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# **Subklausale Lokalitätsbeschränkungen der Relativsatzextraposition**

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# Outline of the Talk

- Introduction: Relative Clause Extraposition
- Subclausal Locality Constraints on Extraposition
  - Review of the Constraints and Discussion of Counterexamples
    - Subjacency (Chomsky 1973)
    - Generalized Subjacency (Baltin 1981, 1983, 2006)
    - Barriers Approach (Chomsky 1986)
- Brief Discussion of Corpus Evidence for German
- Experimental Study I (English and German)
- Experimental Study II (German only)
- Conclusion

Introduction:  
Relative Clause Extraposition  
in English and German

# Relative Clause Extraposition

- Integrated relative clause (“in situ”)

*I met [<sub>DP</sub> a girl [<sub>RC</sub> who looked like you]] yesterday.*

([profile.myspace.com/index.cfm?fuseaction=user.viewprofile&friendid=21174003](http://profile.myspace.com/index.cfm?fuseaction=user.viewprofile&friendid=21174003), 03/11/2007)

*Ich habe [<sub>DP</sub> alle diesbezüglichen Threads [<sub>RC</sub> die ich finden konnte]]  
gelesen.*

([www.rcforum.de/ftopic6950.html](http://www.rcforum.de/ftopic6950.html), 03/11/2007)

- Extraposed relative clause

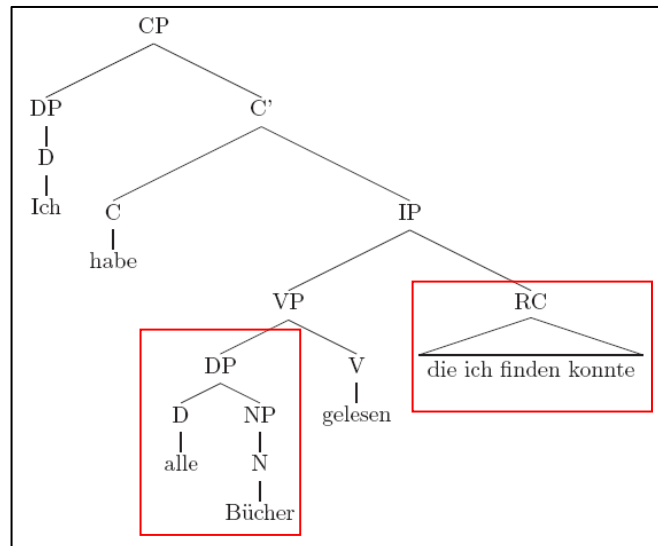
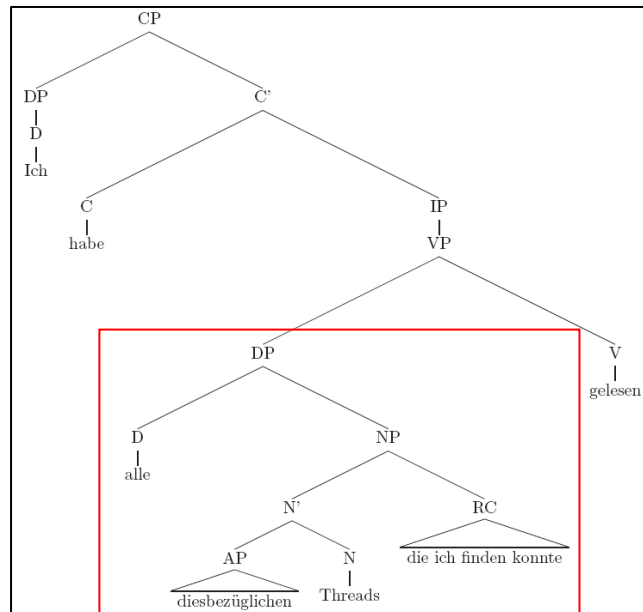
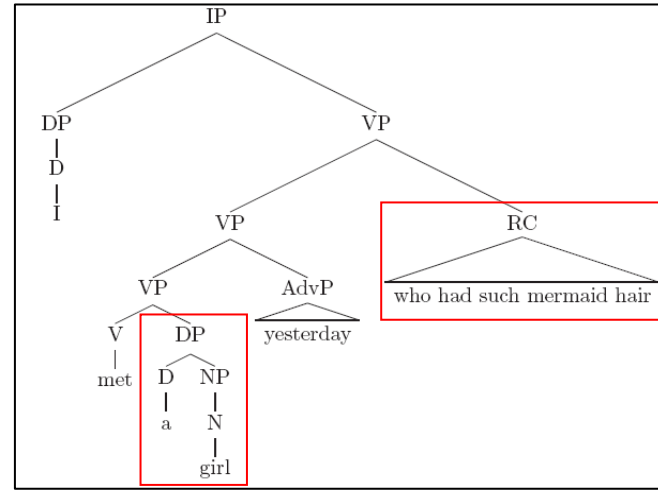
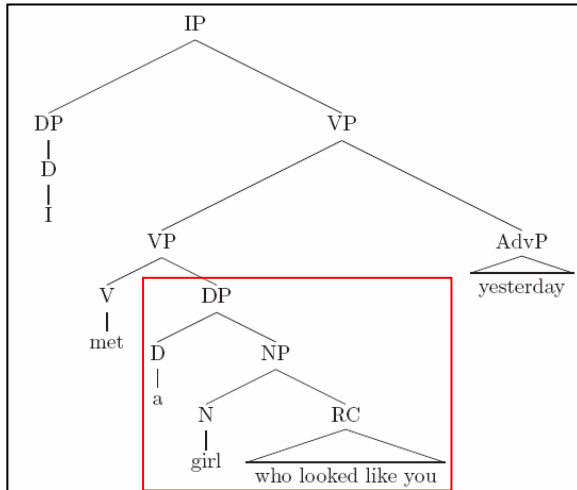
*I met [<sub>DP</sub> a girl t] yesterday [<sub>RC</sub> who had such mermaid hair.]*

([profile.myspace.com/index.cfm?fuseaction=user.viewprofile&friendid=16025622](http://profile.myspace.com/index.cfm?fuseaction=user.viewprofile&friendid=16025622), 03/11/2007)

*Ich habe [<sub>DP</sub> alle Bücher t] gelesen [<sub>RC</sub> die ich finden konnte.]*

([www.wer-weiss-was.de/theme46/article2357606.html](http://www.wer-weiss-was.de/theme46/article2357606.html), 03/11/2007)

# Relative Clause Extraposition



# Subclausal Locality Constraints on Extraposition

# Subjacency

- Chomsky (1973) claims that:
  - Extraposition is not only clause-bounded (Ross 1986)
  - But obeys a stricter, subclausal locality constraint

No rule can move an item from position  $Y$  to position  $X$  in the structure

$\dots [\beta \dots [\alpha \dots Y \dots] \dots] \dots X \dots$   
where  $Y \neq \alpha$  and  $\alpha, \beta$  are cyclic categories, ...

(Chomsky, 1973, p. 271)

- Chomsky (1973) and also Akmajian (1975) assume that the set of cyclic nodes includes **S** (IP) and **NP** (DP)
- **Prediction:** Extraposition “out of” a noun phrase embedded in another noun phrase is impossible

# Generalized Subjacency

- Baltin (1981, 1983, 2006) claims that extraposition obeys an even stricter subclausal locality constraint:

Generalized Subjacency

In the configuration  $A \dots [\alpha \dots [\beta \dots B \dots ]_{\beta} \dots ]_{\alpha} \dots A'$ ,

- a. A and B cannot be related where  $\alpha$  and  $\beta = \text{NP, PP}$ , and either one or both of S and S';
- b. A' and B cannot be related where  $\alpha$  and  $\beta$  are maximal projections of any major category.

(quoted from Baltin 1983, p. 155; see also Baltin 1981, p. 262)

- **Prediction:** Only one maximal projection can intervene between an extraposed relative clause and its “in situ” position

# Generalized Subjacency

- Generalization (Baltin 2006, p. 241):  
“An extraposed phrase is adjoined to the first maximal projection that dominates the phrase in which it originates.”
- See also Akmajian (1975), Asakawa (1979), Jacobson (1987), and Rochemont and Culicover (1997) for English, Wiltschko (1997) for German, and Keller (1995) for both languages.

# Counterexamples - English

- Constructed counterexample from Uszkoreit (1990, p. 2333)

*“ $[_{DP}$  Only letters  $[_{PP}$  from  $[_{DP}$  those people  $t$ ]]] remained unanswered  $[_{RC}$  that had received our earlier reply.]”*

- Naturally occurring examples

*We drafted  $[_{DP}$  a list  $[_{PP}$  of  $[_{DP}$  basic demands  $t$ ]]] that night  $[_{RC}$  that had to be unconditionally met or we would stop making and delivering pizza and go on strike.]*

([portland.indymedia.org/en/2005/07/321809.shtml](http://portland.indymedia.org/en/2005/07/321809.shtml), 02/22/2007)

*A wreath was placed  $[_{PP}$  in  $[_{DP}$  the doorway  $[_{PP}$  of  $[_{DP}$  the brick rowhouse  $t$ ]]]] yesterday,  $[_{RC}$  which is at the end of a block with other vacant dwellings.]*

(<http://www.firerescue1.com/DutyDeaths/278039/>, 02/22/2007)

# Counterexamples - German

- Constructed example by Müller (2004)

*Karl hat mir [DP eine Kopie [DP einer Fälschung [DP des Bildes  
Karl has me a copy a.GEN forgery the.GEN painting  
[DP einer Frau t]]]] gegeben, [RC die schon lange tot ist.]  
a.GEN woman given who already long dead is*

‘Karl gave me a copy of a forgery of the painting of a woman who has been dead for a long time.’

- Other authors also claim that such examples are grammatical in German: Haider (1997), Kiss (2005), Müller & Meurers (2006) and others.

# Counterexamples - German

*Und dann sollte ich* [<sub>DP</sub> *Augenzeuge* [<sub>DP</sub> *der* *Zerstörung*  
and then should I eye witness the.GEN destruction  
[<sub>DP</sub> *einer Stadt t*]]] *werden*, [<sub>RC</sub> *die mir am Herzen lag*]  
a.GEN city become that me at.the heart lay  
- *Sarajevo.*  
- Sarajevo

‘And then I was about to become an eye witness of the  
destruction of a city that was dear to my heart – Sarajevo.’  
(Tübinger Baumbank des Deutschen / Schriftsprache (TüBa-D/Z),  
sentence 16294)

# Intermediate Summary

- Extraposition from an DP embedded inside another DP has been argued to be grammatical in German by some authors.
- Natural German but also English examples can indeed be found in corpora.
- Chomsky's (1973) version of Subjacency is therefore falsified as a categorical constraint on extraposition in both German and English (if NP is taken to be a cyclic node).
- Baltin's even more restrictive Generalized Subjacency is therefore also falsified:

An extraposed RC is not always adjoined to the first maximal projection containing its antecedent.

# Chomsky's Barriers Approach

- Chomsky (1986, p. 14) makes a revised proposal which incorporates the distinction between arguments and adjuncts:

$\gamma$  is a BC for  $\beta$  iff  $\gamma$  is not L-marked and  $\gamma$  dominates  $\beta$ .

$\gamma$  is a barrier for  $\beta$  iff (a) or (b):

Barrier by inheritance

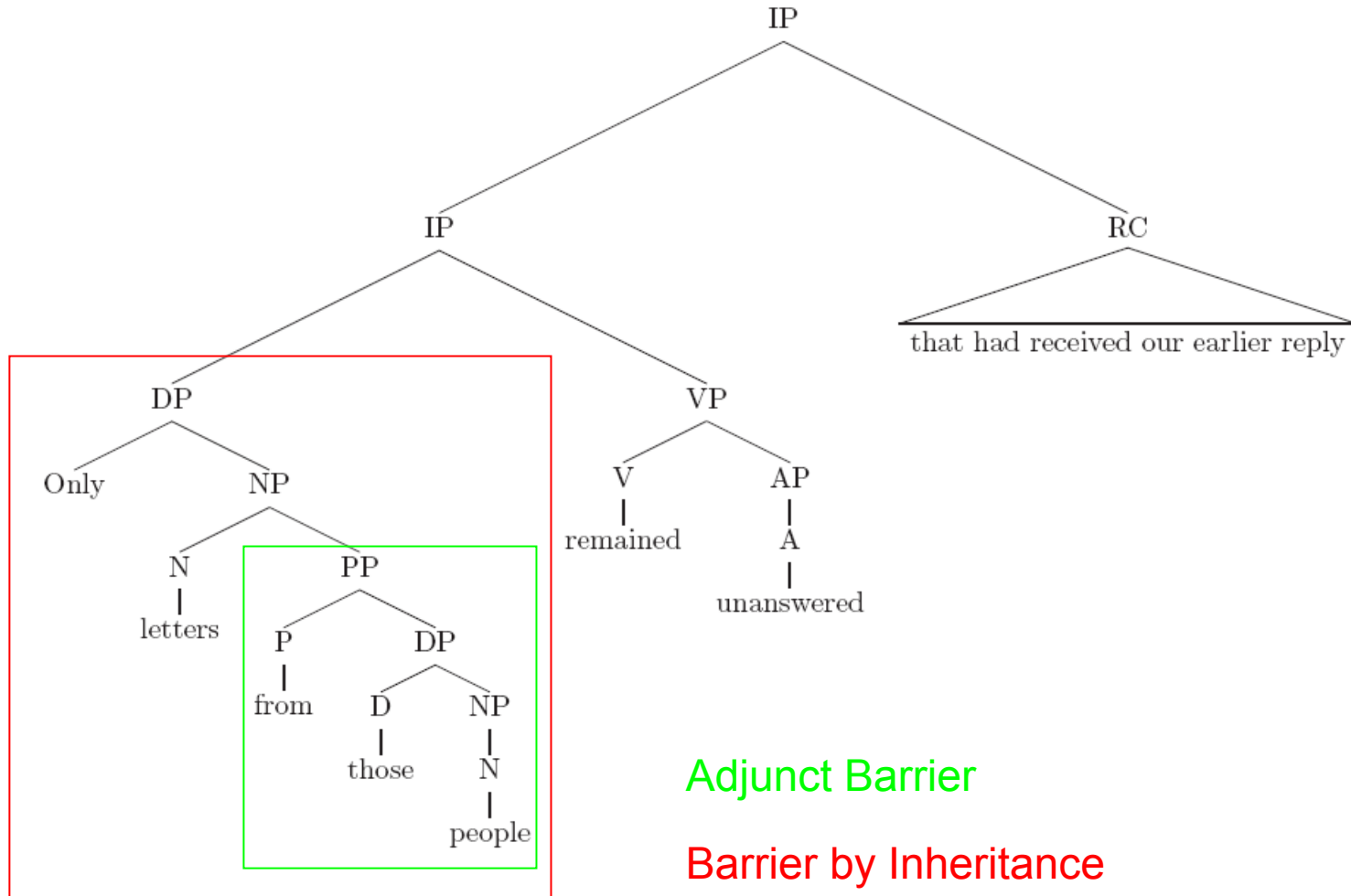
a.  $\gamma$  immediately dominates  $\delta$ ,  $\delta$  a BC for  $\beta$ ;

b.  $\gamma$  is a BC for  $\beta$ ,  $\gamma \neq \text{IP}$ .

Adjunct Barrier

- Again, two barriers are needed to render extraposition illicit
- Prediction:** Extraposition from a DP that is contained in some kind of adjunct (e.g., of another DP) is ungrammatical

# Chomsky's Barriers Approach



# Counterexamples - English

*I'm reading [<sub>DP</sub> a book [<sub>PP</sub> about [<sub>DP</sub> Elliott Smith t]]]  
**right now**, [<sub>RC</sub> who killed himself]]*

([www.songmeanings.net/lyric.php?lid=3530822107858518290](http://www.songmeanings.net/lyric.php?lid=3530822107858518290), 02/28/2007)

*For example, we understand that Ariva buses have won  
[<sub>DP</sub> a number [<sub>PP</sub> of [<sub>DP</sub> contracts [<sub>PP</sub> for [<sub>DP</sub> routes  
[<sub>PP</sub> in [<sub>DP</sub> London]] t ]]]]] **recently**, [<sub>RC</sub> which will not be run  
by low floor accessible buses.]*

(<http://www.publications.parliament.uk/pa/cm199899/cmselect/cmenvtra/32ii/32115.htm>,  
02/24/2007)

# Counterexamples - German

*... hielt sie vor allem [DP das Andenken [PP an [DP “die gute alte Zeit”*  
held she above all the memory of the good old time  
*[PP unter [DP ihrem verstorbenen Mann t]]]]] hoch, [RC der im*  
under her deceased husband high who in the  
*Mittelpunkt ihres Wahlkampfes stand.]*  
center of her campaign stood

‘... she mostly kept the memory of the good old times under her deceased husband alive who was at the center of her election campaign.’

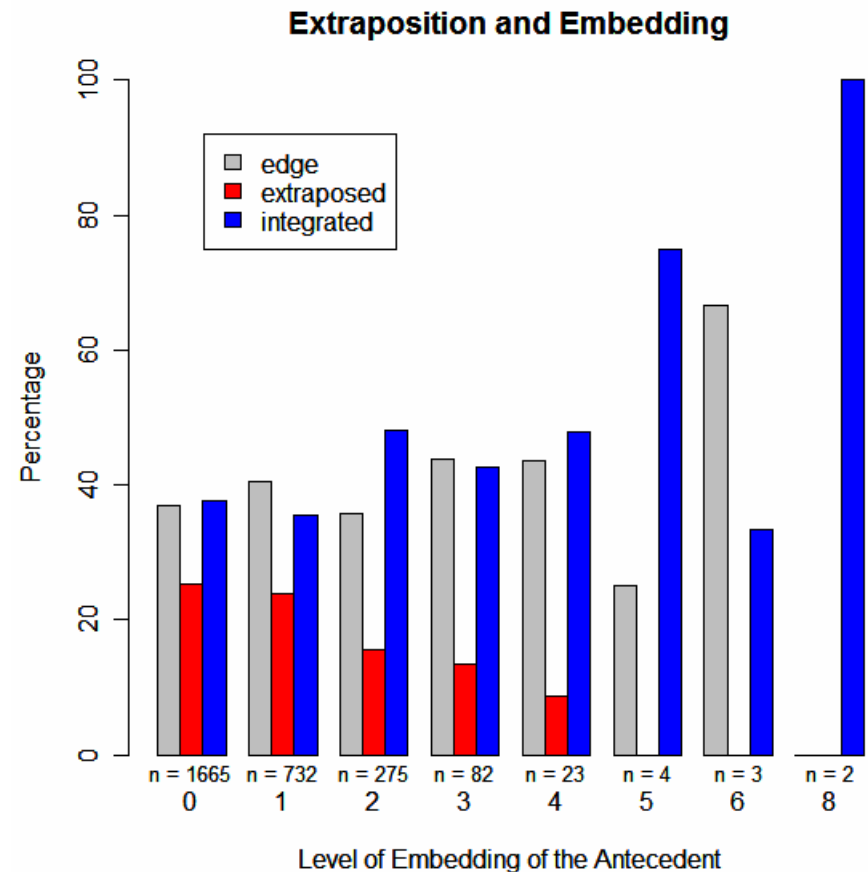
(Tübinger Baumbank des Deutschen / Schriftsprache (TüBa-D/Z), sentence 12507)

# Intermediate Summary

- Counterexamples against Chomsky's Barriers approach can be found both in German and English
- Extraposition is possible "out of" multiply embedded DPs
- No subclausal locality constraint proposed so far is compatible with the counterexamples we have presented
- The null hypothesis should be that there is no syntactic subclausal locality constraint on extraposition
- More systematic empirical research is needed

# Corpus Evidence for German

- German newspaper corpus TüBa-D/Z
- 2,789 relative clauses
- Likelihood of RC extraposition decreases with deeper embedding
- But the decrease is very gradual:
  - Embedding 0 – 25.4 %
  - Embedding 1 – 23.9 %
  - Embedding 2 – 15.5 %
  - Embedding 3 – 13.4 %
  - Embedding 4 – 8.7 %
  - Embedding 5-8 – 0 %



# Experimental Study I

# Motivation

- Are there consistent non-categorical effects of subclausal locality constraints?
- Questions
  - Do systematic experiments reveal subclausal locality effects?
  - What is the strength of these effects?
  - Are there differences between offline and online measures (acceptability and reading time data)?
  - Are there any differences between English and German?

# Experiments – Acceptability

- Systematic elicitation of acceptability judgments
  - Participants read a sentence on screen
  - And judged it on a scale from 1 (natural / acceptable) to 8 (unnatural / unacceptable)

Ich habe einen gefeierten Heiler aus einem einheimischen Dorf zu einer schweren Epidemie befragt, die Misstrauen gegen die westliche Medizin gesät hat.

natürlich  1  2  3  4  5  6  7  8 unnatürlich

- Dependent variable:  
Mean (z-normalized) acceptability rating

# Experimental Design - English

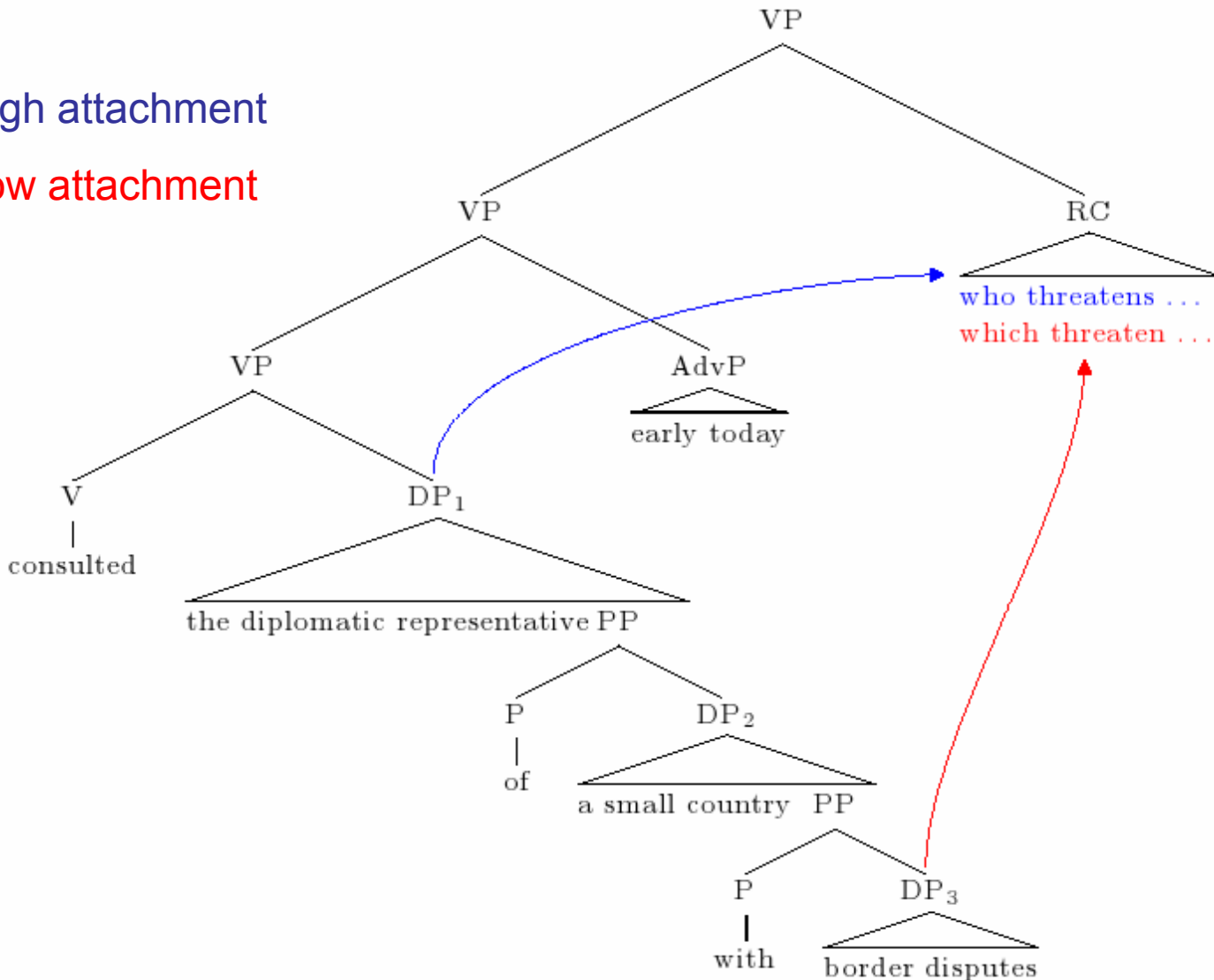
- 3 x 2 factorial design crossing the two factors
  - depth of **embedding** of the antecedent of the RC
  - height of **attachment** of the RC
- Experimental items consisted of a matrix sentence which contained 3 DPs and an extraposed relative clause (inspired by Gibson & Breen 2003)

<i>I consulted</i>	Subj. + Verb
<i>[<sub>DP1</sub> the diplomatic representative</i>	DP 1
<i>[<sub>PP</sub> <b>of</b> [<sub>DP2</sub> a small country</i>	DP 2
<i>[<sub>PP</sub> <b>with</b> [<sub>DP3</sub> border disputes t]]]]]</i>	DP 3
<i>early today</i>	Interv. Adv.
<i>[<sub>RC</sub> which threaten to cause a hugely disastrous war.]</i>	Extrap. RC

# Design – Deep Embedding

■ High attachment

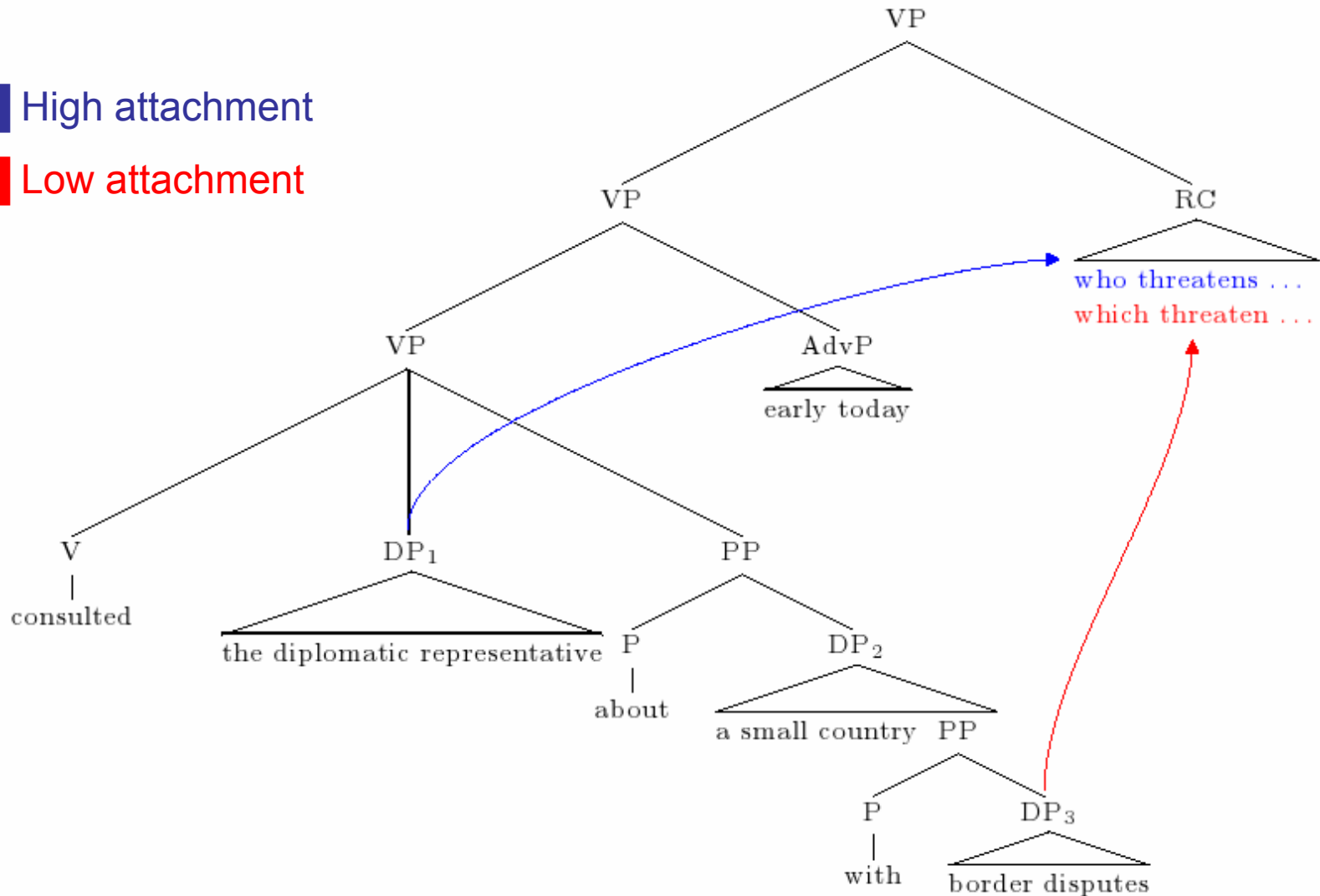
■ Low attachment



# Design – Mid Embedding

■ High attachment

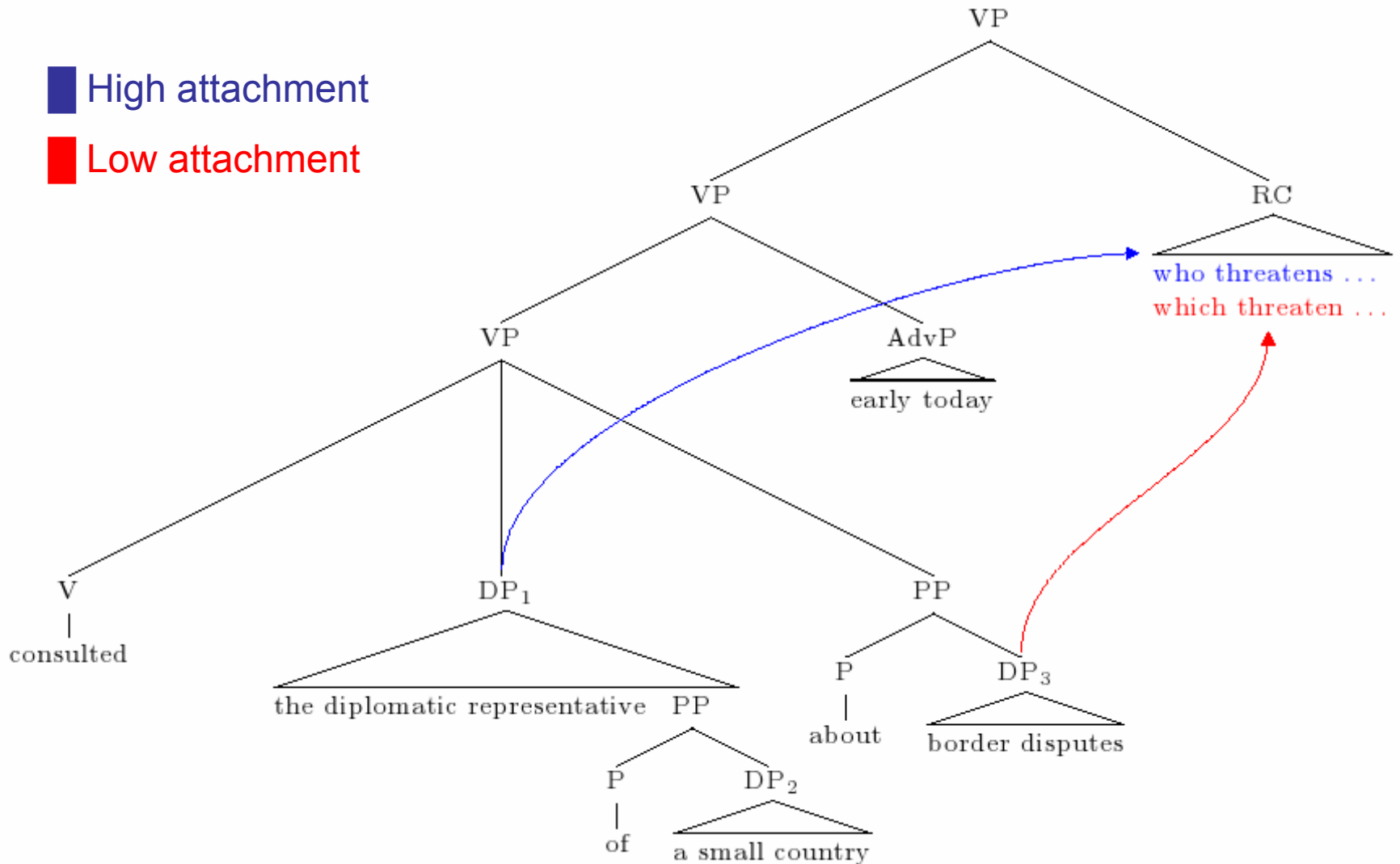
■ Low attachment



# Design – Shallow Embedding

■ High attachment

■ Low attachment



# Experimental Design - German

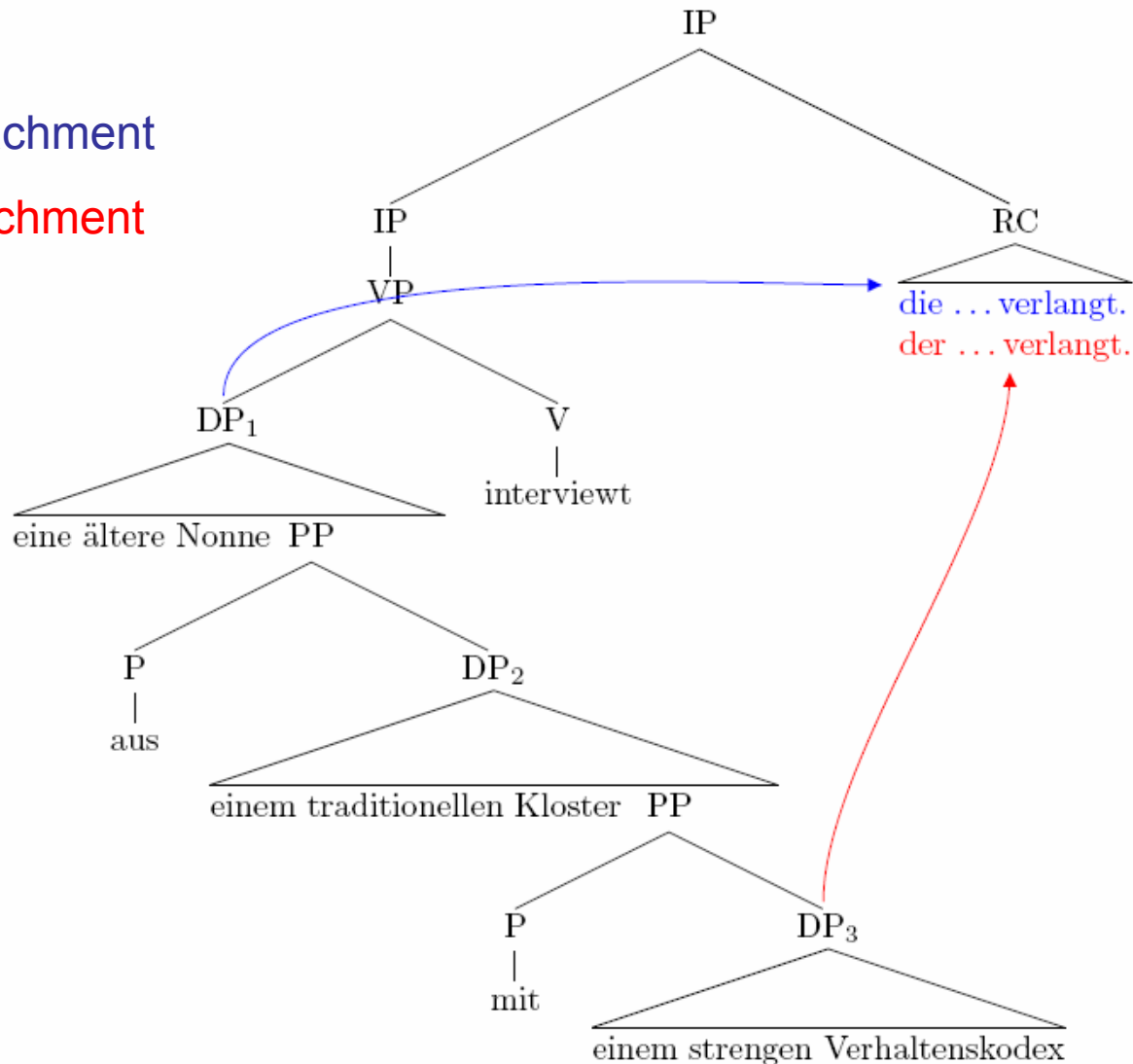
- 3 x 2 factorial design crossing the two factors
  - depth of **embedding** of the antecedent of the RC
  - height of **attachment** of the RC
- Same basic structure as in the English version
- Intervening material: Participle instead of adverb
- Attachment is forced by gender of the relative pronoun

<i>Ich habe</i>	Subj. + Verb1
<i>[<sub>DP1</sub> eine ältere Nonne</i>	DP 1
<i>[<sub>PP</sub> aus [<sub>DP2</sub> einem traditionellen Kloster</i>	DP 2
<i>[<sub>PP</sub> mit [<sub>DP3</sub> einem strengen Verhaltenskodex t]]]]]</i>	DP 3
<i>interviewt</i>	Verb2
<i>[<sub>RC</sub> der große Hingabe an die täglichen Rituale verlangt.]</i>	Extrap. RC

# Design – Deep Embedding

■ High attachment

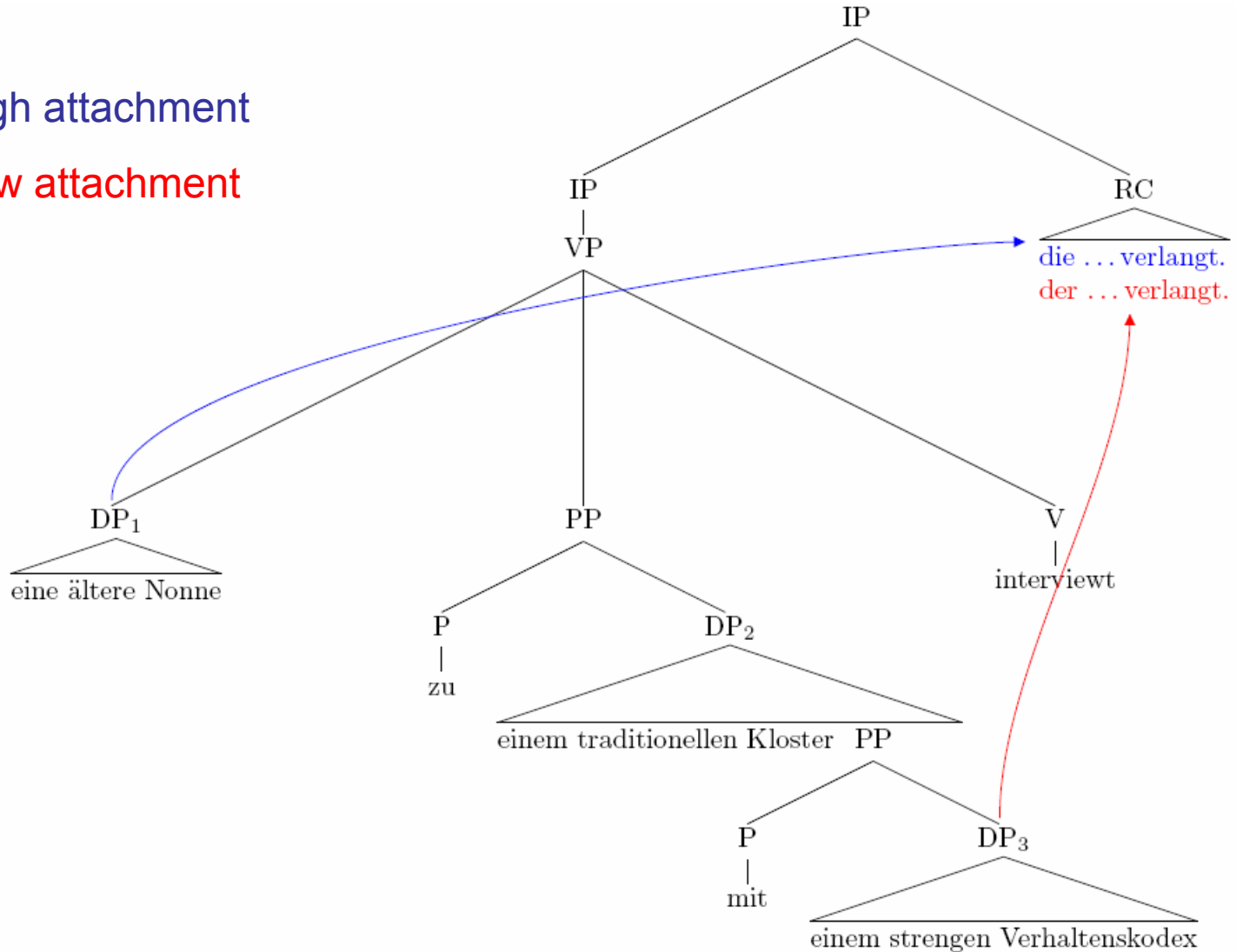
■ Low attachment



# Design – Mid Embedding

■ High attachment

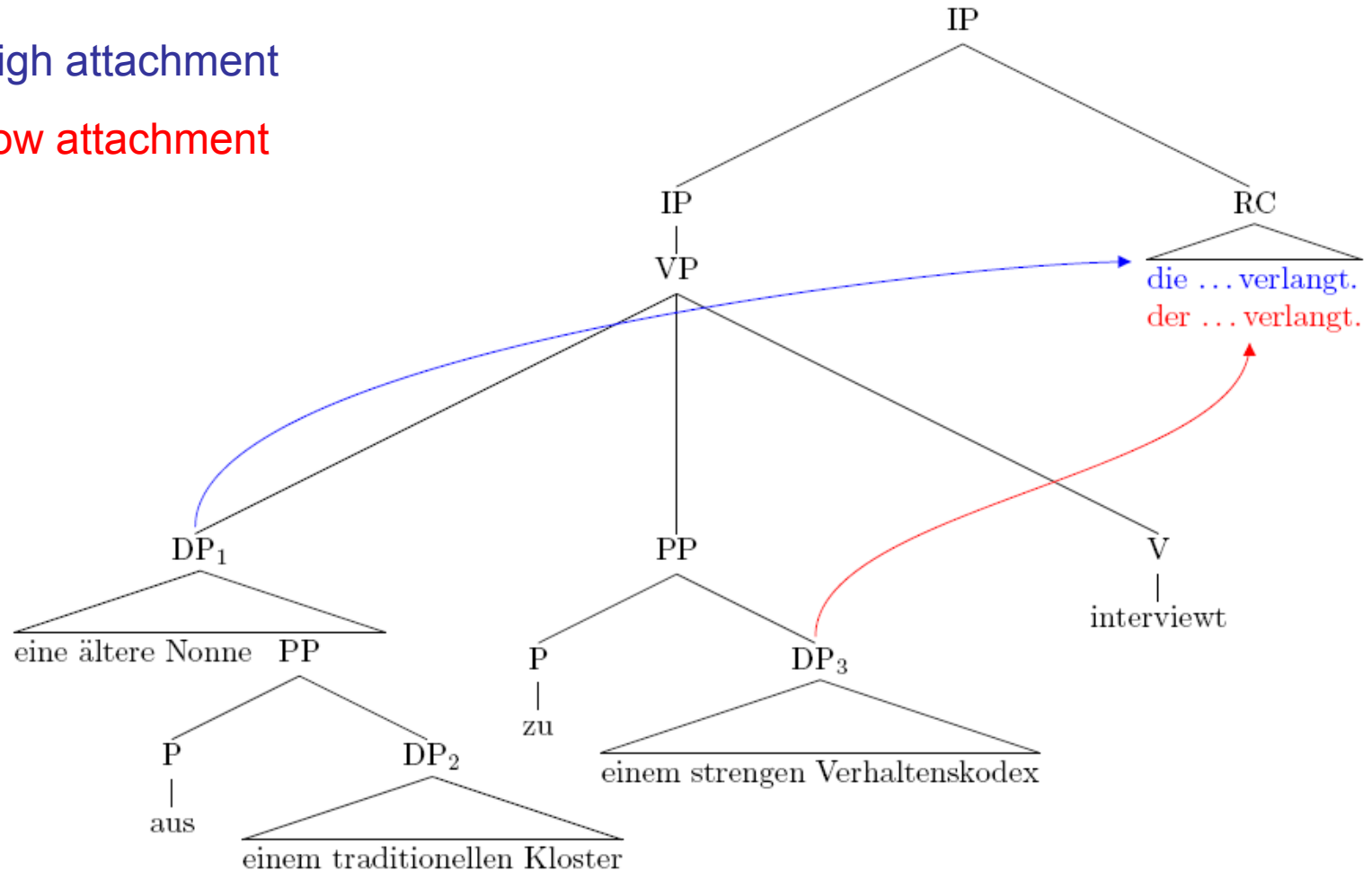
■ Low attachment



# Design – Shallow Embedding

■ High attachment

■ Low attachment



# Crucial Comparisons and Predictions

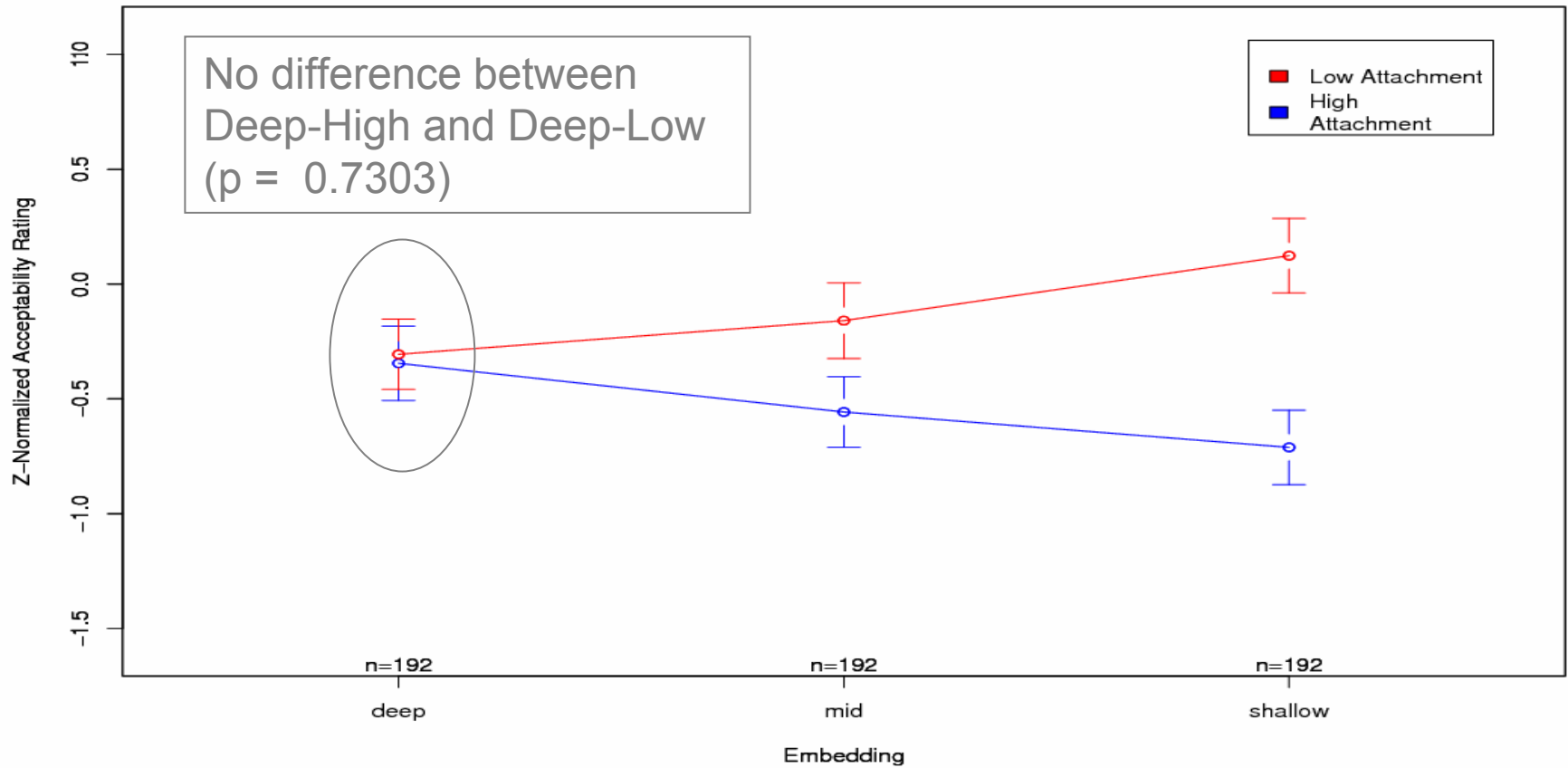
- Subclausal Locality
  - Deep-High (no subjacency violation)
  - vs.
  - Deep-Low (severe subjacency violation)
- Predictions
  - Subjacency predicts that Deep-High should be more acceptable than Deep-Low.
  - We expect no difference because we believe that Subjacency is not an important constraint on extraposition.

# Crucial Comparisons and Predictions

- Subclausal Locality
  - Deep-Low (severe subjacency violation)  
vs.  
Mid-Low (medium subjacency violation)  
vs.  
Shallow-Low (no subjacency violation)
- Predictions
  - Subjacency predicts a clear increase in acceptability from Deep-Low to Mid-Low to Shallow-Low.
  - We predict no or only a very gradual effect of depth of embedding.

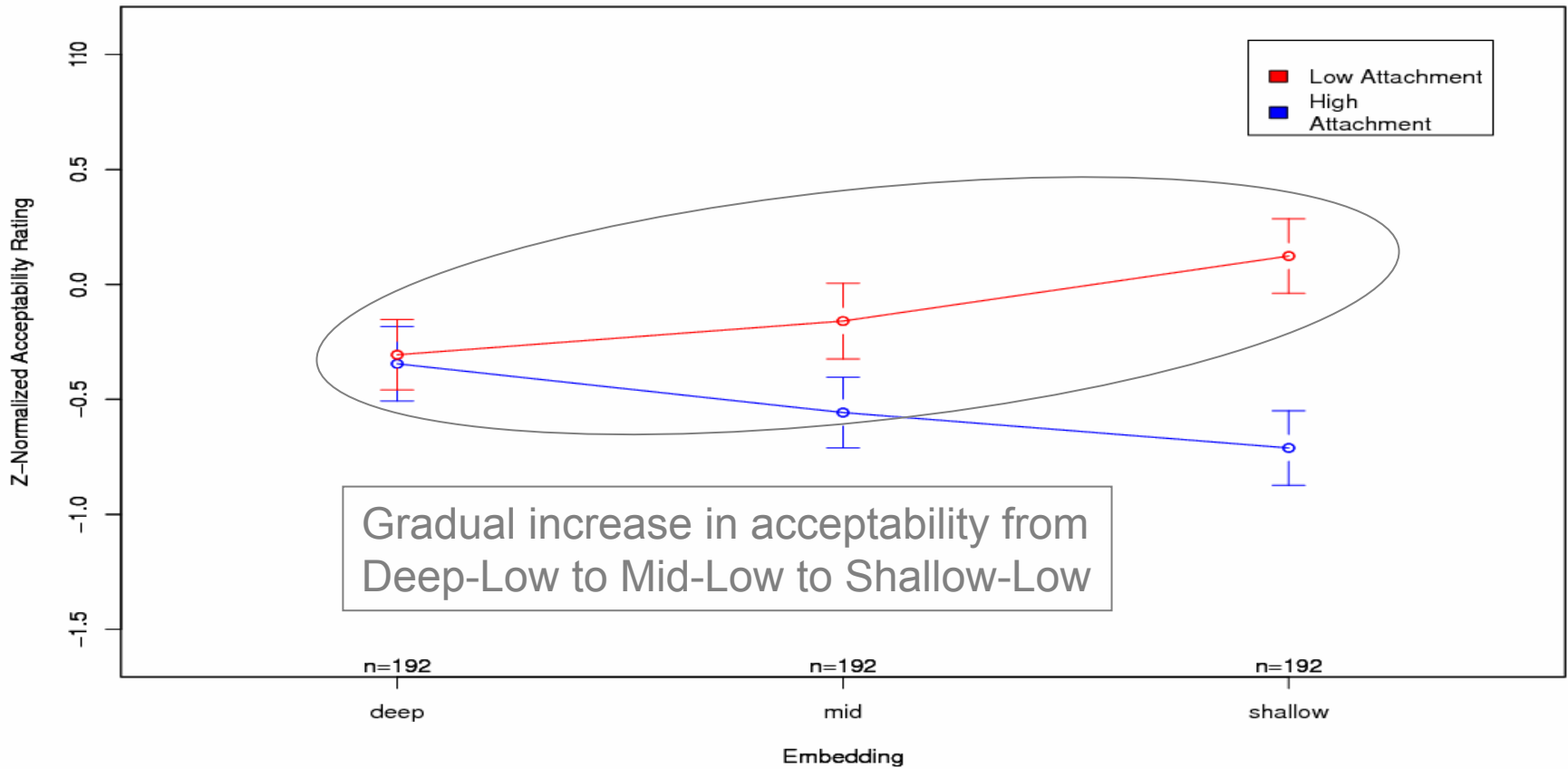
# Acceptability – English

Acceptability (Z-Score): Embedding \* Attachment

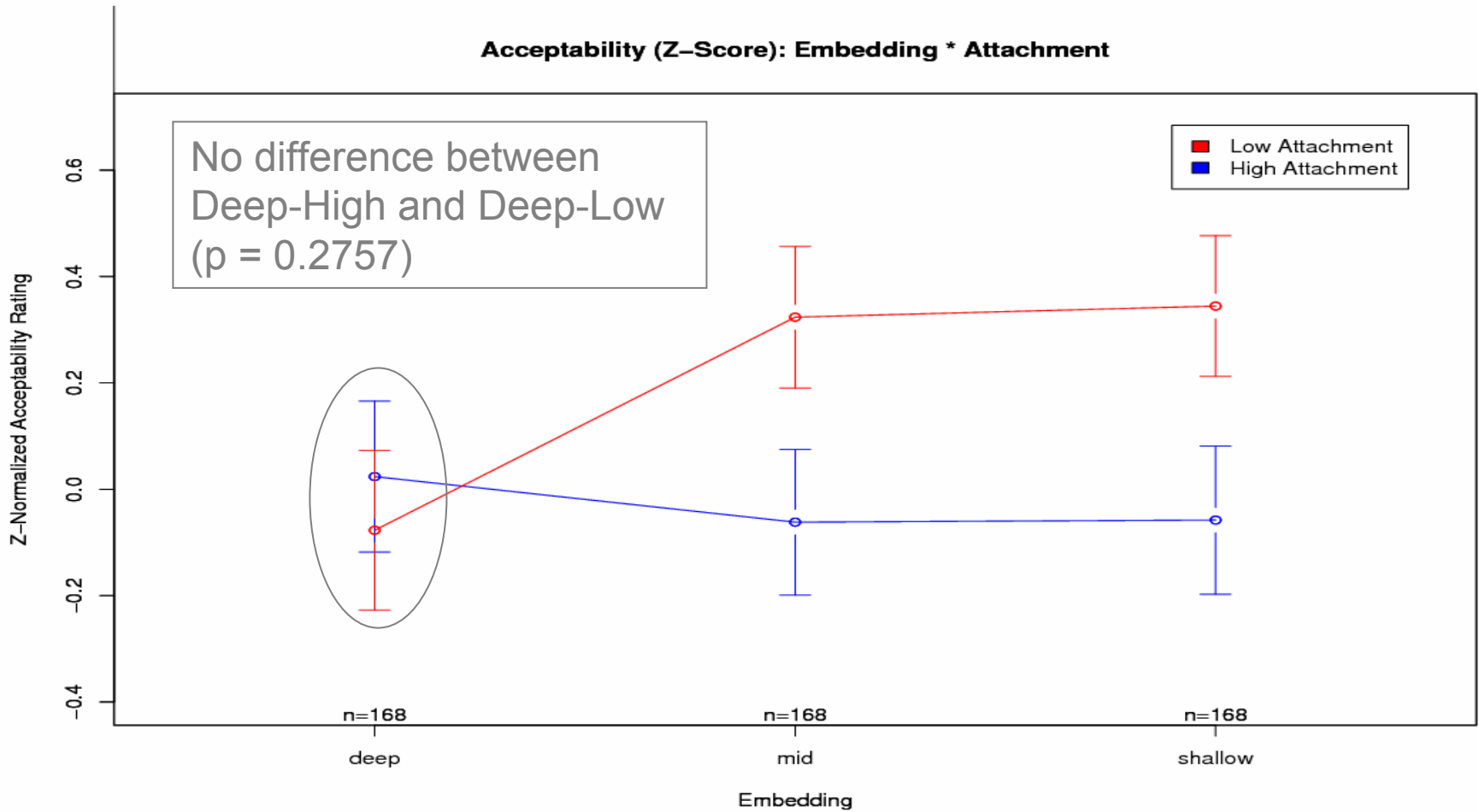


# Acceptability – English

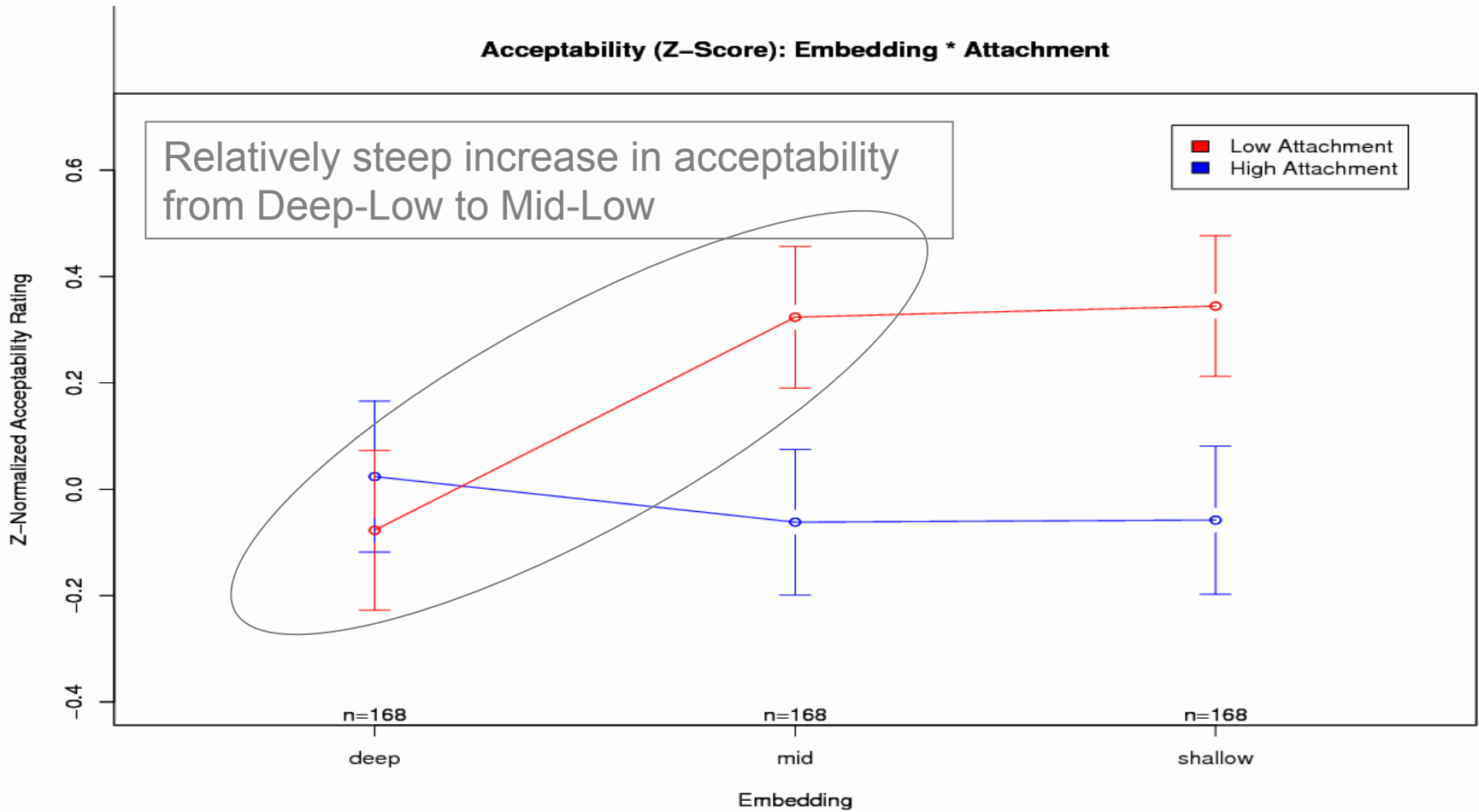
Acceptability (Z-Score): Embedding \* Attachment



# Acceptability – German



# Acceptability – German



# Acceptability – Mixed Results

- The results with regard to Subjacency are somewhat mixed...
  - The difference in acceptability between Deep-High and Deep-Low predicted by Subjacency did not occur, neither for English nor for German.
  - Examples with severe Subjacency violations thus do not seem to be necessarily worse than parallel examples without such violations.
  - This result further strengthens our claim that the influence of subclausal locality constraints on extraposition has been overrated.

# Acceptability – Mixed Results

- But there also was an increase in acceptability from Deep-Low to Mid-Low to Shallow-Low in both experiments.
- This suggests that there is probably some kind of gradient, noncategorical locality constraint after all.
- However, since the three embedding conditions also varied the argument structure of the verb, etc., further experimental and corpus evidence is needed...

# Experimental Study II

## (German only)

# Motivation

- Less complicated stimuli than in Study I
- Constant argument structure in the matrix clauses
- Comparison of integrated and extraposed relative clauses
- Influence of subclausal locality constraints on attachment preferences

# Experiments – Acceptability

- Systematic elicitation of acceptability judgments
  - Pen and paper questionnaire
  - Items were judged on a scale from 1 (natural / acceptable) to 6 (unnatural / unacceptable)

(7) Stefan hat die Sprecherin des Abgeordneten begrüßt, die bei den Bürgern sehr angesehen ist.

natürlich             unnatürlich

- Dependent variable:  
Mean (z-normalized) acceptability rating

# Experimental Design - English

- 2 x 2 factorial design crossing the two factors
  - **Extraposition:** The RC was either integrated or extraposed.
  - **Attachment:** The RC was attached high or low.
- Attachment was forced by varying the gender of the relative pronoun.

# Experimental Items

- Experimental items

- High-Integrated:

*Ulli hat  $[_{DP1}$  den Mitarbeiter $_i$ ,  $[_{DP2}$  der Professorin $_j$ ],  
 $[_{RC}$  der $_i$  die Stelle ausgeschrieben hat,]] verärgert.*

- High-Extraposited:

*Ulli hat  $[_{DP1}$  den Mitarbeiter $_i$ ,  $[_{DP2}$  der Professorin $_j$ ] t] verärgert,  
 $[_{RC}$  der $_i$  die Stelle ausgeschrieben hat.]*

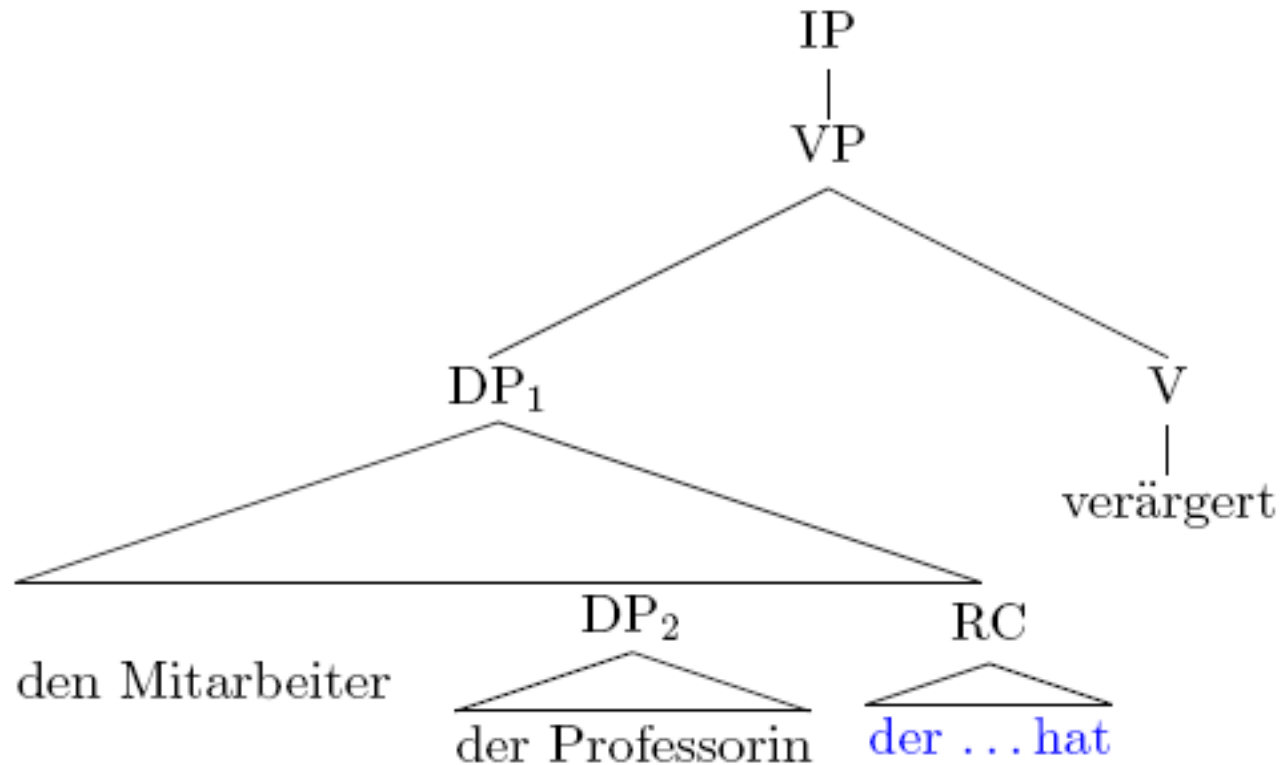
- Low-Integrated:

*Ulli hat  $[_{DP1}$  den Mitarbeiter $_i$ ,  $[_{DP2}$  der Professorin $_j$ ,  
 $[_{RC}$  die $_j$  die Stelle ausgeschrieben hat,]]] verärgert.*

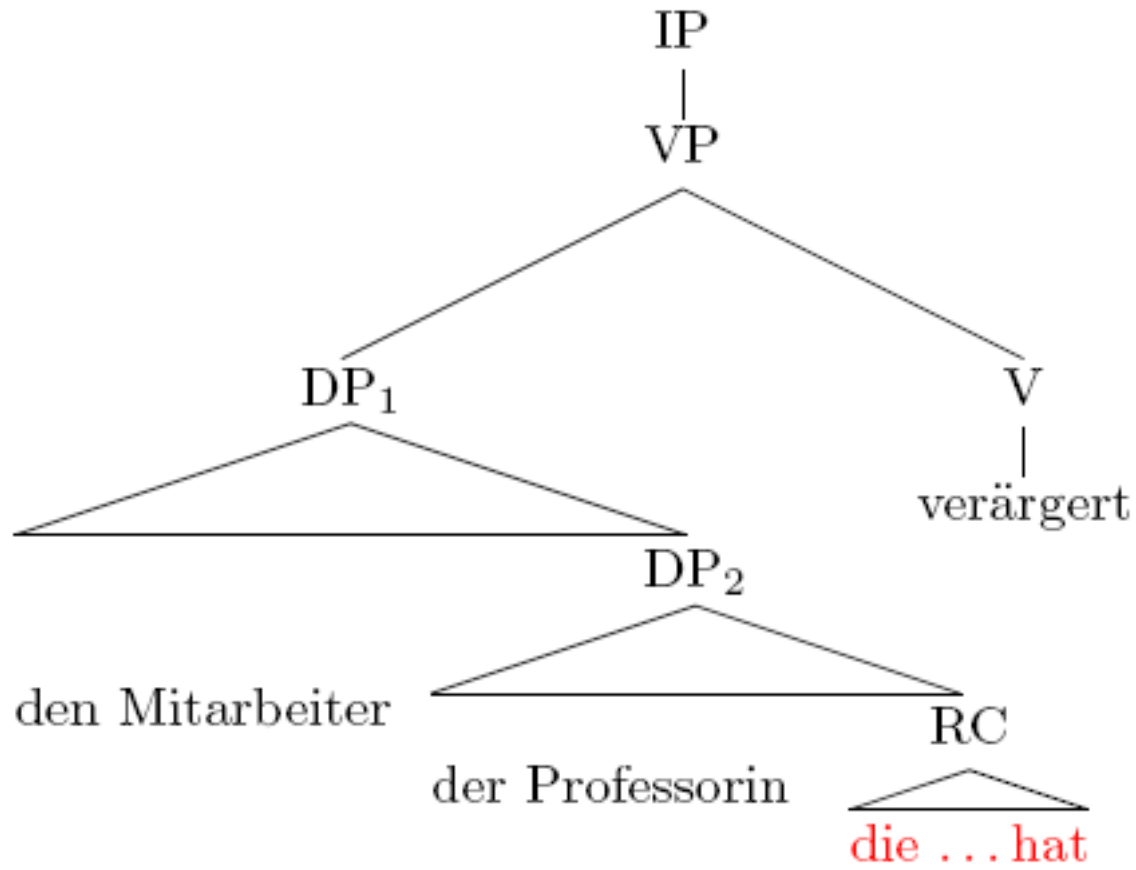
- Low-Extraposited:

*Ulli hat  $[_{DP1}$  den Mitarbeiter $_i$ ,  $[_{DP2}$  der Professorin $_j$ ] t]] verärgert,  
 $[_{RC}$  die $_j$  die Stelle ausgeschrieben hat.]*

# Design – High-Integrated



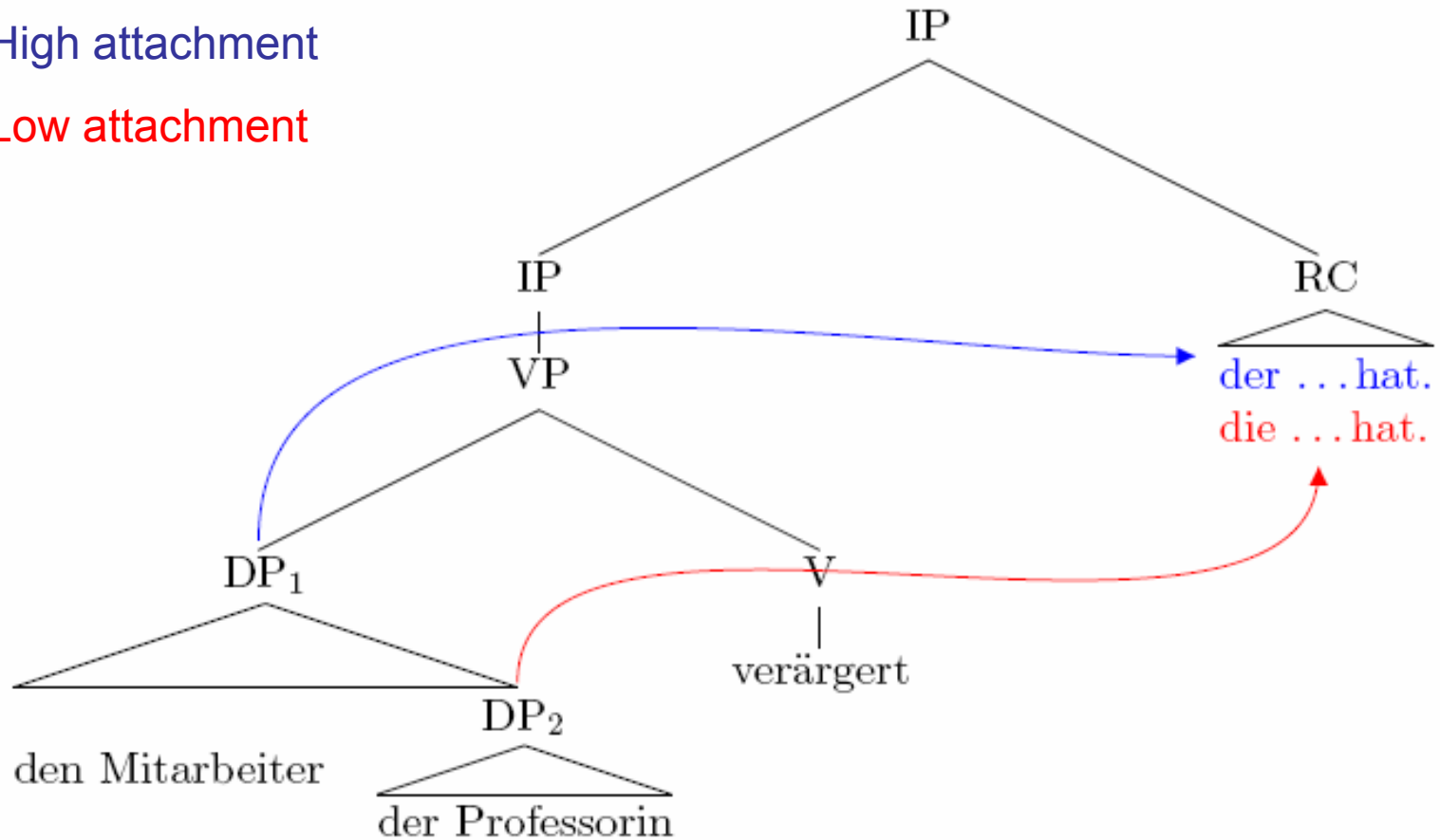
# Design – Low-Integrated



# Design – Extraposed

■ High attachment

■ Low attachment

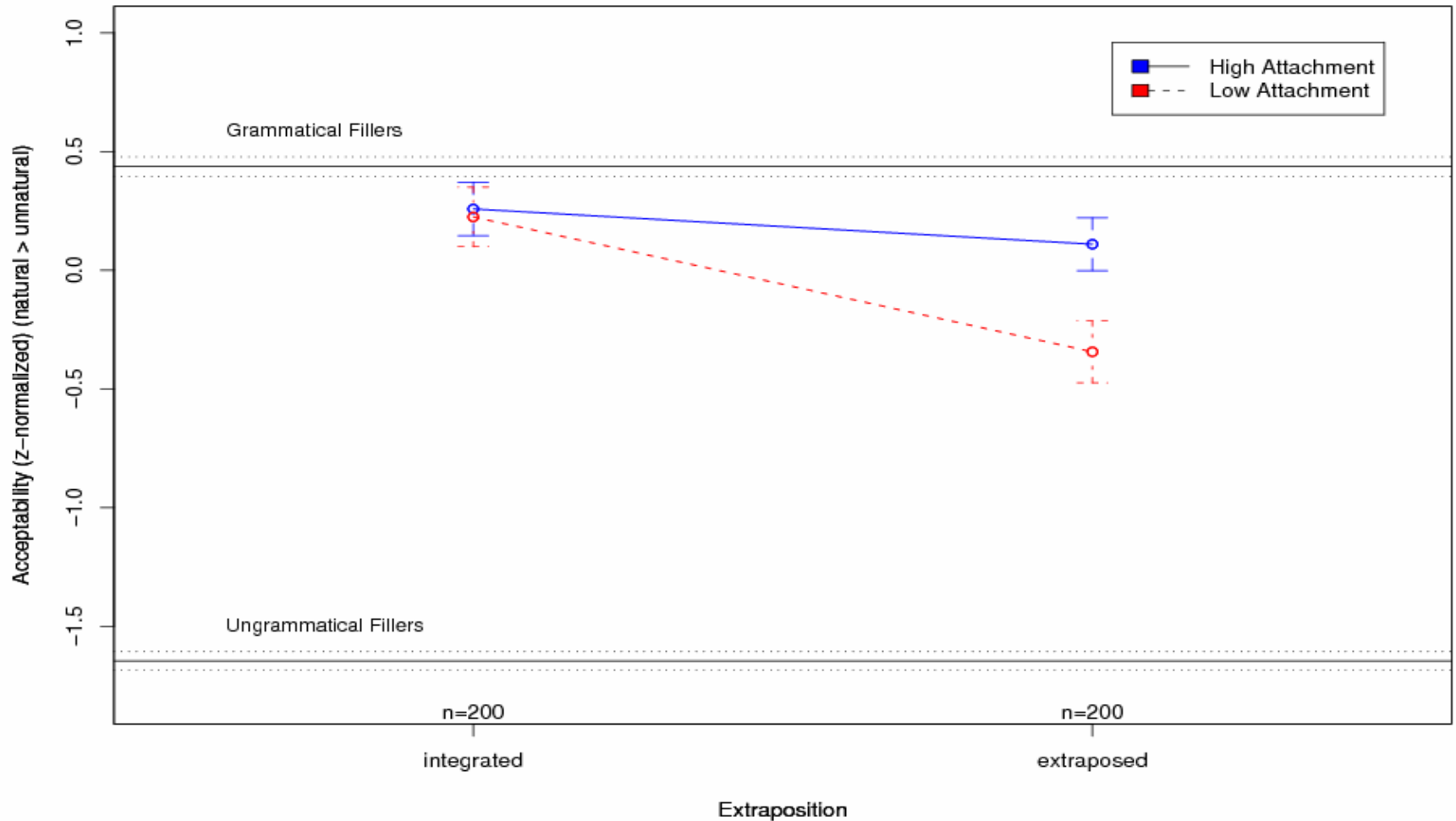


# Predictions

- Subjacency
  - Only Low-Extrapolated violates Subjacency
  - Low-Extrapolated should therefore be judged significantly worse in comparison to Low-Integrated than High-Extrapolated in comparison to High-Integrated.
- We expect a small penalty for Low-Extrapolated based on the results of Study I.

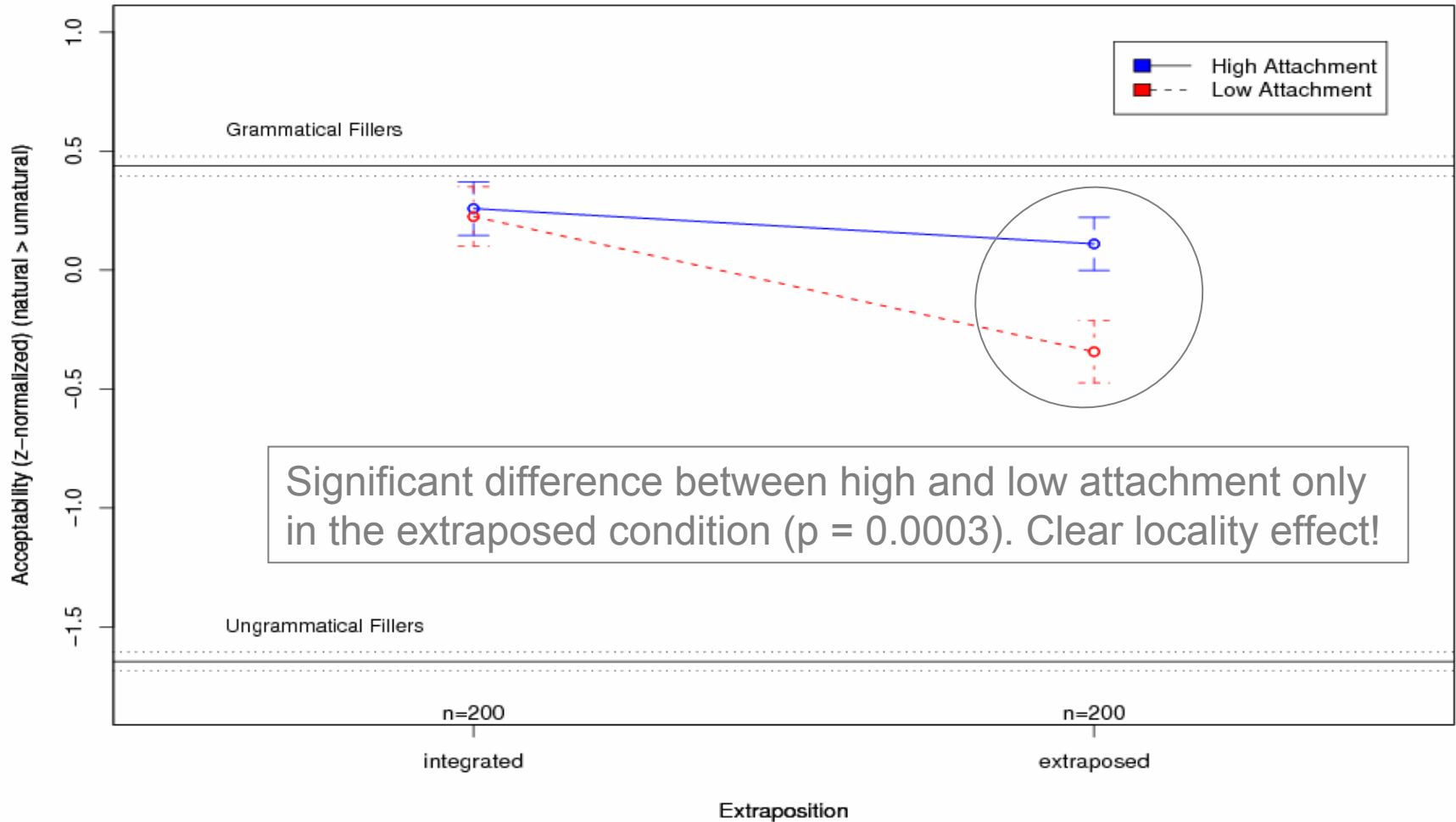
# Acceptability – German

Acceptability: Attachment \* Extraposition



# Acceptability – German

Acceptability: Attachment \* Extraposition



# Conclusion

- No categorical subclausal locality constraints on extraposition, neither in English nor in German (contra Baltin 2006)
- Results of parallel acceptability studies of English and German extraposition (Experiment I) are partly incompatible with predictions made by subclausal locality constraints.
- The similarity of the results for German and English would be unexpected if extraposition in English and German were two fundamentally different phenomena (as proposed by Inaba 2005).
- Our experimental results, especially Experiment II on German, suggest that there are robust but gradient, non-categorical subclausal locality effects.
- **Conclusion: Subclausal locality constraints are soft constraints, not hard constraints.**

# Further Questions

- How does locality interact with other factors?
- Is the gradient influence of locality part of competence or performance?
  - Is it a probabilistic constraint that is part of grammatical competence (cf. e.g. Bresnan 2007)?
  - Or does it arise from processing factors and should be excluded from syntax proper (cf. e.g. Hofmeister et al. 2007) ?

Thank you!

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