Conditional inferences are derived without delay

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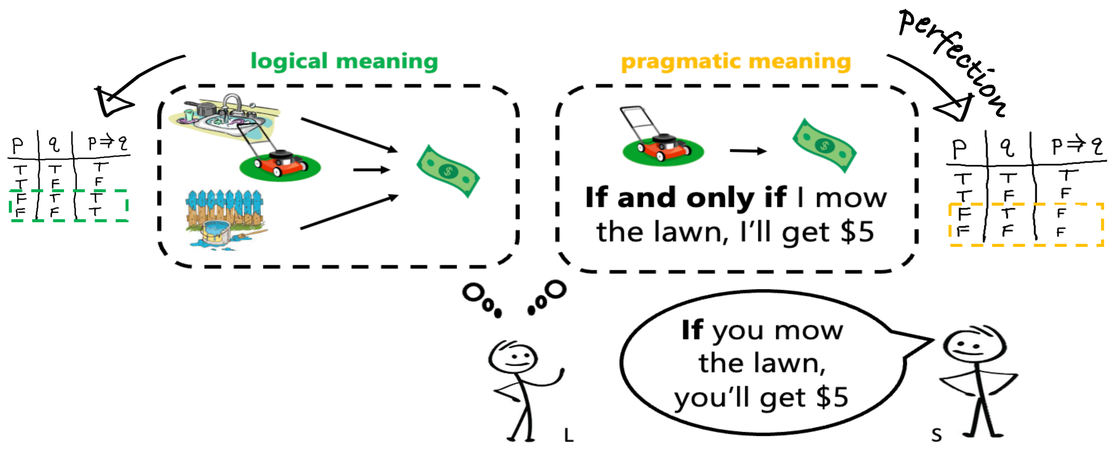
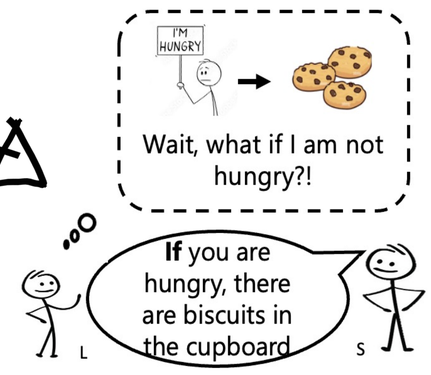
background

Conditional Perfection (CP): where language users violate the strict logical meaning of the conditional.[1]



CP is an implicature:

- Defeasible
  - e.g., You'll also receive $5 if you do the dishes.
- Non-perfectible conditionals
  - e.g., biscuit conditionals[2]



Previous accounts:

- CP arises from pragmatic reasoning as a form of 'scalar implicature'.[3,4]
  → takes time and cognitive effort[5, 6, 7]

We ask:
How do people arrive at the pragmatic interpretation as opposed to the logical one?

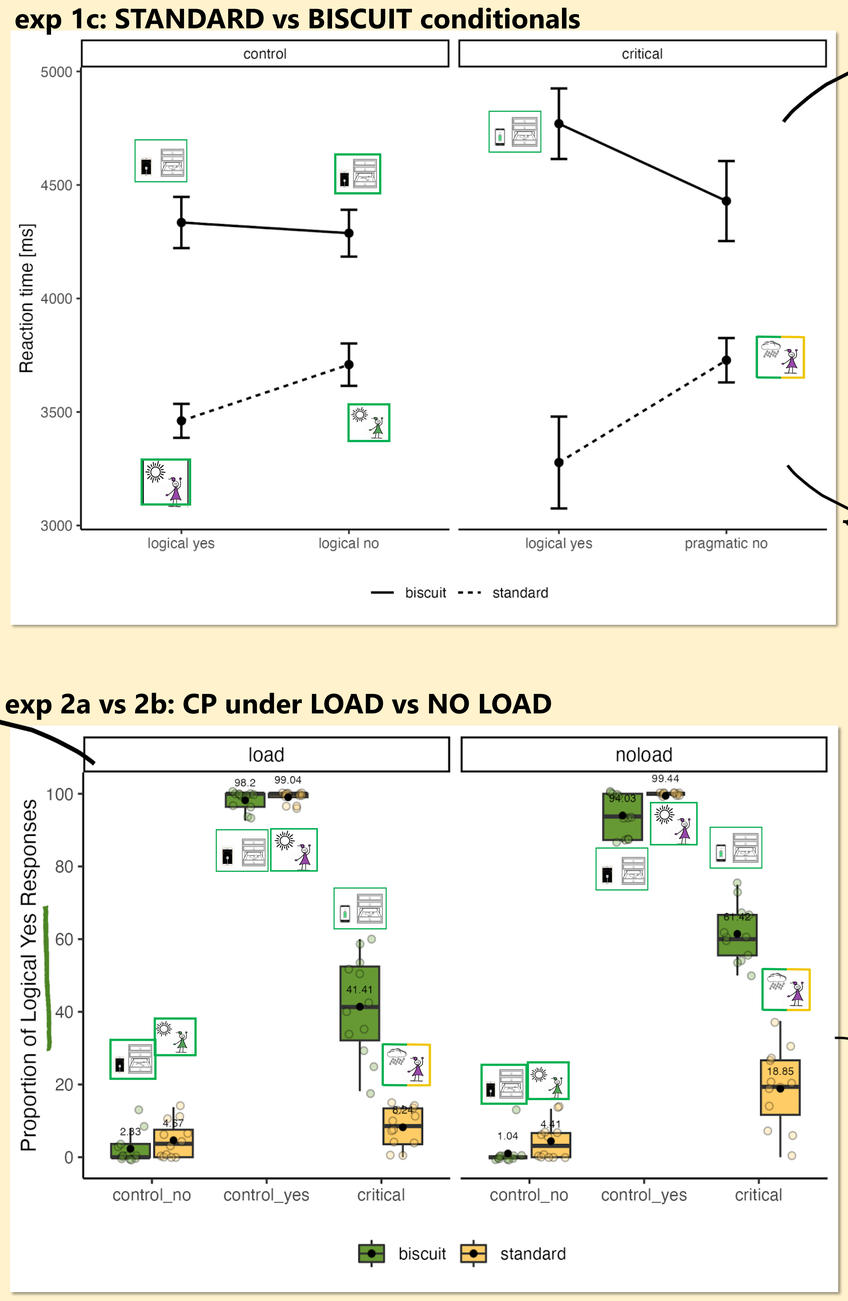
CP-later hypothesis: L starts with the logical meaning, then derive the perfected form via implicature → an enrichment cost (from logical to perfected meaning)

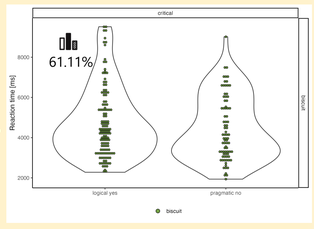
CP-first hypothesis: L instead begins with a perfected (i.e., only-if) meaning → a weakening cost (from perfected to logical meaning)

Already perfect:

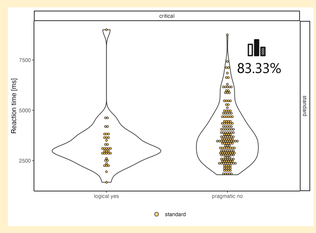
'**if**' is naturally interpreted with its pragmatic meaning '**only if**' without effort

exp 1c: STANDARD vs BISCUIT conditionals





Overall slower interpretation in biscuit conditionals + The logical interpretation of biscuit conditionals was also slower than that of control trials



High & Low load collapsed

exp 2a vs 2b: CP under LOAD vs NO LOAD

More logical responses in biscuit and standard conditionals when there is no cognitive load

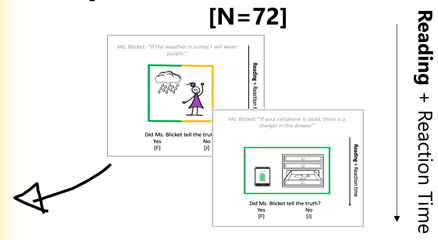
exp 1: reaction time

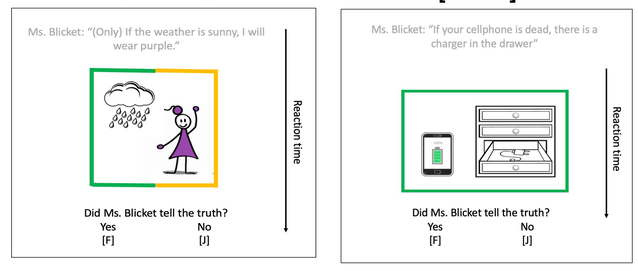
- Sentence-picture verification task
- Online study via Prolific
- 9 critical items per conditional
  3 per condition [control: (p & q), (p & ¬q); critical: (¬p & q)]

exp 1a: IF vs ONLY IF [N=151]

exp 1b: BISCUIT [N=75]

exp 1c: STANDARD vs BISCUIT [N=72]





exp 2: cognitive load

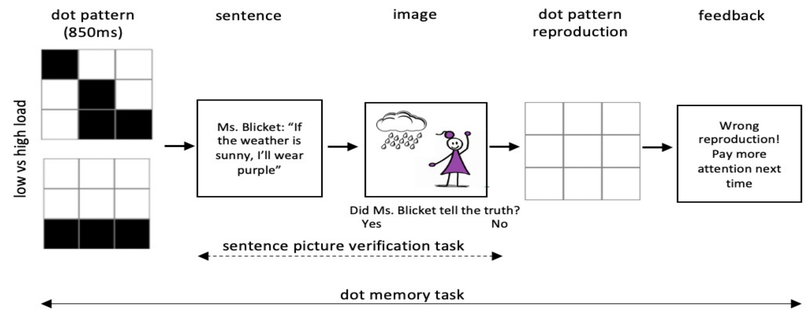
- An increase in load → reduced capacity to compute pragmatic inferences[11, 14]
- If CP is an inference on top of the logical meaning → less likely under high load.

exp 2a: LOW vs HIGH LOAD [N=90]

- Dual task paradigm
- In lab study, recruitment via SONA
- Conditional (n=12) & Load (high, low) as within subjects

exp 2b: NO LOAD [N=45]

- No difference between high vs low load: Task complexity sufficient to exhaust cognitive resources in either condition, unique to this study.



- Higher pragmatic responses in standard conditionals (92%) vs lower logical responses for biscuit conditionals (41%), irrespective of the degree of the load

In Exp 1, 60-80% logical responses for biscuit conditionals.

discussion

Summary: Across two different paradigms, we showed that

- CP is highly regularly computed in if-sentences, like only if-sentences, without further effort and remains even under cognitive load.
- Biscuit conditionals are not susceptible to perfection; a richer pragmatic inference might be necessary to establish logical interpretation, requiring more resources.
- Converging evidence for the **CP-first hypothesis**: Listeners appear to begin with a perfected meaning and retreat to the weaker meaning if the richer meaning is not supported.

Present data in relation to existing accounts:

- **Challenges** standard Gricean accounts of implicature[11]
- **Compatible with** finding that some implicatures (e.g., 'exact' interpretation of numerals[12] & free-choice inferences[13]) are not associated with a processing cost[9]
- Conditional statements - and conditional perfection - may require a unique analysis.

References: [1] Geis & Zwicky, 1971; [2] Austin, 1961; [3] Cornulier, 1983; [4]Horn, 2000; [5] von Fintel, 2001; [6] van der Auwera 1997; [7]Marcus & Rips, 1979; [8] van Tiel & Schaeken, 2016; [9] Barrouillet et al., 2000; [10] Bott & Noveck 2004; [11] De Neys & Schaneken, 2007; [12] Noveck et al., 2011; [13] Huang & Snedeker, 2009; [14] Chemla & Bott, 2011; [15] Marty & Chemla, 2013