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# Structural priming of SO vs. OS in German: Clauses with psychological verbs as a test case

## Introduction

**Structural priming**: Speakers tend to reuse linguistic structures they have processed previously.

- Lexical boost: Repeating lexical heads and especially the verb enhances the effect of structural priming (cf. Pickering & Ferreira, 2008).
- Studies targeting priming of OS order in canonically SO languages apart from passivization are sparse (cf. Mahowald et al., 2016).
- Probable reason: The specific discourse functional demands on the use of active OS are hard to create in experimental settings.
- However, in German, experiencer-object psych-verbs occur with the stimulus subject and the experiencer as object. Using them with OS order in a NP-V-NP structure does not result in information structural peculiarity (Primus, 2003).

## Current study

Taking advantage of experiencer-object verbs and the relatively flexible word order in German, we tested the persistence of OS (vs. SO) structures in two primed sentence production experiments.

**Aims:**

- to investigate the representations involved in structural priming
- to contribute to the evaluation of explanatory accounts

## Materials

- Prime structure (SO vs. OS) and target noun order (stimulus > experiencer vs. experiencer > stimulus) were manipulated within experiments.
- Verb overlap was manipulated between experiments (Exp1: same verb; Exp2: different verbs).

**Item:**

| | | | |
|---|---|---|---|
| SO-prime | *Der Fehler* | *erzürnt* | *den Vorgesetzten.* |
| | the.NOM mistake | enrages | the.ACC boss |
| OS-prime | *Den Vorgesetzten* | *erzürnt* | *der Fehler.* |
| | the.ACC boss | enrages | the.NOM mistake |

'The mistake enrages the boss.'

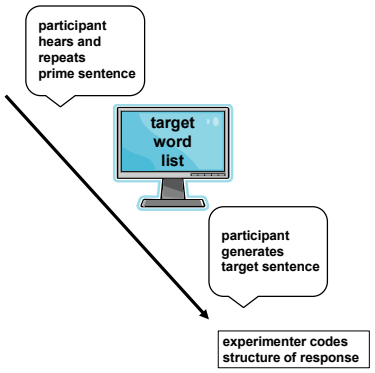
- 36 experiencer-object verbs for 36 experimental items
- experiencer = animate; stimulus = inanimate

| Target Exp1: | Target Exp2: |
|---|---|
| *erzürnen* (enrage) | *verunsichern* (unsettle) |
| *Verrat* (betrayal) | *Nebel* (fog) |
| *König* (king) | *Rennfahrer* (racing driver) |

**Coding:**

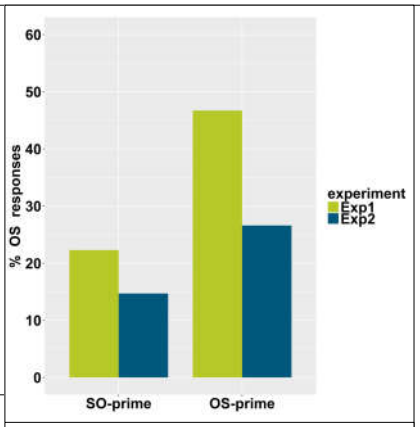
- Valid responses were grammatical sentences that had SO or OS structure.

## Procedure




## Results experiment 1

- 1299 valid trials from 48 participants
- Thereof 34.6% OS responses
- OS responses in OS prime trials: 46.7%; in SO prime trials: 22.3%
- Main effect of prime structure ($p < .001$), target noun order ($p < .05$), no interaction ($p = .25$)
- Binomial mixed model on OS (vs. SO) responses:
  OS ~ prime.structure * target.noun.order + (1 | Subject) + (1 + target.noun.order | Item)




Relative frequency of OS (vs. SO) responses by prime structure and experiment (~ verb overlap), averaged over target noun order.

## Results experiment 2

- 1103 valid trials from 48 participants
- Thereof 20.5% OS responses
- OS responses in OS prime trials: 26.6%; in SO prime trials: 14.7%
- Main effect of prime structure ($p < .001$), target noun order ($p < .001$), no interaction ($p = .45$)
- Binomial mixed model structure equal to Exp1
- A GLMM on the data from both experiments showed an interaction of prime structure and experiment (~ verb overlap; $p < .01$).

## Discussion

Given the main effect of prime structure in both experiments we commit to the inference that participants in our samples showed persistence of prime structure in their sentence production. The interaction of prime structure and experiment suggests that this effect was boosted by verb overlap between prime and target. We attribute the outcome to the persistence of conceptual representations in terms of participant order (stimulus-before-experiencer or vice versa) or the alignment of animacy since participant roles were confounded with animacy features. Constituent structure overlap can be ruled out because both OS and SO had NP-V-NP. Priming of syntactic functions can not be fully excluded, but see Köhne et al. (2014) for evidence against persistence at a functional level. Persistence of case marking is improbable in light of the evidence from Santesteban et al. (2015).

## Conclusion

The findings are in line with accounts of structural priming that assume a primed linearization of event participant roles at a pre-linguistic conceptual level of sentence production or a parallelization of the mapping from concepts onto syntactic structure (Cai et al., 2012; Pappert & Pechmann, 2014). In a broader sense this corresponds to direct mapping from semantic features to functional syntactic categories and positions in sentence production theories (Bock, Loebell, & Morey 1992). Additionally, under the standard assumption that the SO/OS serialization in a NP-V-NP frame is not part of a verb`s argument structure, or that monotransitive NP-V-NP as default is not represented at all (Van Gompel et al., 2012), the boost by verb overlap is best explained by episodic memory traces (Bock & Griffin, 2000). Upcoming experiments will be conducted to dissociate the contribution of conceptual, syntactic and lexical factors to the present priming effect in detail.

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