

Unifying Everything:  
Simpler Syntax, Construction Grammar, Minimalism and HPSG

Stefan Müller

Deutsche Grammatik  
Institut für Deutsche und Niederländische Philologie  
Freie Universität Berlin

Stefan.Mueller@fu-berlin.de

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## Non-Headed Structures and Phrasal Constructions

- Jackendoff (2011) gives the following examples for phrasal constructions:

- (1) a. student after student (Jackendoff, 2008)  
[NP/advP N-P-N]
- b. The bus rumbled around the corner.  
[VP V PP] = 'go PP in such a way to make a V-ing sound'

- N-P-N construction is a convincing example of a phrasal construction. G. Müller (2011) suggested a reduplication analysis, but his proposal has the problems that were pointed out in Jackendoff's original paper.
- Discussion of phrasal approaches in Müller (2006, 2007, To appear)

## Datives Licensed by Phrasal Construction?

Goldberg (1995, Section 6.2): dative is licenced phrasally

- (2) ich hab ihr jetzt diese Ladung Muffins mit den Herzchen  
I have her now this load Muffins with the little.heart  
drauf gebacken und gegeben.<sup>1</sup>  
there.on backed and given  
'I now baked and gave her this load of Muffins with the little heart on top.'

Conclusion: The information about the dative of *gebacken* has to be present when the verb is coordinated with *gegeben*.

<sup>1</sup><http://www.musiker-board.de/diverses-ot/35977-die-liebe-637-print.html>.  
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## Move and Merge and Their Constraint-Based Relatives

- Lexical analyses use a richly structured lexicon together with syntactic schemata that licence complex syntactic structures.
- The HPSG schemata are the well-behaved cousins (or parents) of Move and Merge!

## (Binary) Merge and Labelling according to Chomsky (2008)

- $\alpha + \beta = \{ I, \{ \alpha, \beta \} \}$ , where  $I$  is the category of the resulting object.
- assumption: all constituents are headed  
→ category that is assigned to  $\{ \alpha, \beta \}$  has to be either  $\alpha$  or  $\beta$ .
- Chomsky (2008, p. 145):
  - a. In  $\{ H, \alpha \}$ ,  $H$  an LI,  $H$  is the label.
  - b. If  $\alpha$  is internally merged to  $\beta$  forming  $\{ \alpha, \beta \}$  then the label of  $\beta$  is the label of  $\{ \alpha, \beta \}$ .
- Chomsky: label is not uniquely determined in all cases.

## (Binary) Merge and Labelling according to Chomsky (2008)

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  - b. If  $\alpha$  is internally merged to  $\beta$  forming  $\{ \alpha, \beta \}$  then the label of  $\beta$  is the label of  $\{ \alpha, \beta \}$ .
- A special case is the Internal Merge of an LI  $\alpha$  with a non LI  $\beta$ :
  - (4a) label =  $\alpha$  (since  $\alpha$  is lexical)
  - (4b) label =  $\beta$  (since something is taken out of  $\beta$ )
 example: combination of *what* with *you wrote* is either a CP or a DP as needed for (6) (Donati, 2006):
  - what [ C [you wrote  $t$ ]]
  - |                             |    |
|-----------------------------|----|
| a. I wonder what you wrote. | CP |
| b. I read what you wrote.   | DP |

## Why this Labelling is Insufficient

- fails on free relatives with complex relative phrases:
  - I'll read [whichever book] you give me.<sup>2</sup>
  - |  |
|--|
| a. Ihr könnt beginnen, [mit <i>wem</i> ] ihr wollt. <sup>3</sup>   |
| you can start with whom you want   |
| 'You can start with whoever you like.'   |
| b. [ <i>Wessen Birne</i> ] noch halbwegs in der Fassung steckt, pflegt solcherlei Erloschene zu meiden; <sup>4</sup>                   |
| c. [ <i>Wessen Schuhe</i> ] „danach“ besprenkelt sind, hat keinen Baum gefunden und war nicht zu einem Bogen in der Lage. <sup>5</sup> |
- Ott's account 2011 fails on so-called non-matching free relatives.

<sup>2</sup>Bresnan and Grimshaw, 1978, p. 333.<sup>3</sup>Bausewein, 1990, p. 155.<sup>4</sup>Thomas Gsella, taz, 12.02.1997, p. 20. Quoted from Müller, 1999.<sup>5</sup>taz, taz mag, 08./09.08.1998, p. XII. Quoted from Müller, 1999.

## Labelling: What is Needed

Head/functor-based computation of the Label seems to be needed:

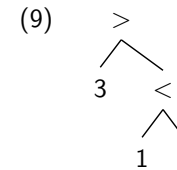
- Categorical Grammar (Ajdukiewicz, 1935; Steedman, 2000),
- HPSG (Pollard and Sag, 1994), and
- Stabler's Minimalist Grammars (2011).

## Specifiers, Complements, and the Remains of $\bar{X}$ Theory

- Chomsky tries to get rid of  $\bar{X}$  Theory.
- Being a specifier or a complement is a derived property:
  - first-merged items are complements
  - later-merged items are specifiers
- Problems with:
  - intransitive verbs
  - coordination of lexical elements
  - coordination in head final languages

## Minimalist Grammars

- Stabler's work is close to Minimalist approaches but much more precise (Stabler, 2010, p. 397, 399, 400).
- Stabler (2001) formalizes and implements Kayne's theory of remnant movement.
- Stabler: results of the two Merge operations are not sets but pairs. head marked by a pointer ('<' or '>'):



1 is the head, 2 is the complement and 3 the specifier.  
Daughters are ordered: 3 is serialized before 1 and 1 before 2.

## External Merge According to Stabler (2010, p. 402)

$$(10) \text{ em}(t_1[=f], t_2[f]) = \begin{cases} \begin{array}{c} < \\ / \quad \backslash \\ t_1 \quad t_2 \end{array} & \text{if } t_1 \text{ has exactly 1 node} \\ \begin{array}{c} > \\ / \quad \backslash \\ t_2 \quad t_1 \end{array} & \text{otherwise} \end{cases}$$

=f is a selection feature and f the corresponding category.

When  $t_1[=f]$  and  $t_2[f]$  are combined, the result is a tree in which the selection feature of  $t_1$  and the respective category feature of  $t_2$  are deleted.

## Internal Merge

$$(11) \text{ im}(t_1[+f]) = \begin{array}{c} > \\ / \quad \backslash \\ t_2^> \quad t_1\{t_2[-f]^> \mapsto \epsilon\} \end{array}$$

if (SMC) exactly one head in  $t_1[+f]$  has  $-f$  as its first feature.

$t_1$  is a tree with a subtree  $t_2$  which has the feature f with the value '-'.  
This subtree is deleted ( $t_2[-f]^> \mapsto \epsilon$ ) and a copy of the deleted subtree without the  $-f$  feature is positioned in specifier position.

The element in specifier position has to be a maximal projection.  
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## Problems

- While this proposal is much more precise than Chomsky's, it suffers from the same problems (except for the labelling problem).
- But there is an easy way out, also suggested by Stabler: Directional Minimalist Grammars.

## Directional Minimalist Grammars

- Stabler (2011) suggests to mark the position of an argument relative to its head together with the selection feature and gives the following redefinition of External Merge:

$$(12) \text{ em}(t_1[\alpha], t_2[x]) = \begin{cases} \begin{array}{c} < \\ \wedge \\ t_1 \quad t_2 \end{array} & \text{if } \alpha \text{ is } =x \\ \begin{array}{c} > \\ \wedge \\ t_2 \quad t_1 \end{array} & \text{if } \alpha \text{ is } x= \end{cases}$$

The position of the equal sign specifies on which side of the head an argument has to be realized.

## The Good Thing about Directional Minimalist Grammars

- DMGs do not have any of the problems that Chomsky's approach has.
- External Merge = Forward and Backward Application in Categorical Grammar!

## The Head Feature Principle and Labelling

- '>' and '<' corresponds directly to the HPSG representation of heads.
- syntactic information is contained under `SYNSEM|LOC|CAT`.  
head features are grouped together under `HEAD`
- Head Feature Principle:

$$(13) \text{ headed-phrase} \Rightarrow \left[ \begin{array}{l} \text{SYNSEM|LOC|CAT|HEAD } \boxed{1} \\ \text{HEAD-DTR|SYNSEM|LOC|CAT|HEAD } \boxed{1} \end{array} \right]$$

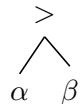
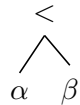
## Notational Issues: HPSG vs. MG

Ginzburg and Sag (2000, p. 30)

$$\left[ \begin{array}{l} \text{HEAD-DTR } \boxed{1} \\ \text{DTRS } \langle \boxed{1} \alpha, \beta \rangle \end{array} \right]$$

$$\left[ \begin{array}{l} \text{HEAD-DTR } \boxed{1} \\ \text{DTRS } \langle \alpha, \boxed{1} \beta \rangle \end{array} \right]$$

Stabler



## Internal Merge and the Head-Filler Schema

- Stabler's Internal Merge  $\equiv$  Head-Filler-Schema (Pollard and Sag, 1994)
- Stabler does not define category of head daughter, but PS restrict the head daughter to be a finite verb. Chomsky (2007, p. 17) assumes that all operations but External Merge operate on Phase level. Chomsky assumes that CP and v\*P are Phases.
- In HPSG, sentences like (14) are treated as VPs, not as CPs:
 

(14) Bagels, I like.
- The two definitions are very similar!
- Please ask me about the differences . . .

## Conclusions on Merge

- There are well-behaved and well-formalized definitions of Move and Merge.
- They are constraint-based as required by Jackendoff.
- They are around for 25 years now, External Merge even for 76 years.

## Conclusions: Desiderata

Desiderata for linguistic theories:

- constraint-based formalization (Pullum and Scholz, 2001; Pullum, 2007; Sag and Wasow, 2011)
- strongly lexicalist orientation (Sag and Wasow, 2011, Müller, 2006, Müller, To appear)
- parallel/sign-based architecture including constraints on phonology, morphology, syntax, semantics, and information structure and the interactions between the various levels of linguistic description (Jackendoff, 2011; Kuhn, 2007)
- not restricted to headed configurations (Jackendoff, 2008; Jacobs, 2008)
- possibility to describe complex linguistic objects rather than just lexical items (Kay and Fillmore, 1999; Sag, 1997)

## The Future

- We know that we need both lexical and phrasal approaches.
- The question is what we do how.
- This is an empirical issue (given some basic assumptions ...).
- Let's work out large scale grammar fragments and publish open access books about them with Language Science Press!

<http://langsci-press.org/>

## Conclusion

Ivan participated in the development of

- GPSG
- HPSG
- CxG
- Minimalism!

## Chomsky, 2013: On Labeling, two Lexical Items

- Problem of Chomsky, 2008: combination of two lexical items
- Chomsky's solution in 2013:
  - All lexical elements have to be projected.
  - Roots are combined with a functional head and roots do not count for label determination (by stipulation).
- Consequence:

(15) a.  $N' \rightarrow N$  ( $\bar{X}$  Theory)  
b.  $N \rightarrow N\text{-func root}$  (Chomsky, 2013)

We are not better off than  $\bar{X}$  Theory and one of the goals of Minimalism is to provide simpler mechanisms/structures than GB.

## Chomsky, 2013: On Labeling, two Phrasal Items

- Missing in Chomsky, 2008: combination of two phrasal items.
- When two phrases XP and YP are combined:
  - Either one has to move away and the other provides the label or
  - the label is computed from features that XP and YP share.
- Details are unclear ...

## Coordination

- Chomsky's suggestion:

- (16) a.  $[\alpha \text{ Conj } [\beta \text{ Z W}]]$   
 b.  $[\gamma \text{ Z } [\alpha \text{ Conj } [\beta \text{ Z W}]]]$

- Since Z in  $\beta$  is only a copy, it does not count for labeling and  $\beta$  can get the label of W.
- By stipulation Conj cannot be a label, hence the label of  $\alpha$  should be the label of W.
- We have to choose between Z and W to determine the label of  $\gamma$ .
- Chomsky claims, the label is Z, but either Z or W would have to move on to make  $\gamma$  labelable. Chomsky mentions this in footnote 40, but does not provide a solution.

## Coordination further Problems

- According to Chomsky the label of Z Conj W is Z.
- Borsley (p.c. 2013): coordinations of two singular noun phrases with *and*. result of the coordination is a plural NP and not a singular one like the first conjunct
- No explanation for ill-formedness of (17b):

- (17) a. both Kim and Lee  
 b. \*both Kim or Lee

The information about the conjunction has to be part of the representation for *or Lee* in order to be able to contrast it with *and Lee*.

## Specifiers

Chomsky, Footnote 27:

There is a large and instructive literature on problems with Specifiers, but if the reasoning here is correct, they do not exist and the problems are unformulable.

## Differences

- In HPSG "movement" is not feature-driven. Feature-driven movement cannot deal with so-called altruistic movements (Fanselow, 2003).
- No restriction regarding the completeness of the filler daughter. Whether the filler daughter has to be a maximal projection (English) or not (German) follows from restrictions that are enforced locally when the trace is combined with its head.
- Analysis of (18) without remnant movement possible in HPSG:

- (18) Gelesen<sub>i</sub> hat<sub>j</sub> das Buch keiner <sub>-i -j</sub>.  
 read has the book nobody

## Remnant Movement

- Stabler has to assume a remnant movement analysis.  
G. Müller, 1998:

- (19) a. Hat [keiner [<sub>VP</sub> das Buch gelesen]].  
b. Hat [das Buch]<sub>i</sub> [keiner [<sub>VP</sub> -<sub>j</sub> gelesen]].  
c. [<sub>VP</sub> -<sub>j</sub> Gelesen]<sub>i</sub> hat [das Buch]<sub>j</sub> [keiner -<sub>i</sub>].

Haider (1993); De Kuthy and Meurers (2001); Fanselow (2002):  
such remnant movement analyses are problematic.

- The only phenomenon that Fanselow identified as requiring a remnant movement analysis are multiple frontings (Müller, 2003).
- Analysis in Müller, 2005a,b, In Preparation does not need remnant movement,  
but uses argument composition (Geach, 1970; Hinrichs and Nakazawa, 1994)
- Chomsky (2007, p. 20) uses argument composition in a different area of syntax and hence both tools are used in recent Minimalist proposals.
- A theory that works with fewer assumptions has to be preferred over others.

## Further Differences

See Borsley, 2012 and Gazdar, 1981.

- Not all information is shared between filler and gap.
  - avoids movement paradoxes
- No transformations: There may be several gaps related to one filler.
- There may be resumptive pronouns.

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