

# PP modifiers do not reconstruct for principle C: Evidence from German wh- and ATB-movement

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## 1 Poster recap: ATB-movement

In ATB-movement, one filler is related to multiple gaps – how can this be derived?

- asymmetric approaches: only one conjunct is targeted by sub-extraction (Bošković & Franks 2000; Franks 1993, 1995; Munn 1992, 1993, 2001; Salzmann 2012; Zhang 2010)
- symmetric approaches: all conjuncts are targeted by sub-extraction (Bachrach & Katzir 2009; Biskup 2018; Citko 2005; Hein & Murphy 2020; Ross 1967; Wilder 1994; Williams 1978)
- sideward movement: movement launches in non-initial conjunct and has intermediate landing site in initial conjunct (Nunes 2001)



Figure 1: Link to poster.

It has previously been claimed that ATB-movement reconstructs asymmetrically for principle C (Citko 2005; Salzmann 2012). **Current claim:** the observed asymmetry in coreference rates is (i) fairly small but robust, however (ii) also present in the absence of a principle C violation, pointing to a multitude of influences and a highly limited, if any, role of c-command. **The principle C reconstruction test does not yield conclusive evidence for the underlying syntax of ATB-movement.**

## 2 Simple wh-movement dependencies

Longstanding debate on PP modifier reconstruction (Barss 1988; Freidin 1986; Lebeaux 1988; van Riemsdijk & Williams 1981; Sauerland 1998; Takahashi & Hulseley 2009, vs. Bianchi 1995; Fox 1999; Henderson 2007; Kuno 2004; Lasnik 1998; Safir 1999). **Idea:** previous experimental studies on principle C reconstruction under wh-movement diverge due to differences in item structure as well as experimental task and design (Adger et al. 2017; Bruening & Al Khalaf 2019; Salzmann et al. 2023; Stockwell et al. 2022). **Aim:** isolate the influence of c-command by systematically varying only the aforementioned factors, keeping items and conditions constant, taking Salzmann et al. (2023) as a baseline.

## 2.1 Salzman, Wierzba & Georgi (2023)

- 32 items, 2x2x2 MOVEMENT (in situ/moved), CATEGORY (adjunct/argument), PHRASE (object/subject) → only object, moved, argument and subject, moved, argument relevant here
- 32 German native participants
- two yes/no questions per trial inquiring about coreference with either of the referents

### (1) Item structure by Salzman et al. (2023)

#### a. Object, moved, argument

Kerstin erzählt, welches Geschenk für Ilse<sub>j</sub> sie<sub>i/j</sub> \_\_\_ entzückend fand.  
 Kerstin recounts which present for Ilse she delightful found  
 ‘Kerstin recounts which present for Ilse she found delightful.’  
 Can this sentence be understood such that...

...Ilse found a present delightful?  yes  no

...Kerstin found a present delightful?  yes  no

#### b. Subject, moved, argument

Kerstin erzählt, welches Geschenk für Ilse<sub>j</sub> \_\_\_ sie<sub>i/j</sub> entzückt hat.  
 Kerstin recounts which present for Ilse her delighted has  
 ‘Kerstin recounts which present for Ilse delighted her.’  
 Can this sentence be understood such that...

...a present delighted Ilse?  yes  no

...a present delighted Kerstin?  yes  no

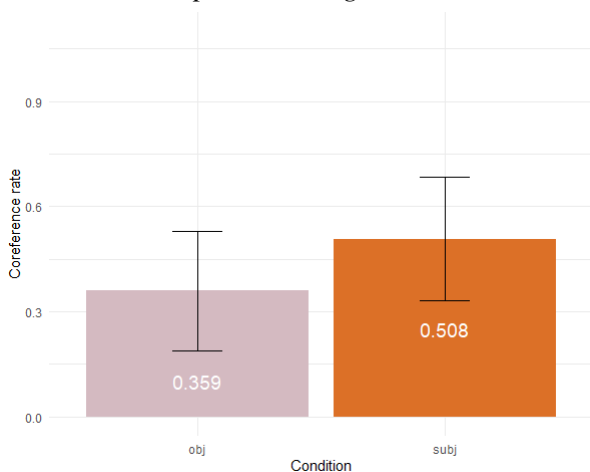


Figure 2: Overall coreference rates with embedded referent (*Ilse*) in conditions object, moved, argument and subject, moved, argument reported by (Salzman et al. 2023). Error bars indicate standard error.

Salzman et al. (ibid.) interpret the significant contrast as an indicator of successful reconstruction.

## 2.2 Experiment 4: Salzman et al. (2023), simplified

Mediocre coreference rate found by Salzman et al. (ibid.) does not correspond to absolute predictions based on c-command – principle C violation should rule out the respective reading, the absence of a violation should allow it. **Idea:** simplifying the task may increase coreference rates.

- 150 German native participants

- 32 target items, 2x2 PHRASE (subject/object), REFERENT (embedded/matrix) from Salzman et al. (2023), 24 pseudofillers (targets from ATB experiment 2 on poster), 12 unrelated fillers
- items presented with context sentence
- one yes/no question per trial about either one of the matching referents (balanced, hence REFERENT)

(2) a. Object, matrix

Kerstin<sub>i</sub> erzählt, [welches Geschenk für Ilse<sub>j</sub>] **sie<sub>i/?j</sub>** \_\_\_ entzückend fand.  
 Kerstin recounts which present for Ilse she delightful found  
 ‘Kerstin recounts which present for Ilse she found delightful.’  
*Kerstin found a present delightful.*  
 yes  no

b. Object, embedded

Kerstin<sub>i</sub> erzählt, [welches Geschenk für Ilse<sub>j</sub>] **sie<sub>i/?j</sub>** \_\_\_ entzückend fand.  
 Kerstin recounts which present for Ilse she delightful found  
 ‘Kerstin recounts which present for Ilse she found delightful.’  
*Ilse found a present delightful.*  
 yes  no

c. Subject, matrix

Kerstin<sub>i</sub> erzählt, [welches Geschenk für Ilse<sub>j</sub>] \_\_\_ **sie<sub>i/?j</sub>** entzückt hat.  
 Kerstin recounts which present for Ilse her delighted has  
 ‘Kerstin recounts which present for Ilse delighted her.’  
*A present delighted Kerstin.*  
 yes  no

d. Subject, embedded

Kerstin<sub>i</sub> erzählt, [welches Geschenk für Ilse<sub>j</sub>] \_\_\_ **sie<sub>i/?j</sub>** entzückt hat.  
 Kerstin recounts which present for Ilse her delighted has  
 ‘Kerstin recounts which present for Ilse delighted her.’  
*A present delighted Ilse.*  
 yes  no

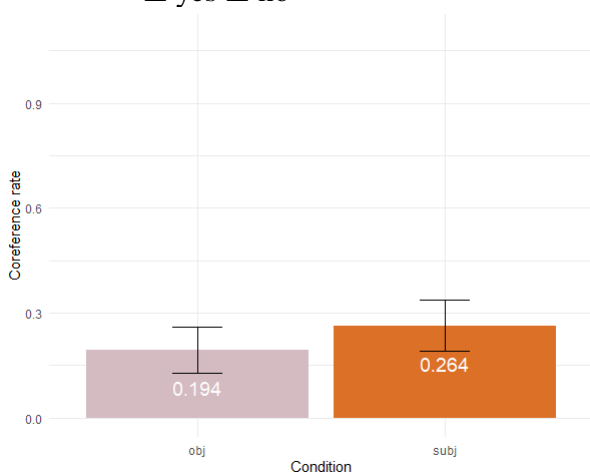


Figure 3: Overall coreference rates with embedded referent (*Ilse*) in experiment 4. Error bars indicate standard error.

Coreference rates are below chance across conditions and **even lower than reported by (Salzmann et al. 2023)**. The effect of PHRASE is not significant, which points to **non-syntactic factors**. Difference in sample size between Salzmann et al. (ibid.) and this study may play a role (32 vs. 150 participants, higher statistical power here).

### 2.3 Experiment 5: Stockwell et al. (2022), simplified

Coreference rates are astonishingly low. Since there seems to be little evidence for reconstruction, the matrix referent may be too prominent, making participants less likely to consider the embedded referent. **Idea:** omit sentence embedding and matrix referent altogether and use a forced choice task between the embedded referent and ‘someone else’ (Stockwell et al. 2021, 2022, cf.).

- 60 German native participants
- 32 target items, single factor PHRASE (subject/object), 24 pseudofillers (targets from ATB experiment 3 on poster), 12 unrelated fillers
- global context: picking up snippets of a conversation at a party (Stockwell et al. 2021, 2022, cf.)
- measuring preferences, not possibilities

(3) a. Object

[Welches Geschenk für Ilse<sub>j</sub>] fand **sie<sub>i/?j</sub>** \_\_\_ entzückend?  
 which present for Ilse found she delightful  
 ‘Which present for Ilse did she find delightful?’

*What is this about?*

Ilse found a present delightful.  Someone else found a present delightful.

b. Subject

[Welches Geschenk für Ilse<sub>j</sub>] hat \_\_\_ **sie<sub>i/?j</sub>** entzückt?  
 which present for Ilse has her delighted  
 ‘Which present for Ilse has delighted her?’

*What is this about?*

A present has delighted Ilse.  A present has delighted someone else.

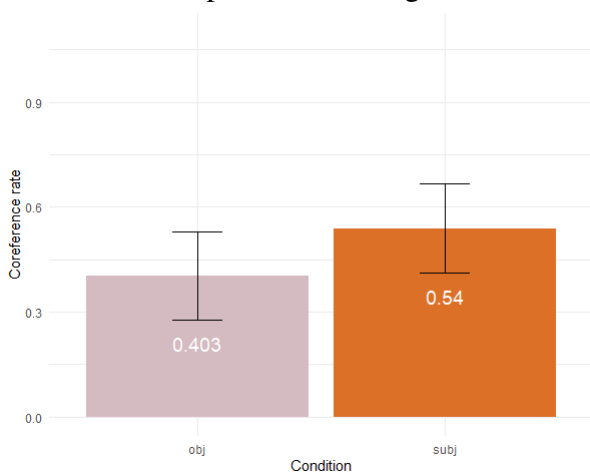


Figure 4: Overall proportion of responses indicating coreference with the embedded referent (*Ilse*) in experiment 5. Error bars indicate standard error.

Drastic increase in positive responses due to the design (preferences) and omission of matrix referent. The significant effect of PHRASE suggests that an underlying principle C violation decreases the preference for coreference, though it clearly does not rule it out. Non-syntactic factors (Gor 2020; Temme & Verhoeven 2017; Varaschin et al. 2023) and a bias to resolve pronominal reference (Gordon & Hendrick 1998) may increase the acceptability of coreference.

### 3 Summary

Overall coreference rates can be manipulated through the experimental task, design and alternative referents. The coreferent reading between the pronoun and the embedded referent is indicated to be possible/preferred more frequently in the absence of an underlying principle C violation. This suggests a **lingering effect of c-command, which varies across all experiments** (cf. ATB experiments on poster). The lack of robustness of the effect suggests that underlying c-command is **at most one of a multitude of contributing factors**, prompting the conclusion that PP modifiers do not reconstruct reliably for principle C in German. An adequate **theory needs address the gradience** found in the data.

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