Mental simulation of actions conveyed by gapped verbs?
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Findings within the embodied-simulations framework indicate that language comprehension interacts with the comprehender’s action and perception in the actual situation – supporting the view that language comprehension involves mental simulations that are grounded in perception and action.

The goal of the present study was to explore whether an interaction between described and actually performed motor actions would also occur for elliptically conveyed actions. We focused on verb gapping, that is, omission of the finite verb in the second conjunct of a conjoined sentence. The experiment was conducted in German. Participants read short narrative texts. Each experimental text included a gapping sentence. There were two versions: the gapping sentences either described clockwise or counter clockwise manual rotations (see Example: closing vs. opening). We adopted a paradigm developed by Zwaan & Taylor (2006): Participants read the text sentences segment-by-segment, with each segment consisting of between one and three words (see Example: vertical lines indicate segment boundaries). Participants advanced through the sentences by turning a knob either in clockwise or in counter clockwise direction.

Example
(setting: children’s birthday party)
Tina | schließt[clockwise] / öffnet[counter clockwise] eine Limonadenflasche | auf der Terrasse |
Tina | closes[clockwise] / opens[counter clockwise] a lemonade bottle | on the terrace |
und Tom | eine Saftflasche | im Kinderzimmer.|
and Tom | a juice bottle | in the children’s room.|

Reading times per segment were analysed to test for an effect of compatibility between the direction of the linguistically conveyed action and the knob-turning direction. A significant compatibility effect was found for the overt-verb segment in the first conjunct (e.g., | closes / opens a lemonade bottle |) as well as for the gapping segment (e.g., | a juice bottle |) in the second conjunct. There was no significant compatibility effect for any of the other sentence segments. Different from Zwaan & Taylor’s findings, reading times in the two action-conveying segments were longer – rather than shorter – when there was a match between the direction of the linguistically conveyed action and the actual knob rotation compared with when there was a mismatch (see Figure 1). It should be noted that not all studies on the interaction between language comprehension and action have found a “match advantage” effect; some studies yielded a “match disadvantage” effect (e.g., Borregine & Kaschak, 2006; Buccino et al., 2005). Research on which factors determine the type of effect (match advantage/mismatch disadvantage vs. match disadvantage/mismatch advantage) is still in its beginning and it remains a question how the different types of effects in our experiment and in the study by Zwaan & Taylor can be accounted for. A possibility to discuss is that the opposite result patterns may be due to differences in the particular experimental task demands (our experiment: knob turning of approx. 50 degrees and releasing the knob to its centre position after each turning; Zwaan & Taylor: knob turning of approx. 5 degrees and releasing the knob to its centre position only after having read all the segments of a sentence).
However, the crucial point here is that the compatibility effect in our experiment was specific to the segments that implied an action and did obtain not only for the overt-verb segment but also for the gapped-verb segment. On the one hand, this indicates that language-induced motor activation is not bound to the processing of overt words. On the other hand, the result for the gapped-verb segment suggests that the missing verb information was reconstructed online. To conclude, our experiment provides preliminary evidence that the embodied-simulations framework may prove of value with regard to genuine linguistic phenomena such as verb gapping. If the compatibility effect for the gapped-verb segment could be established (and fully accounted for), then this would open up new possibilities for research on the processing of verb gapping, for example with regard to issues concerning gap detection and reactivation of verb information (e.g., *Jim opens a water bottle and John a lemonade bottle vs. beer bottle*).

![Figure 1. Mean reading times (in ms) for the sentence segments in the match and mismatch conditions.](image)

**References:**

