



# 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

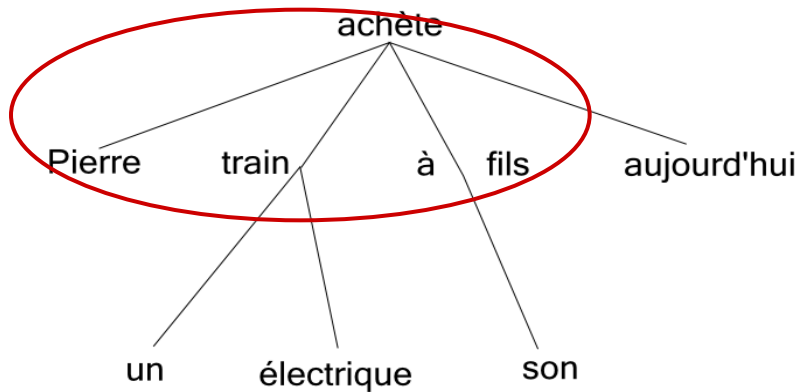
documentation: <http://ufal.mff.cuni.cz/pdt2.0/doc/manuals/en/t-layer/html/index.html>

# 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.*



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# 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 ...*
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*„Valencí rozumíme v lingvistice schopnost lexikální jednotky, především slovesa, vázat na sebe jiné výrazy a mj. tak zakládat větné struktury.”*

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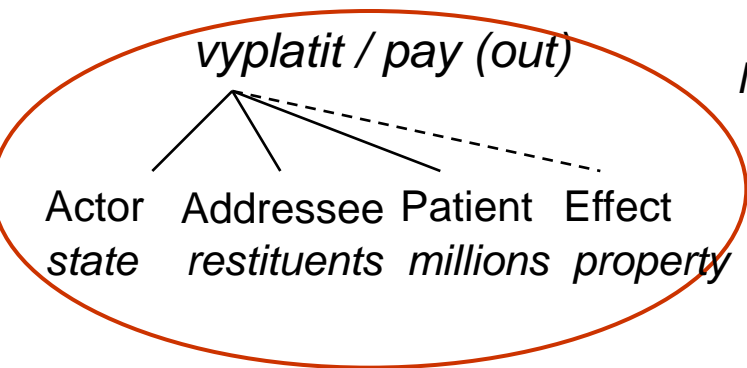
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*Stát vyplatil restituentům miliony za zabavený majetek /  
The state paid the restituent millions for condemned property*

*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*



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# 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



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# 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

*odpovídat*<sub>1</sub> ... Actor Addressee (Patient) Effect  
 $\approx$  dávat odpověď [to answer]

*odpovídat*<sub>2</sub> ... Actor Patient Effect  
 $\approx$  reagovat [to react]

*odpovídat*<sub>3</sub> ... Actor (Addressee) Patient  
 $\approx$  mít odpovědnost [to be responsible]

*odpovídat*<sub>4</sub> ... Actor Patient  
 $\approx$  být ve shodě [to correspond]



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# Concept of Valency (cont.)

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*admit*<sub>1</sub> ... Actor Patient

*This admits of two possibilities.*

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

*admit*<sub>2</sub> ... Actor Patient Location

*She was admitted to the hospital.*

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

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



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# Prominent Examples of Valency Theories



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

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actants (first / non-first) and circumstants

- 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

# 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<sub>nom</sub> – VF – S<sub>ak</sub>

Otec mi řekl, že nic neví. / My father told me that he knows nothing.

S<sub>nom</sub> – VF – S<sub>dat</sub> – S<sub>ak</sub> / 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)

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# 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



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# 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 /  $\theta$ -roles  
(Chomsky, Standard Theory; Theory of Government and binding)
  - ~ deep cases (Fillmore, 1968)
  - ~ arguments

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# 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



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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}

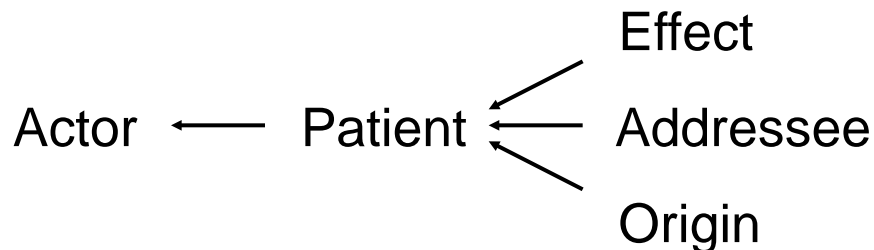
lit: *(They) wrote it in the\_newspapers* {#Unsp}

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# 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

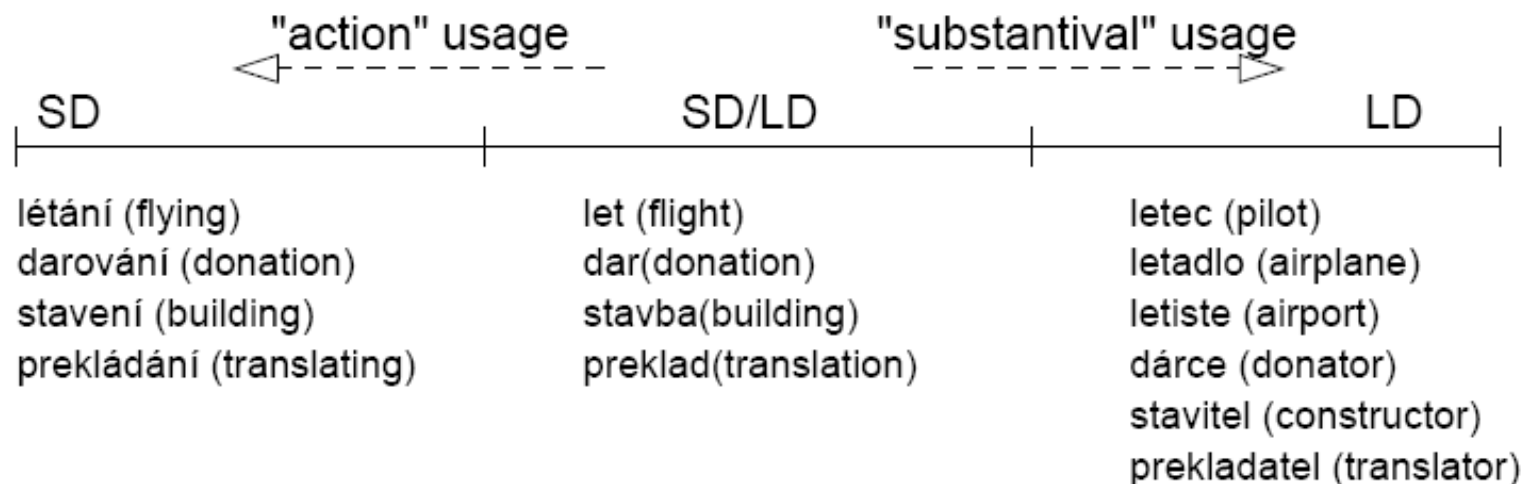
Z banálního nachlazení.PAT se vyvinulo  
závažné onemocnění.ACT.

*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)



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# 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

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# 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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