

Title: Can LLMs draw conversational elicitures and put them to use?

Introduction: In a typical context, sentence (1) invites the addressee to infer not merely that the manager was fired and was embezzling money, but that he was fired because he was embezzling money. Cohen and Kehler [1] termed such inferences **Conversational Elicitures**, a hallmark of which is that, unlike other species of pragmatic enrichment (e.g., implicature), they are not mandated by any linguistic requirement on utterance felicity. This can be seen in (2), which is perfectly felicitous even though no analogous causal inference is typically inferred.

Rohde et al. (2011) further showed that elicitures affect incremental interpretation. Example (3) illustrates a relative clause (RC) attachment ambiguity: the ensuing RC could attach low (i.e., “musician”, e.g. “who lives in La Jolla”) or high (i.e., “children”, e.g. “who are arrogant and rude”). Whereas previous literature predicts a preference for low attachment for (3), Rohde et al. predicted that the occurrence of an object-biased implicit causality (IC) verb in (4), along with the potential for the RC to convey a causal eliciture, may lead to a greater high attachment bias for the RC. These predictions were confirmed in passage completion and eye-tracking studies.

Whereas large language models (LLMs) have exhibited some success at pragmatic tasks [3,4], elicitures provide a novel test in light of their non-mandated status. We therefore examined whether GPT-3.5-turbo, GPT-4, and GPT-4o demonstrate human-like behavior in (i) drawing elicitures, and (ii) their effect on syntactic processing.

Study 1 examined whether LLMs can draw elicitures. Each item (drawn from [2]) was paired with either an IC verb or a non-IC verb as the matrix predicate, and the model was asked whether the sentence provided an explanation of the event in the matrix clause (examples in 5). Twenty items were included for each type of verb, and the results are shown in Figure 1. Overall, all three models were able to distinguish between the two types of verbs and detect elicitures, such that there were more explanation responses when the matrix predicate is an IC verb than when it is a non-IC verb.

Study 2 tested whether elicitures affect RC attachment preferences in LLMs. Forty sentences were included, each of which contained a complex NP with a singular NP and a plural NP as the possible attachment sites for the RC. Half of the sentences were paired with IC verbs and half with non-IC verbs. The continuation was presented as a two-alternative forced choice task between attachment-resolving singular and plural forms of *be* or *have* verbs (examples in 6). The results are shown in Figure 2. Qualitatively, all three models show a preference for high attachment for IC matrix verbs compared to their non-IC counterparts, similar to the human results in [2]. However, the difference is currently marginal for GPT-3.5-turbo and GPT-4.o.

Discussion: These preliminary results suggest that LLMs are able to draw elicitures, and some models, such as GPT-4, show the effect of elicitures on RC attachment biases, similar to human participants. These findings add to previous results that demonstrate the emergent pragmatic abilities of LLMs. That notwithstanding, additional data, which we are in the process of collecting, will be necessary to yield conclusive results.

- (1) The company fired the manager who was embezzling money.
- (2) The company fired the manager who was hired in 2002.
- (3) Melissa babysits the children of the musician who...(lives in La Jolla / are arrogant and rude)
- (4) Melissa detests the children of the musician who...(lives in La Jolla / are arrogant and rude)

(5) Example stimulus (Study 1)

Sentence: Melissa detests/babysits the children who are generally arrogant and rude.

Question: Does this sentence explain why Melissa detests/babysits the children? If yes, please provide an explanation. If not, just say no and you don't need an explanation.

(6) Example stimulus (Study 2)

Sentence: Melissa detests/babysits the children of the musician who ____ generally arrogant and rude.

Options: 1) is, 2) are.

Figure 1. Results of Study 1.

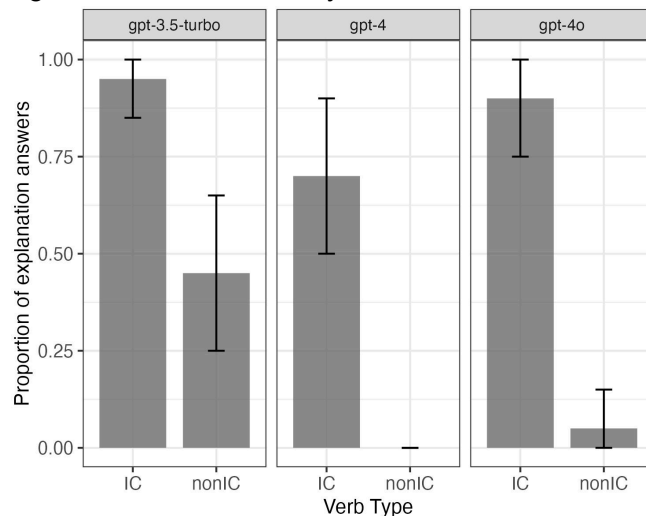
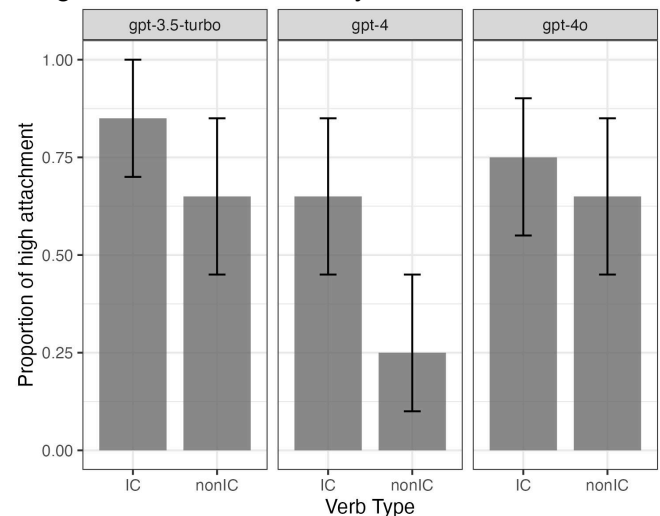


Figure 2. Results of Study 2.



References:

- [1] Cohen, J., & Kehler, A. (2021). Conversational Eliciture. *Philosophers' Imprint*, 21(12), 1–26.
- [2] Rohde, H., Levy, R., & Kehler, A. (2011). Anticipating explanations in relative clause processing. *Cognition*, 118(3), 339–358.
- [3] Hu, J., Floyd, S., Jouravlev, O., Fedorenko, E., & Gibson, E. (2023). A fine-grained comparison of pragmatic language understanding in humans and language models. In *Proceedings of the 61st annual meeting of the association for computational linguistics*, 4194–4213.
- [4] Ruis, L., Khan, A., Biderman, S., Hooker, S., Rocktäschel, T., & Grefenstette, E. (2024). The goldilocks of pragmatic understanding: Fine-tuning strategy matters for implicature resolution by LLMs. *Advances in Neural Information Processing Systems*, 36.