

Interactive Contrast: Does conversational contrast affects action understanding?

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Introduction

- Our recent studies are concerned with the effect of contrastive guidance on action understanding (Singh & Rohlfing, 2023).
- A combination of assertion and negation creates a rich contextual effect which can promote a better recall of the contrastive events.
- A limitation of the study was that verbal guidance was provided in non-interactive setup.
- To address this limitation and explore the impact of interaction, we piloted a new experiment where an agent explains a task to the participant and provides contrastive or noncontrastive verbal guidance only upon request.

Theoretical background

- Two crucial components of an action : path and manner (Talmy, 1985). Studies suggest that these two components remain in the focus of attention due to their encodings in the verbal phrase.
- Contexts facilitating the use of negation: The informativeness of negation will be tested in specific contexts that facilitate its use.

Instruction

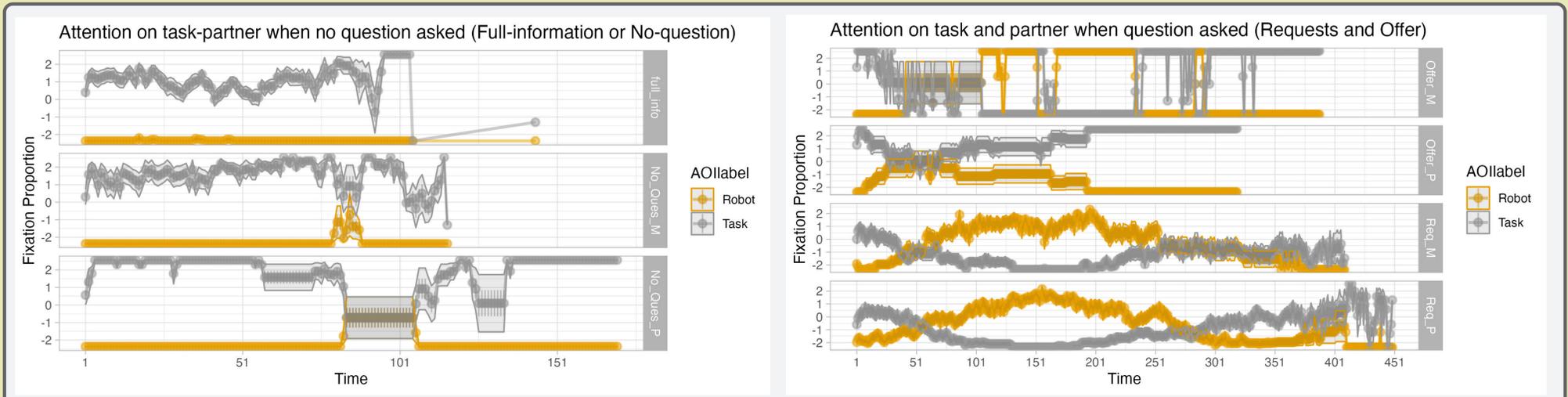
- Full information: Place the red object vertically on letter A [Stell bitte das rote Objekt **hochkant/quer** auf **A**]
- P-Crit: Stell bitte das rote Objekt **hochkant**.
- M-Crit: Stell bitte das rote Objekt auf **A**
- Resolution: Contrastive - [Not vertically] (**Nicht hochkant**) or Noncontrastive [horizontally] (**quer**)

Method



- Task type (Manner vs Path Critical): Each trial sequence includes a final critical trial where crucial information is missing regarding either the manner or the path.
- Context (1/4 vs 2/4): The context manipulation involves the presence or absence of a feature, created by varying the proportion of objects with the opposite feature compared to the rest.
- Task (N=20): Place the objects in specific manner and on path (letters) as instructed by the robot. Participants are free to ask questions. A recall task followed where the objects have to be put back on place.
- Repair type (Contrastive vs Noncontrastive): This factor represents the two types of resolutions provided by the robot in response to participants' requests.
- Participants' eye-movements are captured throughout the task using glasses.

Pilot Results; Eye-tracking (N=6)



- Previous research suggests that the participant maintains attention on their partner until the repair is provided (Dingemans & Enfield, 2015). We find that participants' attention is primarily focused on the partner (robot) until the resolution is given, after which there is a shift towards the task.
- The attention to the task increases when there is no question for the task in hand. And any kind of doubt leads to the attention back to the partner.
- In full information condition, participants' engagement to the partner is minimal.
- A missing information regarding the path, takes more time to be resolved than manner. Supporting the idea that path of an action is more prominent than manner in attention.

Future Analysis Plan

- Previous research indicates that, path remains in the focus of attention. We hypothesize that missing information regarding path will prompt more questions compared to manner.
- Regarding the overall effect of repair type and based on our previous results, we hypothesize that contrastive repair will result in better task recall compared to noncontrastive resolution.
- We also hypothesize that the use of contrastive repairs in the form of negation in the facilitative 1/4 context will have a notable impact on the processing of contrastive resolutions compared to noncontrastive resolutions. We predict that a 1/4 context will facilitate better processing of negation compared to a 2/4 context.

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