



Valency in the Prague Dependency Treebank

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Valency in PDT: Outline



- the concept of valency
- valency in FGD
- valency in PDT, PDT-VALLEX
- valency in other LRs

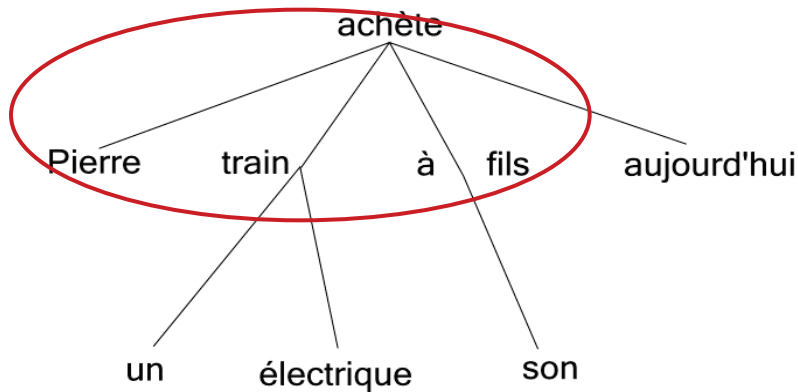
documentation: <http://ufal.mff.cuni.cz/pdt2.0/doc/manuals/en/t-layer/html/index.html>

Concept of Valency

- valency ... Tesnière (1959)

- syntactic structure
- semantic structure

➡ dependency syntax



Aujourd'hui Pierre achète à son fils un train électrique.
Today Pierre is buying his son an electric train.



Concept of Valency (cont.)



- Concise Oxford Dictionary of Linguistics (Matthews, 1997):
valency – *the range of syntactic elements either required or specifically permitted by a verb or other lexical unit ...*
- Svozilová et al. (1997):
„Valencí rozumíme v lingvistice schopnost lexikální jednotky, především slovesa, vázat na sebe jiné výrazy a mj. tak zakládat větné struktury.”

Concept of Valency (cont.)



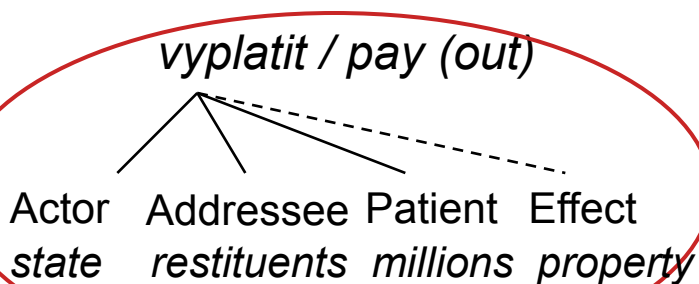
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*Stát vyplatil restituentům miliony za zabavený majetek /
The state paid the restituent millions for condemned property*

*Státem byly vyplaceny restituentům miliony /
Restituentům se vyplatily miliony /
Millions were paid to the restituent for condemned property*

*Stát nechal vyplatit restituentům miliony /
The state had the millions paid to the restituent*

*Restituenti dostali vyplaceny miliony /
The restituent got millions paid out*



Concept of Valency (cont.)



- valency structure of lexical units

vyplatit / to pay ... Actor Addressee Patient (Effect)

jít / to go Actor

sídlit / to reside Actor Location

pršet / to rain – ('dummy subject')



valency dictionaries:

number and type of val. complementations



Concept of Valency (cont.)

- valency structure of lexical units

⇒ valency dictionaries:
number and type of val. complementations

- prototypically: a single valency structure \approx a single word sense

*odpovídat*₁ ... Actor Addressee (Patient) Effect
 \approx dávat odpověď [to answer]

*odpovídat*₂ ... Actor Patient Effect
 \approx reagovat [to react]

*odpovídat*₃ ... Actor (Addressee) Patient
 \approx mít odpovědnost [to be responsible]

*odpovídat*₄ ... Actor Patient
 \approx být ve shodě [to correspond]



Concept of Valency (cont.)

- valency structure of lexical units

⇒ valency dictionaries:
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- prototypically: a single valency structure \approx a single word sense

*admit*₁ ... Actor Patient

This admits of two possibilities.

\approx to concede (připustit/připouštět, dovolit/dovolovat)

*admit*₂ ... Actor Patient Location

She was admitted to the hospital.

\approx to take (přijmout/přijímat, umístit/umísťovat)

⇒ valency lexicon as an ***inventory of word senses***

Prominent Examples of Valency Theories



- syntactically based:
 - Lucien Tesnière (1959)
actants (first / non-first) and circumstants

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- syntactically based:

- Lucien Tesnière (1959)
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- semantically based:

- Charles J. Fillmore (1968)

deep cases: Agentive, Objective, Locative, Instrument, Dative, ... (the list differs)

case frame ... each verb selects a certain number of deep cases

The door (O) opened.

The janitor (A) opened the door (O).

This key (I) opened the door (O).

The janitor (A) opened the door (O) with this key (I).

} *to open ... +[__O (I) (A)]*

grammatical functions are determined by the deep valence of the verb

HOWEVER: FrameNet <http://framenet.icsi.berkeley.edu>

- verbs (and other units) evoke a semantic frame (SF)

buy ... SF Commerce_buy Buyer, Goods (core semantic elements)
Seller, Money, ...

Prominent Examples of Valency Theories



- Czech linguistics:
- František Daneš (1981, 1987) ... intention vs. valency
 - complex sentence patterns (KVV, komplexní větný vzorec):
 - **grammatical sentence pattern** (GVV, gramatický větný vzorec)
Karel rozbil okno. / Karel broke the window. $S_{\text{nom}} - VF - S_{\text{ak}}$
Otec mi řekl, že nic neví. / My father told me that he knows nothing.
 $S_{\text{nom}} - VF - S_{\text{dat}} - S_{\text{ak}} / \text{že SENT}$
obligatory / potential / facultative positions
 - **semantic sentence pattern** (SVV, sémantický větný vzorec) ... *microsituation*
Karel rozbil okno. AGENS – PRED – PATIENS
Jan dal Petře knihu. / Jan gave Petra a book ~ Jane gave a book to Petra.
AGENS – PRED – RECIPIENT – PATIENS
two basic types of semantic roles:
substantive (cz substanční) ... physical objects, location, temporal m.
situational (propositional) ... e.g., information
- Jarmila Panevová (1974, 1980, 1994)

Valency in FGD



- primarily tectogrammatical layer:
number and type of complementations
- reflected also at the surface and morphemic layers:
morphological form
- Panevová (1974-5; 1980; 1994; ...)
 - lexical words: **verbs**, nouns, adjectives, adverbs
frame evoking words / frame bearing words
 - valency complementations

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	inner participants (~ arguments)	free modifications (~ adjuncts)
obligatory		
optional (cz fakultativní)		

valency frame
stored in a valency lexicon



Valency in FGD: Functional Tests

- inner participants (actants) vs. free modifications:
 - can be the given type of complementation repeated?
 - can the given complementation modify any verb?

NO \Rightarrow **inner participant**

*Matka.ACT předělala dětem.ADDR loutku.PAT z Kašpárka.ORIG na čerta.EFF.
V Praze.LOC se sejdeme na Hlavním nádraží.LOC u pokladen.LOC.*



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- additional characteristics of inner participants:
 - the verb prescribes the form of its actant(s) (cz rekce)
potkat někoho, informovat někoho
myslet na něco/na někoho, učit někoho něco/něčemu, soustředit se na něco
odpovídat něčemu; bát se něčeho, docílit něčeho
 - semantically more or less indistinct
- inner participants ~ theta roles / θ -roles
(Chomsky, Standard Theory; Theory of Government and binding)
 - ~ deep cases (Fillmore, 1968)
 - ~ arguments

Valency in FGD: Functional Tests (cont.)



- obligatory vs. optional (cz: fakultativní)
- *dialogue test* (Panevová, 1974):
criterion of obligatoriness for free modification

A: *Přátelé už přišli.* A: *Our friends have already come.*

B: *Kam?* B: *Where (do they come)?*

A: **Nevím.* A: **I don't know.*

applicable also for inner participants

Valency in FGD: Functional Tests (cont.)



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A: <i>*Nevím.</i>	A: <i>*I don't know.</i>

applicable also for inner participants

- BUT: possibility not to express a complementation in a surface
(cz 'vypustitelnost')

- general participant vs. unspecified vs. surface ellipsis

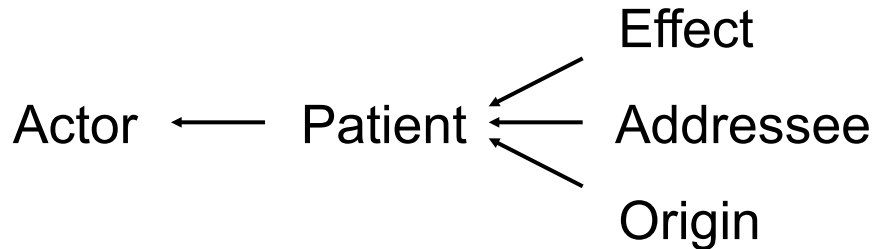
Byl pochválen {#PersPron.PAT}
Jana prodává u Bati {#Gen.PAT}
Vedoucí podniku odcestoval {#Oblfm.DIR1}
Petr a Marie se potkali v Praze {#Rcp.PAT}
Psali to v novinách {#Unsp.ACT}

lit. *(He) was praised* {#PersPron.PAT}
lit: *Jana sells at Baťa* {#Gen.PAT}
lit: *The boss of the company left* {#Oblfm}
Petr and Marie have met in Prague {#Rcp.PAT}
lit: *(They) wrote it in the_newspapers* {#Unsp}

Valency in FGD: Functional Tests (cont.)



- *concept of shifting*



Kniha.ACT již vyšla.

The book has already appeared.

Jan.ACT spadl se skály.

Jan fell from the rock.

Jan.ACT oslovil Marii.PAT (na ulici).

Jan addressed Marie (at the street)

Učitel.ACT vyvolal žáka.PAT.

The teacher called up the pupil.

Petr.ACT vykopal jámu.PAT.

Petr dug a hole.

Jan.ACT vyrostl z jinocha.ORIG

Jan grew from a boy into a man.

v muže.PAT

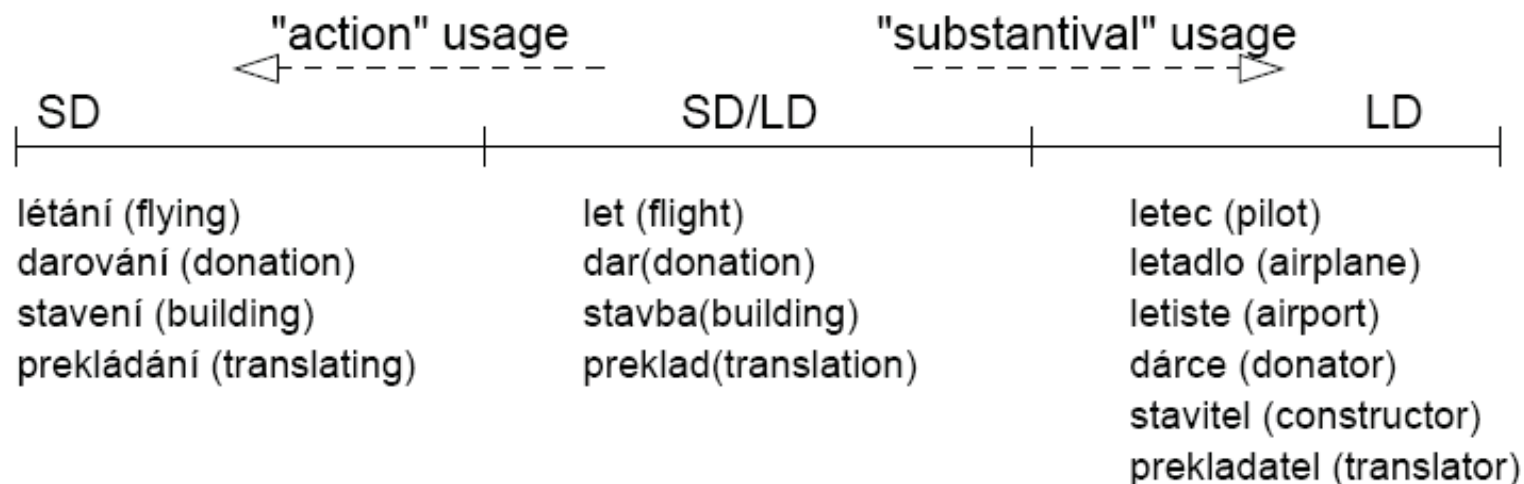
Z banálního nachlazení.PAT se vyvinulo
závažné onemocnění.ACT.

*A serious disease has developed from a
banal cold.*



Valency in FGD: Syntactic and Lexical Derivation

- *verb* → *noun* (deverbal)
 - valency frame is (somehow) inherited
 - depending on the type of derivation
 - depending on surface form
 - structural cases: Nom, Acc → Gen
 - semantic cases + prep. groups ... preserved
- embedded inner participant (e.g. *učit* ACT PAT ADDR → *učitel* PAT ADDR)



Valency in FGD: Syntactic and Lexical Derivation



- **verbs → adjectives**

- valency frame is (somehow) inherited
- reduction of one valency position

dědeček čte dětem pohádky o princeznách

→ dědeček čtoucí dětem pohádky o princeznách

→ pohádky čtené dědečkem dětem

a grandpa is reading a fairy tales on princesses to his grandchildren

→ *a grandpa (who is) reading a fairy tales on princesses to his grandchildren*

→ *a fairy tales read by a grandpa to his grandchildren*

číst [to read] ... ACT (PAT) ADDR EFF → čtoucí ... (PAT) ADDR EFF

→ čtený ... ACT ADDR

omezit [to restrict]... ACT PAT (EFF) → omezený [restricted] ... ACT EFF

Valency in FGD: Adverbs



- not studied yet

- adjectives → adverbs

- valency frame is inherited

kolmý na něco [orthogonal to st] → kolmo na něco [orthogonally to st]

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