Reconstruction in German A′-movement
An experimental investigation

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• major contributions
  – The first experimental investigation of reconstruction in German A′-movement
  – We propose an enhanced method to elicit coreference judgments
  – Reconstruction in German behaves differently from both English and what has been reported for German in the literature:
    * Condition C reconstruction is more robust than reported in recent experimental work on English
    * No evidence for an argument-/adjunct-asymmetry
    * Anaphor binding in both final and intermediate landing sites is possible
    * Logophoric anaphor binding may be (residually) possible after all

1 Background: Reconstruction in A′-movement

1.1 Theoretical aspects

• evidence for movement (movement vs. base-generation, cf., e.g., Aoun et al. 2001)
• Principle A: can be satisfied in different locations during the derivation:
    (1) [Which pictures of himself \$_i / \$_j \] did John\$_i think \_ Fred\$_j liked 
  – binding in the final landing site:
    (2) John\$_i wonders [which picture of himself \$_i / \$_j \] Bill\$_j likes 
• Principle C: reconstruction to the lowest position obligatory
  (3) *[Which picture of John\$_i \] do you think he\$_i likes 
  (4) a. *[Which claim that Mary had offended John\$_i \] did he\$_i repeat \_1?
    b. [Which claim that offended John\$_i \] did he\$_i repeat \_1
  (5) a. *[Which pictures of John\$_j \] did he\$_i destroy \_?
    b. [Which pictures near John\$_i \] did he\$_i destroy \_?
• predicate-/argument-asymmetries: predicates obligatorily reconstruct (contain trace of local subject/are non-referential), arguments do not (always), cf. Huang (1993), Heycock (1995)
  – asymmetry w.r.t. Principle A: no intermediate binding with predicates (vs. ex. (1))
  (6) ... but [listen to each other \$_{i / j} \], they\$_j say the kids\$_j won’t 
  – 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:
  (7) a. ?*How many pictures of John\$_i does he\$_i think that I like 
    b. ?How many pictures of John\$_j do you think that he\$_i will like 

1
1.2 Empirical aspects

1.2.1 English

- data almost exclusively based on introspection
- Principle C in English: contested facts

(8) a. [Whose criticism of Lee_{i}] did he_{i} choose to ignore __1?
   b. [Which picture of John_{i}] does he_{i} like best __1?
   c. [Most articles about Mary_{i}] I am sure she_{i} hates __1.
   d. [That John_{i} had seen the movie_{i}] he_{i} never admitted __1.

- argument-/adjunct-asymmetry
  * What qualifies as an argument/adjunct? Noun-complement clauses may not be complements after all (Stowell 1981); the status of PP-modifiers is contested; the clearest contrasts seem to involve event nominals, cf. Safir (1999: 589, note 1)
  * asymmetry has been generally called into question, cf. Fischer (2004: 161f.) for ex. showing reconstruction with adjuncts and non-reconstruction with arguments

- confounds:

(9) a. Bill_{i} remembered that the Times had printed a picture of himself_{i} in the Sunday edition.
   b. The picture of himself_{i} in Newsweek dominated John_{i}’s thoughts.

- implicit PRO (Principle A/C): Normally, both pronouns and reflexives are possible inside picture NPs, cf. (10-a); in some semi-idiomatic expressions, however, only the reflexive is possible, (10-b); possible explanation: these NPs contain an implicit PRO that binds the reflexive, cf. (10-c) → binding can obtain in the absence of reconstruction:

(10) a. Lucie_{i} saw a picture of her_{i}/herself_{i}.
    b. Lucie_{i} told a story about *her_{i}/herself_{i}.
    c. Lucie_{i} told [PRO_{i} a story about *her_{i}/herself_{i}].

→ one should test nouns where a coreferential PRO is ruled out, either because the PRO would be disjoint, cf. (11), or because the noun is unaccusative and thus lacks an external argument (Bianchi 1999: 118–119, Cecchetto 2005: 16–18), cf. (12):

(11) Arbeitnehmer_{i} sollten Gerüchte über sich_{i} nicht einfach ignorieren
    ‘Workers shouldn’t simply ignore rumours about themselves.’
https://rp-online.de/leben/beruf/wie-man-auf-geruechte-richtig-reagiert_aid-22142659

(12) Il poeta descrive il [riflesso di se stesso_{i}] che Narciso_{i} vide nella fonte.
    ‘The poet describes the reflection of himself which Narcissus saw in the fountain.’

1.2.2 German

- **Principle A**

  (13) a. *Gernot_1 erinnerte sich daran, dass die Zeit ein Bild von Gernot veröffentlicht hatte._

  "Gernot remembered that _1 published a picture of himself._"

  b. *Gernot_1 dachte, dass niemand ein Bild von sich_1 veröffentlichen wollte._

  "Gernot thought that nobody would publish a picture of himself._"

- No binding in final ((15)) and intermediate ((16)) A'-positions ((16-a) is from Kiss 2001: 186, Frey 1993: 136 for a similar ex.; other ex. from Salzmann 2017: 264f.; for Dutch, see van de Koot 2004: 187; for a case where intermediate binding is possible after all in German, cf. Frey 1993: 138):

  (15) a. Hans_1 fragt sich, [CP [welches Foto von sich/ihn_1] ich am besten _1 mag].

  "John wonders which picture of himself/him I like best."

  b. Peter_1 denkt, [CP [dieses Buch über *sich/ihn_1] finde ich _1 interessant].

  "Peter thinks that this book about himself/him finds interesting."

  (16) a. [Das Buch über sich_1] glaubt der Urs_1 mag der Ulrich_1.

  "This book about himself, Urs thinks that Ulrich likes."

  b. *Sich_1 denkt Peter_1 immer, dass du _1 magst.

  "Himself always thinks that you like._"
2 Experiments: Reconstruction in German \textit{wh}-movement

2.1 Method

- We did not directly ask for co-reference judgments as in \textit{Adger et al. (2017)} as this may be unnatural for non-linguists and could lead subjects to engage in metalinguistic analysis.
- We adapt the embedding method from \textit{Bruening and Al Khalaf (to appear)}:
  - indirect questions
  - Participants are presented with two potential antecedents for a pronoun: the R-expression inside the moved \textit{wh}-phrase and an R-expression in the matrix clause
  - a question after the item then asks for the referent of the local subject
  - relatively natural task
- But we explicitly asked for each of the readings whether it is possible or not (two separate yes/no questions), as illustrated in the (translated) example below; cf. app. 1 for German ex.

\begin{tabular}{|l|}
\hline
Maria tells us how proud of Anna she is. \\
\textit{Can this sentence be interpreted such that...} \\
...Mary is proud? □ Yes □ No \\
...Anna is proud? □ Yes □ No \\
\hline
\end{tabular}

- explicit information about coreference possibilities
- optionality can be captured; especially relevant for Principle A: binding in the final landing site and in intermediate positions
- In the questions, we did not use pronouns in order to exclude potential Principle A or C effects there. For example, we avoided asking questions like “Is Mary proud of Mary?” (cf. \textit{Featherston 2002}, who used sentences like “Martin saw Martin” to enforce the intended reading in their experiment on binding in double objects).
- the order of referents in the answers was randomized
- We used SoSci Survey (www.soscisurvey.de) to create online questionnaires.
- We ran four experiments (32/48/36/36 participants, respectively).
- We used a Latin Square Design, with a 1:1 proportion of items and fillers (for a description of the fillers, see the appendix 2).

2.2 Design

Factors

- Principle C vs. Principle A
- DPs (arguments) vs. APs (predicates)
- in situ vs. moved
- distance (short, coord, emb 1, emb 2)
- R-expression inside argument vs. R-expression inside adjunct (DP-arguments only)
- For an example of a complete item set, see appendix 1.
2.2.1 Principle C – Conditions

(17) Principle C: APs (predicates)
   a. **Mary** tells (us) that [she] is very proud of **Anna**.
      Principle C predicts: co-reference between *she* and *Anna* impossible.
   b. **Mary** tells (us) [how proud of **Anna**] she is.

(18) Principle C: DPs – R-exp. inside argument
   a. **Mary** tells (us) that [she] saw a statue of **Anna**.
   b. **Mary** tells (us) [which statue of **Anna**] she saw.

(19) Principle C: DPs – R-exp. inside adjunct
   a. **Mary** tells (us) that [she] saw a statue on the desk of **Anna**.
   b. **Mary** tells (us) [which statue on the desk of **Anna**] she saw.

• argument vs. adjunct: R-expression contained in PP argument or PP adjunct to N
  – PP-arguments mostly involved selected prepositions: *an ‘at/to’, über ‘about’, für ‘for’* etc.
  – ~50% of the nouns were event nominals (*ung*-derivations), ~50% were underived (e.g. statue, portrait, rumor) or verb-related (anger, hate, attack) → the former are more likely to take proper arguments (*ung*-derivations vs. other nouns did not end up behaving differently in the experiments)
  – a coreferential implicit PRO was ruled out (either unacc. noun or disjoint agent, cf. rumor)

• 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.

(20) a. **Mary** tells (us) [which statue of **Anna**] she saw __.
   b. **Mary** tells (us) [which statue of **Anna** and the siblings] she saw __.

• 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.

(21) a. **Mary** tells (us) [which statue of **Anna**] she thinks that you saw __.
   b. **Mary** tells (us) [which statue of **Anna**] you think that she saw __.

• These conditions were adopted from [Adger et al. (2017)](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:

(22) 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):

(23) a. How proud of Anna does she think that you are (how proud of her).
   b. *How proud of Anna do you think that she is (how proud of her).
### 2.2.2 Principle C – Results

#### PRINCIPLE C – APs

![Graph showing proportion of yes-answers for Principle C APs across conditions](image)

**Exp1**

**Exp3: replication**

**Exp3: new conditions**

#### PRINCIPLE C – DPS

![Graph showing proportion of yes-answers for Principle C DPSs across conditions](image)

**Exp2**

**Exp4: replication**

**Exp4: new conditions**

Q1 (matrix subject)  Q2 (local subject)

### 2.2.3 Principle C – Main findings

- Reconstruction is very robust across conditions, and with both arguments and predicates.

- No support for the predicted argument-/adjunct-asymmetry (argues against a late-merger approach).

- Significant effect of embedding (but not of linear distance), 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).

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1. All statistical results reported in this section are based on univariate GLMMs with yes-answers to Q2 (main indicator of Principle A/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 lm4 and lmerTest (R Core Team 2016, Bates, Mächler, Bolker and Walker 2015, Kuznetsova et al. 2017).

2. No significant effect of interaction with movement in the Principle C conditions of exp 1 (linear distance: $z = 0.96, p = 0.33$; movement: $z = 0.52, p = 0.60$; dist:mov: $z = -1.04, p = 0.30$; all binary factors sum-coded). See next footnote for a qualification concerning exp 2.

3. In exp 2, there is a numerically small but significant three-way interaction between distance, movement, and arg./adj. ($z = 2.83, p = 0.005$): there is less reconstruction with adjuncts in the short conditions; in the coord. conditions, the opposite holds. But it is not the case that there is generally less reconstruction with adjuncts.

4. In 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: $z = 0.009, p = 0.99$; emb1: $z = 3.30, p < 0.001$; emb2: $z = 3.92, p < 0.001$; exp 4: coord: $z = 0.23, p = 0.81$; emb1: $z = 3.17, p = 0.002$; emb2: $z = 5.65, p < 0.001$).
2.2.4 Principle A – Conditions

(24) Principle A: APs (predicates)
   a. Mary tells (us) that Anna is very proud of [herself]. \(\text{in situ}\)
   b. Mary tells (us) [ how proud of [herself] | Anna is ____]. \(\text{moved}\)
   Principle A predicts: co-reference between herself and Anna possible (obligatory if AP contains trace of subject).

(25) Principle A: DPs
   a. Mary tells (us) that Anna saw the statue of [herself]. \(\text{in situ}\)
   b. Mary tells (us) [ which statue of [herself] | Anna saw ____]. \(\text{moved}\)
   Principle A predicts: co-reference between herself and Anna possible.

• linear distance between anaphor and R-expression: increased by means of NP-coordination

(26) a. Mary tells (us) [ which statue of [herself] | Anna saw ____]. \(\text{short}\)
    b. Mary tells (us) [ which statue of [herself] and the teams] | Anna saw ____]. \(\text{coord}\)

• structural distance: embedding
   – ‘embedding 1’: R-expression and anaphor are not clausemates underlingly.
   – ‘embedding 2’: R-expression and anaphor are clausemates underlingly.

(27) a. Mary tells (us) [ which statue of [herself] | Anna thinks that you saw ____]. \(\text{emb 1}\)
    b. Mary tells (us) [ which statue of [herself] | you think that Anna saw ____]. \(\text{emb 2}\)
   – if full reconstruction is obligatory, Anna and herself can be co-referential only in emb 2
   – if binding in intermediate position is possible, Anna and herself can be co-referential in emb 1 as well (at least with DPs)
   – if Vehicle Change is possible (herself \(\rightarrow\) her), Anna can be antecedent for herself in emb 1 without binding in intermediate position

• Further predictions of Vehicle Change for Principle A
   – binding by matrix subject Mary possible (even if interpretation in final landing site impossible)
   – matrix binding should then only be possible in the moved condition but not in-situ (Vehicle Change only applies to movement chains)
   – Vehicle Change should have the same effect with APs and DPs (w.r.t. matrix and intermediate binding)
2.2.5 Principle A – Results

PRINCIPLE A – APs

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<tr>
<th>Exp1</th>
<th>Exp3: replication</th>
<th>Exp3: new conditions</th>
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<td>Principle A coord in situ moved in situ moved</td>
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PRINCIPLE A – DPS

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<th>Exp2</th>
<th>Exp4: replication</th>
<th>Exp4: new conditions</th>
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Q1 (matrix subject) Q2 (local subject)

2.2.6 Principle A – Main findings

• Reconstruction for Principle A is less systematic than for Principle C

• Reconstruction for Principle A is more likely with predicates than with arguments

• APs (predicates): reconstruction all the way down preferred, but
  – intermediate binding accepted by 50% (argues against obligatory trace of subject within AP)
  – matrix binding much less acceptable: less than 20% [except with coord] (argues against vehicle change)

• DPs:
  – Intermediate binding accepted by 70% (against claims in the literature); fillers testing intermediate binding also showed a high acceptance rate: 65–87%
  – Matrix binding accepted by 50–60% (against claims in the literature)
  → Both argue against the presence of a silent PRO within DP

5Significant interaction between movement and linear distance in exp 1 (z = -2.44, p = 0.01) and exp 2 (z = -2.29, p = 0.02).
3 Further issues

Methodological insights:

• The findings from experiments 1 + 2 were replicated in experiments 3 + 4, supporting the reliability of our method.

• The responses to the fillers were consistent and mostly in line with the expectations (see appendix), confirming that subjects understood the task as intended and were paying attention.

• In experiment 3 + 4, we additionally collected acceptability ratings for the sentences (on a 1–7 scale), because the acceptability of long-distance movement varies between speakers. The ratings will allow us to potentially exclude speakers that do not accept this kind of structure, and to explore correlations between acceptability and coreference judgments: → A first inspection suggests that the patterns are robust even for items that received a low acceptability rating.

Open issues

• With nominal arguments (exp 2/4), there is a surprisingly high proportion of matrix binding (around 30%) even in the short in situ condition. Can this be considered evidence for logophoric anaphor binding in German?

• For Principle A, the presence of coordination has a strong effect on the availability of matrix binding with adjectival predicates. This could mean that a larger linear distance between the anaphor and the potential local binder makes this binding relation less likely. But then, the same effect would be expected for the ‘embedding 2’ structure; there, a similar increase of matrix binding is observed only for nominals, but not for adjectives.

• To do: more detailed analysis of the availability of matrix binding and its relation to the availability of local binding (multivariate statistical analysis including both Q1 and Q2 as dependent variables).

4 Conclusion

• Principle C
  – reconstruction is very robust across conditions, with both nouns and adjectival predicates
  – no argument-/adjunct asymmetry (against Late-Merger)
  – small effect of embedding, but (unlike in experiments on English) there remains a strong preference for non-coreference

• Principle A
  – reconstruction is less systematic than for Principle C
  – reconstruction is more likely with adjectival predicates than with nouns
  – nouns: binding in final and intermediate landing sites accepted to a high degree (against claims in the literature)

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6According to a univariate GLMM with yes-answers to Q1 as the dependent variable, there was a significant effect of linear distance in exp 1: $z = 3.25$, $p = 0.001$. 

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9
References


5 Appendix 1: Items: original German version

Experiment 1: adjectival predicates (local movement)

(28) Principle A
a. Maria erzählt, dass Anna sehr stolz auf sich (und die Mannschaften) ist. \textit{in situ}
b. Maria erzählt, [ wie stolz auf sich (und die Mannschaften) ] Anna ___ ist. \textit{moved}
→ Q1: Kann man den Satz so verstehen, dass jmd stolz auf Maria (und die Mannschaften) ist?
→ Q2: Kann man den Satz so verstehen, dass jmd stolz auf Anna (und die Mannschaften) ist?

(29) Principle C
a. Maria erzählt, dass sie sehr stolz auf Anna (und die Mannschaften) ist. \textit{in situ}
b. Maria erzählt, [ wie stolz auf Anna (und die Mannschaften) ] sie ___ ist. \textit{moved}
→ Q1: Kann man den Satz so verstehen, dass Maria stolz ist?
→ Q2: Kann man den Satz so verstehen, dass Anna stolz ist?

Experiment 2: nominal arguments (local movement)

(30) Principle A
a. Maria erzählt, dass Anna die Statue von sich (und den Geschwistern) gesehen hat. \textit{in situ}
b. Maria erzählt, [ welche Statue von sich (und den Geschwistern) ] Anna ___ gesehen hat. \textit{moved}
→ Q1: ...so verstehen, dass jmd eine Statue von Maria (und den Geschwistern) gesehen hat?
→ Q2: ...so verstehen, dass jmd eine Statue von Anna (und den Geschwistern) gesehen hat?

(31) Principle C (argument)
a. Maria erzählt, dass sie die Statue von Anna (und den Geschwistern) gesehen hat. \textit{in situ}
b. Maria erzählt, [ welche Statue von Anna (und den Geschwistern) ] sie ___ gesehen hat. \textit{moved}
→ 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?

(32) Principle C (adjunct)
a. Maria erzählt, dass sie die Statue auf dem Tisch von Anna (und...) gesehen hat. \textit{in situ}
b. Maria erzählt, [ welche Statue auf dem Tisch von Anna (und...) ] sie ___ gesehen hat. \textit{moved}
→ 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: adjectival predicates (local and long-distance movement)

(33) Principle A (only additional conditions):
   a. Maria erzählt, dass Anna denkt, dass du sehr stolz auf sich bist. \textit{in situ, emb 1}
   b. Maria erzählt, [wie stolz auf sich] Anna denkt, dass du \underline{____} bist. \textit{moved, emb 1}
      → Q1: Kann man den Satz so verstehen, dass du stolz auf Maria bist?
      → Q2: Kann man den Satz so verstehen, dass du stolz auf Anna bist?
   c. Maria erzählt, dass du denkst, dass Anna sehr stolz auf sich ist. \textit{in situ, emb 2}
   d. Maria erzählt, [wie stolz auf sich] du denkst, dass Anna \underline{____} ist. \textit{moved, emb 2}
      → Q1: Kann man den Satz so verstehen, dass du denkst, dass jemand stolz auf Maria ist?
      → Q2: Kann man den Satz so verstehen, dass du denkst, dass jemand stolz auf Anna ist?

(34) Principle C (only additional conditions):
   a. Maria erzählt, [wie stolz auf Anna] sie denkt, dass du \underline{____} bist. \textit{moved, emb 1}
      → Q1: Kann man den Satz so verstehen, dass Maria denkt, dass du bist?
      → Q2: Kann man den Satz so verstehen, dass Anna denkt, dass du bist?
   b. Maria erzählt, [wie stolz auf Anna] du denkst, dass sie \underline{____} ist. \textit{moved, emb 2}
      → 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: nominal arguments (local and long-distance movement)

(35) Principle A (only additional conditions):
   a. Maria erzählt, dass Anna denkt, dass du die Statue von sich gesehen hast. \textit{in situ, emb 1}
   b. Maria erzählt, [welche Statue von sich] Anna denkt, dass du \underline{____} gesehen hast. \textit{mvd, emb 1}
      → Q1: Kann man den Satz so verstehen, dass du eine Statue von Maria gesehen hat?
      → Q2: Kann man den Satz so verstehen, dass du eine Statue von Anna gesehen hast?
   c. Maria erzählt, dass du denkst, dass Anna eine Statue von sich gesehen hat. \textit{in situ, emb 2}
   d. Maria erzählt, [welche Statue von sich] du denkst, dass Anna \underline{____} gesehen hat. \textit{mvd, emb 2}
      → Q1: ...so verstehen, dass du denkst, dass jemand eine Statue von Maria gesehen hat?
      → Q2: ...so verstehen, dass du denkst, dass jemand eine Statue von Anna gesehen hat?

(36) Principle C (only additional conditions):
   a. Maria erzählt, [welche Statue von Anna] sie denkt, dass du \underline{____} gesehen hat. \textit{mvd, emb 1}
      → 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?
   b. Maria erzählt, [welche Statue von Anna] du denkst, dass sie \underline{____} gesehen hat. \textit{mvd, emb 2}
      → 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?
6 Appendix 2: Fillers

- (Almost) the same filler materials were included in all four experiments.
- They were all constructed in such a way that two yes/no questions could be asked about their interpretation, to keep the task constant.
- Description of the filler groups:

1. Subject/object control
   Anja hat Markus versprochen, in der WG die Möbel umzustellen.
   ‘Anja promised Markus to rearrange the furniture in the shared apartment.’
   → Will Anja/Markus rearrange the furniture?

2. VP coordination (1/3: SVO, 2/4: OVS)
   Die Chefin rief den Assistenten an und machte sich Notizen.
   ‘The boss[NOM] called the assistant[ACC] and took some notes.’
   → Did the boss/assistant take notes?
   Den Kollegen kritisierte die Ingenieurin und ging nach draußen.
   ‘The colleague[ACC] criticized the engineer[NOM] and left.’
   → Did the colleague/engineer leave?

3. Relative clauses (1/3: non-ambiguous, 2/4: ambiguous)
   Peter hat erzählt, dass der Schüler, den er geärgert hat, eine Strafarbeit bekommen hat.
   non-amb
   ‘Peter told us that the student who he teased got a punishment.’
   → Did Peter/the student tease someone?
   Leyla hat erzählt, dass die Verwandte, die sie besucht hat, in Budapest wohnt.
   amb
   ‘Leyla told us that the relative {who she visited | who visited her} lives in Budapest.’
   → Did Leyla/the relative visit someone?

4. Case ambiguity
   Die Königin hat die Herzogin eingeladen.
   ‘The queen[ACC/NOM] invited the duchess[ACC/NOM].’
   → Did the queen invite someone?

5. PP attachment ambiguity
   Linus hat erzählt, dass er den Nachbarn mit dem Teleskop beobachtet.
   ‘Linus told us that he observes the neighbor with a telescope.’
   → Does the neighbor/Linus have/use a telescope?

6. Long movement
   Welches Bild von sich denkt Paula, dass Isabell hochgeladen hat?
   ‘Which picture of herself does Paula think that Isabell uploaded?’
   → Is the sentence about a picture of Paula/Isabell?

7. ECM
   Gustav hat erzählt, dass Karl und Jonas ihn Bücher einscannen ließen.
   ‘Gustav told us that Karl and Jonas had him scan books.’
   → Did Karl/Jonas scan books?

8. Coordinated dative
   Gabriel hat Egon und Lars erzählt, dass er nach München ziehen will.
   ‘Gabriel told Égon and Lars that he wants to move to Munich.’
   → Did Egon/Lars move to Munich?
Figure 1: Results for the fillers (in experiment 1)
7 Appendix 3: Experimental work on Principle C in English

7.1 Adger et al. (2017)

7.1.1 Method

• Participants were explicitly asked for coreference judgments (forced-choice task):

“To assess the availability of coreference, participants were presented with a sentence containing a pronoun and proper name. The pronoun and proper name were then highlighted. Participants were asked whether they could use the sentence when the two highlighted expressions referred to the same individual. They were given the option of answering Yes or No.”

How proud of Elizabeth is she?

Could you use this sentence when the two highlighted expressions refer to the same individual?

☐ Yes ☐ No

7.1.2 Results

• predicates vs. arguments (R-expression inside PP-complements):
  – predicates: robust reconstruction; coreference becomes slightly more acceptable under increasing distance between R-expression and pronoun (pace Huang 1993; who only observes this effect for arguments), but non-coreference remains preferred
  – arguments: weak Principle C effect under local extraction; coreference becomes even preferred once a clause-boundary is crossed (unlike with predicates), disconfirming the claims in the literature

• argument-/adjunct-asymmetries (R-expression inside complement clause vs. relative clause):
  – DP-arguments: Coreference is preferred with both arguments and adjuncts (contrary to claims in the literature); weak Condition C effect with complement clauses (more non-coreference answers than with adjuncts)
  – predicates: coreference preferred with both arguments and adjuncts; weak Condition C effect with complement clauses (more non-coreference answers than with adjuncts)

• distance effect: Condition C effect is weakest when the coreferential pronoun is in the embedded clause; scale: local mvt > pronoun in matrix clause > pronoun in embedded clause (evidence for linear distance: adding material in local extraction between R-expression and pronoun leads to same results as (37-b)):

(37)  a. Which picture of John does he like?
     b. Which picture of John does he think that Sue likes?
     c. Which picture of John does Sue think that he likes?
7.2 Bruening and Al Khalaf (to appear)

7.2.1 Method

- Participants were not asked directly for coreference judgments but had to choose between two potential referents for a pronoun.

A female staffer told everyone which of the announcements that Hillary Clinton was running for president she had actually authorized.

Who authorized the announcement?

☐ the staffer  ☐ Hillary Clinton

7.2.2 Results

- distance not investigated/not controlled for

- arguments vs. adjuncts (complement clauses/relative clauses to N): no significant contrast:
  - arguments: 42.7% accept coreference (only 57% Condition C)
  - adjuncts: 56% accept coreference (only 44% Condition C)

- arguments vs. adjuncts (PP-complements/PP-adjuncts to N): no significant contrast
  - arguments: 22% accept coreference (78% Condition C)
  - adjuncts: 30.7% accept coreference (69.3% Condition C)

7.3 Possible shortcomings of previous experiments

- Adger et al. (2017):
  - The task may be unnatural (for non-linguists) and may lead subjects to engage in metalinguistic analysis.
  - Remarkable differences between experiments that test for (non-)co-reference in local extraction: In Exp1, non-co-reference is clearly preferred, in Exp2, co-reference is preferred

- Bruening and Al Khalaf (to appear):
  - Since speakers can choose only one referent, coreference with the other referent cannot be ruled out with certainty; cannot diagnose optionality.
  - definiteness/prominence of R-expressions not controlled for: R-expression inside wh-phrase always definite, R-expression in matrix sometimes indefinite; R-expression inside wh-phrase often much more prominent than matrix R-expression (Hillary Clinton, Putin, president, Queen vs. reporter, secret service agent, literature professor, female aide)