

Phrasal or lexical constructions? Some comments on underspecification of constituent order, compositionality, and control

Stefan Müller 

Freie Universität Berlin

Proceedings of the 14th International Conference on
Head-Driven Phrase Structure Grammar

Stanford Department of Linguistics and CSLI's LinGO Lab

Stefan Müller (Editor)

2007

pages 373–393

Keywords: Construction Grammar, HPSG, particle verb, resultatives, control, constituent order

Müller, Stefan. 2007. Phrasal or lexical constructions? Some comments on underspecification of constituent order, compositionality, and control. In Stefan Müller (ed.), *Proceedings of the 14th International Conference on Head-Driven Phrase Structure Grammar, Stanford Department of Linguistics and CSLI's LinGO Lab*, 373–393. DOI: 10.21248/hpsg.2007.22. 

Abstract

In this paper I want to discuss Goldberg's claim that phrasal Constructions can be regarded as underspecified statements about dominance and that therefore my claim that she would have to assume 218 Constructions to account for resultative secondary predication in German is wrong. I will discuss earlier HPSG approaches to particle verbs, which are similar to resultatives in many respects.

In addition to this I will provide more data against a surface-based phrasal solution.

1 Introduction

The main topic of this paper is resultative constructions like the one in (1).

- (1) weil niemand den Teich leer fischt
because nobody_{nom} the pond_{acc} empty fishes
'because nobody fishes the pond empty'

Resultatives involving unergative verbs usually consist of a main verb that selects for a subject, a secondary predicate (in German, adjective or PP) and an accusative object. The secondary predicate predicates over the accusative. In some cases the accusative can be interpreted as an argument of the main verb, but as (1) shows, this is not necessarily the case.

(1) has a meaning that involves more than the predicates *empty* and *to fish*: The action of fishing stands in a causal relation to the result predicate. The question of interest here is: Where does this additional meaning come from? There are two main ways of answering this question.

Answer 1 It is there since the NP[nom], NP[acc], Pred and V are used in a certain phrasal configuration.

Answer 2 It is there since a special lexical item selects for NP[nom], NP[acc], Pred and contributes the appropriate meaning.¹

[†]This paper was presented at the Workshop *Constructions and Grammatical Theory* which was part of the HPSG conference that was organized in conjunction with the 2007 LSA Linguistic Institute. This paper address a number of issues raised by Adele Goldberg in the class she and Michael Tomasello gave at that institute.

I want to thank Ivan Sag and Gert Webelhuth for the invitation to the workshop and the audience for discussion and comments on the talk. During the institute I had a lot of discussion that was connected to the preparation of the talk. I want to thank Farrell Ackerman, Doug Arnold, Emily M. Bender, Jürgen Bohnemeyer, James Blevins, Adele Goldberg, Petter Haugereid, Gerald Penn, Ivan Sag, Thomas Stolz, Michael Tomasello, Gert Webelhuth, and Shravan Vasishth for the discussion of different perspectives on phrasality, morphology, periphrasis, underspecification, iteration, and other connected topics.

Thanks to Petter Haugereid for the discussion of his phrasal analysis and to Frank Richter, Ivan Sag, Manfred Sailer, Gert Webelhuth and Stephen Wechsler for comments on an earlier version of this paper. I thank Philippa Cook for proof-reading.

¹There are different versions of the lexical analysis that will be discussed below.

The phrasal approach was suggested by Goldberg (1995) and by Goldberg and Jackendoff (2004). The respective authors suggest the following phrasal configurations:

- (2) a. [SUBJ [V OBJ OBL]] (Goldberg, 1995, p. 192)
 b. VP → V NP AP/PP (Goldberg and Jackendoff, 2004)

In both approaches the semantics is associated with the whole object, that is with [SUBJ [V OBJ OBL]] or with the VP, respectively.

Lexical analyses were suggested by Simpson (1983), ?, p. 45, Verspoor (1997), Wechsler (1997), Wechsler and Noh (2001), and Müller (2002a) for English, German, and Korean. The authors assume a lexical rule that relates the lexical item with the resultative semantics to the lexical item of the verb that is used in constructions without a result predicate.

As was discussed in Müller, 2006, the difference between the two approaches is rather small. This can be seen by looking at the picture in Figure 1. While in the syntactic analysis the lexical item is inserted into a certain phrase structural configuration which provides the resultative meaning, in the lexical rule-based approach, the lexical item is mapped to another lexical item that provides the resultative reading. Under one view of lexical rules, lexical rules are equivalent to unary branching rules (Krieger and Nerbonne, 1993, Chapter 7.4.1; Copestake and Briscoe, 1992; Meurers, 2001).

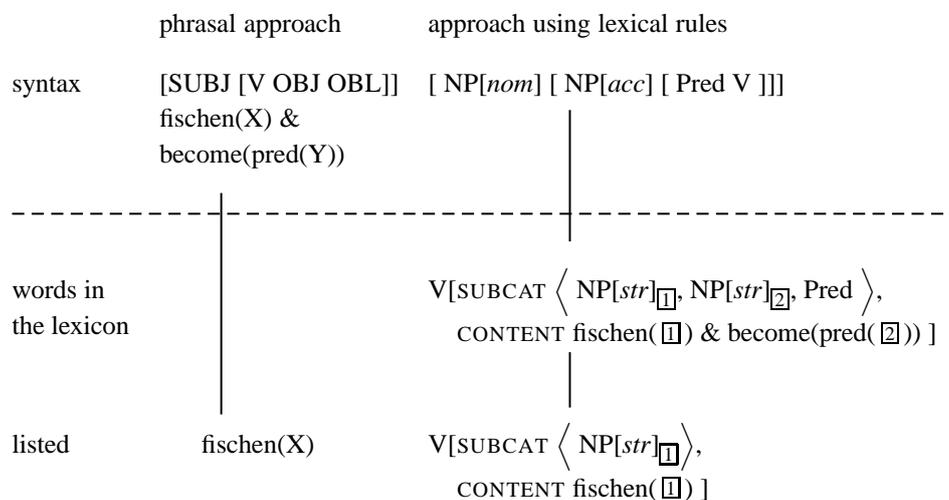


Figure 1: Phrasal vs. Lexical Rule-Based Analyses

The figure shows that the differences between the two analyses are small. However, as I pointed out in Müller, 2006 the consequences are severe if one takes a closer look at the interaction of the resultative construction with other phenomena in grammar. Depending on the assumptions one makes, one needs 218 Constructions to account for different ordering patterns and for interactions with valence

changing processes like active and passive. If one is willing to abstract away from local reorderings one still needs to stipulate 32 Constructions.

A possible counter argument to this view might be that a phrasal Construction does not make any claims about the order of the construction parts and that it is only the interaction with other constructions that determines the actual order of the material.²

In her lecture, Goldberg discussed the Ditransitive Construction, which consists of subject, verb, obj1, and obj2:³

(3) V SUBJ OBJ1 OBJ2

She claimed that this construction is phrasal but does not make any statement about the constituent order. The constituent order facts follow from the ways this construction interacts with other Constructions. For simple sentences with ditransitive verbs (3) interacts with the Subject-Predicate Construction and with the VP Construction (Kay and Fillmore, 1999, p. 8, p. 13). Assuming a parallel treatment for the Resultative Construction, it should have the form in (4) rather than the one given in (2a).

(4) V SUBJ OBJ OBL

The rest of the paper will be structured as follows: I will discuss the problems that one runs into if one assumes that phrasal Constructions are simple form-meaning pairs that connect a dominance constraint to a meaning without making reference to internal structure. The alternative to an approach that does not refer to internal structure is approaches that make internal structure available to higher nodes in the tree (constituent order approaches relying on additional features like DOMAIN (Reape, 1994) or approaches that collect all words that are dominated by a certain node (Riehemann, 2001)). I will start discussing constituent order in Section 2. Sections 4 and 5 deal with two other phenomena that are problematic for phrasal analyses: control constructions and valence changing processes like passive.

Before I start discussing the various points, I want to summarize the basic assumptions Goldberg makes: She assumes that there are no transformations (Goldberg 1995, p. 7; 2006, p. 205), a view that is shared by everybody working in constraint-based theories. Furthermore she does not allow for empty elements (Michaelis and Ruppenhofer, 2001, p. 49–50; Goldberg, 2006, p. 10).

2 Constituent Order

In this section I want to look at the interaction between the Construction in (4) and other Constructions in a local context. The first part deals with the problems that

²Goldberg (lecture at the LSA institute and presentation at the Workshop on *Constructions in Grammatical Theory* in 2007 in Stanford).

³Constructions are form-meaning pairs. Both (3) and (4) are associated with a meaning. Since the details of the meaning representation are irrelevant in the present context, they are omitted here.

arise if one does not assign any internal structure to phrasal Constructions.

2.1 Descriptions without Reference to Syntactic Structure

Linguistic objects are usually described by feature value pairs. Construction Grammar (CxG) and HPSG share the view that both syntactic and semantic properties of linguistic objects have to be described in the same representation of the linguistic object. CxG and all variants of HPSG share the view that simple lexical items (lexemes, words) are form meaning pairs and are described by one feature description. The constraints on possible lexical items can be represented in a type hierarchy in a non-redundant way. By making use of a type hierarchy, generalizations over linguistic objects are captured.

Similarly we can describe the properties of mother nodes of complex linguistic objects by feature descriptions and we can use the type hierarchy to organize the respective constraints. The relations of the mother node to its immediate daughters can also be represented by feature value pairs and the constraints can be grouped in the hierarchy. Depending on the assumptions one makes in the theory, it is possible to describe complex trees of arbitrary depth and properties of parts of such trees. Accessing the internal structure of complex linguistic objects should be avoided where possible, but it might be needed for the analysis of idioms (Sailer, 2000). Sign-Based CxG (Sag, 2007b,a) and some versions of HPSG (Sag, Wasow and Bender, 2003) try to exclude the last option explicitly by setting up the feature geometry in a way that makes it difficult to access the internal structure of linguistic objects.⁴

After these introductory remarks we can now look at the structure in Figure 2.

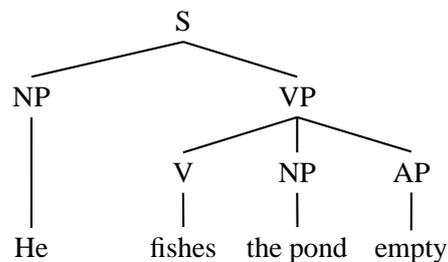


Figure 2: The Resultative Construction in Interaction with the Subj-Pred and VP Construction

If (4) is a form-meaning pair, it has to be a constraint on the S node since only this node contains the subject and the assumption is that (4) is a phrasal construction. If we assign the meaning to the highest node that contains all material that is part of a Construction, we get a problem with the compositional determination of the semantics of utterances. For example consider the embedding of the VP under a modal as it is depicted in Figure 3. To get the right compositional semantics for

⁴See Müller, 2007a, Section 12.3 for discussion.

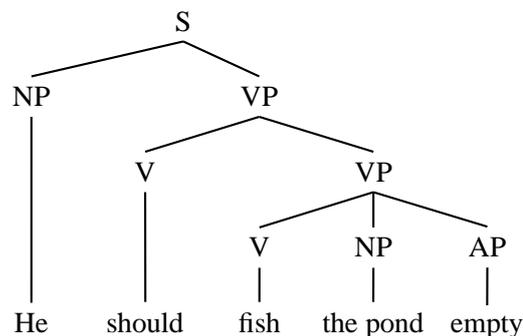


Figure 3: Auxiliaries and modals may intervene

sentences like the one in Figure 3, the meaning of the Resultative Construction has to be present at the VP node that is embedded under the modal.⁵ The consequence is that there has to be some VP node in the description of the Resultative Constructions since the phrasal approach refuses to assign the resultative semantics to the V node. Therefore one has to assume a more structured description, namely [SUBJ [V OBJ OBL]] which is the representation that was suggested in Goldberg, 1995, p. 192.⁶ Once one refers to nodes in more complex linguistic objects, one necessarily reduces the degree of freedom in constituent order.⁷ The statement in (2a) involves the two linguistic objects Subj and [V OBJ OL] and if one ignores analyses that assume discontinuous constituents such a statement leaves only two possibilities for constituent order: Subj [V OBJ OL] and [V OBJ OL] Subj.

Note that a VP seems to be necessary for another reason: The combination of the verb with the accusative element and the predicate has to be licensed syntactically. Since neither the NP nor the secondary predicate is an argument of the verb in (4), there is nothing that licenses the two elements in the configuration in Figure 2. If one allows a VP node, the two elements could be licensed in a special VP configuration in the spirit of Goldberg, 1995, p. 192.

If one wants to do without a VP node in the Resultative Construction, one would have to represent the constraints on the semantic contribution in an underspecified way. This could be done by using a semantics formalism like *Minimal Recursion Semantics* (Copestake, Flickinger, Pollard and Sag, 2005) or a semantic description language like CLLRS (Penn and Richter, 2004). In any case one has to make sure that the resultative semantics is introduced at a node below the modal/

⁵It is possible that one can find ways to encode the semantic representation by making use of elaborated pointer mechanisms and similar semantic constraints, but the analysis in which *should* embeds the content of the VP (modulo quantifiers) will always be simpler and therefore preferable.

⁶Note also that neither *the pond* nor *empty* are arguments of the base verb *fish* in *fish the pond empty*. There has to be a way to ensure that these components of the resultative construction (and no other constituents) are present in the VP node. Since there is no lexical item that selects these elements, the assumption of a special VP node that ensures that this material appears together in the VP seems to be the most straightforward solution.

⁷However, see Section 2.2 for a discussion of approaches that assume discontinuous constituents.

auxiliary, which is not straightforward without any additional machinery.⁸

One could suggest not specifying the subject as part of the phrasal configuration. This is basically the approach that Goldberg and Jackendoff (2004) suggest. Note that this approach is similar to the valence based approach since the subject slot of the VP is open and the constraints on subjects would be represented as valence features in the description of the VP.

I want to turn to German now. The example in (5) involves an adverb that scopes over the resultative meaning:

- (5) weil niemand den Teich absichtlich leer fischt
because nobody_{nom} the pond_{acc} deliberately empty fishes
'because nobody fishes the pond empty deliberately'

In a transformational framework one could assume that *den Teich leer fischt* forms a VP and that *absichtlich* modifies this VP. *den Teich* would be scrambled out of the VP in a later step of the derivation of (5). Since Construction Grammar does not allow transformational derivations and since reorderings like the one in (5) are usually not modeled in a way that uses the devices that are analogous to movement in transformational theories (SLASH), the resultative meaning has to be present at the node for *leer fischt*. The consequence would be that the resultative construction involves reference to a predicate complex in German while it refers to a VP in English. In the lexical treatment, English and German (and Korean) are parallel, the differences follow from the general syntactic constraints that hold for the respective languages but not from the stipulations that have to be made with respect to the resultative construction.⁹

A way to avoid this difference might be the assumption of discontinuous constituents, a proposal I turn to in the next section.

2.2 Discontinuous Constituents

A suggestion to fix the problems that were touched on in the previous section may involve discontinuous constituents. Discontinuous constituents would allow us to talk about the relationships that have to hold between the involved linguistic objects: There has to be a predicative element of a certain category, it predicates over an object, and the verb comes together with a subject. Since the construction can be discontinuous, we predict that parts of the construction appear in other parts of

⁸See for instance Riehemann, 2001 for an analysis of idioms using MRS. The event variable and pointers to the semantic contribution of idiomatic constructions are provided at lower nodes, but the semantic contribution of a Construction is stated higher up in the tree. In order to apply this technique to the case at hand one would have to make sure that the event variable belonging to the resultative semantics is introduced at the node of the embedded VP, that is, reference to this node would be necessary.

⁹As Gert Webelhuth pointed out to me, this argument is parallel to the argument by Perlmutter and Postal (1977, Section 2.1) against the Chomskian transformational theory of passive: The transformations that were suggested for the English passive were highly language specific and did not capture the general properties of the phenomenon.

the sentence and are not necessarily adjacent to each other. This would give us enough flexibility to talk about the relations among the constituents in a certain well-defined syntactic environment and would allow us to account for the sentence in Figure 3, provided we allow for the respective discontinuous constituent.

Everything I have said thus far on this issue has involved statements about possible suggestions and those were rather vague. In order to get more concrete, I would like to discuss proposals that were made in the literature. These proposals deal with particle verbs, which are similar to resultative constructions in many respects. For instance some particles license arguments that are not arguments of the base verb. In the cases where particle frontings are possible, they have to obey the restrictions that hold for partial frontings of resultatives. See Müller, 2002a for a detailed discussion of the data. In what follows I discuss linearization-based analyses of particle verbs.

Kathol (1995, p. 244–248), Booij (2002, Section 2), and Blom (2005) suggested phrasal analyses of particle verbs in the framework of HPSG, CxG, and LFG. These analyses come with the following claim: Particles cannot be fronted without their verb. This claim is sometimes restricted to certain types of particle verbs. Kathol, for instance, distinguishes between particle verbs with a frontable particle and those that do not allow for particle fronting.

The general claim that particles cannot be fronted is not empirically valid: Both German and Dutch allow particle fronting (Hoeksema, 1991; Bennis, 1991; Lüdeling, 1997, 2001; Müller, 2002a,b, 2007a). The data is rather complicated and even for the particle verbs that are said to be non-compositional fronting examples can be found. The following is an example involving Kathol's *aufwachen*:

- (6) Nach einigen Zügen, „die irgendwie komisch schmeckten“, fielen dem Interviewten die Augen zu. **Auf wachte** der „39jährige Mitarbeiter des Mitropafahrbetriebes, Mitglied der SED. Glückliche verheiratet, drei Kinder“ erst wieder im Westen – gerade rechtzeitig, um „einen Paken D-Mark-Scheine auf dem Tisch“ des „gewissenlosen Schleppers“ zu sehen.¹⁰

Kathol suggested the lexical item in (7) for *aufwachen*:

- (7) *aufwachen* (following Kathol (1995, p. 246)):

$$\left[\begin{array}{l} \dots | \text{HEAD } \boxed{1} \text{ verb} \\ \dots | \text{VCOMP } \langle \rangle \\ \text{DOM } \left\langle \left[\begin{array}{l} \langle \text{wachen} \rangle \\ \dots | \text{HEAD } \boxed{1} \\ \dots | \text{VCOMP } \langle \boxed{2} \rangle \end{array} \right] \right\rangle \circ \left\langle \left[\begin{array}{l} \langle \text{auf} \rangle \\ \text{SYNSEM } \boxed{2} \left[\dots | \text{HEAD } \left[\begin{array}{l} \text{FLIP } - \\ \text{sepref} \end{array} \right] \right] \\ \text{vc} \end{array} \right] \right\rangle \end{array} \right]$$

The DOMAIN feature has as its value a list of domain objects that describe the parts of the particle verb. The order of the elements in a domain list corresponds to their surface realization. \circ is Reape's shuffle operator (Reape, 1994). As far as (7) is

¹⁰Die Menthol-Affäre, taz, 03.11.2004, p. 17.

concerned, the combination of the two lists containing *wachen* and *auf* allows for both orders in (8):

- (8) a. weil er aufwacht
 because he up.wakes
 ‘because he wakes up’
 b. Wacht er auf?
 wakes he up
 ‘Does he wake up?’

In (8a) the particle is serialized to the left of the verb, in (8b) it is the other way round. (8b) is an example of the discontinuous serialization of the particle verb: When bigger structures are built, constituent order domains are unioned, which allows for the serialization of objects that are higher up in the tree between the parts of the word. This analysis of particle verbs is attractive since the phonology of the particle is constrained in the lexical item. One does not have to refer to phonological properties of the particle in the valence representation of the verb (Crysmann, 2002, Chapter 4.2). However, examples like (6) cannot be analyzed with the lexical entry in (7) since the particle is specified to appear in the verbal cluster (*vc*) and in (6) it appears in the Vorfeld. One could try to fix this by disjunctively assigning the particle to the verbal complex or the Vorfeld ($vc \vee vf$) and by assuming a linearization analysis for short frontings (Nunberg, Sag and Wasow, 1994, Kathol, 1995, Crysmann, 2002).¹¹ Crysmann’s account of the reordering of particles works for sentences like (6) in which the particle is the only element in the Vorfeld, but it fails for more complex examples like the ones in (9):¹²

- (9) a. [_{vf} [_{mf} Den Atem] [_{vc} an]] hielt die ganze Judenheit.¹³
 the breath PART held the whole Jewish.community
 ‘The whole Jewish community held their breath.’
 b. [_{vf} [_{mf} Wieder] [_{vc} an]] treten auch die beiden Sozialdemokraten.¹⁴
 again PART kick also the two social.democrats
 ‘The two Social Democrats are also running for office again.’
 c. [_{vf} [_{vc} Los] [_{nf} damit]] geht es schon am 15. April.¹⁵
 PART there.with went it already at.the 15 April
 ‘It already started on April the 15th.’

The problem with the data in (9) is that the Vorfeld is complex. The particle constitutes the right sentence bracket in the complex Vorfeld, *den Atem* and *wieder* are serialized in the Mittelfeld of the complex Vorfeld and *damit* is serialized to the right of the particle in the Nachfeld of the complex Vorfeld. If (9) were analyzed as

¹¹See also Gunkel, 2003 for an analysis of German clauses with a totally flat structure.

¹²See also Müller, To Appear; 2007a, Section 18.3.1.

¹³Lion Feuchtwanger, *Jud Süß*, p. 276, quoted from Grubačić, 1965, p. 56.

¹⁴taz, bremen, 24.05.2004, p. 21.

¹⁵taz, 01.03.2002, p. 8.

simple reordering, the verbs and the particle would be in the same ordering domain and the order constraints would enforce an order in which the particle would be realized to the right of the verb and the constituents that are marked *nf* for Nachfeld would be realized to the right of the particle at the right periphery of the whole clause. The data in (9) demonstrates that a more complex domain object is needed that has an internal structure and that allows for separate topological fields inside the Vorfeld that do not interact in terms of linearization constraints with the rest of the sentence. In order to license this type of complex Vorfeld one would have to have relational constraints that select a subset of the domain objects in the clause and construct a new domain object that is placed in the Vorfeld. Kathol and Pollard (1995) suggested relational constraints for the formation of new domain objects for extraposition. The constraints that would be needed for cases like (9) are much more complex and they are not needed at all if one relies on the analysis of the verbal complex and partial fronting that is usually assumed in HPSG (Hinrichs and Nakazawa, 1989, 1994; Kiss, 1995; Meurers, 1999; Kathol, 1998; Müller, 1996, 1999, 2002a, 2007a). If this analysis is combined with an analysis of verb movement that relies on an empty verbal head, cases of multiple frontings and complex frontings like (9) can be accounted for (Müller, 2005a,b).

The fact that particle verbs and resultative constructions share a lot of properties should be captured by an analysis. Since the domain-based analysis has problems with data like (9), particle verbs have to be analyzed in a different way, which means that the domain-based analysis should not be used for resultatives either if an analysis is available that explains both particle verbs and resultative constructions in similar ways. The analysis developed in Müller, 2002a captures the similarities of the two constructions by assuming that both the particle and the result predicate are selected by the verb.

2.3 Constraints on Dominated Words

Riehemann suggests another way to analyze particle verbs: she develops an analysis of idioms in which she assumes that a bag of all the words that are dominated by a certain node is accessible at this node. For the particle verb *einschalten* ('to switch on') she assumes the following representation:

(10) *einschalten* ('to switch on') Riehemann (2001, p. 292):

$$\left[\begin{array}{l} \text{WORDS} \\ \text{C-CONT} \\ \text{schalt_ein_spv} \end{array} \left\{ \begin{array}{l} \left[\begin{array}{l} \dots \text{LZT} \langle \text{empty_rel} \rangle \\ \dots \text{COMPS} \langle \text{NP} \rangle \end{array} \right] \overset{\leq}{\sqcap} \left[\begin{array}{l} \dots \text{LZT} \langle \text{schalt_rel} \rangle \\ \text{verb} \end{array} \right], \\ \left[\begin{array}{l} \dots \text{LZT} \langle \text{empty_rel} \rangle \\ \text{ein_sep_pref} \end{array} \right] \end{array} \right\} \right]$$

The value of WORDS in (10) is a bag containing two elements: a form of the verb *schalten* and the particle *ein*. $\overset{\frown}{\sqcap}$ stands for default unification. Riehemann uses defaults to capture the fact that the verb in the WORDS bag is similar to the normal verb *schalten*. The semantic contribution of the verb and its COMPS list are overridden. The verb does not contribute semantically.¹⁶ C-CONT is a feature that is used in Minimal Recursion Semantics (MRS) to represent semantic information that is contributed by a Construction as a whole rather than by the individual parts (Copestake, Flickinger, Pollard and Sag, 2005). MRS uses pointers (handles) to refer to parts of the semantic contribution. The relation contributed in C-CONT has the same handle as the verb in the WORDS bag (which is not shown in (10)). Therefore the problem that was discussed in Section 2.1 does not occur in Riehemann’s account: Although the semantic contribution is introduced at a higher node, it can be interpreted at the word node.

Riehemann’s approach does not have problems with the examples in (9) since it does not involve statements about the Vorfeld, it just mentions the words that are part of the Construction. However, Riehemann’s proposal is not without problems either: the question to be asked is: What is *schalt_ein_spv* a constraint on? (11) shows local environments that contain the two elements of the WORDS bag.

- (11) a. Einschalten!
 on.switch
 ‘Switch it on!’
- b. Schaltet er das Radio ein?
 switched he the radio on
 ‘Does he switch the radio on?’
- c. Ein hat er es nicht geschaltet.
 on has he it not switched
 ‘He did not switch it on.’

In (11a) we have the particle and the verb in a word or—depending on the analysis—in a *head-cluster-phrase*. (11b) is an example of a verb first clause (*head-argument-phrase*) and (11c) is a verb second clause (*head-filler-phrase*). This means that all three phrase types have to be compatible with C-CONT $\langle \rangle$ and with C-CONT $\langle \dots \rangle$. The C-CONT would be the empty list in cases where no particle verb is present and a list containing (at least) the particle verb relation in cases where a particle verb is part of the dominated words. The case in which C-CONT is the empty list must not apply in cases in which a particle verb is present. To ensure this, one has to either extend the type system by a type *non_particle_verb_phrase* and crossclassify all phrases with respect to particle verbs and this additional type or one has to have

¹⁶I think that this is the wrong analysis of *einschalten*. *einschalten* is very similar to resultative constructions in syntax and meaning and therefore *ein* should be treated as a predicate and the *schalten* that is part of *einschalten* should be analyzed as the intransitive version of the verb *schalten*. However there are other particle verbs which are non-compositional and Riehemann’s analysis could be used to account for them in a way analogous to (10).

negative constraints on the word bag which rule out particle verbs in it. Note that this is not trivial since multiple particle verbs can occur in an utterance:

- (12) Er schaltete das Radio, das ich ausgeschaltet habe, wieder ein.
 he switched the radio that I off.switched have again on
 ‘He switched the radio that I switched off on again.’

The semantic contribution of all the particle verbs could be contributed at every dominating node which leads to a high amount of spurious ambiguities (see Sailer, 2000, p. 315 for a similar point regarding an earlier idiom analysis of Riehemann’s).

One way to reduce the spurious ambiguities is to use the idiom analysis that Riehemann developed in other parts of her thesis.¹⁷ In this analysis the idiom constraints attach to the root node. At the root node it is ensured that all parts of idioms are found in the bag of words. One would have to find a way to introduce the constructional semantics at this level (since neither *schalten* nor *ein* contributes meaning in Riehemann’s analysis, the contribution has to be done constructionally¹⁸), which is not straightforward since one does not know how many particles are present in an utterance. Therefore no statement about the length of the C-CONT list should be made at the root node.

Note that Riehemann’s proposal for particle verbs cannot be extended to resultatives straightforwardly. In order to be licensed in head argument phrases, both the object and the resultative predicate have to appear in a valence list. Furthermore, the semantics of the resultative construction which embeds the semantics of the base verb has to be available at the node where the verb is used in the syntactic structure. For example, in (13) the resultative semantics has to be present below the modal verb *will* (‘wants’), which is in turn embedded under the assertion operator, *glauben* (‘to believe’), and the negation.

- (13) Leer glaub’ ich nicht, dass er den Teich fischen will.
 empty believe I_{nom} not that he_{nom} the pond_{acc} fish wants.to
 ‘I do not believe that he wants to fish the pond empty.’

A semantic representation for (14a) in the framework of MRS could be (14b):

- (14) a. der Mann den Teich leer fischt
 the man the pond empty fishes
 b. h1:man(x), h2:pond(y), h3:empty(e1,y), h4:fish(e2,x),
 h5:cause(e3,h4,h6), h6:become(e4,h3)

In order for the MRS mechanics to work, the handle h5 and the event variable e3 have to be present below *will* (‘want’) in (13). This means that the handle of the description in the WORDS bag that refers to the verb would have to point to the

¹⁷See Sailer, 2000, p. 316 for criticism of this analysis.

¹⁸Of course one could stipulate that *schalten* contributes the relation for *einschalten* in this particular Construction, but this would require a lexical entry that is exactly like *schalten*, except that it means *einschalten*. See Section 6 on implausible verb senses.

cause relation, that is, the pointer to the relation of the main verb (h4) had to be overridden. At the same time the meaning of the whole construction has to refer to the meaning contributed by the main verb (h4) since h4 is an argument of the *cause* relation. This is impossible without the use of auxiliary features.

3 Haugereid (2007)

Haugereid (2007) suggests an analysis in which the meaning of an utterance is determined by the argument slots that are filled. He assumes a neo-Davidsonian semantic representation together with slots for arguments which he numbers arg1 to arg5. In the case of resultative constructions arg1 (subject), arg2 (object), and arg4 (secondary predicate) are filled. According to Haugereid (2007, p.c.), the sentence in (15a) gets the semantic interpretation in (15b):

- (15) a. der Mann den Teich leer fischt
the man the pond empty fishes
b. h1:man(x), h2:pond(y), h3:empty(e), h4:fish(e2), h4:arg1(x), h4:arg2(y),
h4:arg4(h3)

The representation is an MRS representation. Each elementary predication comes with a handle. The only argument of the *fish* relation is an event variable and there are other relations that express the arguments of *fish*. The fact that the arguments belong to a certain predicate is expressed by the identification of the handles. In (15b), the arg1, arg2, and arg4 relations have the same handle as the *fish* relation. According to the definitions given in Haugereid, 2007 this means that the arg2 is the patient of the event. This makes the wrong predictions in cases like (15a) since the accusative element is not a semantic argument of the main verb. It is a semantic argument of the secondary predicate and raised to the object of the resultative construction. Depending on the analysis one assumes, the accusative element is a syntactic argument of the verb, but never a semantic argument that fills an argument role in the relation of the main verb. In addition to this problem, the fact that *empty* predicates over the object is not captured in (15b). Haugereid (2007, p.c.) suggests that this is implicit in the representation and follows from the fact that all arg4s predicate over arg2s.

The lexical rule-based analysis allows for a much more fine-grained semantic representation that allows one to specify the actual semantic relations between the involved elements and it also accounts for the fact that the accusative element does not necessarily stand in a thematic relation to the main verb.

Haugereid sketches the syntax of German clauses and deals with active/passive alternations. However, he does not explain how other parts of the grammar work. In particular it is not straightforward to account for more complex sentences involving AcI verbs like *see*. The arguments of embedded verbs and matrix verbs can be permuted in such constructions. Haugereid (2007, p.c.) assumes special grammar rules that allow the arguments of an embedded verb to be saturated. That

is, there is a special rule for an *arg2* argument of an argument. In order to combine *das Nilpferd* with *füttern helfen läßt*, he would have to assume a special grammar rule that combines an argument of a verb that is embedded two levels deep:

- (16) weil Hans Cecilia John das Nilpferd füttern helfen läßt.
 because Hans Cecilia John the hippo feed help let
 ‘because Hans lets Cecilia help John feed the hippo.’

As was argued in Müller (2004, p. 220), several complex-forming predicates can be combined in German clauses; it is only performance that blocks more complex clusters. Verbal complexes with more than four verbs are hardly acceptable in German. However, as was pointed out by Evers (1975, p. 58–59) the situation is different for Dutch where complexes with five verbs are more acceptable. Evers suggests that this is due to the different branching of the Dutch verbal complex and the higher processing load for German verbal complexes. Haugereid would have to assume that there are more rules for Dutch than for German. This would just be a stipulation and not an explanation of the unacceptability of very complex verbal complexes.

Note also that the problem of proliferation of Constructions creeps in again: Haugereid has to assume five Constructions that combine a head with one of the arguments (*arg1–arg5*). In addition, Constructions for the realization of the arguments of embedded heads have to be stipulated. Haugereid assumes special extraction Constructions for each of the arguments. Respective extraction Constructions would have to be stipulated for arguments of embedded heads as well. This would result in a combinatorial explosion that is similar to the one that was criticized in Müller, 2006. In comparison, the approach suggested in Müller, 2002a assumes one Head-Argument Schema and Predicate Complex formation.

Until now, I have been dealing with constituent order phenomena and ways that might be suggested to save a phrasal analysis without the stipulation of lots of Constructions for the various surface patterns that can be observed. In what follows I want to address other phenomena that are problematic for the phrasal approach under certain assumptions.

4 Control Constructions

Control constructions are problematic for a phrasal approach since the subject of the resultative construction is not realized at the surface. (17) gives an example for such a control construction. The subject of *leer zu fischen* is not visible in (17):

- (17) Peter zwingt den Mann, den Teich leer zu fischen.
 Peter_{nom} forces the man_{acc} the pond_{acc} empty to fish
 ‘Peter forces the man to fish the pond empty.’

As Höhle (1983, Chapter 6) has shown, the subjects of *zu* infinitives have nominative case (see also Müller, 2002a, p. 49–53 for a publication of the data in English).

Since the case of the subject is nominative, the subject cannot be identical to *den Mann*, which is accusative.¹⁹

Therefore one either has to assume an empty element as the subject of *den Teich leer zu fischen* or admit that at least the subject is represented as a valent and is not part of the phrasal Construction. Since the lexical rule-based analysis treats subject, object, and predicate as valents, it does not have any problem with data like (17) and does not have to assume an empty element, but can use the standard analysis of control (Pollard and Sag, 1994).

Assuming that subjects are not part of the Resultative Construction as was suggested by Goldberg and Jackendoff (2004) would not help, since the object is part of the Construction, and passive infinitives can be embedded under control verbs:

- (18) Der kranke Mann wünschte sich, tot geschossen zu werden.
the ill man wished SELF dead shot to be
'The ill man wanted to be shot dead.'

The new subject of *tot geschossen zu werden* is not expressed in (18). To avoid empty elements in control constructions, all subjects of all controllable Constructions have to be valents.

5 Open Issues for the Phrasal Analysis

As was pointed out in Müller, 2006, p. 867–868, the valence extending or valence reducing variants of Constructions cannot be modeled by inheritance hierarchies. The reason is that multiple inheritance from the same description does not add new information. I explained the problem with data from Yukatek Maya that involve passivization, causativization, and passivization. However, Jürgen Bohnemeyer informed me that this pattern is not productive in current Yucatec Maya. There are some other cases in the language, so it might have been productive. However, there are other languages that allow for similar things (Stolz, 2003). An example is Turkish, which allows double and even triple causation (Lewis, 1967):

- (19) Öl-dür-t-tür-t-
'to cause somebody to cause somebody to kill somebody'

The *t* and *tür* is the causative morpheme (-t/-d- after vowels or sonorants and -tVr-/-dVr after consonants, where V stands for a vowel in vowel harmony).

One could argue that Turkish data is not relevant for English, but there is another problem for the inheritance-based analysis of active/passive alternations: The interaction of various Constructions does not follow from anything. As was shown in Müller, 2006 the algorithm that was suggested by Kay (2002) to compute possible interactions between Constructions is not without problems. Even if it can be

¹⁹See also Hennis, 1989; Andrews, 1982; Neidle, 1982; Bresnan, 1982 for similar conclusions regarding subjects in control constructions based on data from Icelandic, Russian, Malayalam.

made to work, it cannot be applied to Goldberg's grammars since she relies on defaults and the overridings cannot be solved automatically in all cases. The problem is the following: Once a learner has acquired the parts of grammar that are needed for passive, he or she can apply this knowledge to new items (Tomasello, 2000). In the inheritance-based view the interaction between valence changing Constructions and other Constructions has to be stipulated, that is, the theory predicts, that the interaction has to be learned for all Constructions.

Goldberg suggested that GPSG-like metarules could be used to relate active and passive variants of Constructions. However, there is a crucial difference between the GPSG metarules and the metarules that Goldberg would need: GPSG metarules applied to context free rules, that is to local trees. Goldberg's rules would have to apply to complex trees or to dominance constraints which means that these rules would be much much more powerful. In essence, they are transformations,²⁰ which Goldberg does not want to be part of her theory.

6 Implausible Verb Senses

Goldberg argues against lexical rule-based approaches since these have to assume what she calls "implausible verb senses". According to her it is implausible to assume that *fish* means *cause to become Pred by fishing*; but note that this is not what is claimed by the lexical analysis. The lexical analysis should rather be understood as making the following claim: If the word *fish* is used together with a subject, an object, and a predicate, then the sentence means X's fishing caused Y to become Pred.

I want to point out here that Goldberg's argument can be turned around: She claims that certain words have a certain meaning when they are used together. However, if we look at the words that occur in the utterance, they sometimes have a meaning outside of the idiom. Sometimes the words are ambiguous and it is not clear synchronically which of the verb senses actually lead to the formation of the idiom. In such cases assuming one of the available senses would be a stipulation. An example would be *darstellen* ('represent'), which has *stellen* as the main verb, which can be translated as 'provide' or 'put'. Riehemann addressed this issue by overriding the semantic contribution of used words by the *empty_rel*, but this amounts to saying that there are lexical entries for verbs that do not mean anything. Instead of stipulating lexical items for verbs with no meaning contribution or assuming arbitrary verbs inside of idiomatic expressions, I prefer to have lexical items in the grammar that correspond to statements of the type mentioned above: If this word is used with the specified arguments (including certain modifiers), it means whatever it means.

²⁰With the possible difference that the trees they map lack terminal nodes.

7 Conclusion

It is very difficult to come up with all possible suggestions that could be made to save a certain account and I have probably failed to achieve this goal. A participant of the workshop commented that the only thing I can say about the phrasal approach is that it is not worked out in detail. This is probably true, but I nevertheless hope that this paper has some value, even if the value is limited to having shown that some analyses in the spirit of Goldberg that have actually been worked out have empirical or technical problems.

In comparison to Goldberg's suggestions, there is a fully worked out analysis for resultative constructions and particle verbs that relies on lexical rules (Müller, 2002a). It can account for valence alternations (active/passive/middle/free datives), local constituent order, partial fronting and nonlocal dependencies (V2, relatives, interrogatives), interacts with derivational morphology and is compatible with restrictions on locality (Sag, 2007a). It has none of the problems that phrasal accounts have. It works for German, English, and Korean, and probably some other languages as well. The particular syntax of the languages differs, but the resultative construction is described in the same way. Therefore the generalizations regarding resultative constructions are captured.

One aspect of CxG that is very attractive is the language acquisition research that is connected to the framework. The idea that children learn patterns and generalize from them is straightforward, very intuitive, and supported by evidence from experiments (Tomasello, 2006). However, if one looks at more complex utterances, it is clear that adjacency is not required for a Construction to be recognized. What children have to learn is that an utterance has a certain meaning if certain material appears together in an utterance. This is what Goldberg tries to save by saying that Argument Structure Constructions do not make any statement about linear order. But this is exactly what is expressed in the valence-based approach: If a head appears together with its arguments, the respective combination has a certain meaning.

Finally, I would like to repeat a point that I made in Müller, 2006, p. 878: I am not claiming that all observable patterns should be treated lexically. Especially in cases in which one cannot treat one part of a phrase as a functor, a phrasal analysis seems to be more appropriate than a lexical one. Examples for such cases are certain date expressions (Müller and Kasper, 2000), word iteration (Stolz, 2006), or fully fixed expressions. While phrases like *by and large* could be assigned an internal structure, this does not seem to be very enlightening and simply listing them as full phrases in the lexicon is probably the analysis that should be preferred over an analysis that makes *and* (or any other word) the functor selecting for the remaining words.

References

- Andrews, A. D. 1982. Long Distance Agreement in Modern Icelandic. In P. Jacobson and G. K. Pullum (eds.), *The Nature of Syntactic Representation*, pp 1–33, Dordrecht, Boston, London: D. Reidel Publishing Company.
- Bennis, H. 1991. Theoretische Aspecten van Partikelvooropplaatsing. *TABU Bulletin voor Taalwetenschap* 21(3), 89–95.
- Blight, R. C. and Moosally, M. J. (eds.). 1997. *Texas Linguistic Forum 38: The Syntax and Semantics of Predication. Proceedings of the 1997 Texas Linguistics Society Conference*, Austin, Texas, University of Texas Department of Linguistics.
- Blom, C. 2005. *Complex Predicates in Dutch. Synchrony and Diachrony*. Utrecht University.
- Booij, G. E. 2002. Separable Complex Verbs in Dutch: A Case of Periphrastic Word Formation. In Dehé et al. (2002), pp 21–41.
- Bresnan, J. 1982. Control and Complementation. *Linguistic Inquiry* 13(3), 343–434.
- Copestake, A. and Briscoe, T. 1992. Lexical Rules in a Unification Based Framework. In J. Pustejovsky and S. Bergler (eds.), *Lexical Semantics and Knowledge Representation*, pp 101–119, Berlin: Springer-Verlag.
- Copestake, A., Flickinger, D. P., Pollard, C. J. and Sag, I. A. 2005. Minimal Recursion Semantics: an Introduction. *Research on Language and Computation* 4(3), 281–332.
- Crysmann, B. 2002. *Constraint-Based Coanalysis: Portuguese Cliticisation and Morphology-Syntax Interaction in HPSG*. Saarbrücken: Deutsches Forschungszentrum für Künstliche Intelligenz und Universität des Saarlandes.
- Dehé, N., Jackendoff, R. S., McIntyre, A. and Urban, S. (eds.). 2002. *Verb-Particle Explorations*. Berlin, New York: Mouton de Gruyter.
- Evers, A. 1975. *The Transformational Cycle in Dutch and German*. Ph. D.thesis, University of Utrecht.
- Fischer, K. and Stefanowitsch, A. (eds.). 2006. *Konstruktionsgrammatik. Von der Anwendung zur Theorie*. Tübingen: Stauffenburg Verlag.
- Goldberg, A. E. 1995. *Constructions. A Construction Grammar Approach to Argument Structure*. Chicago/London: University of Chicago Press.
- Goldberg, A. E. 2006. *Constructions at Work. The Nature of Generalization in Language*. Oxford, New York: Oxford University Press.
- Goldberg, A. E. and Jackendoff, R. S. 2004. The English Resultative as a Family of Constructions. *Language* 80(3), 532–568.
- Grubačić, E. 1965. *Untersuchungen zur Frage der Wortstellung in der deutschen Prosadichtung der letzten Jahrzehnte*. Ph. D.thesis, Philosophische Fakultät, Zagreb.
- Gunkel, L. 2003. *Infiniheit, Passiv und Kausativkonstruktionen im Deutschen*. Tübingen: Stauffenburg Verlag.
- Haugereid, P. 2007. Decomposed Phrasal Constructions. In Müller (2007b).

- Hennis, K. 1989. 'Covert' Subjects and Determinate Case: Evidence from Malayalam. In E. J. Fee and K. Hunt (eds.), *WCCFL 8 / The Proceedings of the Eighth West Coast Conference on Formal Linguistics*, pp 167–175, Stanford: CSLI.
- Hinrichs, E. W. and Nakazawa, T. 1989. Subcategorization and VP Structure in German. In *Aspects of German VP Structure*, Eberhard-Karls-Universität Tübingen.
- Hinrichs, E. W. and Nakazawa, T. 1994. Linearizing AUXs in German Verbal Complexes. In Nerbonne et al. (1994), pp 11–38.
- Hoeksema, J. 1991. Theoretische Aspecten van Partikelvooropplaatsing. *TABU Bulletin voor Taalwetenschap* 21(1), 18–26.
- Höhle, T. N. 1983. Topologische Felder, Köln, ms.
- Kathol, A. 1995. *Linearization-Based German Syntax*. Ph.D.thesis, Ohio State University.
- Kathol, A. 1998. Constituency and Linearization of Verbal Complexes. In E. W. Hinrichs, A. Kathol and T. Nakazawa (eds.), *Complex Predicates in Nonderivational Syntax*, pp 221–270, San Diego: Academic Press.
- Kathol, A. and Pollard, C. J. 1995. Extraposition via Complex Domain Formation. In *Proceedings of the Thirty-Third Annual Meeting of the ACL*, Boston.
- Kay, P. 2002. An Informal Sketch of a Formal Architecture for Construction Grammar. *Grammars* 5(1), 1–19.
- Kay, P. and Fillmore, C. J. 1999. Grammatical Constructions and Linguistic Generalizations: the What's X Doing Y? Construction. *Language* 75(1), 1–33.
- Kiss, T. 1995. *Infinite Komplementation. Neue Studien zum deutschen Verbum infinitum*. Tübingen: Max Niemeyer Verlag.
- Krieger, H.-U. and Nerbonne, J. 1993. Feature-Based Inheritance Networks for Computational Lexicons. In T. Briscoe, A. Copestake and V. de Paiva (eds.), *Inheritance, Defaults, and the Lexicon*, pp 90–136, Cambridge: Cambridge University Press, a version of this paper is available as DFKI Research Report RR-91-31. Also published in: Proceedings of the ACQUILEX Workshop on Default Inheritance in the Lexicon, Technical Report No. 238, University of Cambridge, Computer Laboratory, October 1991.
- Lewis, G. L. 1967. *Turkish Grammar*. Oxford: Clarendon Press.
- Lüdeling, A. 1997. Strange Resultatives in German: New Evidence for a Semantic Treatment. In Blight and Moosally (1997), pp 223–233.
- Lüdeling, A. 2001. *On Particle Verbs and Similar Constructions in German*. Stanford: CSLI Publications.
- Meurers, W. D. 1999. German Partial-VP Fronting Revisited. In G. Webelhuth, J.-P. Koenig and A. Kathol (eds.), *Lexical and Constructional Aspects of Linguistic Explanation*, pp 129–144, Stanford: CSLI Publications.
- Meurers, W. D. 2001. On Expressing Lexical Generalizations in HPSG. *Nordic Journal of Linguistics* 24(2), 161–217.
- Michaelis, L. A. and Ruppenhofer, J. 2001. *Beyond Alternations: A Constructional Model of the German Applicative Pattern*. Stanford: CSLI Publications.
- Müller, S. 1996. Yet another Paper about Partial Verb Phrase Fronting in German.

- In *Proceedings of COLING 96*, pp 800–805, COLING 96, Copenhagen.
- Müller, S. 1999. *Deutsche Syntax deklarativ. Head-Driven Phrase Structure Grammar für das Deutsche*. Tübingen: Max Niemeyer Verlag.
- Müller, S. 2002a. *Complex Predicates: Verbal Complexes, Resultative Constructions, and Particle Verbs in German*. Stanford: CSLI Publications.
- Müller, S. 2002b. Syntax or Morphology: German Particle Verbs Revisited. In Dehé et al. (2002), pp 119–139.
- Müller, S. 2004. Continuous or Discontinuous Constituents? A Comparison between Syntactic Analyses for Constituent Order and Their Processing Systems. *Research on Language and Computation, Special Issue on Linguistic Theory and Grammar Implementation 2(2)*.
- Müller, S. 2005a. Zur Analyse der deutschen Satzstruktur. *Linguistische Berichte* 201, 3–39.
- Müller, S. 2005b. Zur Analyse der scheinbar mehrfachen Vorfeldbesetzung. *Linguistische Berichte* 203, 297–330.
- Müller, S. 2006. Phrasal or Lexical Constructions? *Language* 82(4), 850–883.
- Müller, S. 2007a. *Head-Driven Phrase Structure Grammar: Eine Einführung*. Tübingen: Stauffenburg Verlag.
- Müller, S. (ed.). 2007b. *Proceedings of the HPSG-2007 Conference, Stanford Department of Linguistics and CSLI's LinGO Lab*, Stanford, CSLI Publications.
- Müller, S. To Appear. Elliptical Constructions, Multiple Frontings, and Surface-Based Syntax. In G. Jäger, P. Monachesi, G. Penn and S. Wintner (eds.), *Proceedings of Formal Grammar 2004, Nancy*, Stanford: CSLI Publications.
- Müller, S. and Kasper, W. 2000. HPSG Analysis of German. In W. Wahlster (ed.), *VerbMobil: Foundations of Speech-to-Speech Translation*, pp 238–253, Berlin Heidelberg New York: Springer-Verlag.
- Neidle, C. 1982. Case Agreement in Russian. In J. Bresnan (ed.), *The Mental Representation of Grammatical Relations*, Cambridge: Massachusetts, London: England: The MIT Press.
- Nerbonne, J., Netter, K. and Pollard, C. J. (eds.). 1994. *German in Head-Driven Phrase Structure Grammar*. Stanford: CSLI Publications.
- Nunberg, G., Sag, I. A. and Wasow, T. 1994. Idioms. *Language* 70(3), 491–538.
- Penn, G. and Richter, F. 2004. Lexical Resource Semantics: From Theory to Implementation. In S. Müller (ed.), *Proceedings of the HPSG-2004 Conference, Center for Computational Linguistics, Katholieke Universiteit Leuven*, pp 423–443, Stanford: CSLI Publications.
- Perlmutter, D. M. and Postal, P. M. 1977. Toward a Universal Characterization of Passivization. In *Proceedings of the Third Annual Meeting of the Berkeley Linguistics Society*, pp 394–417.
- Pollard, C. J. and Sag, I. A. 1994. *Head-Driven Phrase Structure Grammar*. Chicago, London: University of Chicago Press.
- Reape, M. 1994. Domain Union and Word Order Variation in German. In Nerbonne et al. (1994), pp 151–198.
- Riehemann, S. Z. 2001. *A Constructional Approach to Idioms and Word Formation*.

- Dissertation, Stanford University.
- Sag, I. A. 2007a. Locality in Sign-Based Construction Grammar. In Müller (2007b).
- Sag, I. A. 2007b. Sign-Based Construction Grammar: An Informal Synopsis. Unpublished ms, Stanford University.
- Sag, I. A., Wasow, T. and Bender, E. M. 2003. *Syntactic Theory: A Formal Introduction*. Stanford: CSLI Publications, second edition.
- Sailer, M. 2000. *Combinatorial Semantics and Idiomatic Expressions in Head-Driven Phrase Structure Grammar*. Dissertation, Universität Tübingen.
- Simpson, J. 1983. Resultatives. In L. S. Levin, M. Rappaport and A. Zaenen (eds.), *Papers in Lexical Functional Grammar*, Indiana University Linguistics Club.
- Stolz, T. 2003. Pleonastic Morphology Dies Hard. Ms. Bremen: IAAS.
- Stolz, T. 2006. (Wort-)Iterationen: (k)eine universelle Konstruktion. In Fischer and Stefanowitsch (2006), pp 105–132.
- Tomasello, M. 2000. Do Young Children Have Adult Syntactic Competence? *Cognition* 74, 209–253.
- Tomasello, M. 2006. Konstruktionsgrammatik und früher Erstspracherwerb. In Fischer and Stefanowitsch (2006), pp 19–37.
- Verspoor, C. M. 1997. *Contextually-Dependent Lexical Semantics*. Ph. D.thesis, University of Edinburgh.
- Wechsler, S. M. 1997. Resultative Predicates and Control. In Blight and Moosally (1997), pp 307–321.
- Wechsler, S. M. and Noh, B. 2001. On Resultative Predicates and Clauses: Parallels between Korean and English. *Language Sciences* 23, 391–423.