Phrasal constructions, derivational morphology, constituent structure and (cross-linguistic) generalizations: A discussion of template-based phrasal LFG approaches

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Goldberg (1995, 2006) and others argue for a phrasal view on argument structure constructions: lexical entries for verbs come with minimal specifications as for which arguments are required by a verb. Rather than containing fully specified valence frames they contain a specification of argument roles that may be realized. Verbs can be inserted into phrasal constructions and these constructions may express the arguments that belong to a verb semantically or even add further arguments. A frequently discussed example is the one in (1):

(1)   He runs his sneakers threadbare.

run is an intransitive verb, but in (1) it enters the resultative construction, which licenses an additional argument (*his sneakers*) and a result predicate (*threadbare*). The traditional analysis of the resultative construction in the framework of LFG is a lexical one (Simpson, 1983), but recently, several researchers suggested a different view on argument structure constructions in the framework of LFG. For instance, Alsina (1996) and Christie (2010) suggest analyzing resultative constructions as phrasal constructions and Asudeh, Dalrymple & Toivonen (2008, 2013) argue for a phrasal analysis of the (Swedish) caused motion construction. Asudeh & Toivonen (2014) argued for a phrasal analysis of the benefactive construction (2b).

(2)   a. The performer sang a song.
      b. The performer sang the children a song.

This paper wants to address two issues with phrasal approaches: first there are the old level ordering arguments from Dowty (1978, p. 412) and Bresnan (1982, p. 21) and second there are problems with cross-linguistic generalizations that can be captured with reference to f-structures of lexical items but which cannot be captured on a phrasal level since languages may have radically different c-structures despite the fact that the phenomenon under discussion is basically the same. Hence, I will argue that we should stick to the traditional approaches relaying on f-structure specifications of lexical items. The remaining paper is structured as follows: I first discuss requirements by morphological processes in Section 1, I then point out missing generalizations in Section 2 and 3 and finally I draw a conclusion in Section 4.

1   Morphology and valence

Morphological processes have to be able to see the valence of the element they apply to. For instance, the generalization about productive -*bar* 'able' derivation is that it only applies to verbs that govern a subject and an accusative object. While *lösbar* 'solvable' and *vergleichbar* 'comparable' can be formed, * *schlafbar* 'sleepable' and * *helfbar* 'helpable' are ruled out:

(3)   a. lösbar   (NP[nom], NP[acc])
          solveable

      b. vergleichbar (NP[nom], NP[acc], PP[mit])
          comparable

      c. * schlafbar   (NP[nom])
          sleepable

      d. * helfbar   (NP[nom], NP[dat])
          helpable

The resultative construction also interacts with -*bar* derivation: the adjective *leerfischbar* 'empty.fish.able' can be formed. If arguments are introduced by phrasal configurations after the morphology level, the accessibility of the valence information to the morphology component is not given and it remains an open question how phrasal analyses want to explain the contrasts in (3) and the fact that -*bar* derivation does apply to verbs in the resultative construction. So, derivations like *leerfischbar* constitute evidence against Alsina's and Christie's phrasal approach.

2   Phrasal introduction of arguments and missing generalizations about the passive

Asudeh, Giorgolo & Toivonen (2014) discuss the phrasal introduction of cognate objects and benefactives. (4a) is an example of the latter construction.

(4)   a. The performer sang the children a song.
      b. The children were sung a song.

According to the authors, the noun phrase *the children* is not an argument of *sing* but contributed by the c-structure rule that optionally licenses a benefactive (Asudeh et al., 2014, p. 81).

(5)   V′ →   V   DP   DP
                   ↑ = ↓   (↑ OBJ) = ↓   (↑ OBJ$_\theta$) = ↓
                 (@Benefactive)

Whenever this rule is called, the template Benefactive can add a benefactive role and the respective semantics, if this is compatible with the verb that is inserted into the structure. The authors show how the mappings for the passive example in (4b) work, but they do not provide the c-structure rule that licenses such examples. Unless one assumes that the arguments in (5) are optional (see below), one would

need a c-structure rule for passive VPs and this rule has to license a benefactive as well.[1] So it would be:

(6) V′ → V[pass] DP
$\uparrow = \downarrow$ $(\uparrow \text{OBJ}_\theta) = \downarrow$
(@BENEFACTIVE)

Note that a benefactive cannot be added to any verb: Adding a benefactive to an intransitive verb as in (7a) is out and the passive that would correspond to (7a) is ungrammatical as well, as (7b) shows:

(7) a. * He laughed the children.
b. * The children were laughed.

So one could not just claim that all c-structure rules optionally introduce a benefactive argument. Therefore there is something special about the two rules in (5) and (6). The problem is that there is no relation between these rules. They are independent statements saying that there can be a benefactive in the active and that there can be one in the passive. This is what Chomsky (1957, p. 43) criticized in 1957 with respect to simple phrase structure grammars and this was the reason for the introduction of transformations. Bresnan-style LFG captured the generalizations by lexical rules and later by Lexical Mapping Theory. But if elements are added outside the lexical representations, the representations where these elements are added have to be related too. One could say that our knowledge about formal tools has changed since 1957. We now can use inheritance hierarchies to capture generalizations. So one can assume a type (or a template) that is the supertype of all those c-structure rules that introduce a benefactive. But since not all rules allow for the introduction of a benefactive element, this basically amounts to saying: c-structure rule A, B, and C allow for the introduction of a benefactive. In comparison lexical rule-based approaches have one statement introducing the benefactive. The lexical rule states what verbs are appropriate for adding a benefactive and syntactic rules are not affected.

Asudeh (p. c. 2016) and an anonymous reviewer pointed out to me that the rules in (5) and (6) can be generalized over if the arguments in (5) are made optional.

(8) V′ → V (DP) (DP)
$\uparrow = \downarrow$ $(\uparrow \text{OBJ}) = \downarrow$ $(\uparrow \text{OBJ}_\theta) = \downarrow$
(@BENEFACTIVE)

Since both of the DPs are optional (8) is equivalent to a specification of four rules, namely (5) and the three versions of the rule in (9):

(9) a. V′ → V DP
$\uparrow = \downarrow$ $(\uparrow \text{OBJ}_\theta) = \downarrow$
(@BENEFACTIVE)

b. V′ → V DP
$\uparrow = \downarrow$ $(\uparrow \text{OBJ}) = \downarrow$
(@BENEFACTIVE)

c. V′ → V
$\uparrow = \downarrow$
(@BENEFACTIVE)

(9a) is the variant of (8) in which the OBJ_θ is omitted, (9b) is the variant in which the OBJ is omitted and in (9c) both DPs are omitted. Hence, (8) can be used for V′s containing two objects and for V′s in the passive containing just one object. The template-based approach does not overgenerate since the benefactive template is specified such that it requires the verb it applies to to select for an ARG2. Since intransitives like *laugh* do not select for an ARG2 a benefactive cannot be added. So, in fact the actual configuration in the c-structure rule does not play any role at all: the account entirely relies on semantics and resource sensitivity. This means that it is not the case that an argument is added by a certain configuration the verb enters in. Since any verb may enter (9) and since the only important thing is the interaction between the lexical specification of the verb and the benefactive template, the same structures would be licensed if the benefactive template would be added to the lexical items of verbs directly. The actual configuration does not constrain anything. All (alleged) arguments from language acquisition and psycholinguistics for phrasal analyses would not apply to such a phrasal account.

Concluding this section it can be said that the difference between the lexical use of the benefactive template or the phrasal introduction as executed in (8) is really minimal. However, there is one area in grammar where there is a difference: coordination. As Müller & Wechsler (2014, Section 6.1) pointed out it is possible to coordinate ditransitive verbs with verbs that appear together with a benefactive. (10a) is one of their examples and (10b) is an additional example:

(10) a. She then offered and made me a wonderful espresso — nice.[2]
b. My sisters just baked and gave me a nutella cupcake with mint chocolate chip ice-cream in the middle and milk chocolate frosting on top.[3]

If the benefactive information is introduced at the lexical level the coordinated verbs basically have the same selectional requirements. If the benefactive information is introduced at the phrasal level *baked* and *gave* are coordinated and then the benefactive constraints are imposed on the result of the coordination by the c-structure rule. While it is clear that the lexical items that would be assumed in a lexical approach can be coordinated as symmetric coordination, problems seem to arise for the phrasal approach. It is unclear how the asymmetric coordination of the mono- and ditransitive verbs can be accounted for and how the constraints of the benefactive template are distributed over the two conjuncts.

A reviewer suggested that one could assume VP structures for German as well. While many researchers workin in GB, LFG and HPSG assume binary branching structures for German, there is indeed an LFG account that assumes a flat VP for German (Forst & Rohrer, 2009). However, Forst & Rohrer develop a theory of coordination that assumes partial VPs. In the analysis of (11), the

[1]See for instance Bergen & Chang, 2005 and van Trijp, 2011 for Construction Grammar analyses that assume active and passive variants of phrasal construction. See Cappelle (2006) on allostructions in general.

[2]http://www.thespinroom.com.au/?p=102 07.07.2012
[3]http://bambambambii.tumblr.com/post/809470379. 05.06.2012.

VP *seiner Frau buk* 'his wife baked' would be co-ordinated with *seiner Tochter zeigte* 'his daughter showed'.

(11) dass er den Kuchen [seiner Frau buk] und
      that he the cake   his   wife baked but
      [seiner Tochter zeigte]
      his   daughter showed
      'that he baked his wife a cake and showed it
      to his daughter'

See Müller (2016a, Section 21.6.2) for a general discussion of phrasal approaches and coordination.

The partial VPs in (11) are parallel to the VPs in approaches with binary branching. Any LFG of German would have to admit such partial VPs since German allows for partial VP fronting:

(12) a. [Seiner Frau backen] würde er
          his.DAT wife bake   would he.NOM
          solche Kuchen niemals.
          such   cakes never
          'He would never bake such cakes for his
          wife.'
      b. [Solche Kuchen backen] würde er
          such   cakes bake   would he.NOM
          seiner   Frau niemals.
          his.DAT wife never

In (11) and (12a) the verb is realized together with the benefactive but the accusative object is realized outside the verbal projection. In (12b) the accusative is realized together with *backen* but the benefactive stays behind. Hence the idea that the benefactive is introduced in a special phrase structural configuration together with a verb and all other objects would not work for German. See Nerbonne (1986) and Johnson (1986), who introduced lexical valence representations in a Categorial Grammar style into GPSG since there was no way to make the phrasal GPSG approach compatible with German PVP data. See also Müller & Wechsler, 2014, Section 4.3.

3   Missing cross-linguistic generalizations

In Müller & Wechsler (2014) we argued that the approach to Swedish caused motion constructions by Asudeh, Dalrymple & Toivonen (2008, 2013) would not carry over to German since the German construction interacts with derivational morphology. Asudeh & Toivonen (2014) argued that Swedish is different from German and hence there would not be a problem. However, the situation is different with the benefactive construction. Although English and German do differ in many respects, both languages have similar benefactive constructions:

(13) a. He baked her a cake.
      b. Er buk   ihr   einen Kuchen.
          he baked her.DAT a.ACC cake

Now, the analysis of the free constituent order in German was explained by assuming binary branching structures in which a VP node is combined with one of its arguments or adjuncts (see Berman 1996, Section 2.1.3.1; 2003 and also Choi, 1999). For instance, Berman (2003, p. 37) assumes the analysis

depicted in Figure 1. The c-structure rule is provided in (14):

(14)
     VP →   NP   VP
              ($\uparrow$ SUBJ |OBJ |OBJ$_\theta$) = $\downarrow$ $\uparrow = \downarrow$

The dependent elements contribute to the f-structure of the verb and coherence/completeness ensure that all arguments of the verb are present. One could add the introduction of the benefactive argument to the VP node of the right-hand side of the rule as in (15):

(15) VP →   NP   VP
              ($\uparrow$ SUBJ |OBJ |OBJ$_\theta$) = $\downarrow$ $\uparrow = \downarrow$
                                            (@BENEFACTIVE)

However, since the verb-final variant of (13b) would have the structure in (16), one would get spurious ambiguities, since the benefactive could be introduced at several VP nodes:

(16) weil   [VP er [VP ihr [VP einen Kuchen
      because he   her   a   cake
      [VP [V buk]]]]]
           baked

So the only option seems to be to introduce the benefactive at the rule that got the recursion going, namely the rule in (17), that projects the lexical verb to the VP level.

(17) VP →   (V)
              $\uparrow = \downarrow$

Introducing the benefactive at a rule that projects a lexical item to the VP to get some recursion going is almost a lexical approach (for differences see the discussion of (10) above). Note also that the argument above would apply to other constructions as well. So templates for several constructions may be added disjunctively to this projection. Again not much of the original constructional proposal would be left.

Berman (2003) develops an analysis in which the grammatical functions are assigned via implicational constraints that infer the grammatical function from the case of an NP/DP. This was criticized in Müller (2016a, Section 7.4) since case in German cannot be unambiguously related to grammatical functions. In the case at hand the presence of a dative could be used to infer the grammatical function of a benefactive argument. However, the situation is not as simple as it first may appear. In examples like (18) we have a so-called dative passive. The dative object is promoted to subject and hence gets nominative.

(18) Die   Frau   bekam einen Kuchen
      the.NOM woman got   a   cake
      gebacken.
      baked

This can be accounted for straightforwardly in a lexical approach in which the dative is a dependent of *backen*. Either a lexical rule or the auxiliary verb takes care of the fact that the dative argument has to be realized as nominative in dative-passive constructions like (18) (see Müller, 2002, Section 3.2.3 for details of an auxiliary-based approach in HPSG). A phrasal approach that wants to assign grammatical functions based on dative case is lost though.

Note also that the dative can be fronted over clause boundaries:

(19) Dieser Frau hat er behauptet,
this.DAT woman has he.NOM claimed
nie einen Kuchen zu backen.
never a.ACC cake to bake
'He claimed that he never bakes this woman a cake.'

A simple model that adds an OBJ to the f-structure in which a dative appears would fail here since the OBJ belongs into the f-structure of *backen* rather than into the f-structure of *behauptet*. So functional uncertainty would be needed to find the right f-structure. This means that benefactive arguments have to "know" where they could come from. This is an unwanted consequence since the treatment of nonlocal dependencies should be independent of the benefactive construction.

Note also that benefactive datives appear in adjectival environments as in (20):

(20) a. der seiner Frau einen Kuchen
the his.DAT wife a.ACC cake
backende Mann
backing man
'the man who is baking a cake for his wife'

b. der einen Kuchen seiner Frau
the a.ACC cake his.DAT wife
backende Mann
backing man
'the man who is baking a cake for his wife'

The examples in (20) show that the arguments of *backende* may be scrambled, as is common in verbal environments. Like German verbal projections, adjectival projections with adjectival participles can contain adjuncts at various places. (21) provides two examples:

(21) a. der jetzt seiner Frau einen Kuchen
the now his.DAT wife a.ACC cake
backende Mann
backing man
'the man who is baking a cake for his wife now'

b. der seiner Frau jetzt einen Kuchen
the his.DAT wife now a.ACC cake
backende Mann
backing man
'the man who is baking a cake for his wife now'

In order to account for these datives one would have to assume that the adjective to AP rule that would be parallel to (17) introduces the benefactive. The semantics of the benefactive template makes sure that the benefactive argument is not added to intransitive verbs like *lachen* 'to laugh' or participles like *lachende* 'laughing'. Concluding this section I must say that I find the overall approach unattractive. First it is really complex involving several disjunctions, auxiliary levels, and complex formula in linear logic. Second, it does not have anything to do with the original constructional proposal but just
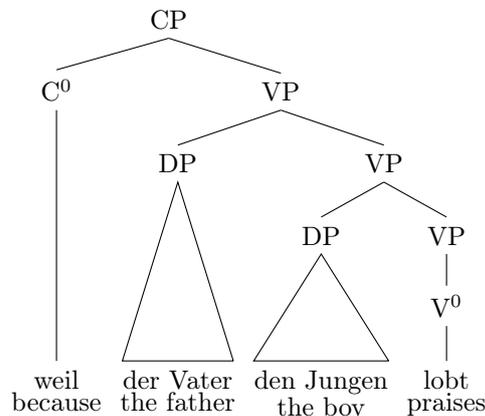

Figure 1: Analysis of German embedded clauses according to Berman (2003, p. 37)

states that the benefactive may be introduced at several places in the syntax, thirdly the unary branching syntactic rule is applying to a lexical item and hence is very similar to a lexical rule and fourthly the analysis does not capture cross-linguistic commonalities of the construction. In a lexical rule-based approach as the one that was suggested by Briscoe & Copestake (1999, Section 5) in the framework of HPSG, a benefactive argument is added to certain verbs and the lexical rule is parallel in all languages that have this phenomenon. The respective languages just differ in the way the arguments are realized in respect to their heads. In languages that have adjectival participles, these are derived from the respective verbal stems. The morphological rule is the same independent of benefactive arguments and the syntactic rules for adjectival phrases do not have to mention benefactive arguments.

4 Conclusion

This paper shows that morphology needs to have access to valence information, which is straightforwardly covered in lexicalist approaches but may be problematic for phrasal ones. Furthermore it is shown that the introduction of arguments at the c-structure results in missing generalizations in the grammar of a single language and that cross-linguistic generalizations are missed in general since c-structures may differ wildly and in some languages they may be less suited for the attachment of templates that introduce arguments.

Because of all these problems I suggest returning to the lexicalist approaches that is to analyses that assume that arguments are introduced by lexical means like lexical rules. Examples of such analyses are the lexical analyses of resultatives by Simpson (1983) in LFG and of Wechsler (1997); Wechsler & Noh (2001) and Müller (2002) in HPSG and the lexical analysis of benefactives by Briscoe & Copestake (1999) in HPSG.

The full paper (Müller, 2016b) also contains a discussion of the syntax of resultative constructions, which are argued to form a verbal complex in German but not in English. This is a difference in syntactic structure, which is unproblematic for lexical accounts but results in missing generalizations in phrasal accounts.

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