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With *Lexical Integrity*

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1 Introduction

Müller and Wechsler (MW) contrast lexical (lexicalist) and phrasal (constructional) approaches to argument structure and conclude that a lexical approach is to be preferred. They present a careful review of the arguments that have been presented for both positions, and they also introduce several new arguments for the lexicalist position. The target article is commendable in many respects, including its thoroughness. However, their representation of our position on Lexical Integrity and constructions is not accurate (Asudeh, Dalrymple, and Toivonen 2008, 2013),[1] and they use too broad a brush in painting their picture of Germanic motion constructions; sections 2 and 3 below deal respectively with these issues.

2 Lexical Integrity

MW set up a strict dichotomy between *lexical/lexicalist* and *phrasal/constructional* approaches to argument structure, but in Asudeh et al. (2013) we present a mixed approach that can bundle linguistic information in *templates* (Dalrymple et al. 2004) such that these templates can be associated with words (analogously to the lexical approach) or with phrase structure configurations (analogously to the phrasal/constructional approach). We take great care to explain how this is *not* in conflict with the Lexical Integrity Principle: we devote the entire first section of the paper to this issue (Asudeh et al. 2013: 2–11) and its importance is even reflected in the title of the paper, *Constructions with Lexical Integrity*. Yet MW (p. 32) write:

1 Asudeh et al. (2013) is the current canonical version of our theory; it is an expanded and revised version of Asudeh et al. (2008).

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> Goldberg and Jackendoff (2004), Alsina (1996), and Asudeh, Dalrymple and Toivonen (2008, 2013) suggest analyzing resultative constructions and/or caused motion constructions as phrasal constructions. As was argued in Müller (2006) this is incompatible with the assumption of Lexical Integrity, that is, that word formation happens before syntax (Bresnan and Mchombo, 1995).

Therefore, MW have either misconstrued or unwittingly misrepresented Asudeh et al. (2008, 2013) with respect to Lexical Integrity.

In fact, the formulation of Bresnan and Mchombo (1995), referred to in the quote from MW above, is one of three formulations that Asudeh et al. (2013) consider. It is repeated here:

(1) **Lexical Integrity** Bresnan and Mchombo (1995: 181)
Words are built out of different structural elements and by different principles of composition than syntactic phrases.

The upshot of this formulation is that syntactic structure-building operations 1) do not take as inputs the same elements as morphological structure-building operations and 2) are not the same operations as morphological structure-building operations. These points are made plainer by the following subsequent version from Bresnan (2001), which is cast in LFG-theoretic terms (Kaplan and Bresnan 1982, Bresnan 2001, Dalrymple 2001):

(2) **Lexical Integrity** Bresnan (2001: 93)
Morphologically complete words are leaves of the c[onstituent]-structure tree and each leaf corresponds to one and only one c[onstituent]-structure node.

In other words, the terminal nodes of syntactic trees are words, not morphemes, and the internal structure of words is closed to syntactic processes. This entails that "word formation happens before syntax", as MW put it, although we prefer not to think of this using a procedural metaphor. The analysis of Asudeh et al. (2008, 2013) is thus true to standard LFG theory in adhering to the *Strong Lexicalist Hypothesis* (Lapointe 1980).

Asudeh, Dalrymple, and Toivonen's analysis captures commonalities between lexical items and phrase structure configurations without giving up Lexical Integrity and without admitting constructions into the theory.[2] In order to see why this is so, we first need to illustrate how templates work in LFG.

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2 In fact, it may also be possible for our theory to give up lexical rules, in which case it is clearly distinct from the theory of MW and arguably simpler. However, this is a matter that requires further investigation.

2.1 Templates in LFG

A template in LFG is just a named lexical description: templates contain all and only the sort of information that is encoded in LFG lexicons.[3] For example, an agreement template for third singular subject agreement, 3SG, can be defined as follows:

(3) 3SG = (↑ SUBJ NUM) = 3
(↑ SUBJ PERS) = SG

As indicated by the equality, the semantics of template invocation (written @TEMPLATE) is just substitution. Therefore, templates do not increase the expressive power of LFG grammars, but allow certain generalizations about common uses of linguistic information to be captured in ways that the extensionally equivalent non-templatic grammar would not.

The following partial lexical entries for the English intransitive verbs *laughs* and *laugh* illustrate the use of the template:[4]

(4) a. *laughs* V (↑ PRED) = 'laugh⟨SUBJ⟩'
(↑ TENSE) = PRESENT
@3SG

b. *laugh* V (↑ PRED) = 'laugh⟨SUBJ⟩'
{ (↑ TENSE) = PRESENT
¬@3SG |
¬(↑ TENSE) }

The disjunction in the lexical entry for *laugh* states that it is either a present tense verb, but not in the third person singular, or else not a tensed verb (as in *It is fun to laugh*.)

It is possible to generalize these lexical entries further, using other templates, including templates that take arguments. This yields the following lexical entries which have abstracted all non-idiosyncratic information away into templates:

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3 Templates are also part of the XLE grammar development suite for LFG (Crouch et al. 2011) and are used in the ParGram project (http://pargram.b.uib.no).

4 {A | B} expresses a disjunction between the descriptions A and B; i.e. {A | B} ≡ A ∨ B. Note that the disjunction in this case is effectively exclusive, since it is not possible to simultaneously satisfy (↑ TENSE) = PRESENT and ¬(↑ TENSE). See Bresnan (2001) or Dalrymple (2001) for further details of LFG's description language.

(5) a. *laughs* V @INTRANSITIVE(laugh)
@TENSE(PRESENT)
@3SG

b. *laugh* V @INTRANSITIVE(laugh)
@BARE-V

The templates INTRANSITIVE and BARE-V can be defined as follows:

(6) INTRANSITIVE(X) = (↑ PRED) = 'X⟨SUBJ⟩'

(7) BARE-V = { @TENSE(PRESENT)
¬@3SG |
¬(↑ TENSE) }

The templates – TENSE, INTRANSITIVE, BARE-V, 3SG – thus capture cross-cutting generalizations about *laugh* and other elements of the lexicon, including *laughs*. The argument to the template TENSE, which is also invoked by BARE-V, captures that *laughs* is necessarily present tense and that *laugh* can be. The argument to INTRANSITIVE captures the fact that *laugh* and *laughs* are instances of the same lemma, while the template itself relates these verbs to other intransitive verbs, which would also invoke this template. Similarly, the template BARE-V captures the relationship between *laugh* and other uninflected regular verbs. Lastly, the negated invocation of 3SG within BARE-V captures the fact that no uninflected regular verbs in English are third person singular. For further details on how templates work, see Dalrymple et al. (2004), Asudeh et al. (2008, 2013), and Asudeh (2012).[5]

2.2 Templates: lexical entries and phrasal configurations

Now let us look at another phenomenon, English restrictive relatives, which illustrates how templates can generalize not just across lexical items, but also

5 Note that templates serve a similar role to *types* in HPSG (Pollard and Sag 1994), but the two systems are not formally equivalent. This is already obvious from the example above, since it would not make sense for both *laugh* and *laughs* to inherit from a *3sg* type, such that *laugh* negates it, but they can both invoke the 3SG template, such that *laugh* negates it. Moreover, it is also obvious that an HPSG grammar without types is not extensionally equivalent to one with types, because types are intrinsic to HPSG grammars: the one without types is in fact not an HPSG grammar. See Asudeh et al. (2013) for further discussion of the distinction between templates and HPSG types.

across lexical items and phrase-structural configurations. We will just zoom in on the distinction between bare and non-bare relative clauses, as in the following examples:

(8) a. *the book Kim read*
b. *the book which Kim read*

The key point is that English relative clauses can contain a relative pronoun, but do not necessarily have to.

It is well-known that c-structure rules in LFG are annotated with the same sorts of descriptions that occur in LFG lexical entries. Now consider the template REL in (9).

(9) $\text{REL} = \lambda Q.\lambda P.\lambda x.P(x) \wedge Q(x) : \mathit{clause} \multimap \mathit{nominal} \multimap \mathit{nominal}$

This template expresses the compositional semantics of restrictive relativization, using Glue Semantics. In LFG+Glue, meaning constructors of the form $\mathcal{M}:\mathcal{G}$ are added to LFG lexical entries, which captures their compositional semantics by relating a term in a meaning language $\mathcal{M}$ to a term in a logic of composition, G, which "glues" meanings together. However, these meaning constructors can also be associated with c-structure rules, as per the analysis of English bare relatives in Dalrymple (2001: 419) (also see Asudeh 2012). We have here abbreviated the glue logic term to $\mathit{clause} \multimap \mathit{nominal} \multimap \mathit{nominal}$, which captures the fact that relativization is a modification of a nominal by an open clause; see Dalrymple (2001: 417) for the full term. In the meaning language side, we see that this amounts to intersective modification of the nominal predicate by the relative clause predicate.

The template REL, so defined, can be associated with a relative pronoun, as in (10), or with a node in a c-structure rule, as in (11).

(10) *which* D @ REL

(11) $\text{CP} \rightarrow \begin{pmatrix} \text{RelP} \\ \dots \end{pmatrix} \quad \begin{matrix} \text{C}' \\ (@\text{REL}) \end{matrix}$

RelP would be the relative pronoun, if there is one.[6] We leave aside other details of the relative pronoun and of the c-structure rule.

6 More accurately, it would be the relative pronoun and anything pied-piped with it; see Dalrymple (2001: 400–405) for more details.

The RelP is optional, because English allows bare relatives, as in (8a) above. If the RelP is present, it contributes the @REL meaning constructor. Otherwise, the very same information is directly contributed by the phrase structure rule, in particular the C′ node.[7] The REL template thus generalizes the same information across relative pronouns and bare relatives. However, we did not need to give up Lexical Integrity to do so: there are no terminal nodes in the analysis that are not words. Furthermore, we did not have to admit constructions into the theory to capture the generalization. We can pretheoretically think of a phrase structure rule that is associated with a template as the equivalent of a construction, but this is only an analogy. This contrasts, for example, with the analyses of relative clauses in HPSG which admit constructional types for relative clauses. This was already the case in Sag (1997), but is further expanded in the subsequent analysis of Sag (2010) in HPSG's sister framework of Sign-Based Construction Grammar (Michaelis 2010, Sag 2012, Sag et al. 2012).

2.3 Templates and the place of "constructions"

We have seen that templates can generalize across lexical entries and phrasal configurations without impinging on Lexical Integrity and without admitting constructions into the theory per se. We can thus think of structure–meaning combinations – such as the relative clause rule in (11) above – as "constructions", but there's no sense in which Asudeh et al. (2008, 2013) assume constructions as formal objects, propose a "usage-based" view of grammar (to use MW's apt term), or give up Lexical Integrity. Based on this overall conception, Asudeh et al. (2008, 2013) propose a detailed analysis of *caused motion constructions*[8] in three Germanic languages (English, Dutch, Swedish), which we consider briefly in section 3. We have thus seen that LFG's templates allow constructional effects into the grammar without violating Lexical Integrity and without expanding the theory to contain constructions (in the sense which MW are critical of).

However, our approach does raise the following question: How do we decide which "constructions" to allow into the grammar? This important question also arises under MW's approach, because they, in fact, *do* allow for "constructions" (in the same strictly pretheoretical sense in which we have used the word): they call these "meaningful phrasal configurations" in section 2.3 of their paper. They cite expressions like *student after student* and *Into the trunk with you!*, and they

7 The resource sensitivity of Glue Semantics (Asudeh 2012) ensures that if the RelP is present, the C′ cannot contribute @REL, but space restrictions preclude further exposition of this point.
8 We use this term for continuity with MW, but we are not committed to it.

conclude that these examples and others warrant including some meaningful grammatical constructions in the grammar. It seems to us that if *some* constructions are allowed, then the question is no longer whether constructions are allowed at all, but rather *which* constructions are allowed. Or to take matters one step further: why not endorse a full constructional framework instead of a mixture of lexicalism and constructionism? Here we agree with MW's discussion and arguments in favor of a lexicalist approach. However, it is still important to address the question of exactly when it is reasonable to appeal to meaningful phrasal configurations within a lexicalist framework.

MW specifically argue against a constructional approach to argument structure, so perhaps they envision an approach which permits constructions of certain types (including those listed in their section 2.3), but specifically disallows argument structure constructions. We would like to propose something different: We adopt a lexicalist view of the grammar that allows meaningful phrasal configurations as exceptions or "marked" options. In other words, "constructions" can be appealed to within a lexicalist framework when there are compelling reasons for doing so. Examples may include the expressions in MW's section 2.3, numerous examples discussed in Culicover (1999), or the Swedish directed motion construction discussed in Toivonen (2002), Asudeh et al. (2013), and the next section. However, this does not entail giving up Lexical Integrity or even expanding the formalism, since templates can do the job, as sketched in the previous section and discussed further in the next.

This view is, we believe, largely compatible with MW's framework, and it is different from an approach where constructions are taken to be the default case or the primary unit of theoretical analysis. A number of authors have argued that constructions are so pervasive in the grammar that they should indeed be viewed as the default (see, e.g., Goldberg 2005 for discussion), and explicitly argue against a view of constructions as "exceptions". It is of course a challenge to determine what criteria should be considered in order to establish what types of linguistic constructs are exceptional or basic, and this debate is far from settled.

3 Motion constructions in Germanic

In their section 6.2, MW cite a number of constructional analyses of Germanic resultatives and caused motion constructions. MW reject constructional accounts of these expressions. They argue that the fact that the verbs in these assumed constructions can exhibit derivational morphology shows that they are formed in the lexicon. The examples in section 6.2 of MW are from German resultatives, where an adjectival participle is derived from a passive participle (MW (33)):

(12) a. Er tanzt die Schuhe blutig / in Stücke.
he dances the shoes bloody into pieces
b. die in Stücke / blutig getanzten Schuhe
the into pieces bloody danced shoes

We agree that morphology should be taken into account when choosing between a lexicalist and a constructional account of some set of expressions, However, MW may be too quick to dismiss a rich and interesting body of data.

Several authors have put forth detailed arguments for a constructional analysis of the English *Way*-Construction (see, e.g., Goldberg 1995, Jackendoff 1990), as in (13):

(13) John elbowed his way into the elevator.

In addition, there is a growing literature on a number of expressions across Germanic that roughly correspond to the English *Way*-Construction and are similar in many ways to resultatives. We follow MW in calling these *caused motion constructions*. For example, see Seland (2001) for Norwegian, Toivonen (2002) and Lyngfelt (2007) for Swedish, Verhagen (2003) and van Egmond (2009) for Dutch, and also Pedersen (2013) for a typological overview. Even if certain German resultatives can undergo derivational morphology, that does not necessarily show that all these expressions are best handled lexically. In fact, as we review below, much of the literature on these expressions specifically focuses on their constructional nature.

Seland (2001) argues for a constructional over a lexical analysis of what she calls the Norwegian Caused Motion Constructions. She spells out in detail the intricate syntactic and semantic characteristics of the construction. Van Egmond (2009) argues that there are in fact two caused motion constructions in Dutch, and she calls them the *Weg*-Construction and the Transition to Location construction (TLC). She shows that the two constructions seem to be close in meaning, yet differ in some important respects. Specifically, she argues that the *Weg*-Construction describes an incremental traversal of a path while the TLC does not (see Asudeh et al. 2013: 14–16 for further details). The TLC is similar to the Swedish Directed Motion Construction (DMC) in that it does not include a word like *weg* 'way'.

Toivonen (2002) argues that the Swedish DMC is very close in meaning to the English *Way*-Construction. She further argues that a lexical analysis in effect involves incorporating into a lexical rule something that closely resembles a construction. The Swedish DMC has the form *verb – reflexive – path*, as shown here:

(14) a. Tanja skämtar sig genom livet.
Tanja jokes self through life.DEF
'Tanja jokes her way through life.'
b. Vi knuffade oss in (i hissen).
we pushed us in (in elevator)
'We pushed our way in(to the elevator).'
c. Jag drömde mig bort.
I dreamed me away
~ 'I escaped by dreaming.'

One peculiar quirk of the Swedish DMC is that the word order in this construction does not completely follow the regular rules of the language. Verbal particles normally precede the direct object NP, but they follow the reflexive in the DMC. In examples (14b–c), the path is expressed by particles, *in* and *bort*. The pronouns *oss* and *mig* appear before the particles, even though Swedish particles normally appear after the object, as shown in the non-DMC examples in (15):

(15) a. Vi lyfte upp dom.
We lifted up them.
'We lifted them up.'
b. Dom skämde ut mig.
they shamed out me
'They embarrassed me.'
c. Roger tvålade in sig.
Roger soaped in self
~ 'Roger used soap on himself.'

The verbs in (14) are not motion verbs, yet the sentences express (often metaphorical) directed motion. Note also that the Swedish DMC has no specific word, such as *way*, that signals the construction. These observations, in combination with the word order generalization, lead Asudeh et al. (2013) to associate the relevant template for Swedish DMC with a specific phrase structure rule, but as explained above, this does not mean that the analysis gives up Lexical Integrity or treats the phenomenon as a construction in the sense of Construction Grammar. Rather, it is another case of a template being introduced by a phrase structure node, as discussed above for English bare relatives.

In Asudeh et al. (2008, 2013), we proposed that there is a common core to these constructions across English, Swedish and Dutch. We can capture the spirit of the analysis as follows. There is a common template, call it CMC, for caused

motion constructions across the three languages. This template is invoked and further modified by language specific templates, call them ENGLISH-WAY, DUTCH-WEG, DUTCH-TLC, and SWEDISH-DMC. These language specific templates are triggered differently in the three languages:

(16) **Germanic Caused Motion Constructions**

1. **Associated with a non-head word** *lexical*
   ENGLISH-WAY, DUTCH-WEG: associated with the word *way*/*weg*, which is obligatory for the constructional effect
2. **Associated with a head word** *lexical*
   DUTCH-TLC: associated with the verbal head, since there is no special word or phrasal configuration necessary for the constructional effect
3. **Associated with a non-head word** *phrasal*
   SWEDISH-DMC: associated with a specific c-structure rule, since the constructional effect is only available with an exceptional word order

The common template, CMC, allows us to capture the cross-linguistic similarities across these related languages, while the language-specific templates that invoke it allow us to 1) capture language-specific aspects of meaning and 2) associate the special meanings with distinct lexical and phrasal possibilities.[9] In other words, "constructions" in the theory of Asudeh et al. (2013) are form-meaning associations that are nevertheless predictable (and therefore grammatically encoded) based on specific uses of certain lexical items or certain phrasal configurations. But, there are in fact strictly speaking no constructions in the theory, just templates.

With this brief discussion of the literature on Germanic caused motion constructions, we want to suggest that it would be worthwhile to explore these interesting expressions in some more detail before concluding that there is no reason to adopt an analysis involving meaningful phrasal configurations. MW dismiss the phrasal account of the Swedish DMC in a footnote by noting that the "parallel" German construction feeds derivational morphology. However, German is in fact not Swedish, and there is no reason to assume that the German and Swedish phenomena are identical.

In sum, the Germanic languages include a number of caused motion constructions (like the *Way*-Construction) that resemble resultatives. Comparisons of constructions within languages and between languages reveal subtle but interesting

9 Incidentally, it is not obvious to us how HPSG could capture association of the constructional effect with a non-head word, given the head-driven nature of the theory.

differences. It does not seem satisfactory to dismiss constructional analyses of these constructions based on a couple of data points on derivational morphology in German resultatives.

4 Conclusion

As MW themselves note, in their section 2.3, every theory must contend in some way with "meaningful phrasal configurations". MW's careful comparison of lexical and constructional approaches to argument structure is therefore important and timely. Asudeh, Dalrymple, and Toivonen (2013) offer a theory that provides the capacity to generalize across lexical entries and phrasal configurations using templates. Contrary to MW's claim, this does not entail giving up Lexical Integrity, as we have attempted to demonstrate, and yet it also does not entail adopting constructions as the norm, as in Construction Grammar. Despite their mischaracterization of our own theory, we find many of MW's arguments against generalized constructional approaches compelling and they have effectively drawn together a large body of data that any theory of argument structure must contend with.

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