

Corpus evidence for syntactic structures and requirements for annotations of treebanks

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Introduction: Purpose of talk

This talk presents three case studies

- illustrating the usefulness of corpora to validate/falsify claims made in the linguistic literature
- highlighting the role of syntactically annotated corpora, the nature of the queries they support, and their limits

Starting point: Why care about corpus data?

- Searching in corpora for linguistically relevant phenomena can
 - help verify linguistic generalizations and
 - provide a broad empirical basis for the development of linguistic theories.
- Corpus data is particularly interesting since it
 - includes variation of properties known or not known to be relevant
 - typically can also provide access to the example context, which
 - is increasingly recognized as relevant for many phenomena
 - makes examples easier to judge
- How can one search for relevant linguistic phenomena and what kind of corpus annotation is needed for this?
 - Complementing our work using part-of-speech annotated corpora (Meurers, 2005), this talk focuses on syntactically annotated corpora.

Fronted Particles: The Issue

- Until recently, almost all grammarians assumed that verb particles cannot be fronted, unless it is a predicative particle like *auf* in *aufmachen* (*open make* = 'to open').
- Sometimes the non-frontability is even used to define particle verbs.
- The claim, however, is not correct as the following example illustrates:
 - (1) **Los ging** es schon in dieser Woche. (taz, 11.10.1995)
PART went it already in this week
'It already started this week.'

More examples

- (2) Ob er seine Strafe dort absitzen muß, war gestern ebenso unklar wie die Frage, ob er die gesamten elf Monate weggeschlossen wird.

Vor hat er das jedenfalls. (taz, 15.07.1999)

PART has he this in.any.case

'Whether he has to serve his sentence there was as unclear yesterday as the question whether he will be locked up for the complete eleven months. But he does plan this.'

- (3) Sein Vortrag wirkte [...] ein wenig arrogant, nicht zuletzt wegen seiner Anmerkung, neulich habe er bei der Premiere des neuen „Luther“-Films in München neben Sir Peter Ustinov und Uwe Ochsenknecht gegessen.

Gut **an kommt** dagegen die Rede des Jokers im Kandidatenspiel: (taz, 4.11.03)
well PART comes though the speech of the joker in the candidate game

'In comparison to this, the speech of the joker in the candidate game went down well.'

Further examples can be found in Müller, 2002a,b, 2005.

Refining the Treebank Query

The query [pos="PTKVZ"] . [pos=finite] wrongly matches verb final clauses such as:

- (4) dem Anfang der neunziger Jahre Hohn und Spott **zuteil wurde**
which beginning of nineties years mock and sneer PART become
'which were mocked at the beginning of the nineties'

A query with more explicit reference to specific properties of the syntactic annotation is required to exclude such examples.

Can We Find Such Examples in a Corpus?

- A basic query: *Search for a verb particle followed by a verb.*
 - Reasoning: Since particle and verb are usually written as one word when realized clause finally, this query finds examples for particles in the Vorfeld.
 - Pro: Query does not require a syntactically annotated corpus.
 - Con: Many false positives, requiring extensive manual filtering.
- A query based on a German treebank (TIGER, Brants et al., 2004):

[pos="PTKVZ"] . [pos=finite]

This searches for

a node with part of speech particle immediately preceding a finite verb.

A More Explicit Treebank Query

```
#s:[cat="S"] > #part:[pos="PTKVZ"] &
#part . [pos=finite] &
#s >@l #leftcorner &
#leftcorner:[pos= ! (prorel | prointer | conjunction)]
```

- Search for a sentence node (#s) that dominates a particle (#part)
- which is adjacent to a finite verb.
- Search for the left edge of the #s.
- The part-of-speech of the left edge may not be a relative pronoun, an interrogative pronoun or a conjunction.

Caveat: The more elaborate a query is, the stronger its dependence on the specifics and the quality of the syntactic annotation used.

Extraposition and Subjacency: The Issue

Baltin (1981) and Chomsky (1986, p. 40):

The relative clause cannot be related to *t*,
 since Subjacency excludes crossing of more than one barrier.

- (5) [_{NP} Many books [_{PP} with [stories *t*]] *t*] were sold [that I wanted to read].
 (6) [_{NP} Many proofs [_{PP} of [the theorem *t*]] *t*] appeared
 [that I wanted to think about].

This view is very common and can also be found in recent textbooks
 (Haegeman, 1994, p. 422, Klenk, 2003, p. 96, Baltin, To Appear 2006).

Extraposition is a Non-Local Dependency (Complements)

- Some proposals assume that extraposed adjuncts, such as those in the previous example, are base-generated and that coreference/coindexation is established via special mechanisms (Kiss, 2005).
- It is, however, also possible to extrapose sentential complements:

- (10) Ich habe [von [der Vermutung _{-i}]] gehört,
 I have of the assumption heard
 [daß es Zahlen gibt, die die folgenden Bedingungen erfüllen]_i.
 that it numbers exist which the following conditions satisfy

and such extraposition is equally non-local.

Extraposition is a Non-Local Dependency (Adjuncts)

Extraposition may cross arbitrarily many NP boundaries (cf. Müller, 1999, 2004b):

- (7) Karl hat mir [ein Bild [einer Frau _{-i}]] gegeben, [die schon lange tot ist]_i.
 Karl has me a book of a woman given who already long dead is
 (8) Karl hat mir [eine Fälschung [des Bildes [einer Frau _{-i}]]] gegeben,
 Karl has me a forgery of a picture of a woman given
 [die schon lange tot ist]_i.
 who already long dead is
 (9) Karl hat mir [eine Kopie [einer Fälschung [des Bildes [einer Frau _{-i}]]]] gegeben,
 Karl has me a copy of a forgery of a picture of a woman given
 [die schon lange tot ist]_i.
 who already long dead is
 'Karl gave me a copy of a forgery of the picture of a woman who has been dead for a long time.'

Extraposition is a Non-Local Dependency (Complements)

- (11) Ich habe [von [einem Beweis [der Vermutung _{-i}]]] gehört,
 I have of the proof of the assumption heard
 [daß es Zahlen gibt, die die folgenden Bedingungen erfüllen]_i.
 that it numbers exist which the following conditions satisfy
 (12) Ich habe [von [dem Versuch [eines Beweises [der Vermutung _{-i}]]]] gehört,
 I have of the attempt of a proof of the assumption heard
 [daß es Zahlen gibt, die die folgenden Bedingungen erfüllen]_i.
 that it numbers gives that the following conditions satisfy
 'I have heard of the attempt to prove the assumption that there are numbers
 for which the following conditions hold.'

Selectional restrictions of the matrix head have to be ensured so that one cannot avoid establishing a relation between the governing noun and the extraposed element.

Can We Find Such Examples in a Corpus?

- A basic query using an unannotated corpus:
 Search for nouns that take sentential complements + *daß*.
- Reasoning: We know many verbs that govern an object clause.
 Heavy clauses tend to be extraposed, so looking for nouns that actually appear with the complement clause should provide some results.
- Pro: Query does not require a syntactically annotated corpus.
- Con: Many false positives, requiring extensive manual filtering.
- Can we improve on this with a query based on a treebank?

Multiple Fronting: The Issue

- German is a V2 Language:
 Usually only one constituent can be placed in front of the finite verb.
- (13) a. Maria stellt Max Peter vor.
 Maria introduces Max Peter PART
 'Maria introduces Max to Peter.'
- b. *Maria Max stellt Peter vor.
 Maria Max introduces Peter PART
- Sometimes this property of German is used as a constituent test:
 Those elements that can be fronted together form a constituent.

A Query Based on the TIGER Treebank

```
#xp:[cat="NP"] >OC [ ] &
[cat=("NP"|"PP")] > #xp &
discontinuous(#xp)
```

1. Search for an NP node (#xp),
 that immediately dominates an object clause (OC).
2. #xp is immediately dominated by a NP or PP node.
3. #xp is discontinuous,
 that is, the object clause is usually extraposed.

We get 12 hits in the 2003 version of the Tiger corpus (40018 sentences).

We get this result in 1.1 seconds + time for typing the query
 in comparison to several hours that are needed for the manual approach.

However, sentences with multiple fronted constituents exist (Müller, 2003):

- (14) [Trocken] [durch die Stadt] kommt man am Wochenende auch mit
 dry through the city comes one on weekends also with
 der BVG. (taz berlin, 10.07.1998)
 the BVG
- (15) [Gezielt] [Mitglieder] [im Seniorenbereich] wollen die Kendoka
 targeted members in.the senior.group wants the Kendoka
 allerdings nicht werben. (taz, 07.07.1999)
 however not advertise
- (16) [Wenig] [mit Sprachgeschichte] hat der dritte Beitrag in dieser Rubrik
 little with language.history has the third article in this group
 zu tun. (Zeitschrift für Dialektologie und Linguistik, 3/2002)
 to do

This data can be analyzed with an empty verbal head in the *Vorfeld*,
 which preserves the V2 property (Müller, 2005),
 but nevertheless such data is problematic for constituency tests.

Can We Find Such Examples in a Corpus?

```
#s:[cat="S"] >HD #fin:[pos=finite] &
#s >@l #sleftedge &
#s > #vf1 & #vf1 >@l #sleftedge &
#s > #vf2 & #vf1 . #vf2 & #vf2 . #fin
```

1. Search for a sentential node that immediately dominates the finite Verb.
2. #s has a left edge #sleftedge.
3. #s immediately dominates #vf1
4. and #vf1 has the same left edge #sleftedge,
that is, #vf1 is the left-most node under #s.
5. #s immediately dominates another node #vf2.
6. #vf1 borders #vf2
7. and #vf2 borders the finite verb.

Making the Query More Precise

- Since the class of such adverbs is small,
one can rule them out explicitly by listing them:

```
#vf2:[! (word= ("aber" | "also" | "auch" | "allerdings" |
"dagegen" | "freilich" | "hingegen" | "jedemfalls" |
"jedoch" | "nämlich" | "schließlich" | "wiederum"))]
```

- Once we also exclude the relative clauses and coordination sentences,
we get: nothing!

False Positives

- The query unintentionally returns relative and interrogative clauses and parts of coordinations.
 - It also finds examples with adverbs such as *indes*, *jedoch*, *wiederum*:
- (17) Hier wiederum mangelt es an Opferbereitschaft.
 here again lacks it of readiness.to.make.sacrifice

Zipf's Curse

- Many examples that are relevant for linguistic argumentation occur infrequently, requiring huge corpora for successful searches.
- A focused search for relevant examples usually requires annotated corpora.
- Obtaining large annotated corpora is difficult:
 - Corpora with rich syntactic annotation of high quality so far involve manual annotation or correction, limiting the size of such corpora.
 - Shallow or statistical parsing provides annotation of large corpora, but annotation quality and the coarse nature of information is often a problem.
 - Syntactic annotation by its nature is based on theoretical assumptions—which can make it difficult or impossible to find examples that contradict some of those assumptions.

Conclusion

- Electronic corpora can be used to search for examples of linguistically relevant phenomena in order to verify generalizations and obtain a wide empirical basis exemplifying the phenomenon.
- Corpus data are attractive since they exhibit a wide variation of properties (un)known to be relevant.
- The linguistic terminology used to single out the relevant phenomenon needs to be reconstructed in terms of the annotation of the corpus, which is easier for more richly annotated corpora.
- Given the limited size of richly annotated corpora, one cannot expect to find examples for all theoretically relevant issues—but experience and the case studies discussed show that data obtained from corpora can often enrich the discussion in theoretical linguistics.

Extrapolation and Subjacency (Cosmas/Tiger)

- (19) Für das Volk der Deutschen Demokratischen Republik ist dabei [die einmütige Bekräftigung [der Auffassung „...]] wichtig, [daß es die Interessen des Friedens und der Sicherheit erfordern, daß [...]]; (Neues Deutschland, 06.12.1969, p. 1, COSMAS)
- (20) [...] die Erfindung der Guillotine könnte [NP die Folge [NP eines verzweifelten Versuches des gleichnamigen Doktors] gewesen sein, [seine Patienten ein für allemal von Kopfschmerzen infolge schlechter Kissen zu befreien]. (s16977)
- (21) Der 43jährige will nach eigener Darstellung damit [NP den Weg [PP für [NP eine Diskussion [PP über [NP den künftigen Kurs [NP der stärksten Oppositionsgruppierung]]]]]] freimachen, [die aber mit 10,4 Prozent der Stimmen bei der Wahl im Oktober weit hinter den Erwartungen zurückgeblieben war]. (s27639)

Particle Verbs (Negra/Tiger)

- (18) a. Fest steht, daß dort 580 der insgesamt 4650 Arbeitsplätze wegfallen. (Tiger:s30056)
 b. Los geht es am Samstag nach der offiziellen Eröffnung mit einem gemütlichen Beisammensein. (Negra:s11241)
 c. Entgegen kamen sich Koalition und Opposition in der Frage um die Verkehrsberuhigung der Titusstraße. (Negra:s11514)

Negra: <http://www.coli.uni-saarland.de/projects/sfb378/negra-corpus/negra-corpus.html>

Tiger: <http://www.ims.uni-stuttgart.de/projekte/TIGER/TIGERCorpus/>

Multiple Fronting

- Baltin, Mark. 1981. Strict Bounding. In Carl Lee Baker and John J. McCarthy (eds.), *The Logical Problem of Language Acquisition*. Cambridge, Massachusetts, London: England. The MIT Press.
- Baltin, Mark. To Appear 2006. Extrapolation, the Right Roof Constraint, Result Clauses, Relative Clause Extrapolation, and PP Extrapolation. Draft of 23.09.2001. In *The Syntax Companion* (<http://www.uolts.let.uu.nl/syncom/>). Utrecht Institute of Linguistics, <http://www.myu.edu/gas/dept/lingu/people/faculty/baltin/papers/etrapos.pdf>. 16.12.2005.
- Bennis, Hans. 1991. Theoretische Aspecten van Partikelvoorzetting. *TABU Bulletin voor Taalwetenschap* 21(3), 89–95.
- Bierwisch, Manfred. 1963. *Grammatik des deutschen Verbs*. studia grammatica II. Berlin: Akademie Verlag.
- Blom, Corrien. 2005. *Complex Predicates in Dutch. Synchrony and Diachrony*. LOT Dissertation Series. No. 111. Utrecht University. <http://www.lotpublications.nl/public/issuers/Blom/c/>. 31.08.2005.
- Brants, Sabine, Dipper, Stefanie, Eisenberg, Peter, Hansen-Schirra, Silvia, König, Esther, Lezius, Wolfgang, Rohrer, Christian, Smith, George and Uszkoreit, Hans. 2004. TIGER: Linguistic Interpolation of a German Corpus. *Research on Language and Computation* 2(4), 597–620.
- Brants, Sabine, Dipper, Stefanie, Hansen, Silvia, Lezius, Wolfgang and Smith, George. 2002. The TIGER
- Treebank. In *Proceedings of the Workshop on Treebanks and Linguistic Theories*, Szeged, Hungary, 2001. www.buitreebank.org/proceedings/paper03.pdf.
- Buring, Daniel and Hartmann, Katharina. 2001. The Syntax and Semantics of Focus-Sensitive Particles in German. *Natural Language and Linguistic Theory* 19(2), 229–281. <http://www.linguistics.ucla.edu/people/buring/>.
- Chomsky, Noam. 1973. *Conditions on Transformations*. In Stephen R. Anderson and Paul Kiparsky (eds.), *A Festschrift for Morris Halle*, pages 232–286. New York: Holt, Rinehart & Winston.
- Chomsky, Noam. 1986. *Barriers*, volume 13 of *Linguistic Inquiry Monographs*. Cambridge: Massachusetts, London: England. The MIT Press.
- Chomsky, Noam. 1993. *Lectures on Government and Binding – The Pisa Lectures*. Studies in Generative Grammar. No. 9. Berlin, New York: Mouton de Gruyter, 7. edition.
- Duden. 2005. *Grammatik der deutschen Gegenwartssprache*, volume 4. Mannheim, Leipzig, Wien, Zürich: Dudenverlag, 7. edition.
- Dürscheid, Christa. 1989. *Zur Vorfeldbesetzung in deutschen Verbzweit-Strukturen*. FOKUS. No. 1. Trier: Wissenschaftlicher Verlag.
- Eisenberg, Peter. 1994. *Grundriss der deutschen Grammatik*. Stuttgart, Weimar: Verlag J. B. Metzler, third edition.
- Eisenberg, Peter. 1999. *Grundriss der deutschen Grammatik*, volume 2. Der Satz. Stuttgart, Weimar: Verlag J. B. Metzler.

- Haider, Hubert. 1997a. Precedence among Predicates. *The Journal of Comparative Germanic Linguistics* 1, 2–41.
- Haider, Hubert. 1997b. Projective Economy. On the Minimal Functional Structure of the German Clause. In Werner Abraham and Elly van Gelderen (eds.), *German: Syntactic Problems – Problematic Syntax*, Linguistische Arbeiten, No. 374, pages 83–103. Tübingen: Max Niemeyer Verlag.
- Haider, Hubert, Olsen, Susan and Vikner, Sten. 1995. Introduction. In Hubert Haider, Susan Olsen and Sten Vikner (eds.), *Studies in Comparative Germanic Syntax*, volume 31 of *Studies in Natural Language and Linguistic Theory*, pages 1–45. Dordrecht, Boston, London: Kluwer Academic Publishers.
- Hoberg, Ursula. 1997. Die Linearstruktur des Satzes. In Hans-Werner Erhard, Gerhard Stieckel and Gisela Zifonun (eds.), *Grammatik der deutschen Sprache*, volume 7.2 of *Schriften des Instituts für deutsche Sprache*, pages 1495–1680. Berlin, New York: Walter de Gruyter.
- Hoeksma, Jack. 1991. Theoretische Aspecten van Partikelvoorzetting. *TABU Bulletin voor Taalwetenschap* 21(1), 19–26.
- Jacob, Joachim. 1980. The Syntax of Focus and Adverbials in German. In Werner Abraham and S. de Meij (eds.), *Topic, Focus, and Configurationality: Papers from the 6th Groningen Grammar Talks*, Groningen, 1984. *Linguistik Aktuell / Linguistics Today*, No. 4, pages 103–127. Amsterdam, Philadelphia: John Benjamins Publishing Company.
- Jacobson, Pauline. 1987. Phrase Structure, Grammatical Relations, and Discontinuous Constituents. In Geoffrey J. Huck and Almaraz E. Ojeda (eds.), *Discontinuous Constituency*, volume 20 of *Syntax and Semantics*, pages 27–69. New York: Academic Press.
- Kathol, Andreas. 1996. Discontinuous Lexical Entries. In Philippe Blache (ed.), *Third International Conference on HPSC – Abstracts*. 22–24 May 1996, pages 43–44. Marseille.
- Kiss, Tibor. 1994. Obligatory Coherence: The Structure of German Modal Verb Constructions. In John Nerbonne, Klaus Netter and Carl J. Pollard (eds.), *German in Head-Driven Phrase Structure Grammar*, CSLI Lecture Notes, No. 46, pages 71–108. Stanford: CSLI Publications.
- Kiss, Tibor. 2005. Semantic Constraints on Relative Clause Extrapolation. *Natural Language and Linguistic Theory* 23(2), 281–334.
- Klenk, Ursula. 2003. *Generative Syntax*. Narr Studienbücher, Tübingen: Gunter Narr Verlag.
- Lötscher, Andreas. 1985. Syntaktische Bedingungen der Topikalisierung. *Deutsche Sprache* 13, 207–229.
- Lüdeling, Anke. 1997. Strange Resultatives in German: New Evidence for a Semantic Treatment. In Ralph C. Blight and Michelle J. Moosally (eds.), *Texas Linguistic Forum 38: The Syntax and Semantics of Predication*. *Proceedings of the 1997 Texas Linguistics Society Conference*, pages 223–233. Austin, Texas: University of

- Engel, Ulrich. 1977. *Syntax der deutschen Gegenwartssprache*, volume 22 of *Grundlagen der Germanistik*. Berlin: Erich Schmidt Verlag.
- Engel, Ulrich. 1994. *Syntax der deutschen Gegenwartssprache*, volume 22 of *Grundlagen der Germanistik*. Berlin: Erich Schmidt Verlag, 3., völlig überarbeitete Auflage.
- Erdmann, Oskar. 1886. *Grundzüge der deutschen Syntax nach ihrer geschichtlichen Entwicklung*, volume 1. Stuttgart: Verlag der J. G. Cotta'schen Buchhandlung. Reprint: Hildesheim: Georg Olms Verlag, 1985.
- Fanselow, Gisbert. 1987. *Konfigurationslärer*. Studien zur deutschen Grammatik, No. 29. Tübingen: Gunter Narr Verlag.
- Fanselow, Gisbert. 1991. *Minimale Syntax*. *Groninger Arbeiten zur Germanistischen Linguistik* 32.
- Fanselow, Gisbert. 1993. Die Rückkehr der Basisgenerierer. *Groninger Arbeiten zur Germanistischen Linguistik* 36, 1–74.
- Fillmore, Charles J. 1973. A Grammarian Looks to Sociolinguistics. In Roger W. Shuy (ed.), *Report of the Twelfth Annual Round Table Meeting on Linguistics and Language Studies*, pages 273–287. Georgetown University Press.
- Grewendorf, Günther. 1988. *Aspekte der deutschen Syntax. Eine Reaktions-Bindungs-Analyse*. Studien zur deutschen Grammatik, No. 33. Tübingen: Gunter Narr Verlag.
- Grewendorf, Günther. 1990. Verb-Bewegung und Negation im Deutschen. *Groninger Arbeiten zur Germanistischen Linguistik* 30, 57–125.
- Linguistik 30, 57–125.
- Grubisic, Emilija. 1965. *Untersuchungen zur Frage der Wortstellung in der deutschen Prosodie der letzten Jahrzehnte*. Ph.D. thesis, Philosophische Fakultät, Zagreb.
- Haegeman, Liliane. 1994. *Introduction to Government and Binding Theory*. Blackwell Textbooks in Linguistics, No. 1. Oxford, UK/Cambridge, USA: Blackwell Publishers, second edition.
- Haider, Hubert. 1982. *Dependenz und Konfigurationen: Zur deutschen V-Projektion*. *Groninger Arbeiten zur Germanistischen Linguistik* 21, 1–60.
- Haider, Hubert. 1990. Topicalization and other Puzzles of German Syntax. In Günther Grewendorf and Wolfgang Steinfeld (eds.), *Scrambling and Barriers*, *Linguistik Aktuell / Linguistics Today*, No. 5, pages 93–112. Amsterdam, Philadelphia: John Benjamins Publishing Company.
- Haider, Hubert. 1991. *Kalkulation kohärenter Infinitivkonstruktionen im Deutschen*. Arbeitspapiere des SFB 340 No. 17, IBM Deutschland GmbH, Heidelberg.
- Haider, Hubert. 1993. *Deutsche Syntax – generativ*. *Vorstudien zur Theorie einer projektiven Grammatik*. Tübingen Beiträge zur Linguistik, No. 325. Tübingen: Gunter Narr Verlag.
- Haider, Hubert. 1996. Downright Down to the Right. In Uli Lutz and Jürgen Pilsel (eds.), *On Extrapolation and Extrapolation in German*, *Linguistik Aktuell / Linguistics Today*, No. 11, pages 245–271. Amsterdam: Benjamins.
- Texas Department of Linguistics.
- McCawley, James D. 1982. How Far Can You Trust a Linguist. In Thomas W. Simon and Robert J. Scholtes (eds.), *Language, Mind, and Brain*, pages 75–88. Hillsdale, NJ: Erlbaum Assoc.
- Meurers, Walf Detmar. 2005. On the Use of Electronic Corpora for Theoretical Linguistics. Case Studies from the Syntax of German. *Lingua* 115(11), 1619–1639. <http://ling.ou.edu/~dm/papers/meurers-03.html>.
- Müller, Frank Henrik. 2004. *Stylbook für die Tübingen Partially Parsed Corpus of Written German (TiPP-P/2)*. Sonderforschungsbereich 441, Seminar für Sprachwissenschaft, Universität Tübingen. <http://www.sfb441.uni-tuebingen.de/al/Publikationen/stylbook-04.pdf>.
- Müller, Stefan. 1999. *Deutsche Syntax deklarativ*. *Head-Driven Phrase Structure Grammar für das Deutsche*. Linguistische Arbeiten, No. 394. Tübingen: Max Niemeyer Verlag. <http://www.cuni-bremen.de/~stefan/Pub/hpsg.html>. 07.02.2006.
- Müller, Stefan. 2002a. *Complex Predicates: Verbal Complexes, Resultative Constructions, and Particle Verbs in German*. Studies in Constraint-Based Linguistics, No. 13. Stanford: CSLI Publications. <http://www.cuni-bremen.de/~stefan/Pub/complex.html>. 07.02.2006.
- Müller, Stefan. 2002b. *Syntax or Morphology? German Particle Verbs Reviewed*. In Nicole Held, Ray S. Jackendoff, Andrew McIntyre and Silke Urbán (eds.), *Verb-Particle Explorations, Interface Explorations*, No. 1, pages 119–139. Berlin, New York: Mouton de Gruyter. <http://www.cuni-bremen.de/~stefan/Pub/syn-morph-part.html>. 07.02.2006.
- Müller, Stefan. 2003. Mehrfache Vorfeldbesetzung. *Deutsche Sprache* 31(1), 29–62. <http://www.cuni-bremen.de/~stefan/Pub/mv-fs-ds.html>. 07.02.2006.
- Müller, Stefan. 2004b. Complex NPs, Subjacency, and Extrapolation. *Snippets* 8, 10–11. <http://www.cuni-bremen.de/~stefan/Pub/subjacency.html>. 07.02.2006.
- Müller, Stefan. 2005. *Zur Analyse der scheinbar mehrfachen Vorfeldbesetzung*. *Linguistische Berichte* 203, 297–330. <http://www.cuni-bremen.de/~stefan/Pub/mv-fb.html>. 07.02.2006.
- Neelamann, Ad and Wiernmann, Fred. 1993. The Balance between Syntax and Morphology: Dutch Particles and Resultatives. *Natural Language and Linguistic Theory* 11, 433–475.
- Olsen, Susan. 1997a. *Prädikative Argumente syntaktischer und lexikalischer Köpfe: Zum Status der Partikelverben im Deutschen und Englischen*. *Folia Linguistica* 31(3–4), 301–329.
- Olsen, Susan. 1997b. *Zur Kategorie Verbpartikel*. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 119, 1–32.
- Paul, Hermann. 1919. *Deutsche Grammatik*. Teil IV: Syntax, volume 3. Halle an der Saale: Max Niemeyer Verlag, 2nd unchanged edition 1968. Tübingen: Max Niemeyer Verlag.

Reis, Marga. 1976. Reflexivierungen in deutschen A.c.I.-Konstruktionen. Ein transformationsgrammatisches Dilemma. *Papire zur Linguistik* 9, 5-82.

Rohrer, Christian. 1996. Fakultativ kohärente Infinitivkonstruktionen im Deutschen und deren Behandlung in der Lexikalisch Funktionalen Grammatik. In Gisela Harras und Manfred Bierwisch (eds.), *Wenn die Semantik arbeitet. Klaus Baumgärtner zum 65. Geburtstag*, pages 89-108. Tübingen: Max Niemeyer Verlag.

Ross, John Robert. 1967. *Constraints on Variables in Syntax*. Ph.D.thesis, MIT, reproduced by the Indiana University Linguistics Club.

Schütze, Carson T. 1996. *The Empirical Base of Linguistics: Grammaticality Judgments and Linguistic Methodology*. Chicago and London: The University of Chicago Press.

Stiebels, Barbara. 1996. *Lexikalische Argumente und Adjunkte: Zum semantischen Beitrag verbaler Präfixe und Partikeln*. *studia grammatica* XXXIX, Berlin: Akademie Verlag.

Stiebels, Barbara und Wunderlich, Dieter. 1992. A Lexical Account of Complex Verbs. *Arbeiten des SFB 282 No. 30*, Seminar für Allgemeine Sprachwissenschaft. Universität Düsseldorf.

Ule, Tylman. 2004. *Markup Manual for the Tübingen Partially Parsed Corpus of Written German (TuPP-D/Z)*. Sonderforschungsbereich 441, Seminar für Sprachwissenschaft, Universität Tübingen, <http://www.sfs.uni-tuebingen.de/tupp/dz/markupmanual.pdf>.

Uszkoreit, Hans, Brants, Thorsten, Duchler, Denys, Krenn, Brigitte, Konieczny, Lars, Oepen, Stephan and Skut, Wojciech. 1998. Studien zur performanzorientierten Linguistik: Aspekte der Relativsatzextrapolation im Deutschen. *Kognitionswissenschaft. Themenheft Ressourcenbeschränkungen* 7(3), 129-133.

van de Velde, Marc. 1978. Zur mehrfachen Vorfeldbesetzung im Deutschen. In Maria-Elisabeth Conte, Anna Giacalone Ramat und Paolo Ramat (eds.), *Wortstellung und Bedeutung: Akten des 12. Linguistischen Kolloquiums, Pavia 1977*, *Linguistische Arbeiten*, No. 61, pages 131-141. Tübingen: Max Niemeyer Verlag.

von Stechow, Arnim und Sternefeld, Wolfgang. 1988. *Bausteine syntaktischen Wissens. Ein Lehrbuch der Generativen Grammatik*. Opladen/Wiesbaden: Westdeutscher Verlag.

Webelhuth, Gert und Ackerman, Farrell. 1999. A Lexical-Functional Analysis of Predicate Topicalization in German. *American Journal of Germanic Linguistics and Literatures* 11(1), 1-61.

Wunderlich, Dieter. 1984. Zur Syntax der Präpositionalphrase im Deutschen. *Zeitschrift für Sprachwissenschaft* 3(1), 65-99.

Zeller, Jochen. 2003. Moved Preverbs in German: Displaced or Misplaced? In Geert Booij und Jaap van Marle (eds.), *Yearbook of Morphology*, pages 179-212. Dordrecht: Holland: Kluwer Academic Publishers, <http://www.zeller.de/pdf/prtmov.pdf>. 02.10.2003.

Zifonun, Gisela. 1999. Wenn mit alleine im Mittelfeld erscheint: Verbpunkteln und ihre Doppelgänger im Deutschen und Englischen. In Heide Wegener (ed.), *Deutsch kontrastiv. Typologisch-vergleichende Untersuchungen zur deutschen Grammatik*, pages 211-234. Tübingen: Stauffenburg Verlag.