

# Testing the time course of conditional inferences

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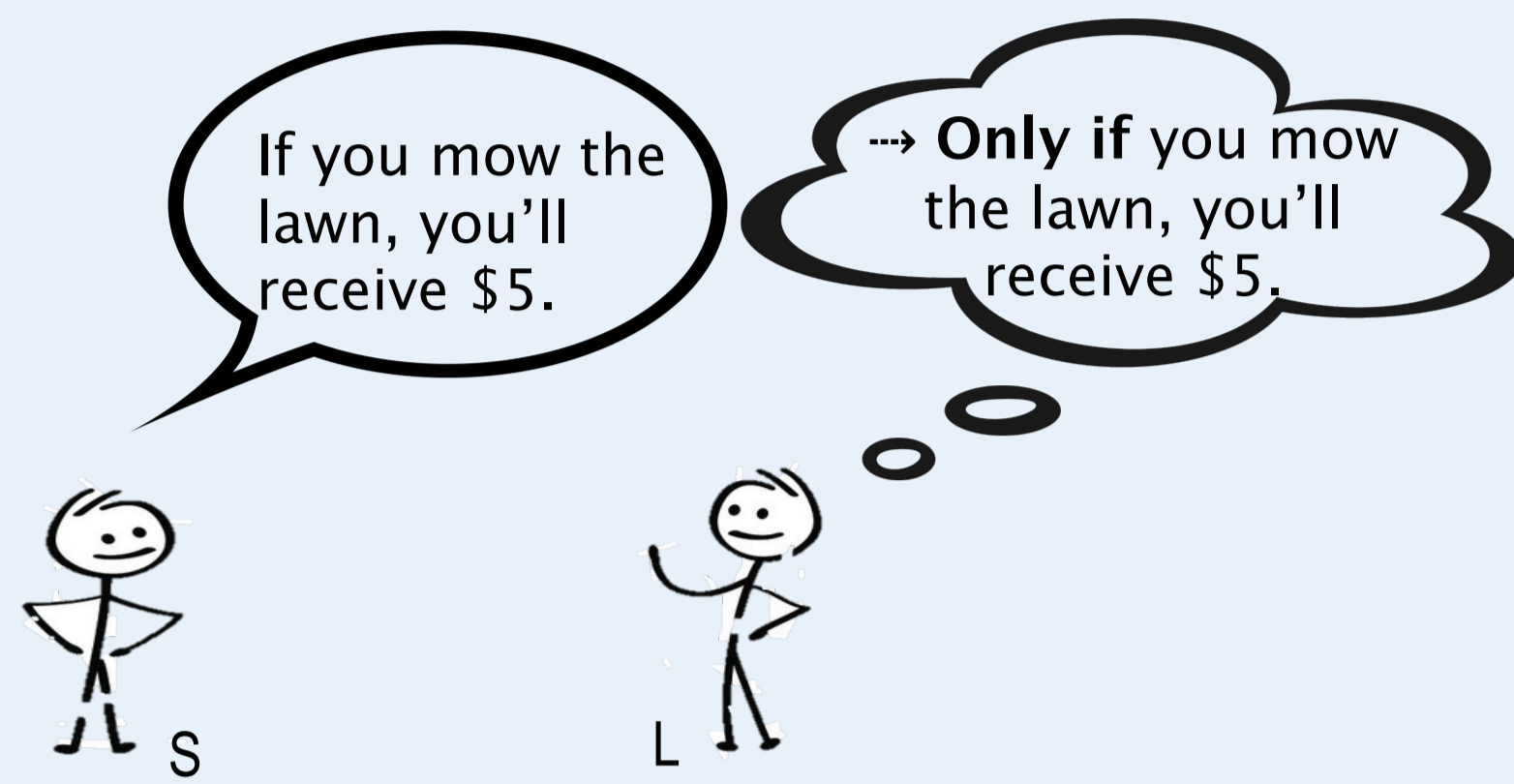
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background

Conditional perfection<sup>[1]</sup>:



CP is limited in its scope:

- Defeasible
  - e.g., *You'll also receive \$5 if you do the dishes.*
- Non-perfectible conditionals (i.e., biscuit conditionals<sup>[2]</sup>)
  - e.g., *If you are hungry, there are biscuits in the cupboard.*

Our aim:

- To investigate the processes that are involved in CP by exploiting the well-attested difference between perfectible and biscuit conditionals.

Previous accounts:

- CP arises from pragmatic reasoning as a form of 'scalar implicature'<sup>[3,4]</sup>
  - takes time and cognitive effort<sup>[5, 6, 7]</sup>
- Few studies have tested whether CP has hallmark features of implicature & have conflicting results.<sup>[8,9,cf.10]</sup>

We ask:

Does CP incur additional processing cost relative to its weak, logical meaning?

Yes: L starts with the logical meaning, then enriches it via implicature (*CP-later hypothesis*)

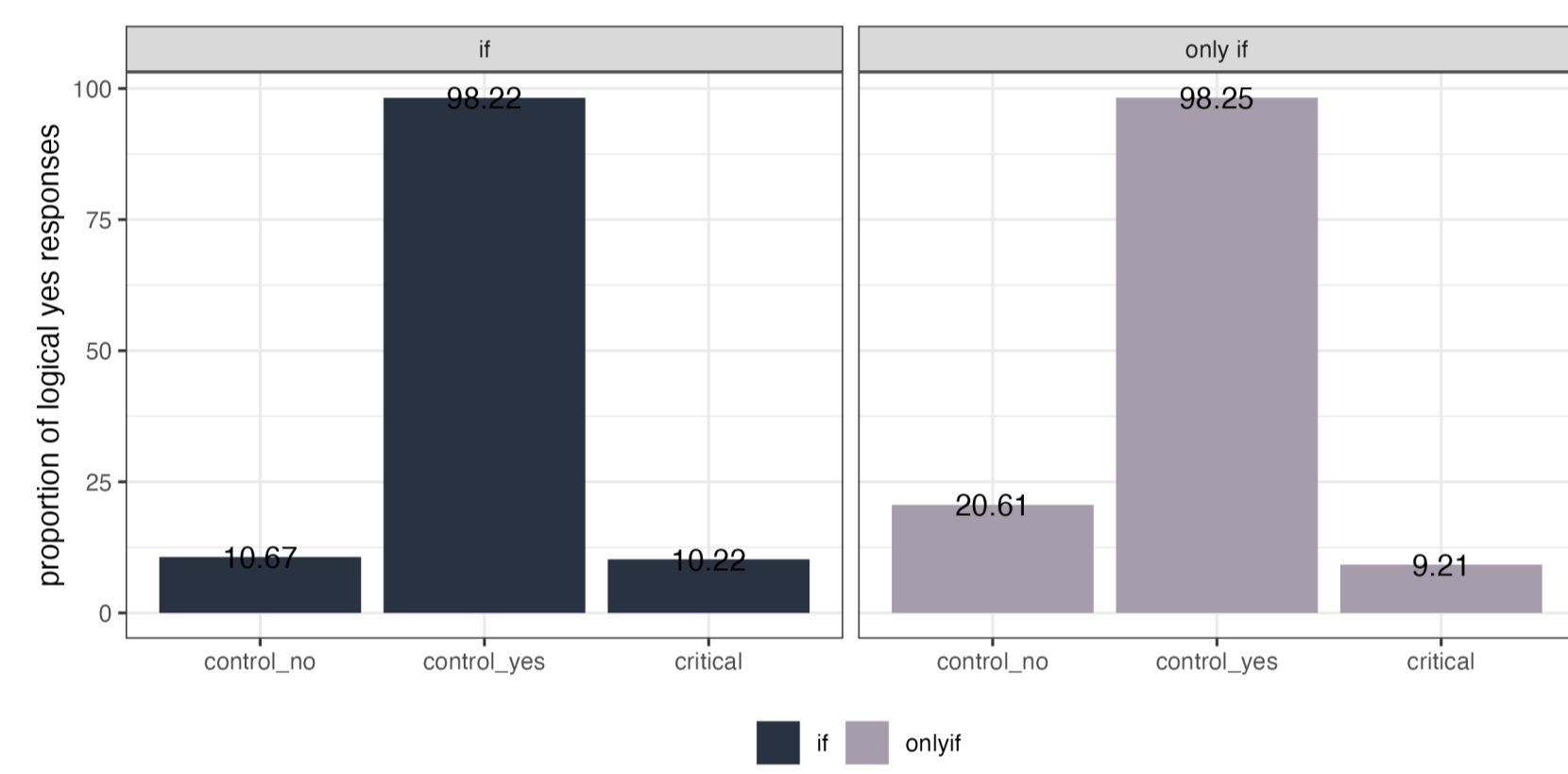
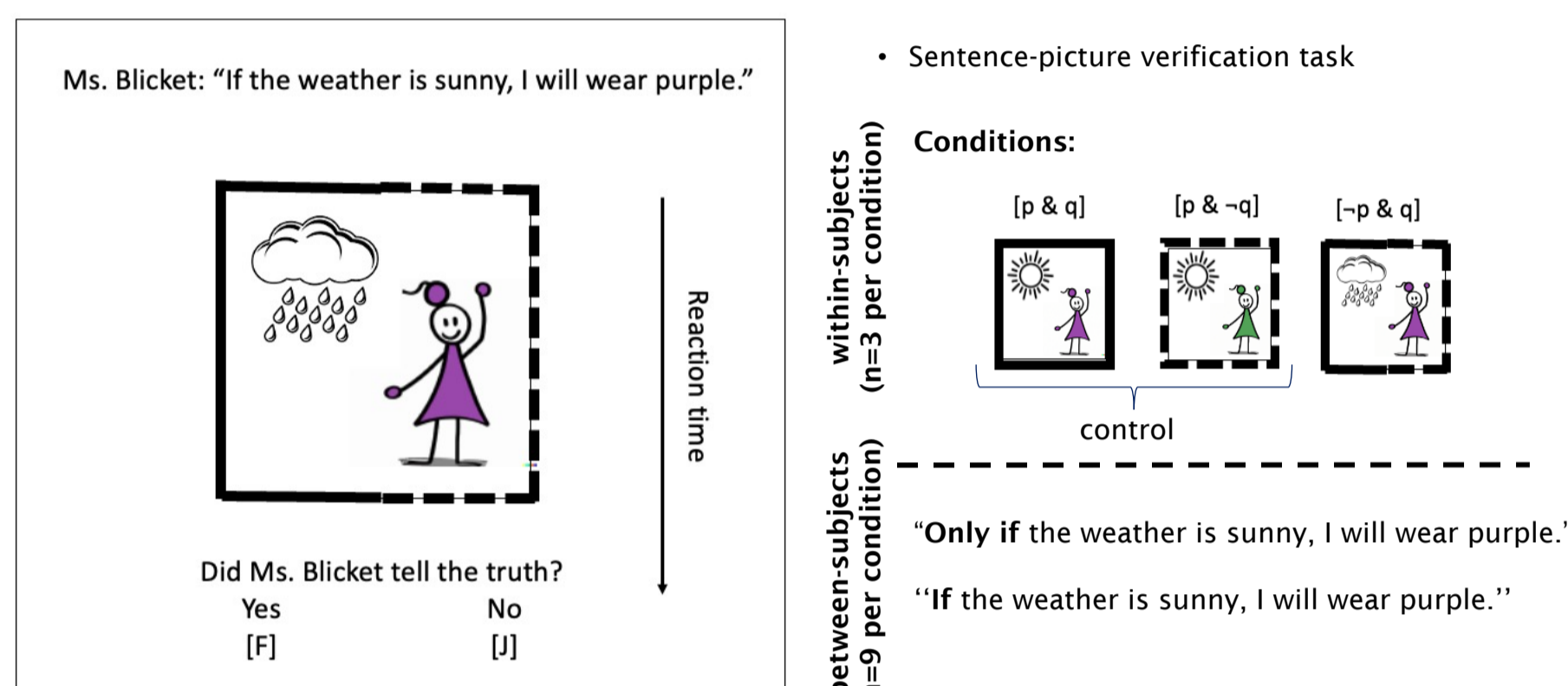
- an enrichment cost (from logical to perfected meaning)

No: L instead *begins* with a perfected (i.e., only-if) meaning (*CP-first hypothesis*)

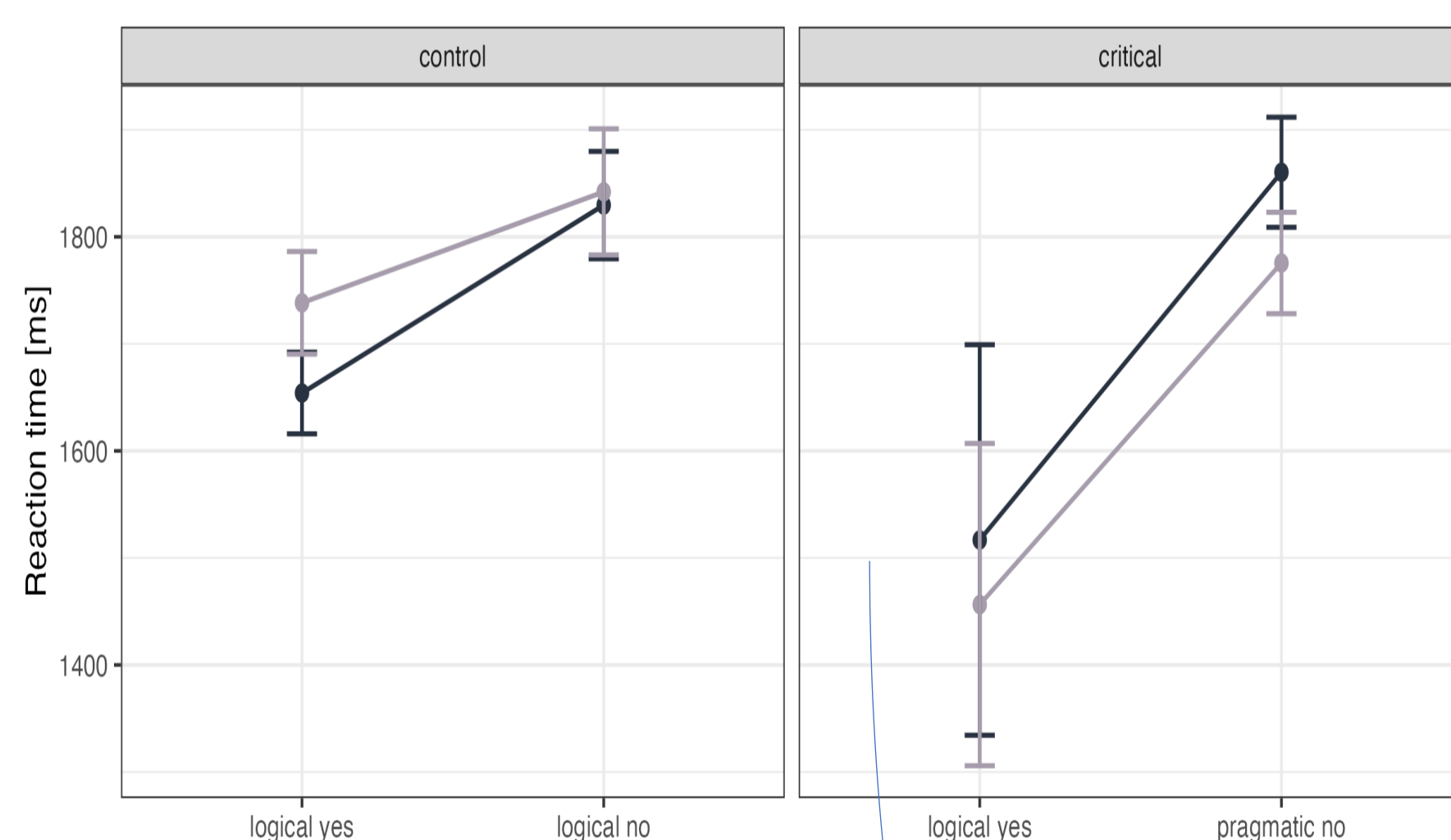
- a weakening cost (from perfected to logical meaning)

methods

## Experiment 1: Standard conditionals (N=151)



- A pronounced preference for pragmatic responses in if-sentences and only if-sentences (89.78%)

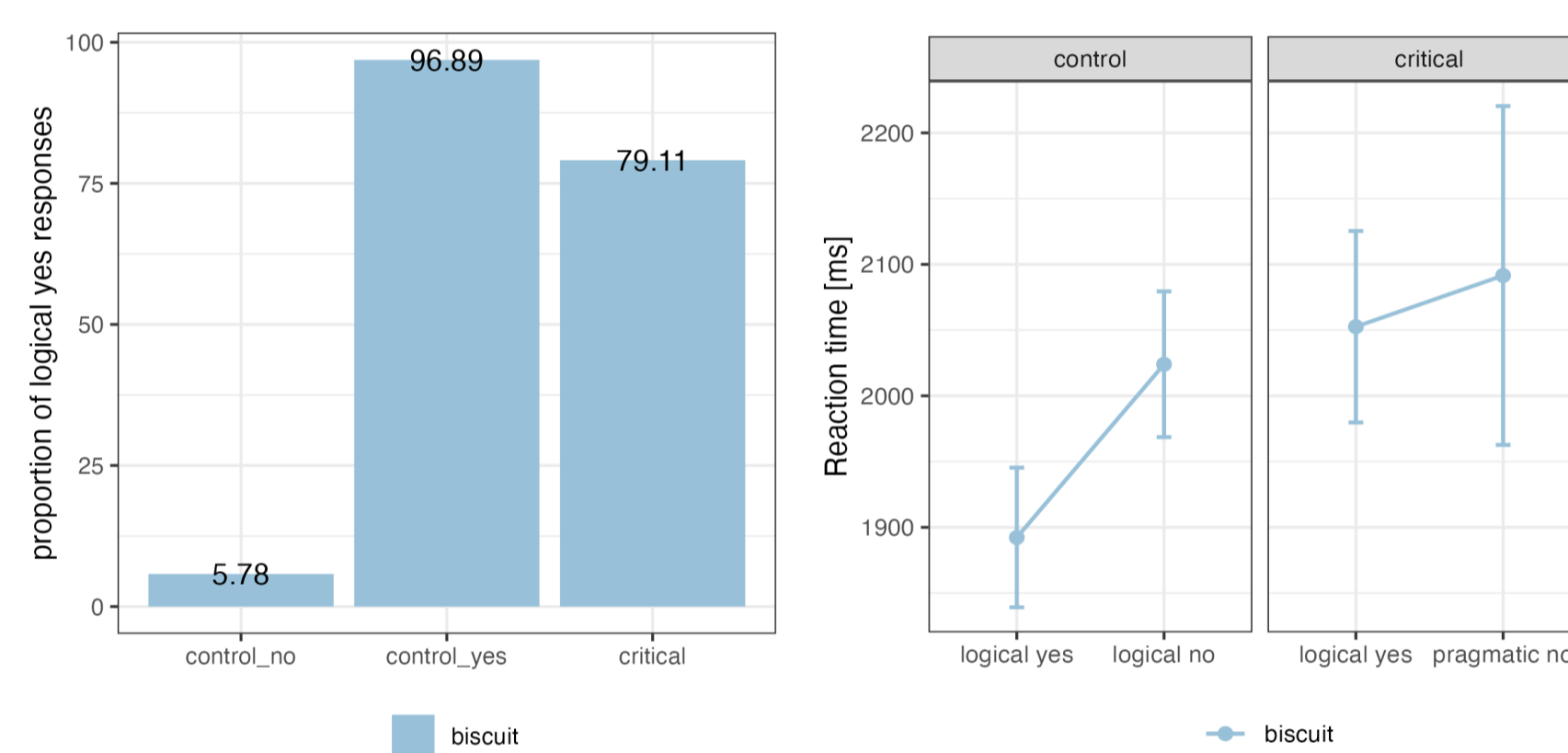
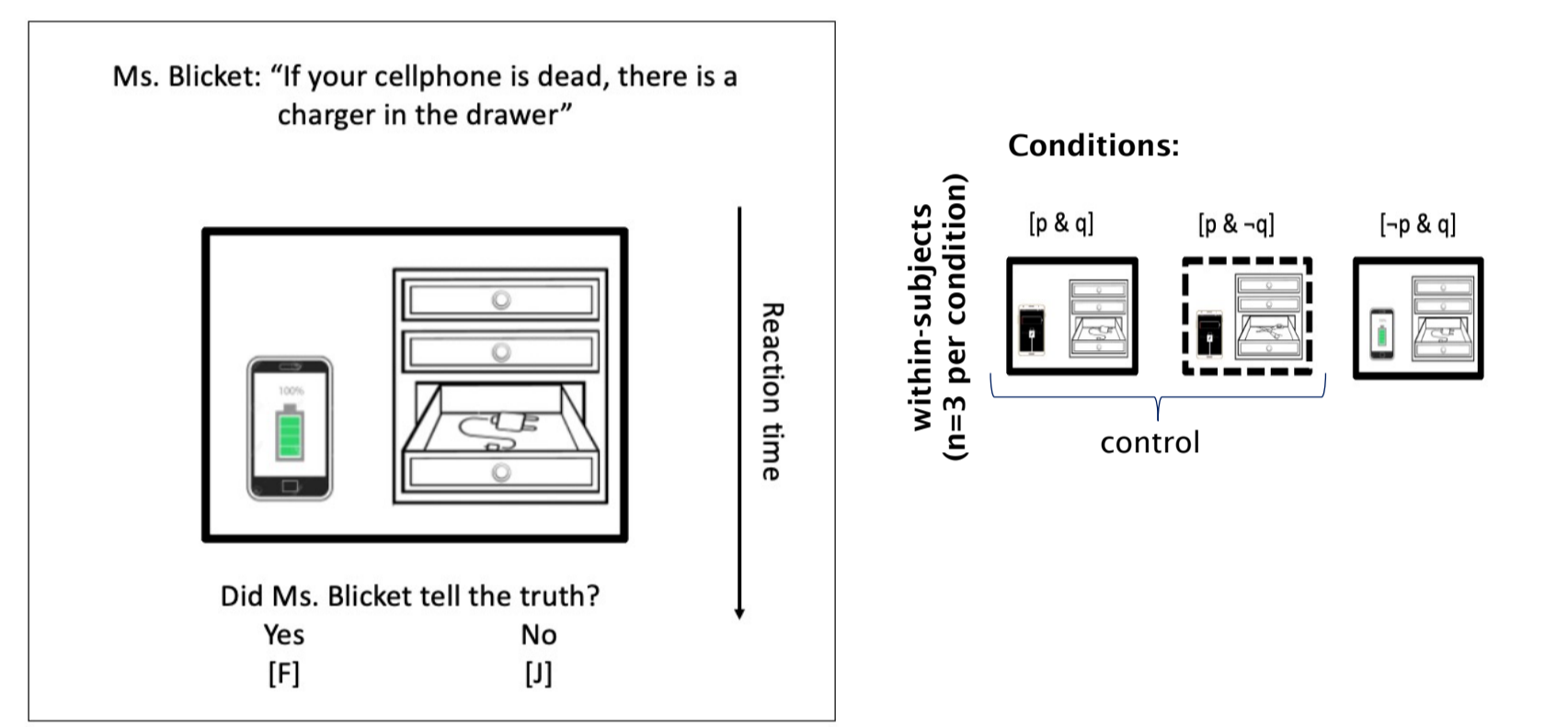


• IF = ONLY IF

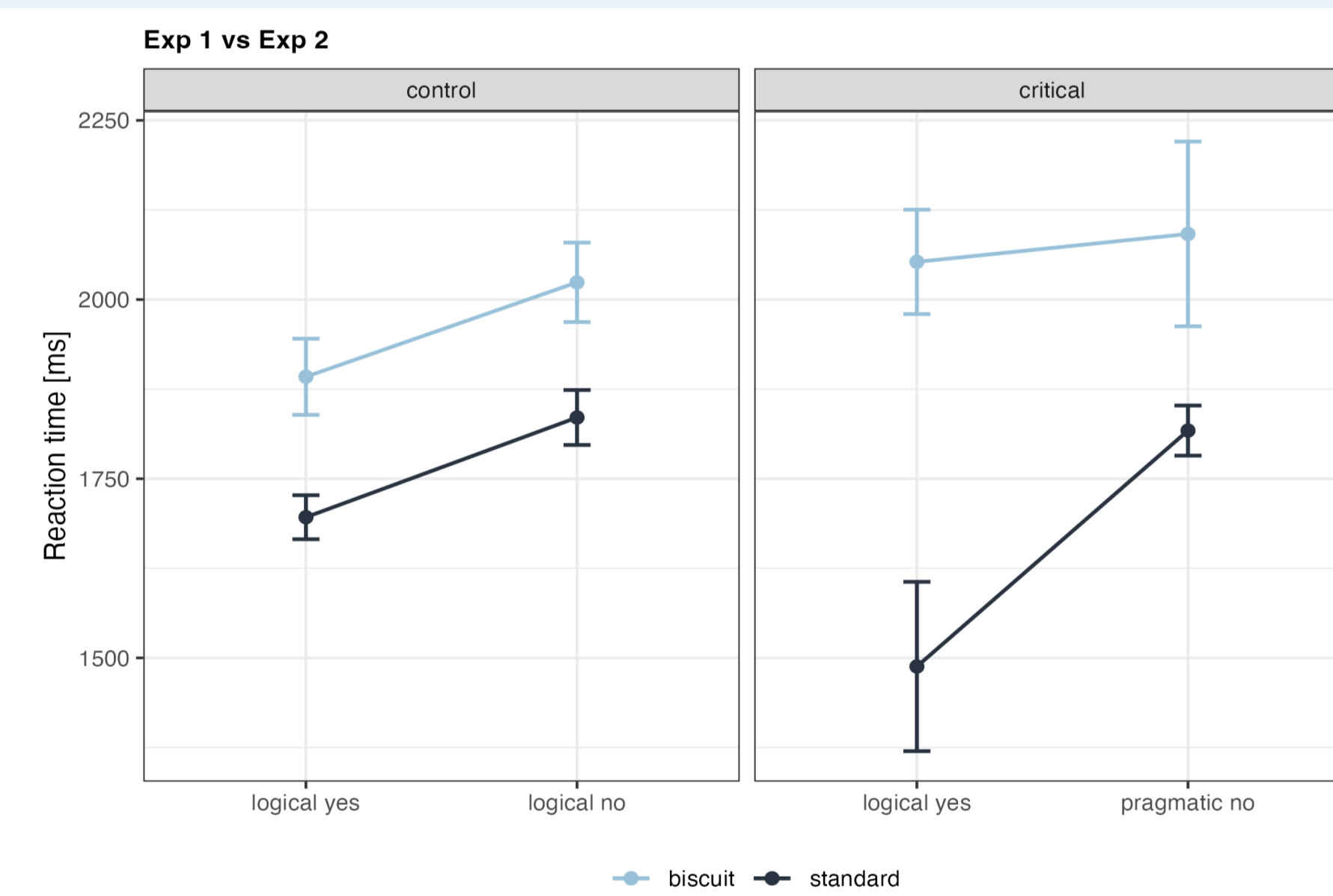
• STANDARD<sub>CRITICAL</sub> = STANDARD<sub>CONTROL</sub>

- No enrichment cost; preliminary evidence for the CP-first hypothesis

## Experiment 2: Biscuit conditionals (N=75)



- In contrast to Exp 1, responses were compatible with a logical interpretation (79.11%)

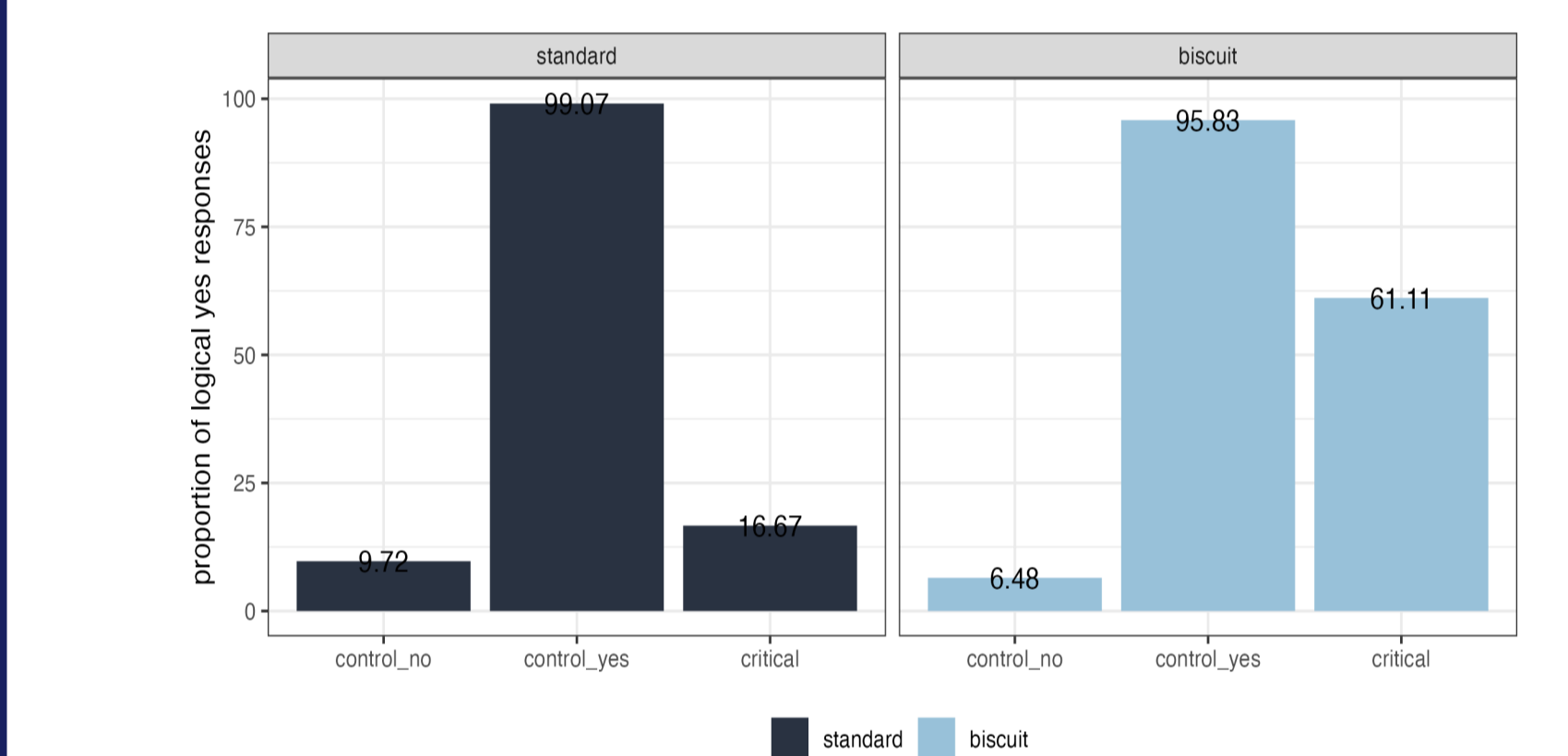
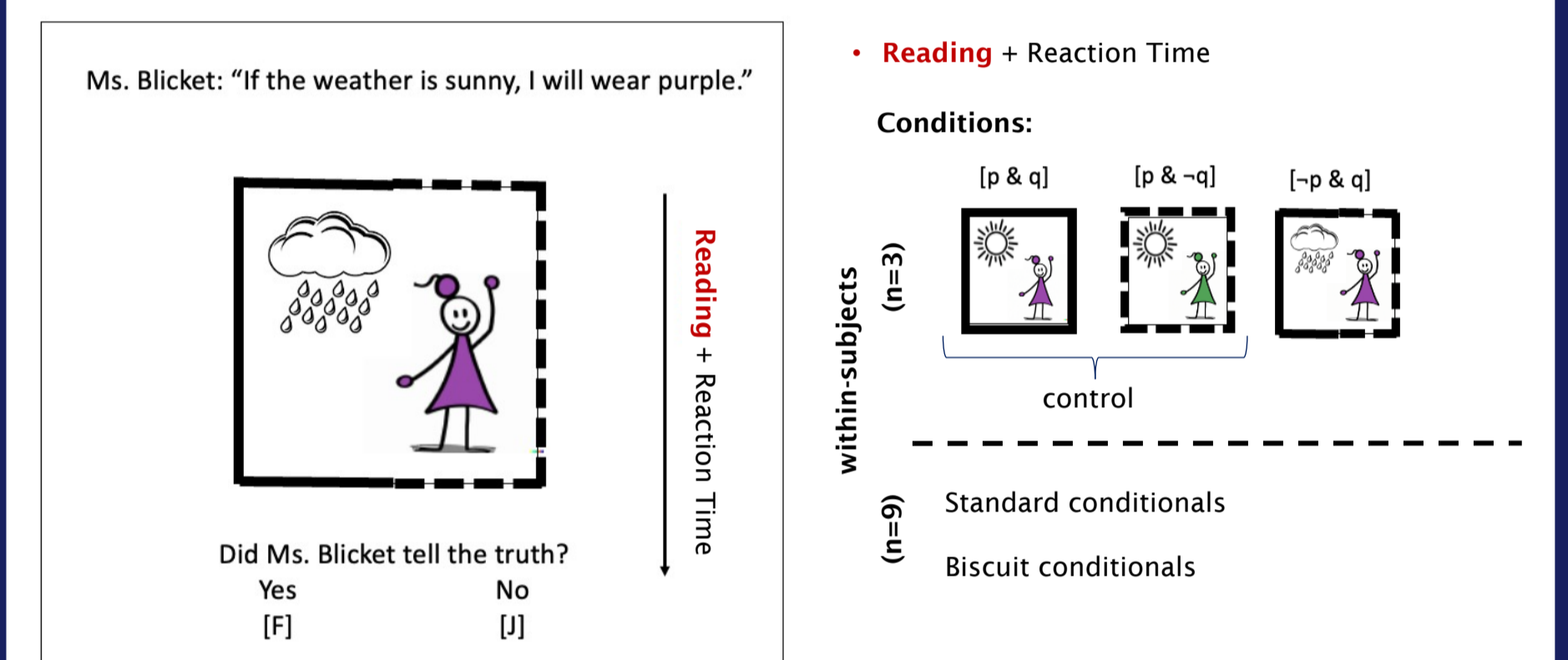


• BISCUIT > STANDARD

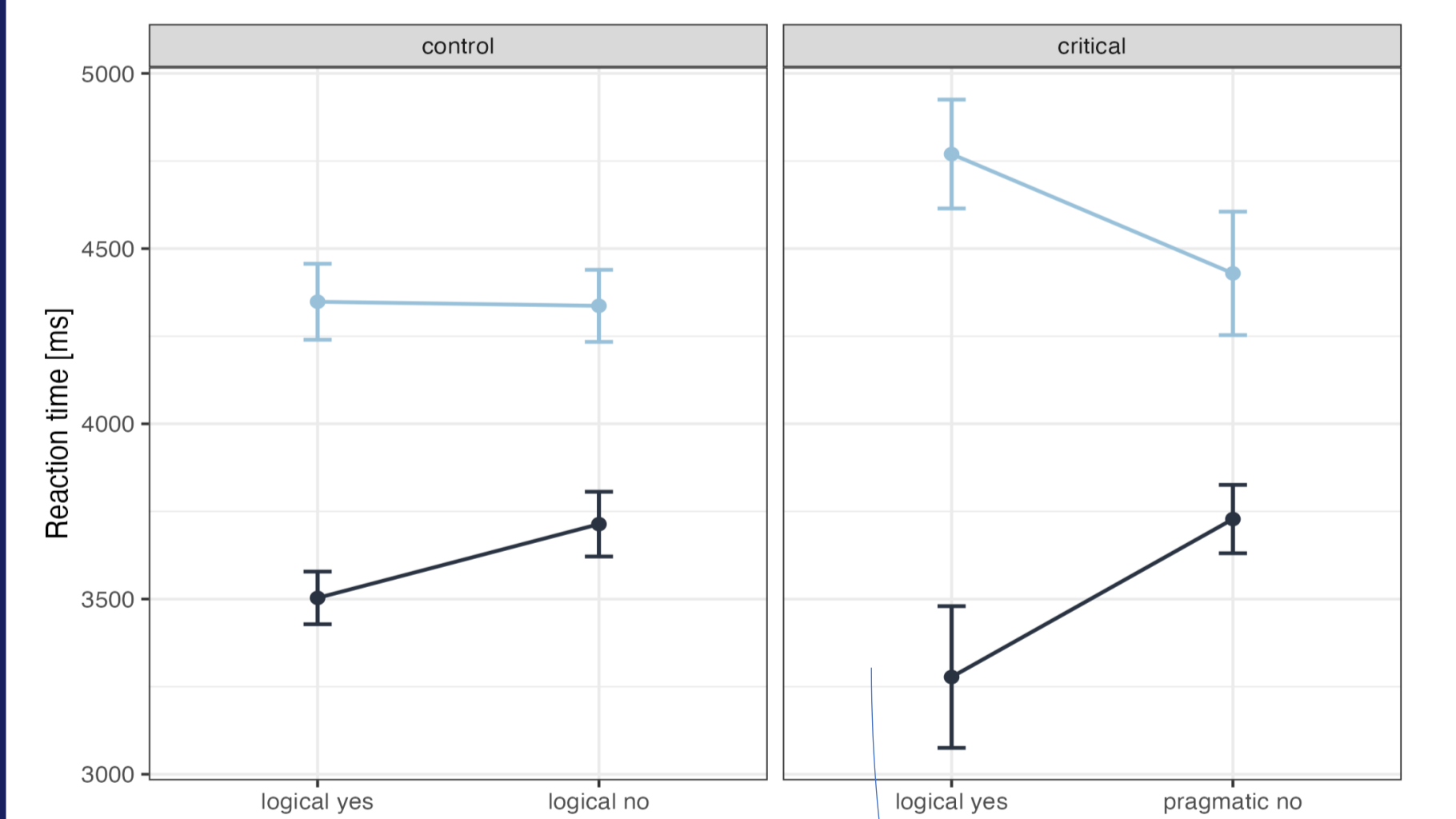
• STANDARD<sub>CRITICAL</sub> = STANDARD<sub>CONTROL</sub>

- BISCUIT<sub>CRITICAL</sub> = BISCUIT<sub>CONTROL</sub>
  - No weakening cost, consistent with CP-later hypothesis

## Experiment 3: Standard vs Biscuit conditionals (N=72)



- Pragmatic responses for standard conditionals (83.33%)
- Logical responses in biscuit conditionals (61.11%)



• BISCUIT > STANDARD

• STANDARD<sub>CRITICAL</sub> = STANDARD<sub>CONTROL</sub>

• BISCUIT<sub>CRITICAL</sub> > BISCUIT<sub>CONTROL</sub>

- Overall slower interpretation and weakening cost in biscuit conditionals, in line with the CP-first hypothesis

results

discussion

Summary: In three studies, we showed that

- CP is highly regularly computed in if-sentences, similar to only if-sentences.
- Biscuit conditionals are not susceptible to perfection.
- Listeners appear to *begin* with a perfected meaning and retreat to the weaker meaning if this is supported by context (CP-first hypothesis)

Present data in relation to existing accounts:

- **Challenges** standard Gricean accounts of implicature<sup>[11]</sup>
- **Compatible with** finding that some implicatures (e.g., 'exact' interpretation of numerals<sup>[12]</sup> & free-choice inferences<sup>[13]</sup>) are not associated with a processing cost<sup>[9]</sup>