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## Argument Structure and Syntax

Uwe Junghanns  
University of Leipzig

### *Structure of the paper*

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### **1. Introduction**

Main aim: clarify the interaction between the lexicon and syntax

Lexicon and syntax interact yielding well-formed linguistic expressions.

- predicates and their arguments in various Slavic languages
- discussion of argument structure (AS) for a number of predicates
- AS substantially determines syntactic structure and semantic interpretation

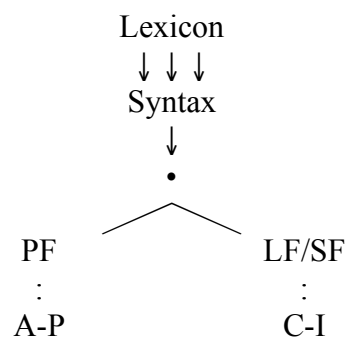


Figure 1: Modular Grammar (cf. Chomsky & Lasnik 1993, Chomsky 1995, Bierwisch 2007)

## 2. Lexical Entries

### *Argument Structure (AS or a-structure)*

“The term refers to the lexical representation of grammatical information about a predicate. The a-structure of a lexical item is thus part of its lexical entry.” (Grimshaw (1990, 1))

“A-structure is a structured representation which represents prominence relations among arguments. The prominence relations are jointly determined by the thematic properties of the predicate (via the thematic hierarchy) and by the aspectual properties of the predicate.” (Grimshaw (1990, 4))

AS interfaces with (i) lexical semantic structure, and (ii) syntax. Syntactic structure is determined by AS and structure-building principles (cf. Grimshaw (1990, 1)).

### *Meaning representation for verbs*

- verb meanings are decomposed into basic semantic predicates at the level of Semantic Form (SF) mediating between syntax and Conceptual Structure
- decomposition yields the number and hierarchy of verbal arguments
- thus, AS is a component part of verbal lexical entries

Cf. Bierwisch (1990, 1996, 1997, 2005, 2007) and Wunderlich (1997).

### *Lexical Entries*

“[...] lexical entries are claimed to be complex data structures whose general organization and basic components are provided by principles of U[niversal ]G[rammar] [...] linguistic expressions must provide a systematic correspondence between two interface levels PF (Phonetic Form) and SF (Semantic Form). [...] UG must furthermore provide the combinatorial properties on the basis of which basic expressions are combined into more complex ones. This combinatorial capacity crucially depends on the Grammatical Form GF (syntactic and morphological categories, as well as semantic and categorial selection) of linguistic expressions. Hence lexical items, representing the basic units in terms of which the correspondence between PF and SF is to be computed, consist of information about their specific contribution to PF, SF, and GF.” (Bierwisch (1996, 129))

$$(1) \quad \lambda x_n \dots \lambda x_1 \lambda e \text{ [e INST [ ... ]]}$$

AS                      SF

$x_1 \dots x_n$ : individual variables corresponding to the syntactic arguments of the verb  
 e: event variable corresponding to the referential argument of the verb  
 INST: instantiation functor relating the proposition “[...]” to e  
 (cf. Bierwisch (1990, 177))

$$(2) \quad \lambda y \lambda x \lambda e \text{ [e INST [[x CAUSE e'] : [e' INST [BECOME NOT ALIVE y]]]]}$$

(cf. Bierwisch (1990, 177))

- identification of thematic roles with lambda abstractors
- thematic roles need not be licensed in the syntax

The syntactic structure of the verb phrase may be projected directly from the lexicon depending on the argument hierarchy.

A lambda abstractor can be supplied with an “address” consisting of specific features (e.g., idiosyncratic case or a particular preposition) which requires that the argument be realized in the corresponding morphosyntactic shape. Unaddressed lambda abstractors correlate with normal structural cases.

- (3) a. Unaccusative verb: *zemřít* ‘to die’  
 $\lambda y \lambda e \text{ [e INST [BECOME NOT ALIVE y]]}$   
*Zemřel Jiří Adamíra. (Cz)*  
 ‘Jiří Adamíra died.’
- b. Unergative verb: *plakat* ‘to weep’  
 $\lambda x \lambda e \text{ [e INST [x WEEP]]}$   
*Marie pláče. (Cz)*  
 ‘Mary is weeping.’
- c. Monotransitive verb: *zabít* ‘to kill’  
 $\lambda y \lambda x \lambda e \text{ [e INST [[x CAUSE e'] : [e' INST [BECOME NOT ALIVE y]]]]}$   
*David zabil Goliáše. (Cz)*  
 ‘David killed Goliath.’
- d. Ditransitive verb: *dát* ‘to give’  
 $\lambda z \lambda y \lambda x \lambda e \text{ [e INST [x CAUSE [BECOME [y HAVE z]]]]}$   
*Sestra dala pacientovi tabletu. (Cz)*  
 ‘The nurse gave the patient a tablet.’
- e. Transitive verb of motion: *přivést* ‘to bring’  
 $\lambda P \lambda y \lambda x \lambda e \text{ [e INST [[x BRING y] : [P e]]]}$   
*Sestra přivedla pacienta do lékařovy pracovny. (Cz)*  
 ‘The nurse brought the patient into the doctor’s examination room.’

### 3. Syntactic Projection

A verb projects from the lexicon into syntax according to its AS.

- (4) a. Unaccusative verb:

$[\text{VP } [\text{V } \textit{zemřel}] [\text{DP } \textit{Jiří Adamíra}]]$

The DP is an internal argument merged to the right of the verb.

Semantic value of the VP node:

$\lambda e [e \text{ INST } [\text{BECOME NOT ALIVE } j]]$

- b. Unergative verb:

$[\text{VP } [\text{DP } \textit{Marie}] [\text{V } \textit{pláče}]]$

The DP is an external argument merged in the specifier position of the VP.

Semantic value of the VP node:

$\lambda e [e \text{ INST } [m \text{ WEEP}]]$

- c. Monotransitive verb:

$[\text{VP } [\text{DP } \textit{David}] [\text{V}' [\text{V } \textit{zabil}] [\text{DP } \textit{Goliáše}]]]$

The verb projects both an internal and an external argument into syntax.

Semantic value of the VP node:

$\lambda e [e \text{ INST } [[d \text{ CAUSE } e'] : [e' \text{ INST } [\text{BECOME NOT ALIVE } g]]]]]$

- d. Ditransitive verb:

$[\text{VP } [\text{DP } \textit{Sestra}] [\text{V}' [\text{V } \textit{dala}] [\text{VP } [\text{DP } \textit{pacientovi}] [\text{V}' t_V [\text{DP } \textit{tabletú}]]]]]]]$

The verb has two internal arguments and an external argument. A VP on top of a VP has to be created to host the three arguments (see Larson 1988 on VP-shells). Verb movement leaving a trace is involved in this process. The internal arguments are projected into structural positions in the lower VP. The external argument is merged in the specifier position of the upper VP.

Semantic value of the VP node:

$\lambda e [e \text{ INST } [[[\text{THE NURSE}] \text{ CAUSE } [\text{BECOME } [[[\text{THE PATIENT}] \text{ HAVE } [\text{A TABLET}]]]]]]]$

- e. Transitive verb of motion:

$[\text{VP } [\text{DP } \textit{Sestra}] [\text{V}' [\text{V } \textit{přivedla}] [\text{VP } [\text{DP } \textit{pacienta}] [\text{V}' t_V [\text{PP } \textit{do lékařovy pracovny}]]]]]]]$

Again, two VPs have to be created. The PP is the most deeply embedded argument. It is merged as the right sister of the verb in the lower VP. The direct object is projected into the second structural position in this VP. The nominative DP occupies the position of the specifier of the upper VP.

Semantic value of the VP node:

$\lambda e [e \text{ INST } [[[ [\text{THE NURSE}] \text{ BRING } [\text{THE PATIENT}]]] : [\text{FIN } [\text{LOC } e] \subset [\text{LOC } [\text{THE DOCTOR'S EXAMINATION ROOM}]]]]]]]$

Projection from the lexicon into syntax according to the verb's AS yields the basic, canonical, linearization of constituents.

The relatively free word order in the Slavic languages results from permutations caused by other factors such as, e.g., information structure.

#### 4. Lexical Operations

Lexical processes affecting the AS of predicates can lead to non-canonical argument realization.

##### (i) *Participial passive*

- verbal stem and participial suffix are combined in the lexicon (cf. Zimmermann 1988)
- two major effects: The external argument (*agent*) gets blocked. It cannot be realized in the canonical way as a nominative DP. The internal argument (*patient*) surfaces with nominative case.

(5) *V četverg v Pakistane (byla) ubita Benazir Bxutto.* (Ru)  
 on Thursday in Pakistan was.sg.f killed.sg.f Benazir Bhutto.nom  
 'Benazir Bhutto was killed on Thursday in Pakistan.'

(6)  $\lambda P [P z]$

(7)  $\lambda y \lambda e [e \text{ INST } [[z \text{ CAUSE } e'] : [e' \text{ INST } [\text{BECOME NOT ALIVE } y]]]]$

(8)  $[_{VP} [_V \textit{ubita}] [_{DP} \textit{Benazir Bxutto}]]$

##### (ii) *Reflexive passive*

The external argument (*agent*) is suppressed. The internal argument (*patient*) realizes nominative case.

(9) *Vidomosti [...] možit' buty vkazani u dodatkovyx blankax,*  
 'Details may be indicated on additional forms,'  
*u jakyx povtorjuzut'sja vidomosti punktu 1, [...]* (Ukr)  
 on which repeat.pres.3p.pl.refl details.nom point.gen one  
 'on which the details indicated under point one will be repeated.'

(10)  $\lambda y \lambda e [e \text{ INST } [z \text{ REPEAT } y]]$

(11)  $[_{VP} [_V \textit{povtorjuzut'sja}] [_{DP} \textit{vidomosti punktu 1}]]$

(iii) *Obligatory subject gaps*

Example: “Indeterminate personal sentences”

- (12) *Aficèrskija kadry ryxtujuc’ u Vaennaj akadèmi Rèspubliki Belarus’, [...] (BRu)*  
 officers.acc train.pres.3p.pl at Military Academy Republic.gen Belarus’  
 ‘Officers are trained at the Military Academy of the Republic of Belarus.’

- (13) ...  $\lambda x \lambda e$  [e INST [...  
 [-overt]  
 [3p]  
 [pl]

- (14) [<sub>VP</sub> [<sub>DP</sub> pro] [<sub>V</sub> [<sub>V</sub> ryxtujuc’] [<sub>DP</sub> aficèrskija kadry]]]

The non-overt third person plural pronoun (pro) and the verb agree.

(iv) *Semantic template, morphosyntactic address and change of argument hierarchy*

Example: Ditransitive verbs in Bulgarian

- (15) *Petâr dade knigata na Ivan / na nego. (Bg)*  
 Peter gave book-the na Ivan / na him  
 ‘Peter gave Ivan / him the book.’

- (16) *Petâr mu dade knigata. (Bg)*  
 Peter him.dat (cl) gave book-the  
 ‘Peter gave him the book.’

- (17) a.  $\lambda z \lambda y \lambda x \lambda e$  [e INST [x CAUSE [BECOME [y HAVE z]]]]  
 b.  $\lambda P \lambda y' \lambda z' \lambda x' \lambda e'$  [P z' y' x' e']  
 [na]  
 c.  $\lambda y' \lambda z' \lambda x' \lambda e'$  [e' INST [x' CAUSE [BECOME [y' HAVE z']]]]  
 [na]

- (18) [<sub>VP</sub> [<sub>DP</sub> Petâr] [<sub>V</sub> [<sub>V</sub> dade] [<sub>VP</sub> [<sub>DP</sub> knigata] [<sub>V</sub> t<sub>V</sub> [<sub>PP</sub> na Ivan / na nego ]]]]]]

(v) *Multiple changes in the course of lexical conversion*

Example: Perception predicates

- (19) *Je vidět vesnici / vesnice. (Cz)*  
 is.3p.sg see.inf village.acc / village.nom  
 ‘One can see the village.’

- (20) *Stąd widać całą wioskę. (Po)*  
 from-here see.inf entire.acc village.acc  
 ‘From here one can see the entire village.’

- (21) *Adhètul' usja vëska vidac'.* (BRu)  
 from-here entire.nom village.nom see.inf  
 'From here one can see the entire village.'

Lexical conversion effects two semantic changes:

- blocking of the external argument (akin to passivization)
- introduction of a modal component

- (22) a.  $\lambda y \lambda x \lambda e [e \text{ INST } [x \text{ SEE } y]]$   
 b.  $\lambda P [P \ z]$   
 c.  $\lambda Q [\text{POSS } [Q \ e']]$

- (23)  $\lambda y \lambda e [e \text{ INST } [z \text{ SEE } y]]$

- (24)  $\lambda y [\text{POSS } [e' \text{ INST } [z \text{ SEE } y]]]$

The differences in case assignment that we find across the Slavic languages (accusative vs. nominative) can be accounted for by a change of the categorial features – [+V] gets replaced by [-V], compare (25) and (26). This can be regarded as the second step of the conversion process.

- (25) [+V,+N,+Praed]

- (26) [-V,+N,+Praed]

- (27)  $[_{VP} [_{V} je] [_{PraedP} [_{Praed} \textit{vidět}] [_{DP} \textit{vesnici} / \textit{vesnice} ]]]]$

## 5. Conclusion

A semantic representation that determines the number and hierarchy of syntactic arguments is part of a verb's entry in the lexicon. Due to the identification of thematic roles with lambda abstractors thematic relations need not be licensed in the syntax. The syntactic structure of the verb phrase may be projected directly from the lexicon depending on the argument hierarchy.

The formal representation also restricts morphosyntactic realization of arguments in a non-trivial manner (addressed and unaddressed lambda abstractors).

Various lexical processes can affect the AS of predicates.

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