

An experimental investigation of reconstruction for Condition C in German A'-movement

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MAJOR CONTRIBUTIONS

- Most important findings:
 - Condition C reconstruction in German *wh*-movement is more robust than reported in recent experimental work on English.
 - No asymmetry between arguments and adjuncts.
 - Weak asymmetry between APs and DPs: reconstruction for both, but slightly less robust for DPs.
 - Strong asymmetry between different types of A'-movement: reconstruction in relative clauses is much weaker than in *wh*-movement.
- Our results argue against Late Merger of adjuncts and suggest that *wh*-movement and relativization differ w.r.t. the bottom copy: full copy vs. modified one (matching analysis).
- We propose an adapted method to elicit coreference judgments and argue that it yields reliable and replicable results and can be more informative than previous methods.

1 Background: Reconstruction in A'-movement

- Reconstruction data is important to distinguish between movement/base-generation (cf., e.g., Aoun et al. 2001). Often assumed for Condition C: obligatory reconstruction to lowest position.
 - (1) *[Which picture of John_i] do you think he_i likes __.
- Some authors question the presence of Condition C effects under A'-movement, cf. Heycock (1995), Fox (1999), Fischer (2002, 2004), Henderson (2007); cf. Safir (1999, 609)
 - (2) a. [Whose criticism of Lee_i]₁ did he_i choose to ignore __₁?
b. [Which picture of John_i]₁ does he_i like best __₁?
c. [Most articles about Mary_i]₁ I am sure she_i hates __₁.
d. [That John_i had seen the movie]₁ he_i never admitted __₁.
- A number of factors have been claimed to influence Condition C reconstruction:
 - **Argument-adjunct asymmetries:** only R-expressions inside arguments trigger Principle C effects, R-expressions inside adjuncts don't (they are merged late), cf. van Riemsdijk and Williams (1981, 201–204), Freidin (1986, 179), Lebeaux (1988, 1990, 1991), Fox (1999), Safir (1999):
 - (3) a. *[Which claim that Mary had offended John_i]₁ did he_i repeat __₁?
b. [Which claim that offended John_i]₁ did he_i repeat __₁
 - (4) a. *[Which pictures of John_i] did he_i destroy __?
b. [Which pictures near John_i] did he_i destroy __?

Controversial issues:

- * What qualifies as an argument/adjunct? Noun-complement clauses may not be complements after all (Stowell 1981); status of PP-modifiers is contested; the clearest contrasts seem to involve event nominals, cf. Safir (1999, 589, note 1).
- * Asymmetry has been called into question, cf. Fischer (2004, 161f.) for ex. showing reconstruction with adjuncts and non-reconstruction with arguments.
- **Predicate-/argument-asymmetries:** predicates obligatorily reconstruct (contain trace of local subject/are non-referential), arguments do not (always), cf. Huang (1993), Heycock (1995)
- **Distance effect:** Principle C effects decrease with increasing distance between R-expression and pronoun (Huang 1993, 110, or even vanish, cf. Heycock 1995, 548ff.) under embedding with arguments but not with predicates:
 - (5) a. ?*How many pictures of John_i does he_i think that I like __?
 - b. ?How many pictures of John_i do you think that he_i will like __?
 - (6) a. ?*How proud of John_i does he_i think I should be __?
 - b. *How proud of John_i do you think he_i should be __?
- **Asymmetry between different types of A'-movement:** relative clauses are sometimes claimed to display weaker Condition C effects than *wh*-movement/no Condition C effects whatsoever; either because the RC-internal representation of the external head can be deleted without violating recoverability (Munn 1994, Citko 2001) or because of vehicle change (Sauerland 1998, 2003):
 - (7) a. The [picture of John_i] [_{CP} which [~~picture of John_i~~] he_i saw [x ~~picture of John_i~~] in the paper] is very flattering.
 - b. The [picture of John_i] [_{CP} which [~~picture of him_i~~] he_i saw [x picture of **him_i**] in the paper] is very flattering.

• **Recent empirical work on English:**

- Adger et al. (2017) found support for predicate-argument asymmetry and distance effect; no clear evidence for argument-adjunct asymmetry.
- Bruening and Al Khalaf (2019): no robust reconstruction; no evidence for argument-adjunct asymmetry.

• **Reported intuitions on German:** Principle C effects are robust in *wh*-movement/topicalization but weak/absent in relativization, according to Salzmann (2006, 2017, to appear):

- (8) a. *[Welche Nachforschungen über Peter_i]₁ hätte er_i dir lieber __₁
 which investigations about Peter] had.SBJV.3SG he you.DAT rather
 verschwiegen?
 conceal.PTCP
 lit.: ‘Which investigations about Peter_i would he_i have rather concealed from you?’
- b. die [Nachforschungen über Peter_i], [die er_i mir lieber __ verschwiegen
 the investigations about Peter which he me rather conceal.PTCP
 hätte]
 have.SBJV.3SG
 ‘the investigations about Peter_i that he_i would have rather concealed from me’

2 Experiments: Reconstruction in German A'-movement

2.1 Method

- We adapt the method used by Bruening and Al Khalaf (2019):
 - indirect questions
 - participants are presented with two potential antecedents for a pronoun: the R-expression inside the moved *wh*-phrase and an R-expression in the matrix clause
 - a question after the item then asks for the referent of the local subject
- But while Bruening and Al Khalaf (2019) asked a single question concerning the preferred interpretation of the pronoun, we explicitly asked for each of the readings whether it is possible or not, as illustrated in the (translated) example below; cf. Appendix 1 for German examples.

Maria tells us how proud of Anna she is.

Can this sentence be interpreted such that...

...Mary is proud?

Yes

No

...Anna is proud?

Yes

No

→ explicit information about coreference possibilities

→ optionality can be captured

- The presentation order of referents (*Mary/Anna*) in the answers was balanced (50:50).
- Seven experiments (between 32–48 participants), using SoSciSurvey (Leiner, 2018) and L-Rex (Starschenko, 2018).
- Participants recruited at University of Potsdam for Exps 1–4, externally for 5–7 (prolific.ac).
- Latin Square Design, 1:1 proportion of items and fillers.
- Fillers also investigated interpretation possibilities with two referents in various constructions (control, asymmetric coordination, ambiguity etc., see Appendix 2). They were used to test whether subjects paid attention and understood the task as intended.

2.2 Investigated factors

- MOVEMENT: in situ vs. moved
- DISTANCE between pronoun and R-expression (linear and structural)
- CATEGORY: DPs (arguments) vs. APs (predicates)
- ARGUMENT/ADJUNCT: R-expression inside argument vs. inside adjunct (for DPs)
- TYPE OF DEPENDENCY: *wh*-movement vs. relativization

→ For an example of a complete item set (in German), see Appendix 1.

(Experiments 1-4 also included materials on Condition A. The results are reported in Georgi et al. 2020.)

2.3 Principle C in *wh*-movement

2.3.1 Principle C in *wh*-movement – Conditions

- (9) APs (predicates)
- a. **Mary** tells (us) that she is very proud of **Anna**. *in situ*
- b. **Mary** tells (us) [how proud of **Anna**] she is _____. *moved*
- Principle C predicts: coreference between *she* and *Anna* impossible.
- (10) DPs – R-expression inside argument
- a. **Mary** tells (us) that she saw a statue of **Anna**. *in situ*
- b. **Mary** tells (us) [which statue of **Anna**] she saw _____. *moved*
- Principle C predicts: coreference between *she* and *Anna* impossible
- (11) DPs – R-expression inside adjunct
- a. **Mary** tells (us) that she saw a statue on the desk of **Anna**. *in situ*
- b. **Mary** tells (us) [which statue on the desk of **Anna**] she saw _____. *moved*
- Late Merger predicts: coreference between *she* and *Anna* is possible

- Argument vs. adjunct: R-expression contained in PP argument or PP adjunct to N.
- Linear distance (local extraction): by means of NP-coordination, the linear distance between the R-expression and the pronoun in the *moved* condition was increased.

- (12) a. **Mary** tells (us) [which statue of **Anna**] she saw _____. *short*
- b. **Mary** tells (us) [which statue of **Anna** and the siblings] she saw _____. *coord*

- Structural distance (another level of embedding):

- ‘embedding 1’: R-expression and pronoun are not clausemates underlyingly.
- ‘embedding 2’: R-expression and pronoun are clausemates underlyingly.

- (13) a. **Mary** tells (us) [which statue of **Anna**] she thinks that you saw _____. *emb 1*
- b. **Mary** tells (us) [which statue of **Anna**] you think that she saw _____. *emb 2*

- These conditions were adopted from Adger et al. (2017) and served to test the predictions of approaches in terms of Vehicle Change:

- Ellipsis: R-expression in antecedent can correspond to pronoun in ellipsis site:

(14) John likes Mary and she thinks that I do, too < like **her** >.

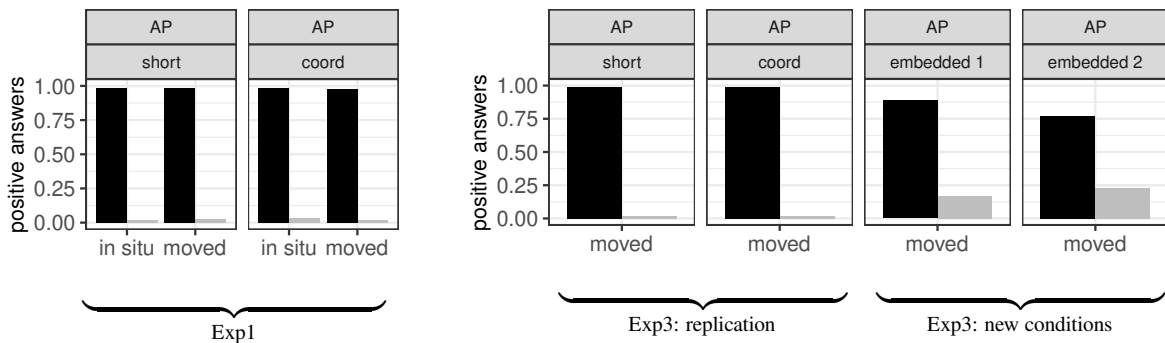
- Vehicle Change extended to A'-movement chains (Safir 1999): R-expression in higher copy can correspond to pronoun in lower copy.
- Under Vehicle Change, the Principle C effect should vanish with nouns and adjectives, but in the ‘embedding 2’ structure, a Principle B effect should arise with adjectives (not with nouns):

- (15) a. How proud of Anna does she think that you are < how proud of her >. *emb 1*
- b. *How proud of Anna do you think that she is < how proud of her >. *emb 2*

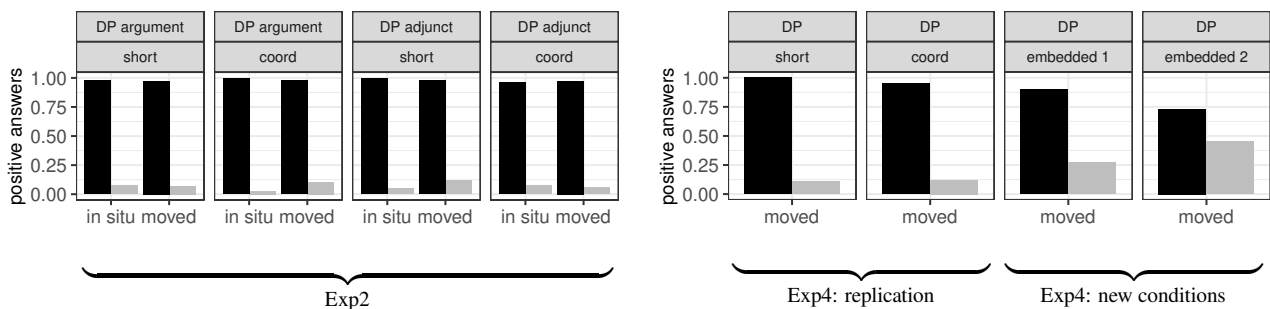
2.3.2 Principle C in *wh*-movement – Results

PRINCIPLE C IN *wh*-MOVEMENT – APs

■ Q1 (matrix R-expr.), ■ Q2 (embedded R-expr.)



PRINCIPLE C IN *wh*-MOVEMENT – DPs



2.3.3 Principle C in *wh*-movement – Main findings¹

- Reconstruction is very robust across conditions, and with both DP-arguments and adjectival predicates²
- No stable argument-adjunct asymmetry (argues against a Late-Merger approach.)³
- Significant effect of embedding (but not of linear distance)⁴; but unlike in Adger et al. (2017), there remains a clear preference for non-coreference
- No evidence for Vehicle Change (reverse pattern: more acceptance of coreference with the lower R-expression for embedding 2 than embedding 1)

¹All statistical results reported in this section are based on univariate GLMMs with yes-answers to Q2 (main indicator of Principle C violations) as the dependent variable. They were fit following the recommendations for identifying parsimonious models by Bates, Kliegl, Vasishth and Baayen (2015) using the R packages lme4 and lmerTest (R Core Team 2016, Bates, Mächler, Bolker and Walker 2015, Kuznetsova et al. 2017).

²No significant simple effect of movement in Exp 1, nor a significant interaction (movement [sum-coded]: $z = -0.52$, $p = 0.60$; distance [treatment-coded with short as baseline]: $z = 0.28$, $p = 0.78$; dist:mov: $z = 1.05$, $p = 0.30$); same for Exp 2 (distance: $z = -1.22$, $p = 0.22$; movement: $z = -0.14$, $p = 0.89$; dist:mov: $z = -0.29$, $p = 0.77$). See the next footnote for a qualification on Exp 2.

³Exp 2: significant interaction between movement and argument/adjunct [sum-coded] ($z = 2.03$, $p = 0.04$) in the short baseline, qualified by a three-way interaction between all three factors ($z = -3.44$, $p < 0.001$). The presence of coordination increases the positive answers to Q2 with arguments, while the opposite holds for adjuncts. It is not the case that there is overall less reconstruction for adjuncts, as predicted by the asymmetry hypothesis.

⁴In comparison to the short, local baseline increasing linear distance via coordination does not make a significant difference in Exps 3 + 4, but embedding does (Exp3: coord: $z = -0.01$, $p = 0.99$; emb1: $z = 3.29$, $p < 0.001$; emb2: $z = 3.34$, $p < 0.001$; Exp 4: coord: $z = 0.24$, $p = 0.81$; emb1: $z = 3.17$, $p = 0.002$; emb2: $z = 5.53$, $p < 0.001$).

2.4 Principle C in relativization

2.4.1 Principle C in relativization – Conditions

Peter mentioned every statue of Robert which he saw.

Can this sentence be interpreted such that...

...Peter saw the statues? Yes No
 ...Robert saw the statues? Yes No

- A universal quantifier was used to ensure a restrictive reading of the relative clause.
- Proper names and head nouns were chosen in such a way (with respect to number and gender) that the interpretation of the relative pronoun was unambiguous (was only compatible with the head noun).

(16) Factor distance in relativization

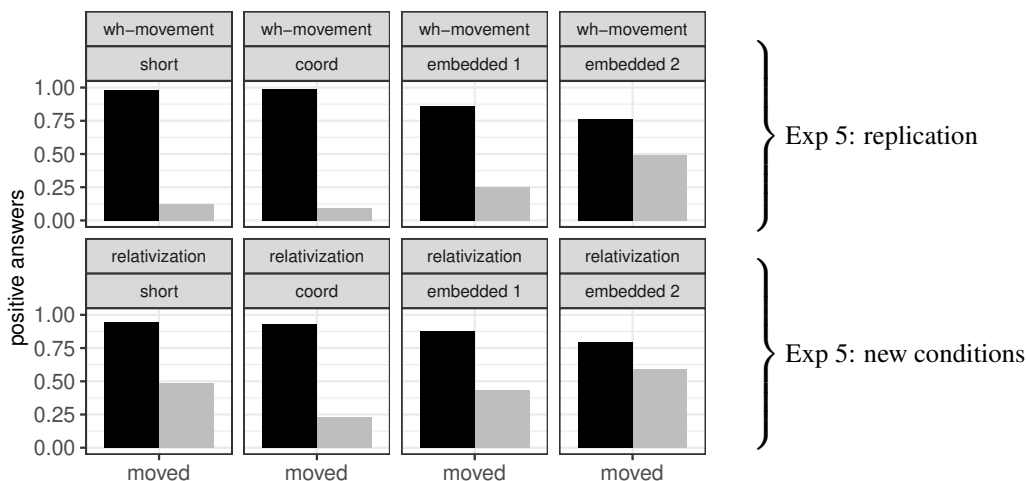
- Peter** mentioned [every statue of **Robert**] which he saw _____. *short*
- Peter** mentioned [every statue of **Robert** and the deer] which he saw _____. *coord*
- Peter** mentioned [every statue of **Robert**] which he thinks that you saw _____. *emb1*
- Peter** mentioned [every statue of **Robert**] which you think that he saw _____. *emb2*

(17) *wh*-movement vs. relativization:

- Peter** mentioned [which statue of **Robert**] he saw _____. *wh-movement*
- Peter** mentioned [every statue of **Robert**] which he saw _____. *relativization*

2.4.2 Principle C in relativization – Results

PRINCIPLE C IN *wh*-MOVEMENT VS. RELATIVIZATION ■ Q1 (matrix R-expr.), ■ Q2 (embedded R-expr.)



2.4.3 Principle C in relativization – Main findings

- In the short condition, there is less reconstruction in relativization than in *wh*-movement.⁵
- In all other conditions, the difference between *wh*-movement and relativization is less pronounced.⁶
- *Wh*-movement differs significantly from relativization in the following conditions: short, coordination, and embedded 1.⁷
- Possible theoretical interpretations
 - The findings argue against a full representation of the external head in the RC-internal bottom position as under the head raising analysis.
 - A recoverability-based account can motivate the higher acceptance of coreference (but not why it is lower than non-coreference), but cannot explain the difference between the distance conditions.
 - A Vehicle Change account can motivate the higher acceptance of coreference (but not why it is lower than non-coreference), but cannot explain the difference between the distance conditions if speakers accept coreferential pronouns within NPs:

- (18)
- | | | | |
|--|----|---|--------------------|
| | a. | He _i likes the statue of him _i (and the deer) | <i>short/coord</i> |
| | b. | He _i thinks that you like the statue of him _i . | <i>emb1</i> |
| | c. | You think that he _i likes the statue of him _i . | <i>emb2</i> |

- The fact that coreference with the matrix R-expression is preferred in all conditions even under relativization can be accommodated by assuming that speakers have access to two derivations of relative clauses (cf. Sauerland 2003): head-raising (Condition C effect) vs. matching (no Condition C effect).

2.5 Comparing two methods

2.5.1 Comparing two methods – Conditions

- First goal: We re-tested the factor AP vs. DP (arguments) in a within-subjects design, because in the previous experiments it was only compared across experiments.
- Second goal: to make sure that the results of our experiments on German do not depend on the method and can be compared with the results of the experiments on English, especially those obtained by means of the forced-choice paradigm in Bruening and Al Khalaf (2019), we ran two experiments with the same materials, but using two different methods.

Exp. 6: Two-question method:

Maria tells us how proud of Anna she is.

Can this sentence be interpreted such that...

...*Mary is proud?* Yes No

...*Anna is proud?* Yes No

Exp. 7: Single-question method:

Maria tells us how proud of Anna she is.

Who is proud?

Mary Anna

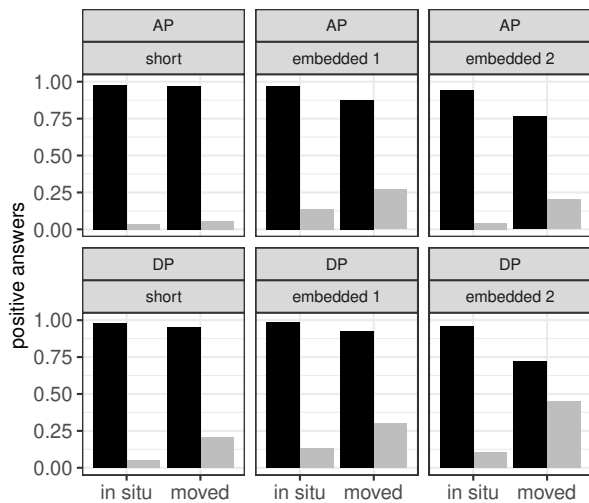
⁵Significant effect of movement type at the short baseline level of distance: $z = 6.67, p < 0.001$.

⁶Significant interaction between movement type and distance at all other levels in comparison to the short baseline condition: coord: $z = 2.07, p = 0.04$, emb1: $z = 2.92, p = 0.004$, emb2: $z = 4.12, p < 0.001$.

⁷According to a post-hoc Tukey test with $\alpha = 0.05$.

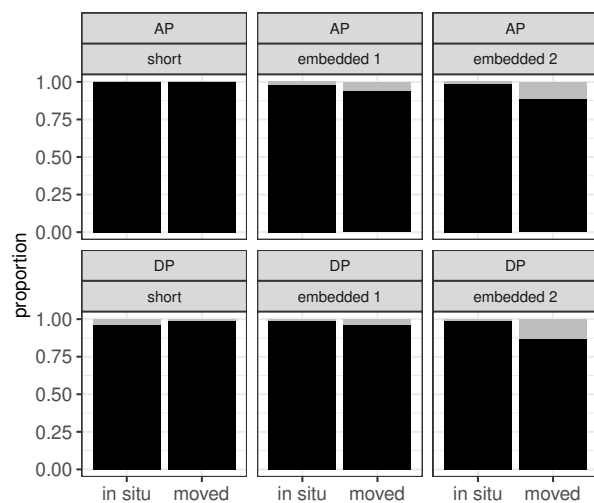
2.5.2 Comparing two methods – Results

PRINCIPLE C IN WH-MOVEMENT: APs VS. DPs, USING DIFFERENT METHODS



Exp. 6: 2-question method, positive responses:

■ Q1 (matrix R-expr.), ■ Q2 (embedded R-expr.)



Exp. 7: Single-question method, preference for:

■ matrix R-expr., ■ embedded R-expr.

- Asymmetry between APs and DPs found in Experiment 6⁸, but not in Experiment 7⁹.

REPLICATION OF BRUENING AND AL KHALAF (2019)

movement	argument/adjunct	preference (German)	original results (English)
in situ	argument	98.6% / 1.4%	97.3% / 2.7%
in situ	adjunct	97.2% / 2.8%	98.7% / 1.3%
moved	argument	91.7% / 8.3%	78.0% / 22.0%
moved	adjunct	94.4% / 5.6%	69.3% / 30.7%

- Clear asymmetry between English and German even with same materials (direct translations) and method.

2.5.3 Comparing two methods – Main findings

- While there is a difference between APs and DPs (Exp 6, see also Adger et al. 2017), the results do not suggest there is only reconstruction with APs (both category types show a clear preference for coreference with the matrix R-expression).
- Under the single question method (Exp 7), no asymmetry between APs and DPs is found.
- Surprising cross-ling. difference: much more robust reconstruction in German than in English.

⁸Exp 6: significant simple effect of movement in the short baseline condition ($z = -3.02$, $p = 0.003$) and significant interaction with category [sum-coded] ($z = 1.97$, $p = 0.049$): the difference between in situ and moved is larger for DPs than for APs. The difference is even more pronounced in emb2 (dist:mov: $z = -2.29$, $p = 0.02$). For emb1, an overall higher proportion of positive responses to Q2 was found (dist:cat: $z = 2.36$, $p = 0.02$), but this equally affected in-situ and moved structures (dist:mov: $z = -0.14$, $p = 0.89$). No significant three-way interactions.

⁹For Exp 7, it was not possible to include all conditions in the analysis due to complete separation (100% positive responses in the AP/short condition). We decided to analyze only emb1 and emb2 for both APs and DPs, using sum-coding for distance (this was a post-hoc decision). A significant main effect of movement was found ($z = 3.46$, $p < 0.001$), but not a significant main effect of category nor any significant interaction. In particular, the interaction between distance and category was non-significant ($z = -0.89$, $p = 0.37$).

3 Conclusion

- Summary of the observations:
 - Robust reconstruction for Principle C in *wh*-movement: very similar pattern in moved and in-situ conditions.
 - No evidence for an argument-adjunct asymmetry.
 - Small effect of (structural) distance, but (unlike in experiments on English) there remains a strong preference for non-coreference.
 - Slight AP/DP asymmetry in Experiment 6, but both category types show a clear preference for coreference with the matrix R-expression.
 - Reconstruction in relative clauses is less robust than in *wh*-movement.
 - Reconstruction is more robust in German than in English.
- Theoretical implications:
 - Robust reconstruction in *wh*-movement suggests the presence of a full representation of the antecedent in the bottom position, especially with predicates.
 - Absence of an argument-adjunct asymmetry argues against Late Merger.
 - Reduced reconstruction in relativization argues against analyses that posit a full representation of the external head inside the RC; alternatives such as the matching analysis with vehicle change or optional deletion of the lower copy seem descriptively more adequate but cannot do justice to the full paradigm.
 - Some of the facts, especially the embedding effect, suggest that non-syntactic factors play an important role.
 - Open question: reason for cross-linguistic difference. Tentative hypothesis – differences in pronoun inventory (suggested by Kyle Johnson, p.c.): English personal pronouns are ambiguous between topic-anaphoric and antitopical uses, while German has distinct sets. Absence of Condition C effect obtains in English if speakers posit the antitopical version.
- Methodological insights:
 - The basic findings from Experiments 1–2 were replicated in Experiments 3–7, supporting the reliability of our method.
 - The responses to the fillers were consistent and mostly in line with the expectations (see appendix 2), confirming that subjects understood the task as intended and were paying attention.
 - In Experiment 3–5, we additionally collected acceptability ratings for the sentences (on a 1–7 scale), because the acceptability of long-distance movement varies between speakers. Coreference judgment patterns seem to be relatively robust even for speakers who gave long-distance movement items low acceptability ratings.
 - We did not find support for speaker groups with clearly distinct grammars: a by-subject analysis did not reveal a split between participants with respect to reconstruction possibilities, but rather a gradient pattern (unimodal distribution, at least in the short + coord conditions).
 - Experiments 6–7 suggest that the two-question method is more sensitive and informative: AP/DP asymmetry was found only in Exp 6; inspection of ambiguous fillers suggests that a present but less salient reading can be undetectable in the forced-choice method.

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4 Appendix 1: Original German versions of items

Experiment 1: APs

- (19) In situ (a) / moved (b)
- Maria** erzählt, dass sehr stolz auf **Anna** (und die Mannschaften) ist.
 - Maria** erzählt, [wie stolz auf **Anna** (und die Mannschaften)] __ ist.
Q1: Kann man den Satz so verstehen, dass **Maria** stolz ist?
Q2: Kann man den Satz so verstehen, dass **Anna** stolz ist?

Experiment 2: DPs

- (20) Argument: in situ (a) / moved (b)
- Maria** erzählt, dass die Statue von **Anna** (und den Geschwistern) gesehen hat.
 - Maria** erzählt, [welche Statue von (und den Geschw.)] __ gesehen hat.
Q1: Kann man den Satz so verstehen, dass **Maria** eine Statue gesehen hat?
Q2: Kann man den Satz so verstehen, dass **Anna** eine Statue gesehen hat?
- (21) Adjunct: in situ (a) / moved (b)
- Maria** erzählt, dass die Statue auf dem Tisch von **Anna** (und...) gesehen hat.
 - Maria** erzählt, [welche Statue auf dem Tisch von (und...)] __ gesehen hat.
Q1: Kann man den Satz so verstehen, dass **Maria** eine Statue gesehen hat?
Q2: Kann man den Satz so verstehen, dass **Anna** eine Statue gesehen hat?

Experiment 3: APs

- (22) Only illustrating additional distance conditions: embedded 1 (a) / embedded 2 (b)
- Maria** erzählt, [wie stolz auf **Anna**] denkt, dass du __ bist.
Q1: Kann man den Satz so verstehen, dass **Maria** denkt, dass du stolz bist?
Q2: Kann man den Satz so verstehen, dass **Anna** denkt, dass du stolz bist?
 - Maria** erzählt, [wie stolz auf **Anna**] du denkst, dass __ ist.
Q1: Kann man den Satz so verstehen, dass du denkst, dass **Maria** stolz ist?
Q2: Kann man den Satz so verstehen, dass du denkst, dass **Anna** stolz ist?

Experiment 4: DPs

- (23) Only illustrating additional distance conditions: embedded 1 (a) / embedded 2 (b)
- Maria** erzählt, [welche Statue von **Anna**] denkt, dass du __ gesehen hast.
Q1: Kann man den Satz so verstehen, dass **Maria** denkt, dass du eine Statue gesehen hast?
Q2: Kann man den Satz so verstehen, dass **Anna** denkt, dass du eine Statue gesehen hast?
 - Maria** erzählt, [welche Statue von **Anna**] du denkst, dass __ gesehen hat.
Q1: Kann man den Satz so verstehen, dass du denkst, dass **Maria** eine Statue gesehen hat?
Q2: Kann man den Satz so verstehen, dass du denkst, dass **Anna** eine Statue gesehen hat?

Experiment 5: *wh*-movement vs. relativization

- (24) Only additional relativization conditions: short/coord (a), embedded 1 (b), embedded 2 (c)
- Hans** erwähnte jede Statue von **Peter** (und dem Team), die gesehen hat.
Q1: Kann man den Satz so verstehen, dass **Hans** die Statuen gesehen hat?
Q2: Kann man den Satz so verstehen, dass **Peter** die Statuen gesehen hat?

- b. **Hans** erwähnte jede Statue von **Peter**, die er denkt, dass du gesehen hast.
 Q1: Kann man den Satz so verstehen, dass **Hans** denkt, dass du die Statuen gesehen hast?
 Q2: Kann man den Satz so verstehen, dass **Peter** denkt, dass du die Statuen gesehen hast?
- c. **Hans** erwähnte jede Statue von **Peter**, die du denkst, dass er gesehen hat.
 Q1: Kann man den Satz so verstehen, dass du denkst, dass **Hans** die Statuen gesehen hat?
 Q2: Kann man den Satz so verstehen, dass du denkst, dass **Peter** die Statuen gesehen hat?

Experiments 6–7 did not contain new conditions.

5 Appendix 2: Selected fillers

(Almost) the same filler materials were included in all experiments. They were all constructed in such a way that two yes/no questions could be asked about their interpretation.

For the purpose of illustration, we present some selected examples here, along with the results from Exp 1.

(25) **Example: unambiguous filler (gapped subject)**

Die Chefin rief den Assistenten an und machte sich Notizen.
 ‘The boss[NOM] called the assistant[ACC] and took some notes.’
 Q1: Kann man den Satz so verstehen, dass die Chefin sich Notizen gemacht hat?
 Q2: Kann man den Satz so verstehen, dass der Assistent sich Notizen gemacht hat?
 ‘Can this sentence be understood such that the boss (Q1) / the assistant (Q2) took notes?’

100%/2% positive answers for to Q1/Q2 in Experiment 1.

(26) **Example: ambiguous filler (relative clause)**

Leyla hat erzählt, dass die Verwandte, die sie besucht hat, in Budapest wohnt.
 ‘Leyla told us that the relative {who[ACC] she[NOM] visited | who[NOM] visited her[ACC]} lives in Budapest.’
 Q1: Kann man den Satz so verstehen, dass Leyla besucht wurde?
 Q2: Kann man den Satz so verstehen, dass die Verwandte besucht wurde?
 ‘Can this sentence be understood such that Leyla (Q1) / the relative (Q2) was visited?’

64%/67% positive answers to Q1/Q2 in Experiment 1.

(27) **Example: ambiguous filler (case ambiguity)**

Die Königin hat die Herzogin eingeladen.
 ‘The queen[ACC/NOM] invited the duchess[ACC/NOM].’
 Q1: Kann man den Satz so verstehen, dass die Königin jemanden eingeladen hat?
 Q2: Kann man den Satz so verstehen, dass die Herzogin jemanden eingeladen hat?
 ‘Can this sentence be understood such that the queen (Q1) / the duchess (Q2) invited someone?’

97%/23% positive answers to Q1/Q2 in Experiment 1.

(28) **Example: filler with expectation for two negative responses**

Gustav hat erzählt, dass Karl und Jonas ihn Bücher einscannen ließen.
 ‘Gustav told us that Karl and Jonas had him scan books.’
 Q1: Kann man den Satz so verstehen, dass Karl Bücher eingescannt hat?
 Q2: Kann man den Satz so verstehen, dass Jonas Bücher eingescannt hat?
 ‘Can this sentence be understood such that Karl (Q1) / Jonas (Q2) scanned books?’

5%/5% positive answers to Q1/Q2 in Experiment 1.