



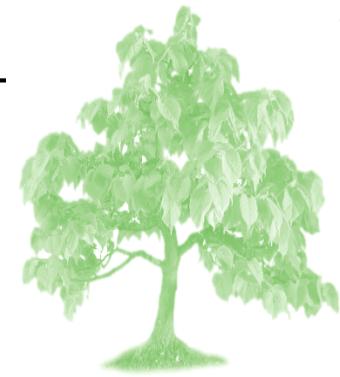
Valency in FGD and in the PDT family (Part II)

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Valency in PDT / PCEDT: Outline



- concept of valency
as the keystone for syntactic structure
- valency in PDT and PDT-Vallex
valency in PCEDT and EngVallex, CzEngVallex

documentation:

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

PCEDT: <https://ufal.mff.cuni.cz/pcedt2.0/en/documentation.html>



Concept of Valency

- 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.“



Valency in FGD

- frame-evoking words: verbs, nouns (adjectives, adverbs)
 - actants vs. free modifications
 - concept of shifting
 - obligatory vs. optional dependents (dialogue test)
 - valency dictionary
 - as an *inventory of word senses*
 - number and type of valency dependents
- ➡ syntactic structure of a sentence

	actants (inner participants) (~ arguments)	free modifications (~ adjuncts)
obligatory	[red hatched]	
optional (cz fakultativní)	[red hatched]	

valency frame

stored in a valency lexicon

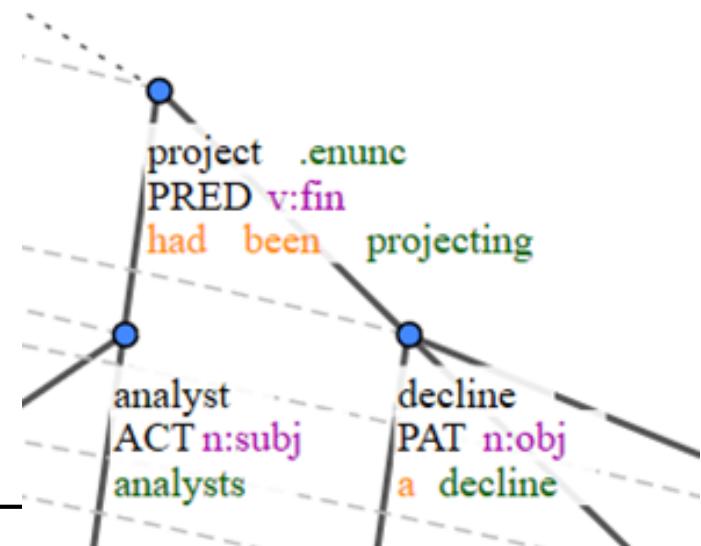


PDT: t-layer

basic t-node attributes:

- 1) lexical items: *t-lemma*
- 2) meaning of morphological categories: *grammatemes* (for complex nodes)
- 3) deep syntactic structure: *functors* (+ *subfunctors*)
valency as a key property → a sentence syntactic structure
- 4) deep word order
- 5) additional annotation:
topic focus, coreference, discourse, etc.

*Many industry analysts
had been projecting a 3%
decline ...*



Syntactic Information in PDT/PCEDT

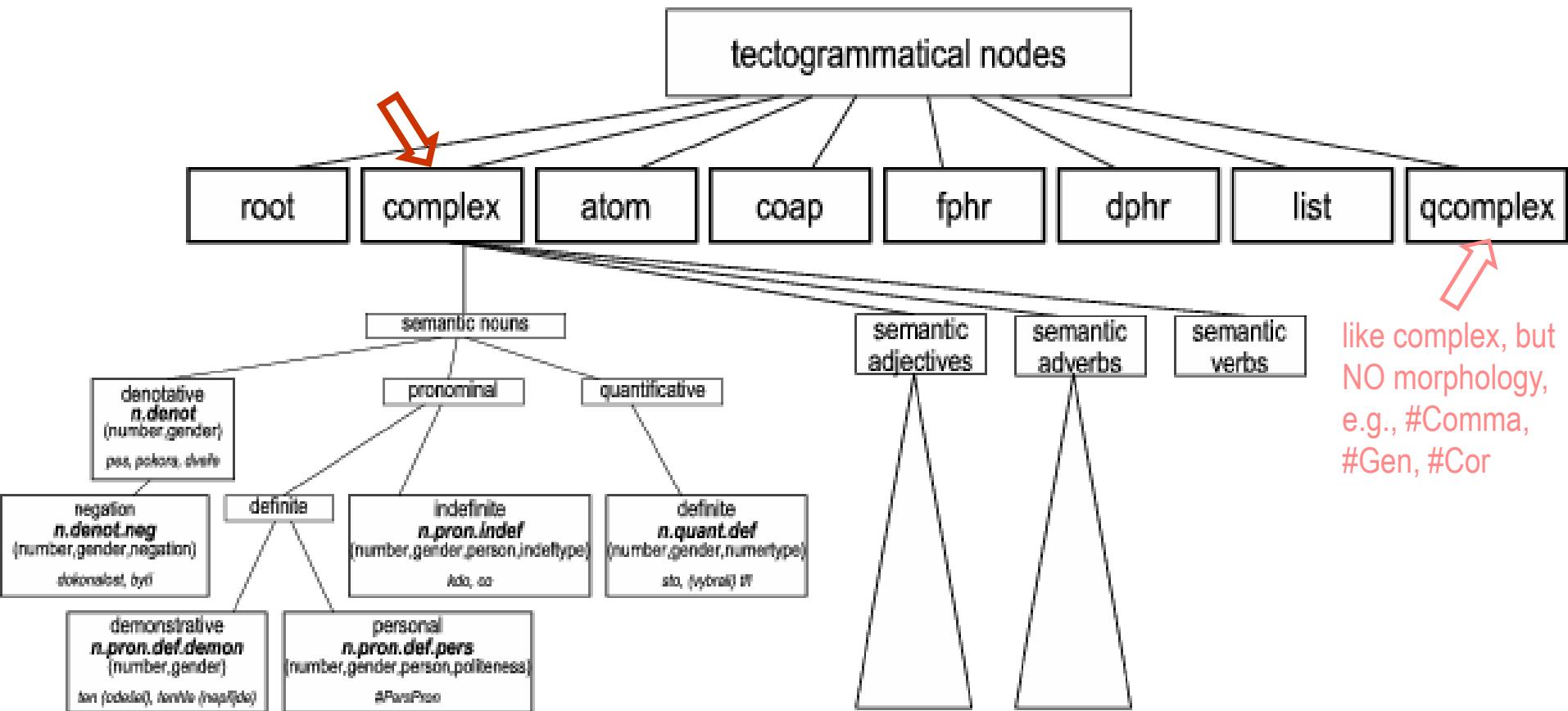


- attribute ***functor*** for ***all*** nodetypes
- functors ... labels for the type of syntactic relation governing/parent node – modifying/child node



PDT: node types

- eight node types ... attribute *nodetype*
- defined on the basis of a *t-lemma* and/or a *functor*



Syntactic Information in PDT/PCEDT



- attribute **functor** for **all** nodetypes
- functors ... labels for the type of syntactic relation governing/parent node – modifying/child node
- **complex nodes** ... functor ~ **type of valency dependent**
 - actants
 - free modifications
 - secondary predication (Cz: doplněk)
- other nodetypes ... functor ~ **non-valency relation**
 - effective root of an independent clause
 - coordination, apposition
 - multiword expressions (complex predicates, phrasemes)
 - rhematizers, conjunction modifiers
- (OPER, ...)



Valency in PDT: PDT-Vallex and other lexicons

- all sem. verbs, some nouns, adjectives, adverbs
(aspectual counterparts as different units)
- attribute ***val_frame.rf*** ~ list of frame members
for each frame member:
 - **functor**
 - obligatory or optional
 - possible realizations
- VALLEX family of valency lexicons
 - PDT-Vallex: <https://lindat.mff.cuni.cz/services/PDT-Vallex/>
 - EngVallex: <https://lindat.mff.cuni.cz/services/EngVallex/>
 - CzEngVallex: <http://lindat.mff.cuni.cz/services/CzEngVallex/>



Valency in PDT: PDT-VALLEX

- all sem. verbs, some nouns, adjectives, adverbs
(aspectual counterparts as different units)
- attribute **val_frame.rf** ~ list of frame members
for each frame member:
 - **functor**
 - obligatory or optional
 - possible realizations
- consistency checking
- alternations/diatheses !!!

* odpovídání

ACT(.2,.v) PAT(*na-1*[.4]) ADDR(.3) ?EFF(*že*[.v]) v-w2838f1 Used: 1x
(odpovídat- dávat odpověď) nedokončitelné odpovídání a tázání

* odpovídat

ACT(.1,*že*[.v]) PAT(.3) v-w2839f1 Used: 85x
zaměstnání odpovídá jeho schopnostem
řešení o. požadavkům

ACT(.1) ?PAT(*na-1*[.4]) ADDR(.3) EFF(.4,.7,*že*[.v],*zda*[.v],*aby*[.v],*at*[.v],.s., v-w2839f2 Used: 28x

odpovídal mu na jeho dotaz, že nemá pravdu
o. nám na dotazy
o. pravdu
o. nám tato slova

ACT(.1) PAT(*za-1*[.4]) ?ADDR(.3) v-w2839f3 Used: 14x
odpovídáš mi za ztrátu
svým majetkem.MEANS

ACT(.1) PAT(*na-1*[.4]) v-w2839f4 Used: 2x
organismus odpovídá na zákrok
tvorbou.MANN vaziva
tímto způsobem.MANN o. na nátlak obyvatelstva

Valency in PDT: PDT-VALLEX (cont.)



TREE EDITOR Default(2/1): C:/PDT-2.0/data/full/tamw/train-1/cmpr9410_001.t.gz

File View Node Session Bookmarks User-defined Help

Podle regulí GATT lze toto opatření přjmout maximálně na období šesti měsíců a pouze u vybraných položek.

root

PDT-VALLEX units frames

verbs	5 300	9 000
nouns	3 750	4 750
adjectives	800	950

Frame editor: unknown user

Words

Search: *

- lemma
- přijmat
- přijít
- přijít si
- přijíždět
- přjmout**
- přikázat
- přizkazova
- příklad

Frames

Search Whole Lexicon

Search frame:

Elements

- ACT(1) PAT(4)
(akceptovat, uznávat) přjmout jeho teorii
COMPL p. ji jako urážku
MANN p. ji s nadhledem {lj01am.fs##38.2} (ZU)
- ACT(1) PAT(4)
(brát) přjmout dělníka na práci
AIM[na+4] p. brigádníky na česání jablek {lm09am.fs##2.2}
p. studenty (ZU)
- ACT(1) PAT(4) ?EFF(.4[jako jakožto]/AuxY);za+4)
(angažovat, vzít) přjmout někoho za člena, jako člena
COMPL jako začátečníka ho přiali dobře (ZU)
- ACT(1) PAT(4) žel vš když vln ?ORIG(nd+2)

Note

Show Obsolete Show Superframes

id: t-cmpr9410-001-p11s1w7 a: a#cmpr9410-001-p11s1w7

Close



Valency in PDT: PDT-VALLEX (cont.)

- a frame element realization ~ a continuous section of an anal. tree (may be incomplete)
 - the syntactic structure of a given modification;
 - the requirements (esp. POS characteristics)

ACT(.1) PAT(.4) ... transitive verb

ACT(.1) PAT(.f) ... infinitive dependent

ACT(.1) PAT(.4) ?ORIG(z-1[.2]) ?EFF(na-1[.4]) ... optional actants

ACT(.3) DPHR(mráz.S1,po-1[záda:P6]) ... idiom

Examples of surface-form encoding:

nominative: .1

accusative: .4

adjective in instrumental: .a7

possessive pronoun or adjective: .u

numeral: .m

pronoun: .p

adverb: .d

interjection: .i

infinitive: .f

subordinate clause, with any kind of

conjunction: j[.v]

content clause

(a subordinate clause beginning with a
relative pronoun/adverb): .c

direct speech: .s

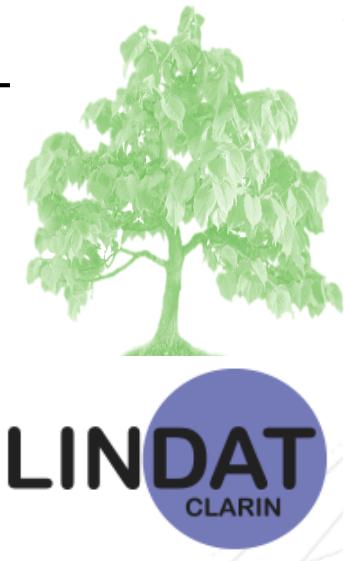


Valency in PDT: PDT-VALLEX (cont.)

- a frame element realization ~ a continuous section of an anal. tree (may be incomplete)
 - the syntactic structure of a given modification;
 - the requirements (esp. POS characteristics)
- regular changes of a surface form:
 - diatheses:
 - passive
 - reciprocity
 - disp. modality
 - resultative
 - other regular changes:
 - numeral constructions
 - distributivity
 - subfunctors
 -

Verbs in PDT-Vallex: <https://lindat.mff.cuni.cz/services/PDT-Vallex/>

Valency in PDT: PDT-VALLEX (cont.)



Verbs in PDT-Vallex:

<https://lindat.mff.cuni.cz/services/PDT-Vallex/>



PDT-Vallex: search and browse (v1.0)

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odpovídat

odpovídat

odpovídat¹ 14x, 3x **ACT(1) PAT(_{za+4}) ?ADDR(3)**

(být zodpovědný, zodpovídat) • odpovídáš mi za ztrátu; svým majetkem.MEANS

odpovídat² 85x, 51x **ACT(1; že) PAT(3)**

(shodovat se) • zaměstnání odpovídá jeho schopnostem; řešení o. požadavkům

odpovídat³ 2x, 8x **ACT(1) PAT(_{na+4})**

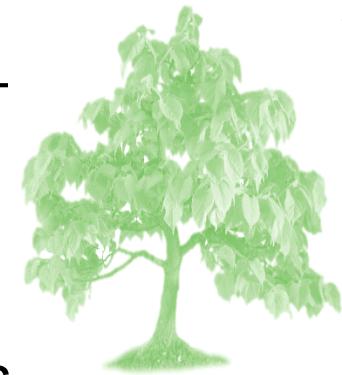
(reagovat, odpovědět) • organismus odpovídal na zákon; tvorbou.MANN vaziva; tímto způsobem.MANN o. na nátlak obyvatelstva; USA o. kladně.MANN na demokratické reformy na Kubě

odpovídat⁴ 2x **ACT(1) ADDR(3) ?PAT(_{na+4}) BEN()|MANN()|MEANS()**
|ACMP()|CRIT()|CPR()

• odpovídala jim na dotazy takto i čtvrtý den; o. mu úsměvem

odpovídat⁵ 28x, 19x **ACT(1) ADDR(3) EFF(4;7; že; zda; aby; láf; s; c)**
?PAT(_{na+4})

(odpovědět, odepisovat) • odpovídal mu na jeho dotaz, že nemá pravdu; o. nám na dotazy; o. pravdu; o. nám tato slova



Valency in PCEDT: EngVallex

- for each occurrence of a semantic verb in the corpus
- each entry is moreover linked to PropBank
(and some also to VerbNet entries for comparison)

<http://lindat.mff.cuni.cz/services/EngVallex/>



EngVallex: search and browse

(v0.5 - Beta)

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ask

Search

Under construction. TESTING ONLY

ask

ask¹ ACT_(sub) PAT_(to+inf;for[objpp;ving]) ADDR_(obj1)

- Argentina will ask creditor banks to halve its foreign debt of \$64 billion.
- The National Institutes of Health asked for an HHS review of its plan to implant fetal tissue into the brain of a patient suffering from Alzheimers.

ask² ACT_(sub) PAT_(obj1;about[objpp;ving;whether+vp];whether+vp;if+v) ADDR_(obj1;off[objpp])

- The mathematics section of the widely used California Achievement Test asks fifth graders "What is another name for the Roman numeral IX?"
- *trace* ask him about this law he tried to pass.
- John asked a question of his professor.

ask³ ACT₍₎ ADDR₍₎ PAT₍₎ ?AIM₍₎

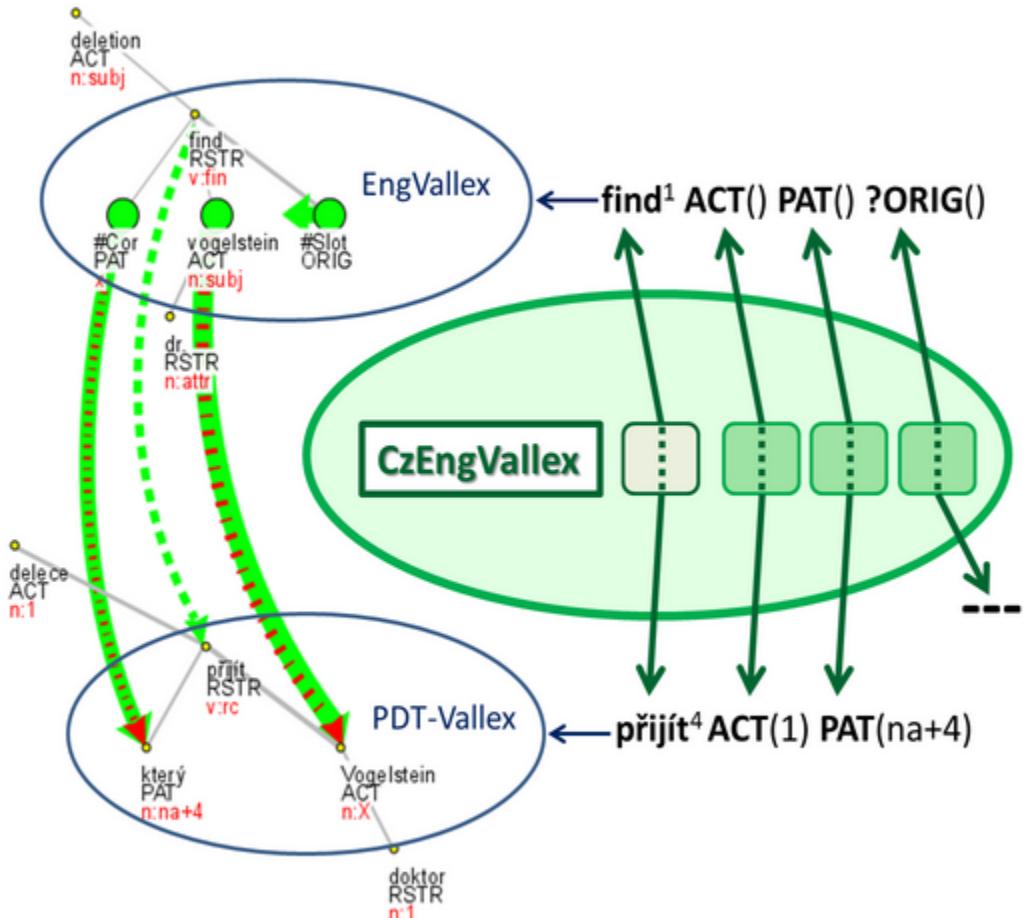
- The company was asking \$100 million for an operation said to be losing about \$20 million a year.

Valency in PCEDT: CzEngVallex



- a cross-linguistic comparison of valency behavior:
Czech and English verbs

The deletion Dr. Vogelstein found ...



Valency in PCEDT: CzEngVallex

<http://lindat.mff.cuni.cz/services/CzEngVallex/CzEngVallex.html>



ptát se PDT-Vallex : ask EngVallex

ptát se ACT₍₁₎ PAT_(na+4; zdá; jestli; c;.s) ADDR₍₂₎ PDT-Vallex

zeptat se, otázat se

- ptát se dcery na známky; p. se na děti



ask ACT_(sub) PAT_(to+inf; for[objpp; ving]) ADDR_(obj1) EngVallex

- Argentina will ask creditor banks to halve its foreign debt of \$64 billion.
- The National Institutes of Health asked for an HHS review of its plan to implant fetal tissue into the brain of a patient suffering from Alzheimers.

Argument mapping for "ptát se" (v-w5371f1) and "ask" (ev-w141f1):

ACT → ACT

PAT → PAT

ADDR → ADDR

Show corpus examples

ask ACT_(sub) PAT_(obj1; about[objpp; ving; whether+vp]; whether+vp;if+v) ADDR_(obj1; of[objpp]) EngVallex

- The mathematics section of the widely used California Achievement Test asks fifth graders "What is another name for the Roman numeral IX?"
- *trace* ask him about this law he tried to pass.
- John asked a question of his professor.

Argument mapping for "ptát se" (v-w5371f1) and "ask" (ev-w141f2):

ACT → ACT

EFF → PAT

ADDR → ADDR

PAT → ---

Show corpus examples

Valency in PCEDT: CzEngVallex

<http://lindat.mff.cuni.cz/services/CzEngVallex/CzEngVallex.html>



ptát se PDT-Vallex : ask EngVallex

ptát se ACT₍₁₎ PAT_(na+4; zdá; jestli; c;s) ADDR₍₂₎ PDT-Vallex

zeptat se, otázat se

- ptát se dcery na známky; p. se na děti



ask ACT_(sub) PAT_(to+inf; for[objpp; ving]) ADDR_(obj1) EngVallex

- Argentina will ask creditor banks to halve it
- The National Institutes of Health asked for implant fetal tissue into the brain of a patient

Argument mapping for "ptát se" (v-w537)

ACT → ACT

PAT → PAT

ADDR → ADDR

pcedt When I ACT asked American Airlines ADDR for PAT its side PAT of the story for use in my MBA class , where I teach business ethics , it did not respond .

pcedt Když jsem se společnosti ADDR American Airlines ptal na PAT její verzi PAT příběhu , abych to použil při výuce ve své třídě manažerského studia , kde vyučuji obchodní etiku , neodpověděla .

ask ACT_(sub) PAT_(obj1; about[objpp; ving; whether+vp]; whether+vp;if+v) ADDR_(obj1; of[objpp]) EngVallex

- The mathematics section of the widely used California Achievement Test asks fifth graders "What is another name for the Roman numeral IX?"
- *trace* ask him about this law he tried to pass.
- John asked a question of his professor.

Argument mapping for "ptát se" (v-w5371f1)

ACT → ACT

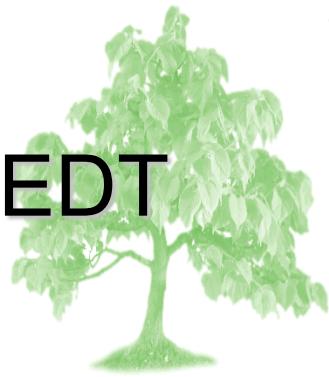
EFF → PAT

ADDR → ADDR

PAT → ---

pcedt The discrepancy may be because asking people ADDR about PAT their fitness regime PAT is a bit like inquiring about their love life .

pcedt Rozpor může být způsoben tím , že ptát se lidí ADDR na PAT cvičební režim PAT je trochu jako vyzvádat podrobnosti milostného života .



Types of Valency dependents in PDT/PCEDT

- actants
- free modifications
- verbal complement / secondary predication (cz: doplěk)

- other dependency relations
 - nominal dependents

- non-valency relations
 - effective root of an independent clause
 - coordination, apposition
 - complex predicates, multiword expressions, phrasemes
 - rhematizers



Valency in PDT/PCEDT: **Actants** (Verbs)

- Actor (ACT) ... functor for the first syntactic position

*Její manžel tam pracuje dál.
radost obyvatel z nezávislosti
Líbí se mi to.*

*Her husband still works there.
the joy of the citizens of an independence
I like it.*

- Patient (PAT) ... functor for the second syntactic position

*Postavili stany.
Prodal dům.
Matce nezbyly žádné peníze.*

*They pitched the tents.
He sold the house.
No money remains to my mother.*

- Effect (EFF) ... the third syntactic position (semantically indistinct)

Považoval Pavla za odborníka.

He considered Pavel a professional

- Addressee (ADDR)

*Dal / vzal dítěti hračku.
Obrátil se na soud s problémem.*

*He gave the child a toy. / Vzal dítěti hračku.
He turned to the court with a problem.*

- Origin (ORIG)

*Vyráběli nábytek ze dřeva.
dárek od maminky*

*They made furniture out of wood.
a present from his mom*



Valency in PDT/PCEDT: Free Modifications

- Local and directional modifications

DIR3 Odešel do města.

He left for a city.

LOC Obchod stojí naproti nádraží.

The shop is located opposite the station.

- Temporal modifications

TWHEN Zítra má být už hezky.

Tomorrow weather should be nice.

- Manner

MANN Pracuje pomalu. *He is working slowly.*

ACMP válečná plavidla včetně bojových letadel a vrtulníků
warships including air force

MEANS Napsal to na počítači. *He wrote it on the computer.*

- Causality

CAUS Nepovím vám to, protože *byste mi stejně nevěřili.*

I will not tell you because you would not believe me anyway.

AIM Jsem tu pro to, abych vám pomohl. lit: *I am here in order to help you.*

- + subfunctors:

TWHEN ... basic, after, approx, before, begin, betw, end, flow, mid, nr



Valency in PDT/PCEDT: New Types (Verbs)

- BEN

Kreslil pro děti nádherné obrázky. He painted beautiful paintings for the children.

Padá mu hlava na prsa. His head is falling on his breast.

Ten pán vám měl ale fousy! The beard the man had!

- CONTRD

Zatímco Ioni v premiéře proti Samprasovi hrál chaoticky, nyní už měl plán.

While he played chaotically last year in his premiere against Sampras, now he had a plan.

- HER

Zůstal zde majetek po třech a půl miliónu Němců.

The property after 3,5 million of Germans was left here.

Jméno dostala holčička po kmotře. The girl has got the name after the godmother.

BUT: Jméno dostala holčička od kmotry.ORIG The girl has got the name from the godmother.

- SUBS

Do učeben zasednou otcové místo svých synů.

The fathers will sit in the classrooms instead of their sons.

Mám-li ovšem mluvit za sebe, trochu maluji a píšu.

But should I speak for myself, I paint and write a little.



Valency in PDT/PCEDT: Nouns

- Partitive (MAT) (also Material) ... **actant**

governing node ... container; quantification

sklenice piva, skupina / miliony lidí a glass of beer, a group / millions of people

- Appurtenance (APP) (cz přináležitost)

~ something belongs to something

otec dítěte, střecha domu, člen tímu, naše skupina

the father of the child, a roof of a house, a member of the team, our band

- Identity (ID)

form ... nominative of identity (cz nominativ jmenovací) / genitive
meta-language expressions

- Author (AUTH)

drsné počasí

rough weather

sedící žena

a sitting woman

několik měsíců

a few months

pět dětí

five children

Karlova univerzita

Charles University

Karel Novák

Karel Novák

rozhodčí Severýn

the referee Severyn

v Praze - Dejvicích

in Prague - Dejvice

- Descriptive attribute (DESCR)
- (Restrictive) attribute (RSTR)

more-or-less used for all non-valency nominal attributes



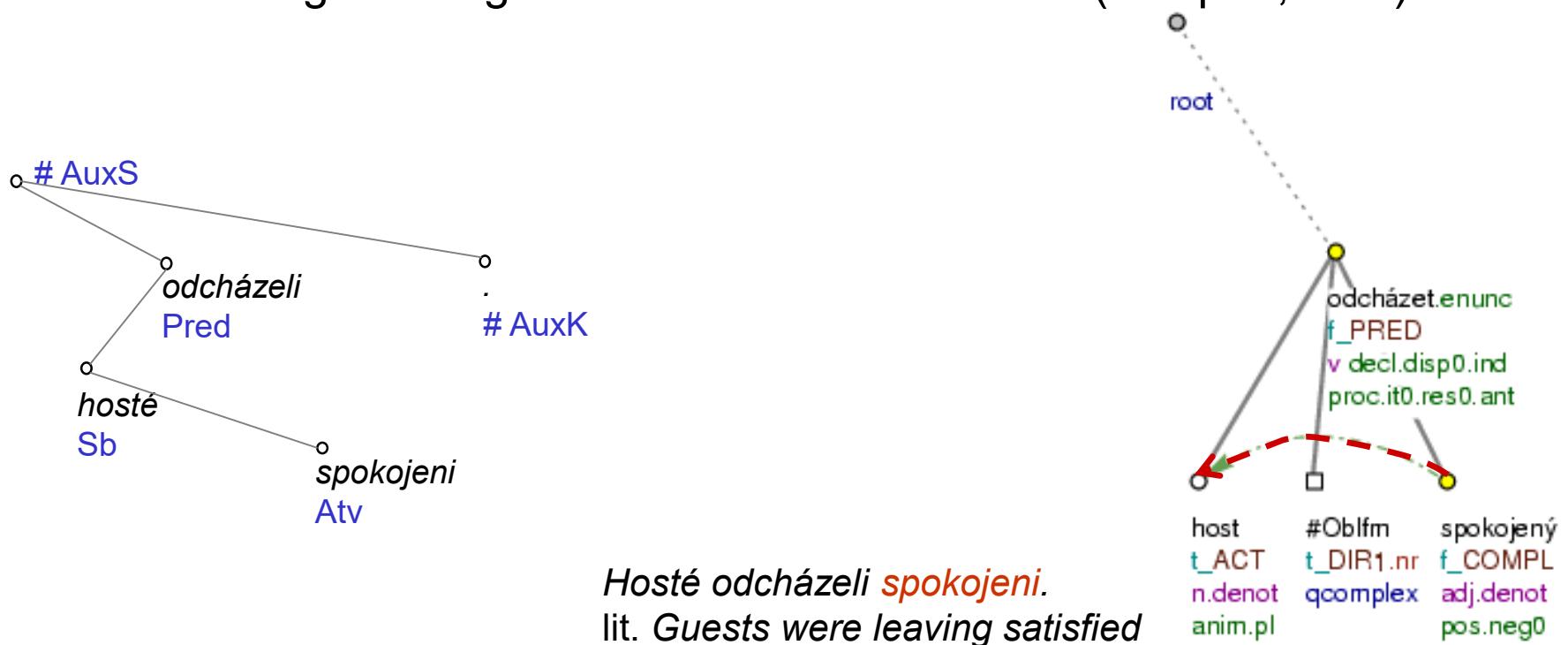
Valency in PDT/PCEDT: Adjectives

- the same repertoire of dependents as for verbs
- plus functors for comparative and superlative
- (Piňha, 1982), (Panevová, 1998)
 - PAT: *plný čeho* [full of st], *schopný čeho* [capable of st],
lačný čeho [thirsty for st], *podobný čemu* [similar to st], *příbuzný čemu* [related to st]
 - ADDR: *nepříjemný komu* [unpleasant to sb], *přístupný komu* [accessible to sb]
povědomý komu [familiar to sb]
 - PAT ADDR: *odpovědný komu za co* [responsible for st to sb], *vděčný komu za co*
[grateful to sb for st]



Valency in PDT/PCEDT: Secondary Predication

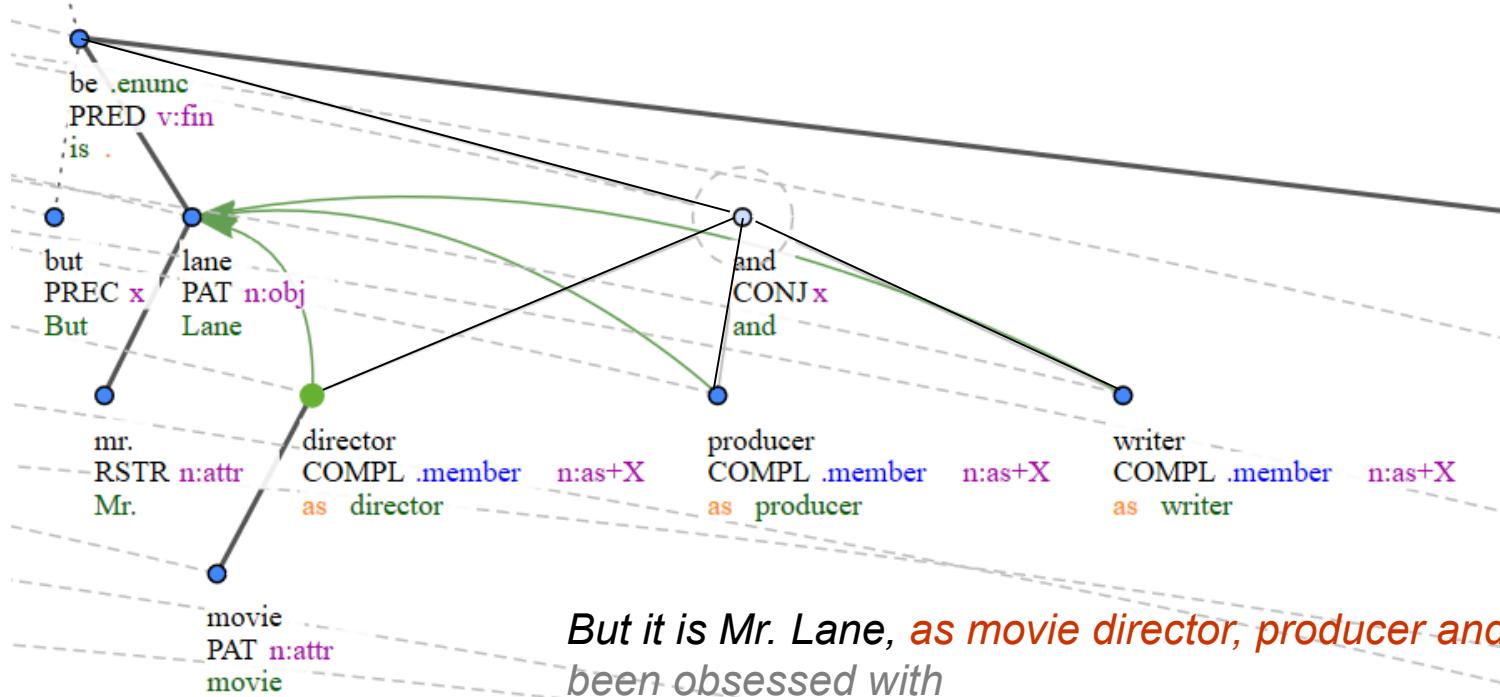
- **functor COMPL** ... secondary predication
(cz: doplněk)
- two syntactic dependencies
 - verbal governing node ... parent in a dependency tree
 - nominal governing node ... coreference arrow (compl.rf, later)



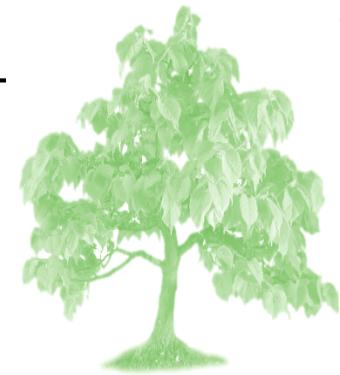


Valency in PDT/PCEDT: Secondary Predication

- **functor COMPL** ... secondary predication
(cz: doplněk)
- two syntactic dependencies
 - verbal governing node ... parent in a dependency tree
 - nominal governing node ... coreference arrow (compl.rf, later)



Functors for Non-Valency Relations



- effective root of an independent clause
- coordination, apposition
- complex predicates, multiword expressions, phrasemes
- rhematizers

Functors for Non-Valency Relations



- effective root of an independent clause

PRED *Pavel dal kytku Marii.* *Paul gave a flower to Mary.*

DENOM restriction to nouns in nominative

Názory čtenářů. *Readers' opinions.*

VOCAT *Milá Jano!* *Dear Jane!*

Pane majore, hodlám zavést nové prvky. *Sir, I intend to introduce new elements.*

PARTL *Pozor!* *Attention!*

Ano, to je pravda. *Yes, that is true.*

PAR *Přijedu 13. prosince (pátek).* *I will arrive on December 13 (Friday).*



Functors for Non-Valency Relations

- effective root of an independent clause
- coordination, apposition

CONJ *Mezi smysly patří zrak a sluch.* *Eyesight and hearing belong to the senses.*
Vyniká jak svědomitostí, tak houževnatostí.

She stands out due to her thoroughness, as well as her stringiness.

Šel, aniž by to viděl. {#Neg.CM} lit. He was walking without seeing it.

DISJ *at' vítaný, či nevítaný* *welcome or not* (only one of them is true)
Vysloví se bud' pro, nebo proti návrhu.

They will be either for or against the proposal.

ADVS *Vypadalo to, že bude hezky, ale začalo pršet.*
The weather looked nice but then it started raining.

CONFR *Bristol je v Anglii, kdežto Glasgow je ve Skotsku.*
Bristol is in England, whereas Glasgow is in Scotland.

CONTRA *spor Klaus versus Zieleniec.* *a variance Klaus vs. Zieleniec*

CSQ *Byl nemocný, proto nepřišel.* *He was sick so that's why he didn't come.*

GRAD *Nemůže se pohnout, natož vstát.* *He can't move, let alone get up.*

REAS *Úkol splníme, vždyť není obtížný.* *We'll fulfill the task, for it is not difficult.*

Functors for Non-Valency Relations



- effective root of an independent clause
- coordination, apposition

APPS

*Právo je souhrnem norem, to jest předpisů, zákazů a sankcí.
Law is a collection of norms, i.e. regulations,
prohibitions and sanctions.*

ODS (Občanská demokratická strana)

Božena Němcová _ autorka Babičky

Božena Němcová _ the author of Babička

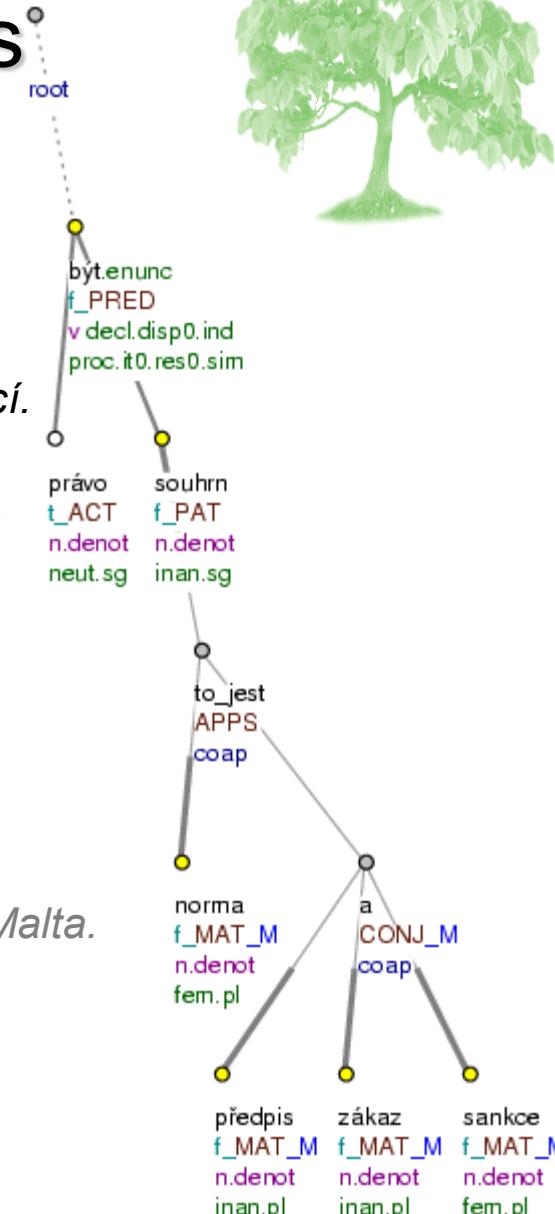
Morová rána _ Skuhravý zraněn.

Catastrophe _ Skuhravý injured

Labe/Elbe.

Tomu odpovídala cílová místa _ Kypr, Kréta, Malta.

This was reflected by the destinations _ Cyprus, Crete, Malta.





Functors for Non-Valency Relations

- effective root of an independent clause
- coordination, apposition
- **complex predicates, multiword expressions, phrasemes**

CPHR ... a part of compound predicate ... 'light verb' + noun

Dostali rozkaz nevycházet ze stanů.

They received a command not to leave their tents.

Učinil rozhodnutí.

He made a decision.

Je třeba odejít.

It is necessary to leave.

BUT: verbonominal predicate with copula *být*

Kočka je savec.PAT

The cat is a mammal.PAT

DPHR ... (a dependent part of) a phraseme

Jde mi na nervy.

He gets on my nerves.

Chodil křížem.DIR2 krážem.

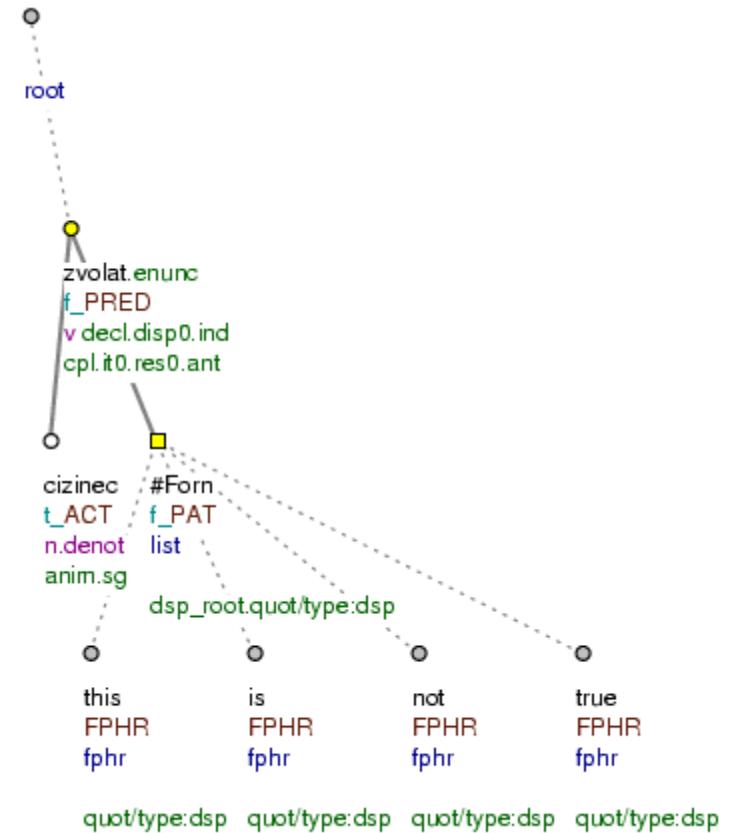
lit: He was walking criss cross.



Functors for Non-Valency Relations

- effective root of an independent clause
- coordination, apposition
- **complex predicates, multiword expressions, phrasemes**

FPHR *Cizinec zvolal: "This is not true."* *The foreigner shouted: "This is not true".*





Functors for Non-Valency Relations

- effective root of an independent clause
- coordination
- complex predicates, multiword expressions, phrasemes
- **rhematizers; conjunction modifiers** (see TFA later)

ATT	<i>Je to <u>bohudíky</u> za námi!</i> <i>Vypovědět ji <u>prostě</u> nelze.</i> <i>To je <u>fakticky</u> zlé.</i>	<i>Is it <u>thank God</u> over!</i> <i>It is <u>simply</u> impossible to expel it.</i> <i>That is <u>really</u> bad.</i>
INTF	<i>To <u>on</u> Jirka ještě spí.</i>	<i>lit: <u>Well</u>, Jirka still is still sleeping.</i>
MOD	<i><u>Pravděpodobně</u> přijdeme.</i> <i>Vím <u>jistě</u>, že Praha mě poznamená.</i>	<i>We will <u>probably</u> come.</i> <i>I know <u>for sure</u> that Prague will affect me.</i>
PREC	<i>Jsem <u>tedy</u> šťasten.</i> <i>Ale to zatím není náš případ.</i>	<i>I am <u>therefore</u> happy.</i> <i><u>But</u> that is not our case so far.</i>

RHEM adverbial and particle expressions

On o tom jen nevěděl nic. *He only did not know anything about it.*

negative/affirmative expressions

Kdyby {#EmpVerb.COND} ano, pak by asi skončil ve vězení
If so then he would probably end up in prison.



Functors for Non-Valency Relations

- effective root of an independent clause
- coordination
- complex predicates, multiword expressions, phrasemes
- rhematizers; conjunction modifiers

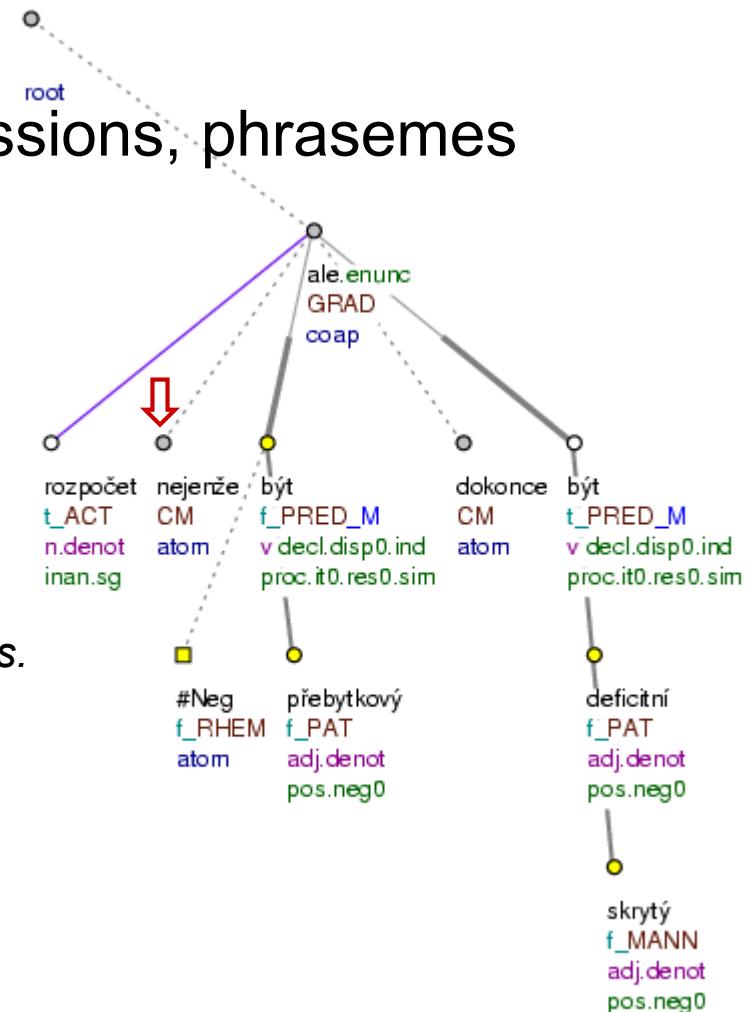
CM

*Rozpočet nejenže.CM není přebytkový,
ale.GRAD dokonce.CM je skrytě deficitní.*

*The budget not only isn't surplus,
it is even covertly deficit.*

*Kreslíme tužkou a.CONJ k tomu.CM ještě.CM
malujeme pastelkami.*

We draw with a pencil and moreover with colored pencils.





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