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Arguments, Grammatical Relations, and Diathetic Paradigm

Three syntactic representation levels are de facto distinguished in recent HPSG research. The ARG-ST list represents the inherent argument structure of a predicate, its syntactic arguments. The DEPS list contains the actual dependents of a predicate, its grammatical relations. The VALENCE lists encode the local combinatorial potential of a predicate in terms of overt grammatical functions like subject (SUBJ), specifier (SPR) and complements (COMPS). We argue that the distinction between ARG-ST and DEPS is the first crucial step towards developing a more general theory of diathesis and diathetic paradigmatic relations in HPSG. Once the feature DEPS is admitted in the architecture of HPSG sign, formal means for modelling the systematic interaction between a tier of co-arguments and a tier of co-dependents are readily available. In this context, we discuss an alternative to the recently proposed HPSG analyses of binding by Manning and Sag (1998) and morphological causatives by Manning et al. (2000) that is consistent with the lexical analysis of extraction proposed by Bouma et al. (1998, to appear), and in addition, incorporates basic linguistic insights from the long-standing dependency grammar tradition.

1 Two-tiered representation of diathesis

A *diathesis* conceptualises the way in which actual syntactic dependencies relate to predicate's argument structure, and encompasses arguments and diathetic grammatical relations. The *arguments* give rise to the pivotal subset of the *diathetic grammatical relations*:

$$\left[\begin{array}{l} \text{ARG-ST} \langle \text{'arguments'} \rangle \\ \text{DEPS} \langle \text{'diathetic grammatical relations'} \mid \text{'adverbials'} \rangle \end{array} \right]$$

The semantic motivation of the diathesis by the head is subject to HPSG linking theory (Davis 1997), and concerns the constraints that mediate the association of thematic roles with syntactic relations. In contrast, no linking to thematic roles is observed with the *adverbial* grammatical relations for which we adopt the analysis of Bouma et al. (to appear).

A *diathetic paradigm* consists of the various ways in which the arguments can be mapped into grammatical relations. Traditional voices and voice-like alternations are trivially included in it, while derivational processes that alter the predicate's lexical meaning in unpredictable ways are not involved in its formation.¹ Constructing a diathetic paradigm presupposes modelling the syntactic aspect of a predicate's diathesis.

Four basic diathesis realisation patterns can be identified: *no alternation*, *re-arrangement*, *reduction* and *extension*. In the first two patterns, all arguments are mapped to grammatical relations, and paired with syntactic dependents. In the third pattern, there is an argument that is not mapped to a grammatical relation, hence, not paired with a syntactic dependent. Note that these three patterns

involve only ARG-ST – DEPS mappings, and inasmuch as thematic role linking is realised at the CONTENT – ARG-ST interface, no derivational types are needed. The fourth pattern is rather special in implying a direct CONTENT – DEPS thematic role linking (in addition to the standard one relating CONTENT and ARG-ST). All arguments are mapped to grammatical relations, and paired with syntactic dependents, but there is a diathetic grammatical relation with no corresponding argument. Since the syntactic dependent realising this grammatical relation is directly linked to a thematic role in the predicate's *derived* content, a derivational type is needed here.

From the outlined perspective we distinguish:

- **argument preserving lexical processes**, e.g., canonical active (*no diathesis alternation*), clitic doubling (*no diathesis alternation*), agentive passive (*diathesis re-arrangement*);
- **argument reducing lexical processes**, e.g., reflexivisation (*diathesis reduction*), impersonalisation (*diathesis reduction*), pronominal affixation (*diathesis reduction*), medio-passives (*diathesis re-arrangement and reduction*);
- **argument embedding lexical processes**, e.g., morphological causative formation (*diathesis extension*).

2 Diathetic constraints

Two general constraints proposed by Bouma et al. (to appear) apply to *all* members of the diathetic paradigm. Argument Structure Extension constraint (ASE) introduces an under-specified list of adverbial grammatical relations (*synsem* objects of type *adverbial*) as a suffix of the DEPS list. Argument Realisation constraint (AR) – called Dependent Realisation in Bouma et al. 1998 – defines the relationship between syntactic dependents and valence, i.e., between grammatical relations and overt grammatical functions. It states that (for a verbal category) the value of the SUBJ feature is a prefix of the DEPS list, and the value of the COMPS feature contains the rest of the DEPS list without the elements of type *gap-ss* (which keep track of long-distance syntactic dependencies). The actual differences in diathetic paradigm formation are captured by a set of diathetic constraints regulating the mapping between arguments and diathetic grammatical relations, with possible reference to the subject grammatical function.²

Argument conservation: all arguments are straightforwardly and trivially (preserving obliqueness) mapped to diathetic grammatical relations.

A-subject blocking: the most prominent term (*a-subject*) is not associated with a grammatical relation.

A-object promotion: the least prominent term (*a-object*) is mapped to the most prominent syntactic dependent, and functions as the surface subject.

A-subject demotion: the most prominent term (*a-subject*) is mapped to a non-subject grammatical relation.

No subject: the value of the valence feature SUBJ must be an empty list. Subjectless 'meteorological' verbs in some Slavic languages – e.g., *svetaet* (Russian: 'it dawns'), *vali* (Bulgarian: 'it rains') – will

¹ Babby (1998) uses this term to refer to "the set of sentences projected from the set of diatheses that can be derived by productive morphological rules of affixation from a verb's initial diathesis".

² In the lexical hierarchy, each of the diathetic constraints will be encoded at the type for which it is appropriate.

have this specification already in their lexical entries.

A-object conservation: the least prominent term (*a-object*) is trivially mapped to the direct-object grammatical relation.

3 Slavic diathetic paradigm

Let us consider how the diathesis is organised depending on verb morphology in Slavic.³

3.1 Category preserving derivations

Active voice (in general):

$$\left[\begin{array}{l} \text{ARG-ST } \langle 1 \rangle \\ \text{DEPS } \langle 1 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \text{argument conservation}$$

Reflexive middle (in general):

$$\left[\begin{array}{l} \text{ARG-ST } \langle 1 | 2 \rangle \\ \text{DEPS } \langle 2 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \text{a-subject blocking}$$

Passive participle (in general) and **agentive reflexive passive** (Russian, Bulgarian):

$$\left[\begin{array}{l} \text{ARG-ST } \langle 1, 2 | 3 \rangle \\ \text{DEPS } \langle 2, 1 | 3 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-object promotion} \\ \text{a-subject demotion} \end{array}$$

Reflexive passive (Czech ex. 1):

$$\left[\begin{array}{l} \text{ARG-ST } \langle 1, 2 | 3 \rangle \\ \text{DEPS } \langle 2 | 3 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-object promotion} \\ \text{a-subject blocking} \end{array}$$

Note that passivisation affects not the argument structure but rather its mapping to grammatical relations, i.e., its realisation in terms of syntactic dependencies.

Reflexive impersonal of transitive verbs (Polish ex. 2, but also Lithuanian):

$$\left[\begin{array}{l} \text{SUBJ } \langle \rangle \\ \text{ARG-ST } \langle 1, 2 | 3 \rangle \\ \text{DEPS } \langle 2 | 3 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-subject blocking} \\ \text{a-object conservation} \\ \text{no subject} \end{array}$$

Impersonal -no/to (Polish ex. 3):

$$\left[\begin{array}{l} \text{SUBJ } \langle \rangle \\ \text{ARG-ST } \langle 1 | 2 \rangle \\ \text{DEPS } \langle 2 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-subject blocking} \\ \text{no subject} \end{array}$$

Polish impersonal constructions pose an interesting challenge to the binding theory, inasmuch as the actual binder of the reflexive anaphor in ex. 2b and ex. 3b corresponds to the blocked a-subject.

Modality infinitive with dative subject (Russian ex. 4, Polish ex. 5):

$$\left[\begin{array}{l} \text{SUBJ } \langle \rangle \\ \text{ARG-ST } \langle 1 | 2 \rangle \\ \text{DEPS } \langle 1 | 2 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{argument conservation} \\ \text{a-subject demotion} \\ \text{no subject} \end{array}$$

The fact that the arguments are conserved with respect to obliqueness correctly predicts that the dative subject of the modality infinitive will bind the reflexive anaphor in ex. 4b.

'Uncontrolled-mediated' impersonal of transitive verbs (Russian ex. 6b):

$$\left[\begin{array}{l} \text{SUBJ } \langle \rangle \\ \text{ARG-ST } \langle 1, 2 | 3 \rangle \\ \text{DEPS } \langle 2, 1 | 3 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-subject demotion} \\ \text{a-object conservation} \\ \text{no subject} \end{array}$$

'Uncontrolled-force' impersonal (Russian ex. 7b):

$$\left[\begin{array}{l} \text{SUBJ } \langle \rangle \\ \text{ARG-ST } \langle 1 | 2 \rangle \\ \text{DEPS } \langle 2 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-subject blocking} \\ \text{no subject} \end{array}$$

The sentences in ex. 6a and ex. 7a illustrate the active-voice counterparts of the two Russian impersonal constructions.

'Feel-like' reflexive (Bulgarian): along with the reflexive verbal morphology, a characteristic trait of this productive lexical process is the presence of a lexical formant in the form of a pronominal clitic (Avgustinova 1997). The employed derivational type is also responsible for co-indexing the clitic with the a-subject. The a-subject is thus linked to the EXPERIENCER thematic role.

$$\left[\begin{array}{l} \text{'feel-like'-drv} \\ \text{RESULT} \left[\begin{array}{l} \text{'feel-like'-v-stem} \\ \text{LEX-FORMANT} \left[\begin{array}{l} \text{clitic} \\ \text{CASE } \textit{dative} \\ \text{INDEX } \langle 5 \rangle \end{array} \right] \\ \text{ARG-ST } \langle 3 | 1:5 | \dots \rangle \\ \text{CONTENT} \left[\begin{array}{l} \text{'feel-like'-relation} \\ \text{EXPERIENCER } \langle 5 \rangle \\ \text{EFFECT } \langle 4 \rangle \end{array} \right] \end{array} \right] \\ \text{SOURCE} \left[\begin{array}{l} \text{active-v-stem} \\ \text{ARG-ST } \langle 3 \rangle \\ \text{DEPS } \langle 1 | \dots \rangle \\ \text{CONTENT } \langle 4 \rangle \end{array} \right] \end{array} \right]$$

The a-subject is demoted, and with intransitive verbs (ex. 8), an impersonal construction is obtained:

$$\left[\begin{array}{l} \text{LEX-FORMANT} \langle \text{INDEX } \langle 5 \rangle \rangle \\ \text{SUBJ } \langle \rangle \\ \text{ARG-ST } \langle 1:5 | 2 \rangle \\ \text{DEPS } \langle 1 | 2 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-subject demotion} \\ \text{no subject} \end{array}$$

With transitive verbs (ex. 9), the a-object is promoted and functions as a surface subject:

$$\left[\begin{array}{l} \text{LEX-FORMANT} \langle \text{INDEX } \langle 5 \rangle \rangle \\ \text{ARG-ST } \langle 1:5, 2 | 3 \rangle \\ \text{DEPS } \langle 2, 1 | 3 \rangle \oplus \text{list}('adverbial') \end{array} \right] \Leftarrow \begin{array}{l} \text{a-subject demotion} \\ \text{a-object promotion} \end{array}$$

3.2 Category changing derivations

Attributive participle derivation is characterised by what we call *subject-to-head advancement*. By means of a derivational type, the most prominent grammatical relation of the source personal verbal stem is identified with the modified nominal head.

$$\left[\begin{array}{l} \text{attr-pcp-drv} \\ \text{RESULT} \left[\begin{array}{l} \text{attr-pcp} \\ \text{HEAD} \langle \text{MOD } \langle 1 \rangle \rangle \\ \text{DEPS } \langle 2 \rangle \end{array} \right] \\ \text{SOURCE} \left[\begin{array}{l} \text{pers-v-stem} \\ \text{DEPS } \langle 1 | 2 \rangle \end{array} \right] \end{array} \right]$$

When applied to active verbal stems, the *attr-pcp-drv* gives rise to **active** attributive participles (ex. 10), while **passive** attributive participles (ex. 11) are derived from passive verbal stems. The modified nominal corresponds in the former case to the a-subject, and in the latter to the a-object. The fact that it binds the reflexive anaphors in ex. 10b can thus be explained by its a-subject status.

Participial adverbials can only be derived from active verbal stems. As illustrated in ex. 12 for Russian, participial adverbial constructions are controlled by the subject dependent of the predicate they modify. Hence, the most prominent dependent

³ For expository purposes, only the interaction of argument structure, syntactic dependents and valence will be shown. The symbol ' \Leftarrow ' is used for indicating that the diathesis at its left hand side results from the right hand side diathetic constraints. And for space reasons, we will illustrate only the 'exotic' members of the Slavic diathetic paradigm.

of the modified personal verbal stem is identified with the a-subject of the participial adverbial.

<i>pcp-adv-drv</i>											
RESULT	<table border="1"> <tr> <td colspan="2"><i>pcp-adv</i></td> </tr> <tr> <td>HEAD MOD</td> <td><i>pers-v-stem</i></td> </tr> <tr> <td>DEPS</td> <td>$\langle \text{[1]} \dots \rangle$</td> </tr> <tr> <td>ARG-ST</td> <td>[3]</td> </tr> <tr> <td>DEPS</td> <td>$\text{[2]} \oplus \text{list}('adverbial')$</td> </tr> </table>	<i>pcp-adv</i>		HEAD MOD	<i>pers-v-stem</i>	DEPS	$\langle \text{[1]} \dots \rangle$	ARG-ST	[3]	DEPS	$\text{[2]} \oplus \text{list}('adverbial')$
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Verbal nouns in Slavic are derived from active (*vnoun1*) as well as from passive (*vnoun2*) verbal stems. The derivational type which provides for the category shift (from verbal to nominal) does not, however, alter the diathesis. In the case of *vnoun1* (ex. 13, ex. 14), the most prominent dependent (corresponding to the a-subject) functions overtly as a specifier (SPR) as an immediate consequence of the AR constraint of Bouma et al. (to appear). But there is no specifier in the case of *vnoun2* (ex. 15), which is achieved by a diathetic constraint **no specifier** that is parallel to the familiar **no subject** constraint.

4 The notion of prominence in binding

With respect to the locus of binding theory, the concepts of obliqueness hierarchy and element prominence gain flexibility in the proposed two-tiered lexical representation of diathesis. The ambiguity of the Russian sentences in ex. 16 trivially shows that the traditional view of anaphoric binding as being subject-oriented in Slavic languages is an over-simplification. Binding appears to be sensitive to either the a-subject or else to the surface-subject status of the binder. So, a reflexive anaphor can be bound either by the most prominent argument or by the most prominent dependent. In active voice the two trivially coincide. But since in agentive passive constructions the most prominent argument differs from the most prominent dependent, both binding possibilities are available. The unambiguous preference in interpreting ex. 16b is due to the animacy restriction; parallel in this respect is ex. 11b.

So, alternatively to Manning's a-subject principle, we propose a **subject-prominence principle**:

Some anaphors must be bound by an entity that is first either on the ARG-ST list (*a-subject*) or on the DEPS list (*d-subject*).

No hierarchical organisation of ARG-ST is needed, and the existing possibilities in languages with subject-oriented binding are captured. The d-subject is equivalent to the notion of 'external (or externalised) syntactic argument', and is defined through identifying the first element of the DEPS list with the single item on the SUBJ list.

The lack of a subject grammatical relation, or d-subject, is expressed as an interaction of a lexically specified empty-list value for the SUBJ feature and the **a-subject blocking** constraint. What matters for binding in such cases is the a-subject. So, it is the unexpressed binder of the reflexive anaphors in ex. 2b and ex. 3b. However, additional factors may interfere: although the discussed condition is formally met in Russian 'uncontrolled force' impersonal constructions (ex. 7b), a semantic 'supernaturalism' restriction excludes a-subject binding.

5 A corollary: Japanese derived causatives

Instead of producing complex nested ARG-ST lists à la Manning et al. 2000 we propose to analyse productive causative morphology in terms of **diathesis extension** involving interaction between ARG-ST and DEPS. An important trait of the morphological causative derivation is that the ARG-ST list retains its original shape, while the DEPS list is prefixed with a new element which, in accord with the ASE constraint, is to be realised via the SUBJ feature. Thus, a number of purely technical solutions employed in the cited work become superfluous: the *complex-pred-drv* type (with the related nesting, PRO-placeholder and compression function) is no longer needed. If retained, it will only have to license derived stem types for which the value of NEW-QS will be set of quantifiers that were not yet scoped in the SOURCE stem from which they were built (and are therefore contained in its QSTORE value). Also, no *zero-derivation* type adding an adjunct onto a verb stem's ARG-ST list is needed as soon as the ASE constraint of Bouma et al. (to appear) is adopted.

The morphological causative formation in Japanese is an argument embedding lexical process. A derivational type (*caus-drv*) is used to (i) integrate the *cause-relation* into the semantics of the predicate by embedding the CONTENT value of the source verbal stem under the EFFECT thematic role, (ii) introduce a diathetic grammatical relation of highest prominence linking it to the ACTOR thematic role of the *cause-relation*, and (iii) identify the UNDERGOER of the *cause-relation* with the a-subject. Thus, the syntax relevant change involves diathetic grammatical relations rather than arguments.

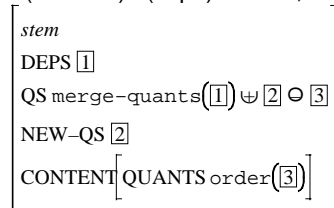
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A derived causative stem systematically extends the number of diathetic grammatical relations of the source predicate, and re-arranges the diathesis, establishing all relevant identities. The SOURCE verbal stem is required to be active, hence, its d-subject is identified with the a-subject. This correctly predicts the interaction of causativisation and passivisation as presented in Manning et al. 2000, namely, that passivisation of the 'lower' object of a causative stem is not allowed.

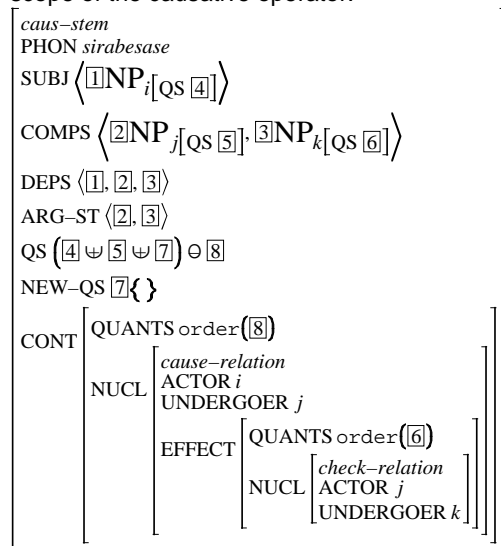
The a-subject preserves its prominence status for the purposes of anaphoric binding. In ex. 17a, the *zibun*-reflexive can be bound to the causee *Taroo*, with the causer *Hanako* being a possible binder too because it is the d-subject. Our interpretation of subject prominence is also relevant for adverbial *-nagara* clauses that can be controlled either by the a-subject or by the d-subject (ex. 17b).

Adverbs in a causative construction can in general be interpreted as modifying either the event denoted by the verb stem or the causation event, so, ex. 17c is ambiguous. The ASE constraint provides a straightforward alternative account of adjunct scope, since it is allowed to apply to verbal as well as causative stems. Adverbials added to the DEPS list of the source stem will modify within the scope of the *cause-relation*, while those added to the DEPS list of the causative stem will have a wide scope. The uniform ASE-based treatment of adverbial scope extends to 'putative coordination' constructions involving phrases with a gerundive verb, e.g., *sutete* in ex. 17d. As noted by Manning et al. (2000), these phrases are correctly analysed as adverbials rather than conjoined VPs. The gerundial phrase is in the scope of the *cause-relation* because it is on the DEPS list of the source verbal stem as its adverbial modification.

As to quantifier scope with morphological causatives, we will not go into details of the lexicalised treatment of Manning et al. (2000). Our modest goal is just to sketch the advantage of incorporating the feature DEPS into their analysis. If the definition of the Quantifier Amalgamation constraint is based, as we propose, on DEPS (rather than ARG-ST), the function *toplevel*, which returns the unembedded members of an ARG-ST list as the value of the *Q(uantifier) s(cope)* feature, is no longer needed:



In ex. 17e, a quantified NP ('three books') functioning as the lower object of the causative verb form can take intermediate scope, i.e. it can scope over the verb stem ('check'), but be still within the scope of the causative operator.



This feature structure illustrates a possible way of instantiating the constraints posed on a causative stem, namely the one corresponding to the reading

where *cause-relation* out-scopes **3-books** which in turn out-scopes *check-relation*.

6 Conclusion and summary of results

This contribution focuses on developing an HPSG theory of diathesis. We formulate a diathetic paradigm for Slavic languages, and explore possibilities of making consistent and compatible two insightful recent HPSG analyses.

Taking the idea of DEPS mediating the mapping between VALENCE and ARG-ST seriously has lead us to the following results. There is no nesting in the ARG-ST list. The placeholder PRO is eliminated (the PRO-effects from Manning and Sag 1998 and Manning et al. 2000 are achieved in the mapping between ARG-ST and DEPS). No compression and no *toplevel* operations are required. Derivational types do not modify the inherent argument structure. The non-canonical *synsem* types are reduced to two: *gap-ss* which can only be a non-canonical dependent, and *affixal* – or depending on the language: *clitic* – which is a possible non-canonical argument; the elements of the VALENCE lists are always canonical. The pro-drop effects are modelled in the mapping between DEPS and VALENCE. In a 'pro-drop' language, a null argument would occur on the ARG-ST list, since it has an interpretation, and would be paired with the appropriate grammatical relation in the DEPS list, since it exists as a syntactic dependency. But it would not occur on any VALENCE list or be extracted via SLASH, since it has no surface realisation.

Finally, for a binding theory that is sensitive to subject prominence, both *a-subject* (the most prominent co-argument) and *d-subject* (the most prominent co-dependent) are potential binders of reflexive anaphors.

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Examples

ex. 1 (Czech)

Tady se staví továrna (*zahraniční firmou).
 here REFL builds factory-NOM (*foreign company-INSTR)
 'A factory is being built here (*by a foreign company).'

- ex. 2 (Polish)
 a. **Buduje się fabrykę.**
 builds REFL factory-ACC
 'A factory is being built.'
 b. **Herbatę kupuje się tylko dla siebie.**
 tea-ACC buys REFL only for SELF
 'The tea is being bought only for oneself.'
- ex. 3 (Polish)
 a. **Pito herbatę.**
 drink-IMPERS tea-ACC
 'Tea has been drunk.'
 b. **Nie mówiono o sobie.**
 NEG speak-IMPERS about SELF
 'It has not been spoken about oneself.'
- ex. 4 (Russian)
 a. **Tebe pet' na koncerte.**
 you-SG.DAT sing-INF at concert
 'You have to sing at the concert.'
 b. **Vam by podumat' o sebe.**
 you-SG.DAT COND think-INF about SELF
 'You should think about yourself'.
- ex. 5 (Polish)
Nie mnie jego sądzić.
 Not I-DAT he-DAT judge-INF
 'It is not my task to judge him.'
- ex. 6 (Russian)
 a. **Voda smyla nadpis'.**
 water-NOM washed-SG.F writing-ACC
 'The water washed away the writing.'
 b. **Vodoj smylo nadpis'.**
 water-INSTR washed-IMPERS writing-ACC
 'The water washed away the writing.'
- ex. 7 (Russian)
 a. **Deti napolnili jamu vodoj.**
 kids-NOM filled-PL pit-ACC water-INSTR
 'The children filled the pit with water.'
 b. **Jamu napolnilo vodoj.**
 pit-ACC filled-IMPERS water-INSTR
 'The pit filled with water.'
- ex. 8 (Bulgarian)
 a. **Na Ivan mu se spi.**
 to John him-CL REFL sleep-IMPERS
 John feels like sleeping.
 b. **Na decata često im se xodi tam.**
 to kids often them-CL REFL go-IMPERS there
 'The kids feel like going there often.'
 (adverbial scope ambiguity!)
- ex. 9 (Bulgarian)
 a. **Na men mi se četat romani.**
 to me me-CL REFL read-PL novels
 'I feel like reading novels.'
 b. **Na Ivo mu se jadjala supa.**
 to Ivo him-CL REFL eat-SG.F soup-SG.F
 'Ivo, reportedly, feels like eating a soup.'
- ex. 10 (Russian)
 a. **poseščajuščie biblioteku deti**
 visiting library-ACC kids
 'children visiting the library'
 b. **verjaščie v sebja i v svoj uspex deti**
 believing in SELF and in SELF's success kids
 'children believing in themselves and in their own success'
- ex. 11 (Russian)
 a. **pobityj xuliganami rebenok**
 beaten hooligans-INSTR child
 'a child beaten by hooligans'
 b. **kuplennaja im dlja sebja kniga**
 bought he-INSTR for SELF-GEN book
 'a book bought by him for himself'
- ex. 12 (Russian)
 a. **Čitaja pis'mo, ona ulybalas'.**
 reading letter-ACC she-NOM smiled
 'Reading the letter, she smiled.'
 b. **Kupiv bilety, my uspokoilis'.**
 having-bought tickets-ACC we-NOM calmed
 'Having bought tickets, we calmed down.'
- ex. 13 (Russian)
 a. **Ivana čtenie apokrifov**
 Ivan-GEN reading apocrypha-GEN
 'Ivan's reading of apocrypha'
 b. **Ivanovo čtenie apokrifov**
 Ivan-POSS.ADJ reading apocrypha-GEN
 'Ivan's reading of apocrypha'
- ex. 14 (Russian)
 a. **Ivana xoždenie v lesu**
 Ivan-GEN walking in wood
 'Ivan's walking in the wood'
 b. **Ivanovo xoždenie v lesu**
 Ivan-POSS.ADJ walking in wood
 'Ivan's walking in the wood'
- ex. 15 (Russian)
 a. **čtenie apokrifov Ivanom**
 reading apocrypha-GEN Ivan-INSTR
 'reading by Ivan of apocrypha'
 b. ***xoždenie v lesu Ivanom**
 walking in wood Ivan-INSTR
 (intended: 'walking by Ivan in the wood')
- ex. 16 (Russian)
 a. **On(1) byl priglašen Annoj(2) iz-za sebja(1/2).**
 he-NOM was invited-SG.M Anna-INSTR because-of SELF
 'He was invited by Anna for his / her sake.'
 b. **Kniga(1) byla kuplena Borisom(2) dlja sebja(2/*1).**
 book-NOM was bought-SG.F Boris-INSTR for SELF
 'The book was bought by Boris for himself.'
 c. **Ona(1) byla predstavlena Borisom(2) svoemu(1/2) šefu.**
 she-NOM was introduced-SG.F Boris-INSTR SELF's boss-DAT
 'She was introduced by Boris to her / his boss.'
- ex. 17 (from Manning et al. 2000)
 a. **Hanako ga Taroo ni zibun no syasin o mi-sase-ta.**
 Hanako NOM Taroo DAT self GEN picture ACC see-CAUS-PAST
 Hanako(1) made Taroo(2) see her(1)/his(2) picture.
 b. **Taroo wa kodomotati ni utai-nagara tegami o kak-ase-ta.**
 Taroo TOP children DAT sing-while letter ACC write-CAUS-PAST
 Taroo(1) made the children(2) write a letter while he(1)/they(2) sang.
 c. **Noriko ga Masaru ni gakkoo de hasir-ase-ta.**
 Noriko NOM Masaru DAT school at run-CAUS-PAST
 Noriko made Masaru run at school.
 d. **Ken wa Naomi ni hurui kutu o sute-te atarasii kutu o kaw-ase-ta.**
 Ken TOP Naomi DAT old shoes ACC throw-GER new shoes ACC buy-CAUS-PAST
 Ken made Naomi throw away her old shoes and buy new ones.
 e. **Tanaka-sensei ga gakusei ni sansatu hon o sirabe-sase-ta.**
 Prof.Tanaka NOM student DAT three book ACC check-CAUS-PAST
 Prof.Tanaka made the student check three books.