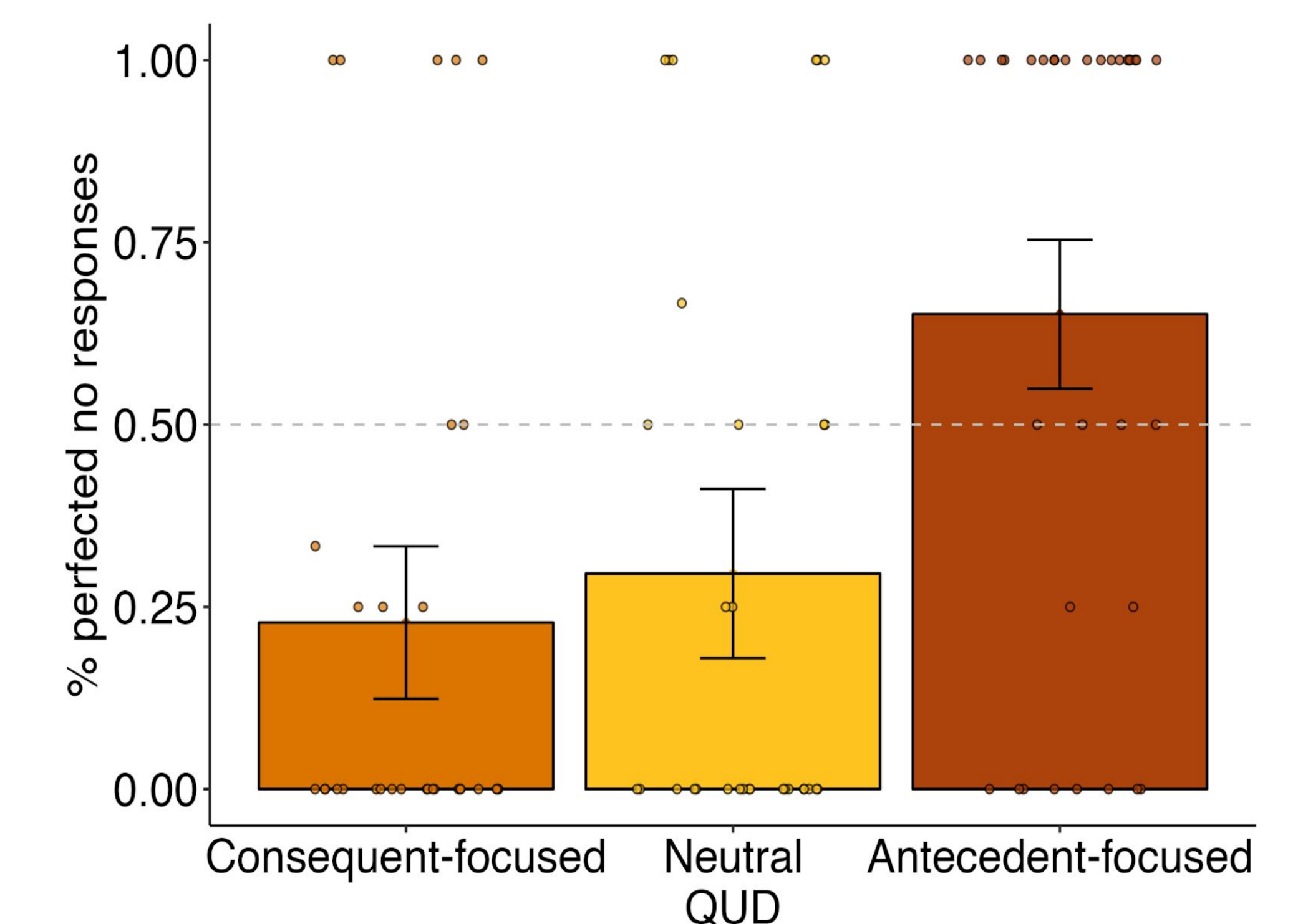
If participants interpret the conditional

- literally:** more "Can't tell" responses
- pragmatically:** more "No" responses
- "Yes" responses were possible but not expected.



Mary responds:

If you press the blue button, it will play a dog barking.

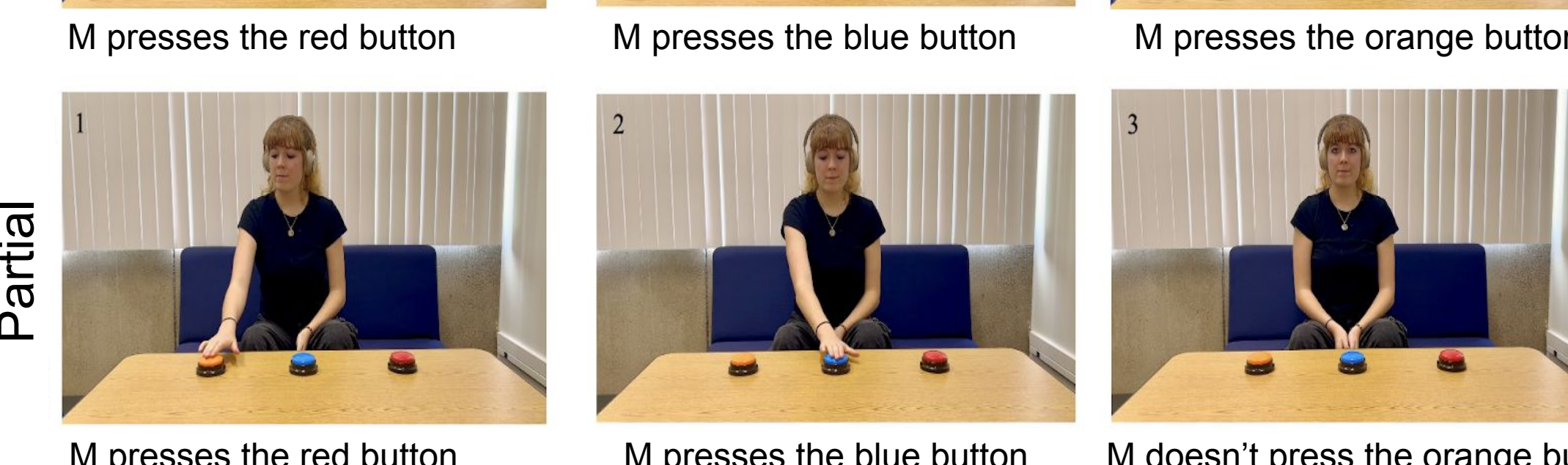
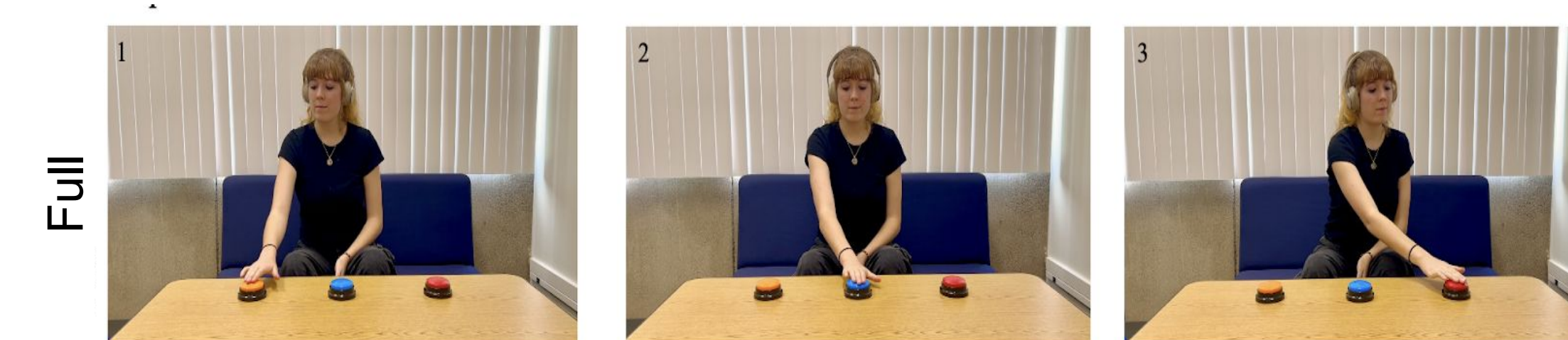


Experiment 1:

When the QUD focused on the **antecedent**, participants were more likely to interpret the conditional as exhaustive. When the QUD focused on the **consequent**, CP was less likely.

Exp 2: Speaker knowledge

72 Adults (Prolific), Speaker Knowledge manipulated within-subjects



Conditions:

Full knowledge: M tested all three buttons.

Partial knowledge: M tested two buttons.

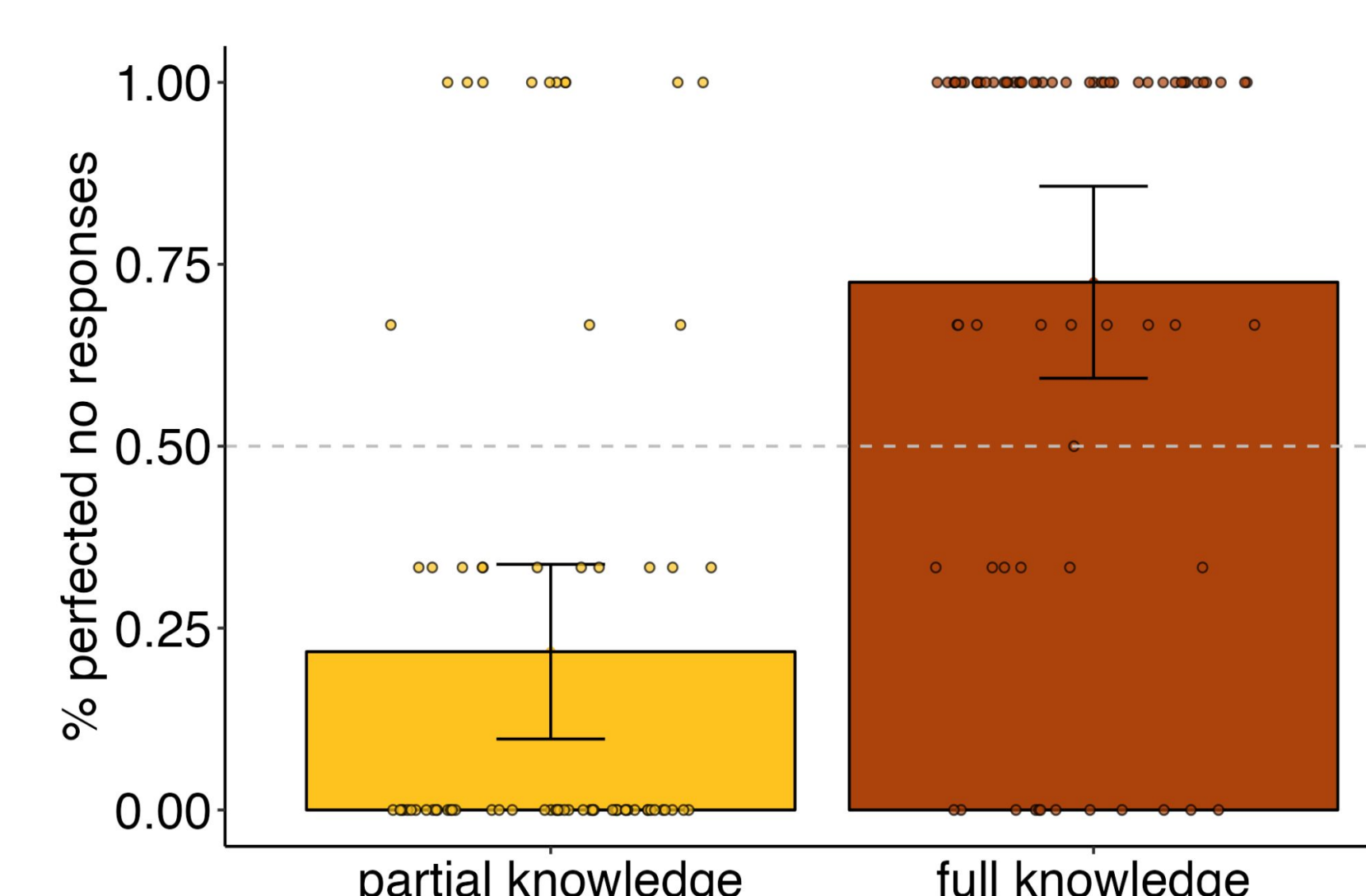
Antecedent-focused: Which of these buttons will play a dog sound?

If you press the blue button, it will play a dog barking.

Critical question: Do you think the orange button plays a dog sound?
(Yes / No / Can't tell)

Experiment 2:

CP was more likely when the speaker demonstrated **full knowledge** of all relevant antecedent statements compared to when the speaker's knowledge was **partial**.



Discussion

- Robust evidence that both QUD and speaker knowledge influence the interpretation of conditional.
- CP as a quantity implicature through exhaustification:** wherein the speaker is presumed to have mentioned all relevant conditions.
- Unlike other implicatures, CP arises even when there is no lexically defined set of alternatives.
- Implications for development of conditional reasoning in children.

References: [1] Geis & Zwicky (1971); [2] von Stechow (2001); [3] Horn (1972); [4] Chierchia (2004); [5] Fox (2007); [6] Hirschberg (1985); [7] Sauerland (2004); [8] Bergen & Grodner (2012); [9] Hochstein et al. (2018); [10] Bale et al. (2025).