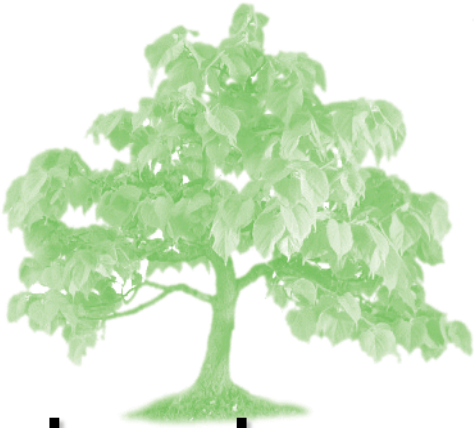

Prague Dependency Treebank (vs. Functional Generative Description) and HamleDT Family

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Prague Dependency Treebank

~ application of the FGD theory on the large set of Czech data

http://ufal.mff.cuni.cz/pdt2.0/

https://ufal.mff.cuni.cz/pdt3.0/

1. data
2. tools
3. documentation:
   - Guide, http://ufal.mff.cuni.cz/pdt2.0/
   - manuals for individual layers https://ufal.mff.cuni.cz/pdt3.0/documentation
   - survey of data formats and tools

- releases: 2.0 (2006), 2.5 (2011), 3.0 (2013)

Prague Dependency Treebank (cont.)

4 layers:

- word layer (w-layer)
- morphological layer (m-layer)
- analytical layer (a-layer)
- tectogrammatical layer (t-layer)

} ***layers of annotation***

layers of description	t,a,m-layer				a,m-layer
	train	dtest	etest	total	total
# documents	2 536	316	316	3 168	2 170
# sentences	38 737	5 228	5 477	**49 442**	**38 538**
# tokens	652 700	87 988	92 669	833 357	671 490

Prague Dependency Treebank (cont.)

- stand-off annotation
- manual annotation
  with a massive post-annotation consistency checking
- formats and tools:
  - TrEd … tree editor and viewer (Pajas, xxxx)
    http://ufal.mff.cuni.cz/~pajas/tred/index.html
  - PML data format (XML-based format)
    http://ufal.mff.cuni.cz/pdt2.0/doc/data-formats/pml/index.html
  - PML-TQ … search tool
    http://ufal.mff.cuni.cz/~pajas/pmltq/
- more during the practical sessions

PDT: w-layer

- layer of source texts (1991-1995)
  - Lidové noviny (daily newspapers)
  - Mladá fronta Dnes (daily newspapers)
  - Českomoravský Profit (business weekly)
  - Vesmír (scientific journal)
- part of the Czech National Corpus
- a sequence of ***tokens*** (word forms and punctuation marks)
- including errors, typing errors, bad segmentation, …

PDT: m-layer

- the sequence of tokens divided into sentences
- errors are corrected
- annotation:
  - ***morphological lemma***
  - ***morphological tag***
  - id
  - reference to w-layer
  - form (corrections: spelling errors, incorrectly split or joined words, …)
- manually annotated (parallel annotation)

PDT: m-layer

Některé kontury problému se však po oživením Havlovým projevem zdají být jasnější .
[Some contours of the problem seem to be clearer after the resurgence by Havel's speech.]

Form	Lemma	Morphological tag
Některé	*některý*	PZFP1----------
kontury	*kontura*	NNFP1-----A----
problému	*problém*	NNIS2-----A----
se	*se_^(zvr._zájmeno/částice)*	P7-X4----------
však	*však*	J^----------
po	*po-1*	RR--6----------
oživení	*oživení_^(*3it)*	NNNS6-----A----
Havlovým	*Havlův_;S_^(*3el)*	AUIS7M---------
projevem	*projev*	NNIS7-----A----
zdají	*zdát*	VB-P---3P-AA---
být	*být*	Vf--------A----
jasnější	*jasný*	AAFP1----2A----
.	*.*	Z:----------

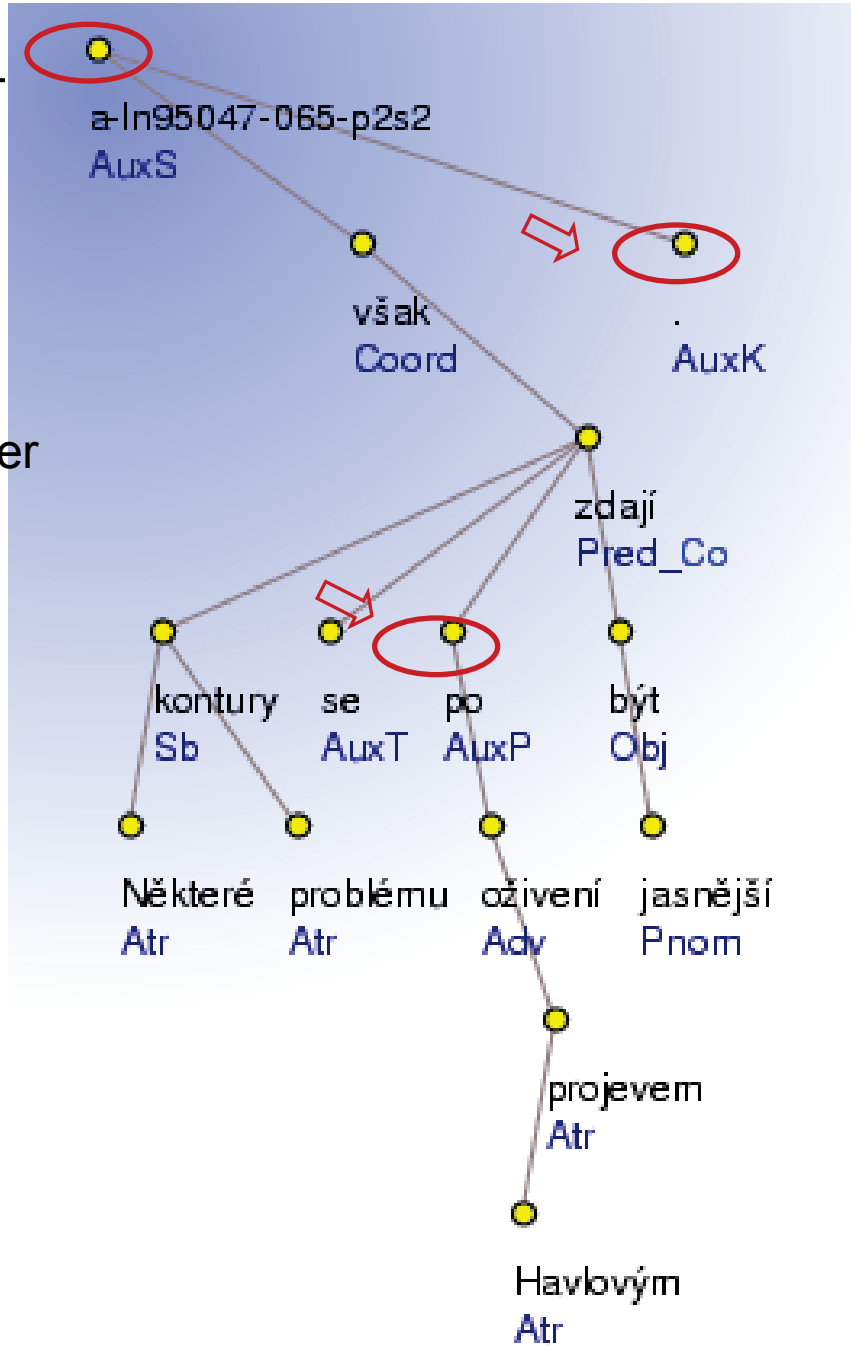
PDT: a-layer

- dependency tree
- one token from m-layer ~ one node incl. prepositions, punctuation … plus technical root
- relations ~ edges
  dependency, coordination, punctuation, …
- linear ordering ~ surface word order
- annotation:
  - ***analytical function*** (afun)
  - ***linear order***
  - is_member
  - is_parenthesis_root

  } coordination, apposition, parenthesis
  - id
  - reference to m-layer

PDT: a-layer

Některé kontury problému se však po oživením Havlovým projevem zdají být jasnější .
[Some contours of the problem seem to be clearer after the resurgence by Havel's speech.]



PDT: t-layer

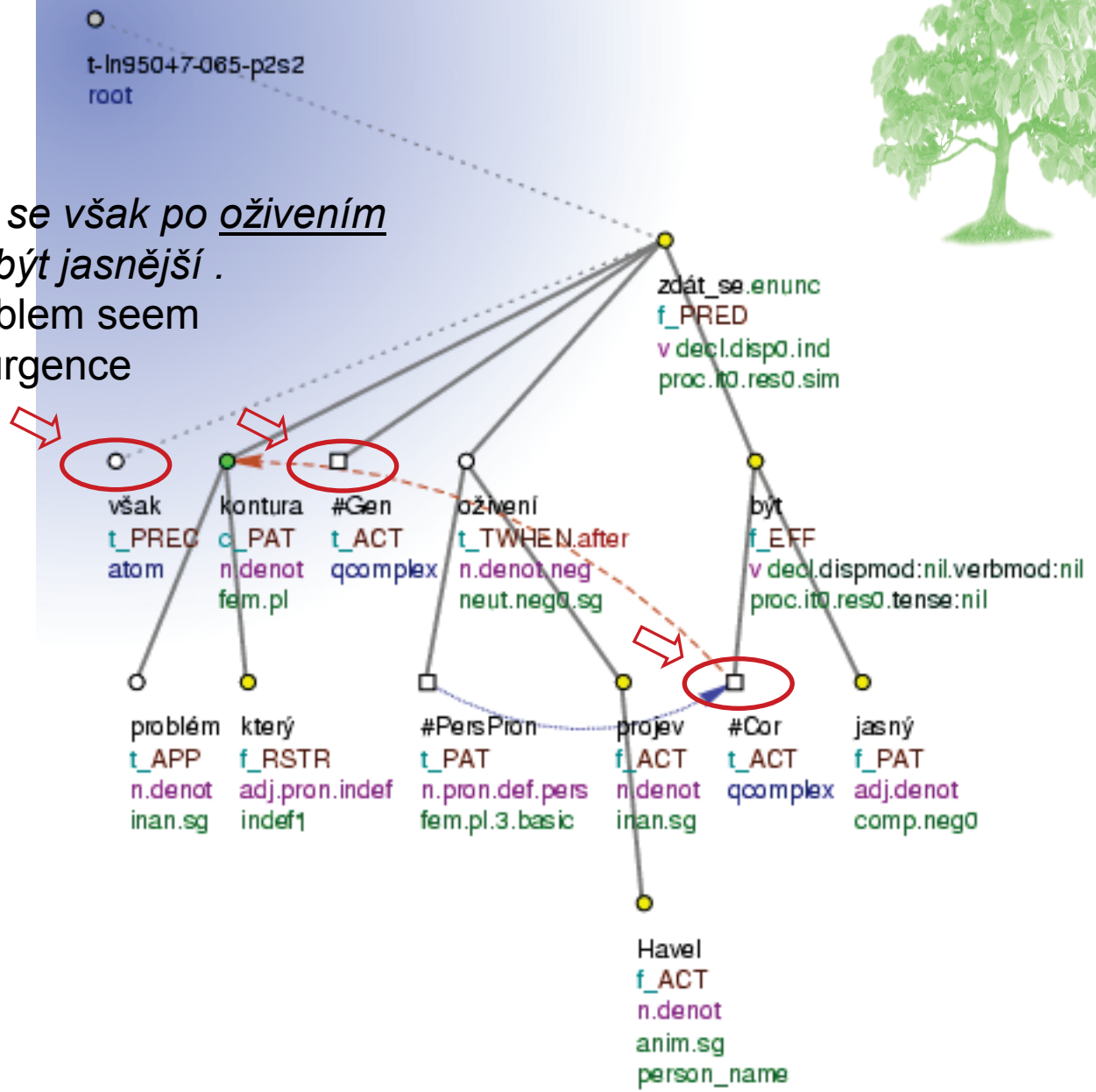
- tectogrammatical tree structure ~ dependency tree
  - nodes for auto-semantic/lexical words only
    syn-semantic/functional words as attributes of lexical words
    (plus technical root)
  - ellipses as nodes
  - edges ~ relations (dependency, coordination, others)
  - link to a valency lexicon for verbs and (certain types of) nouns
- topic-focus articulation (TFA)
  - linear ordering ~ deep word order
  - contextually bounded and unbounded nodes
- coreference

PDT: t-layer (basic attributes)

- tectogrammatical tree structure
  - ***t-lemma***
  - ***functor***
  - ***grammatemes*** (16 attributes starting with the prefix gram)
  - is_member
  - is_parenthesis_root
  - id
  - reference to a-layer
  - ...
- topic-focus articulation (TFA)
  - deepord
  - tfa
- coreference
  - coref_text.rf
  - coref_gram.rf
  - ...

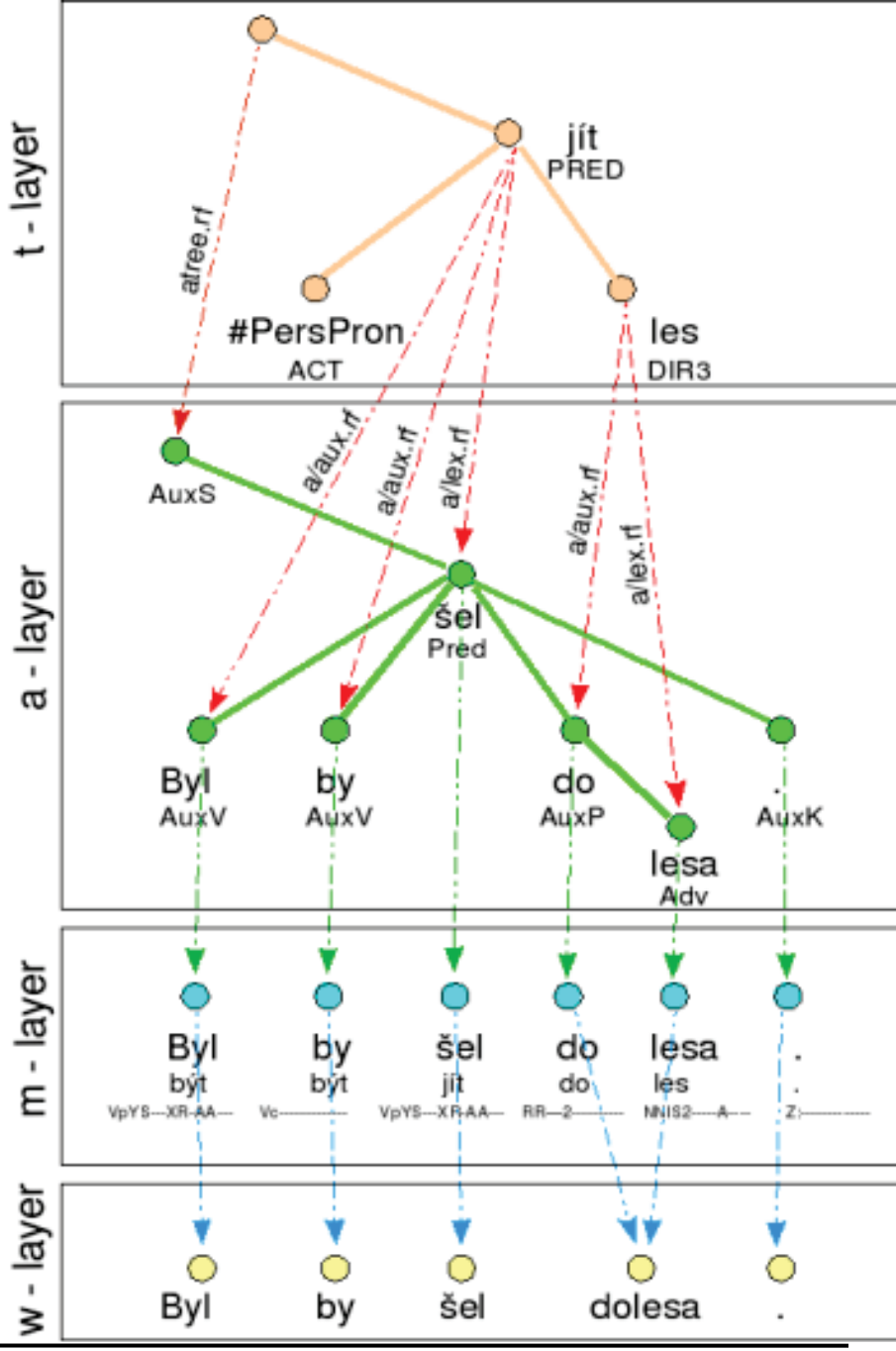
PDT: t-layer

Některé kontury problému se však po oživením Havlovým projevem zdají být jasnější .
[Some contours of the problem seem to be clearer after the resurgence by Havel's speech.]

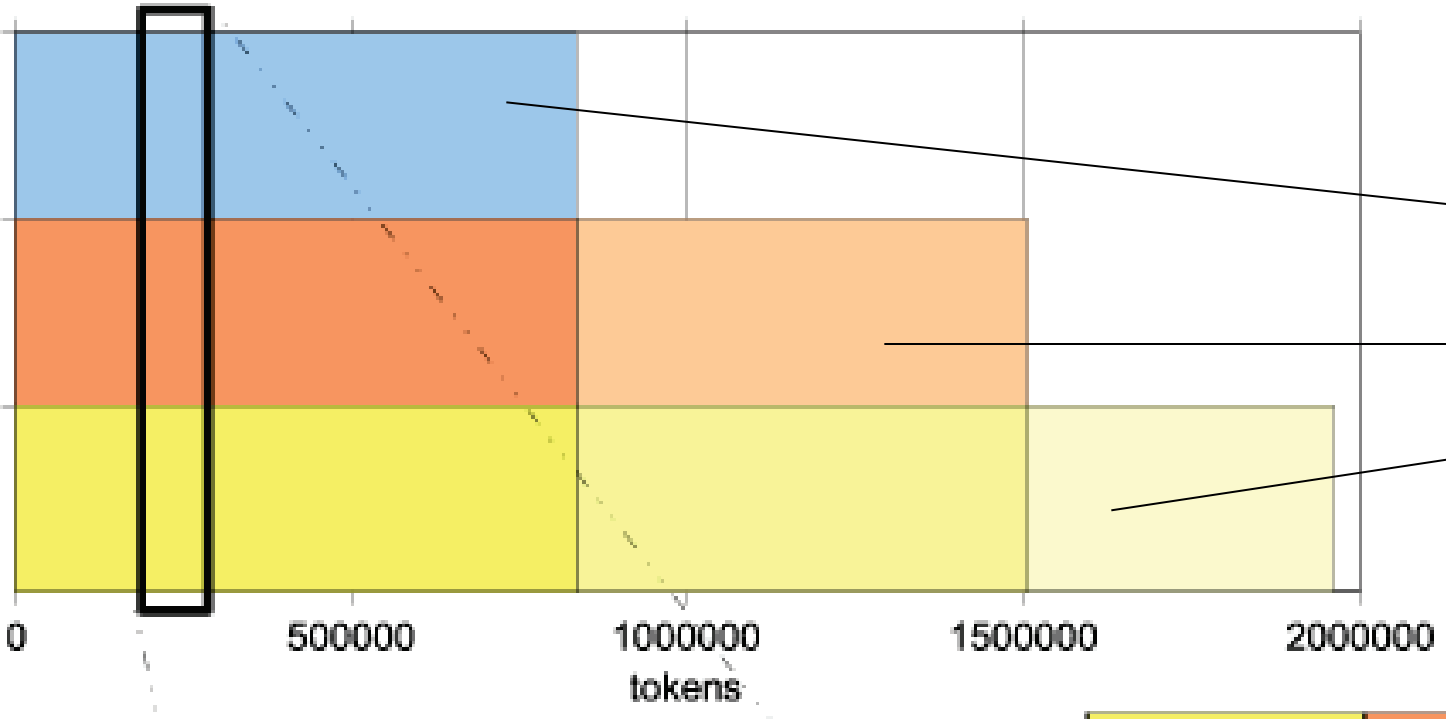


Linking the layers

- references ***from a higher layer to a lower layer***:
  - t-layer → a-layer
  - a-layer → m-layer
  - m-layer → w-layer
- ***1:1*** correspondence between nodes of the ***m-*** and ***a-layers***

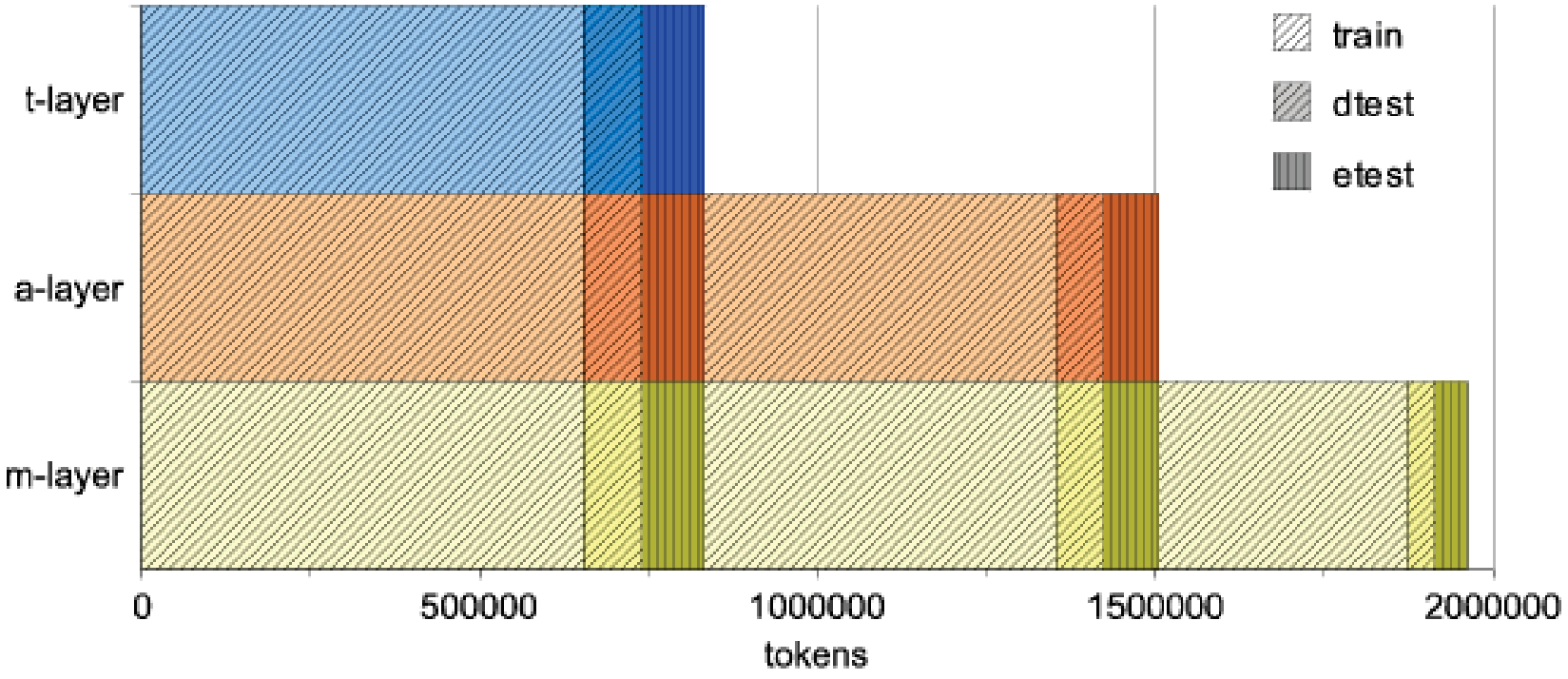


PDT: Division of the data to layers

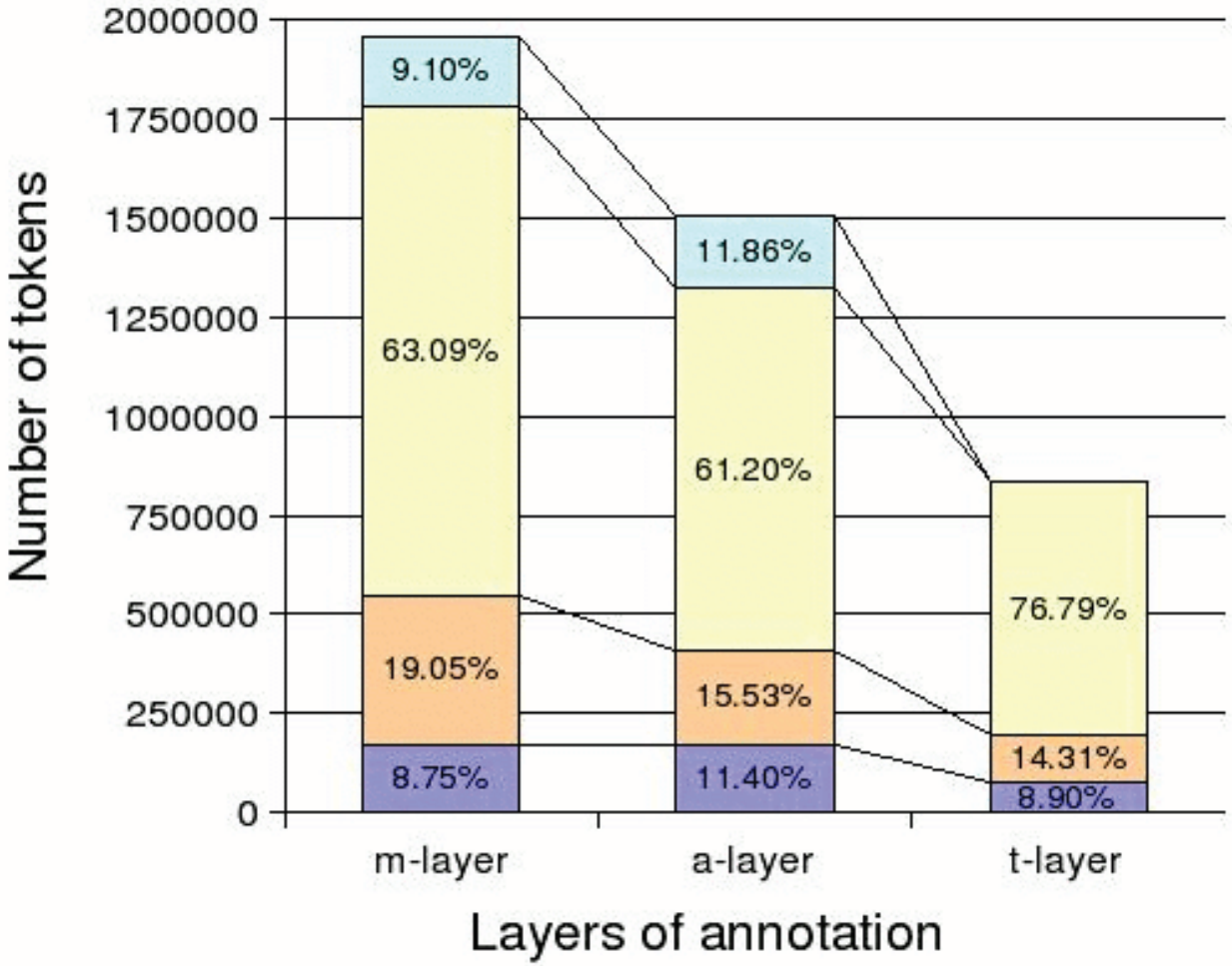


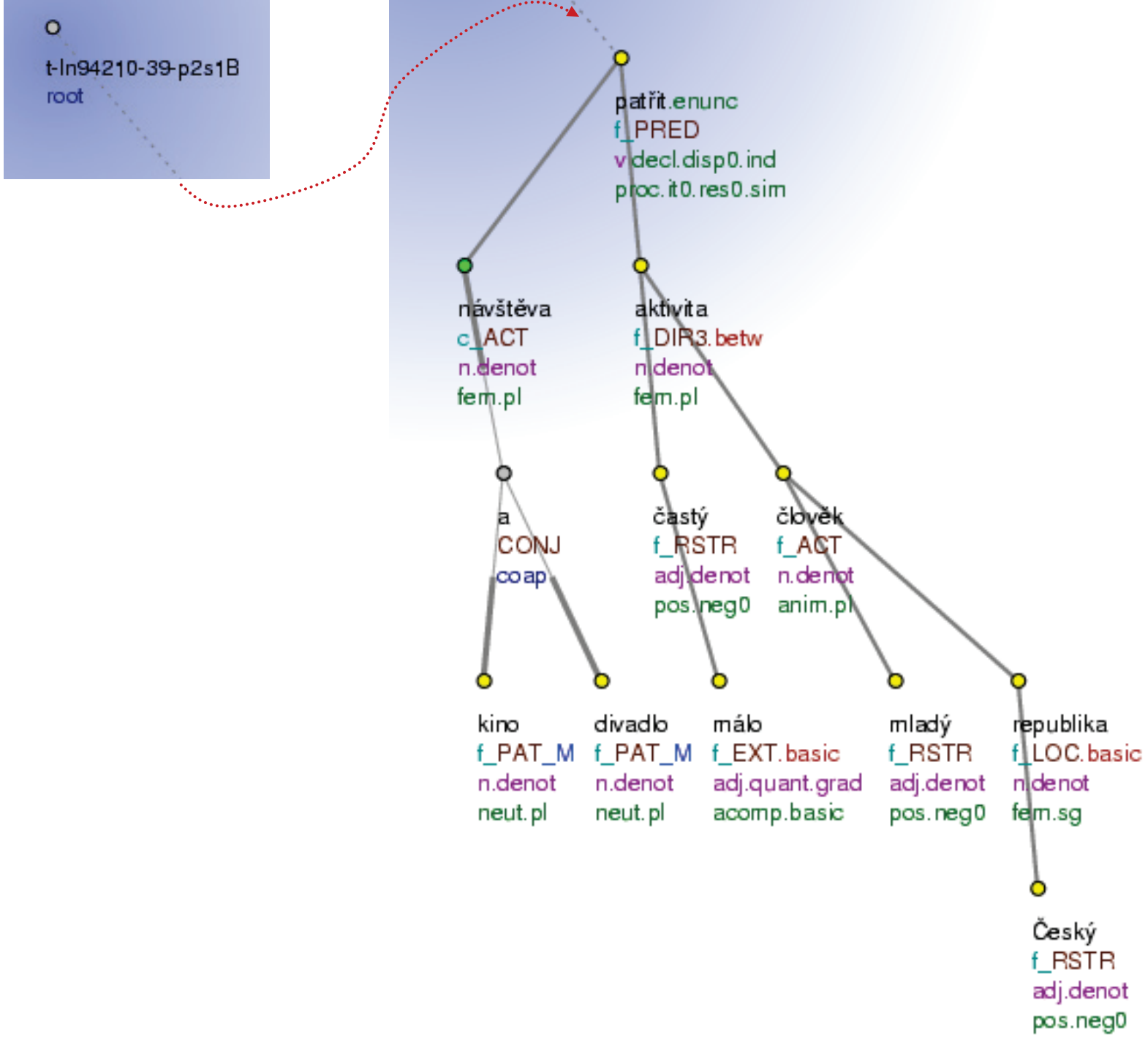
ln94206_1.m.gz + ln94206_1.w.gz	ln94206_1.a.gz	ln94206_1.t.gz
ln94206_2.m.gz + ln94206_2.w.gz	ln94206_2.a.gz	ln94206_2.t.gz
ln94206_3.m.gz + ln94206_3.w.gz	ln94206_3.a.gz	ln94206_3.t.gz

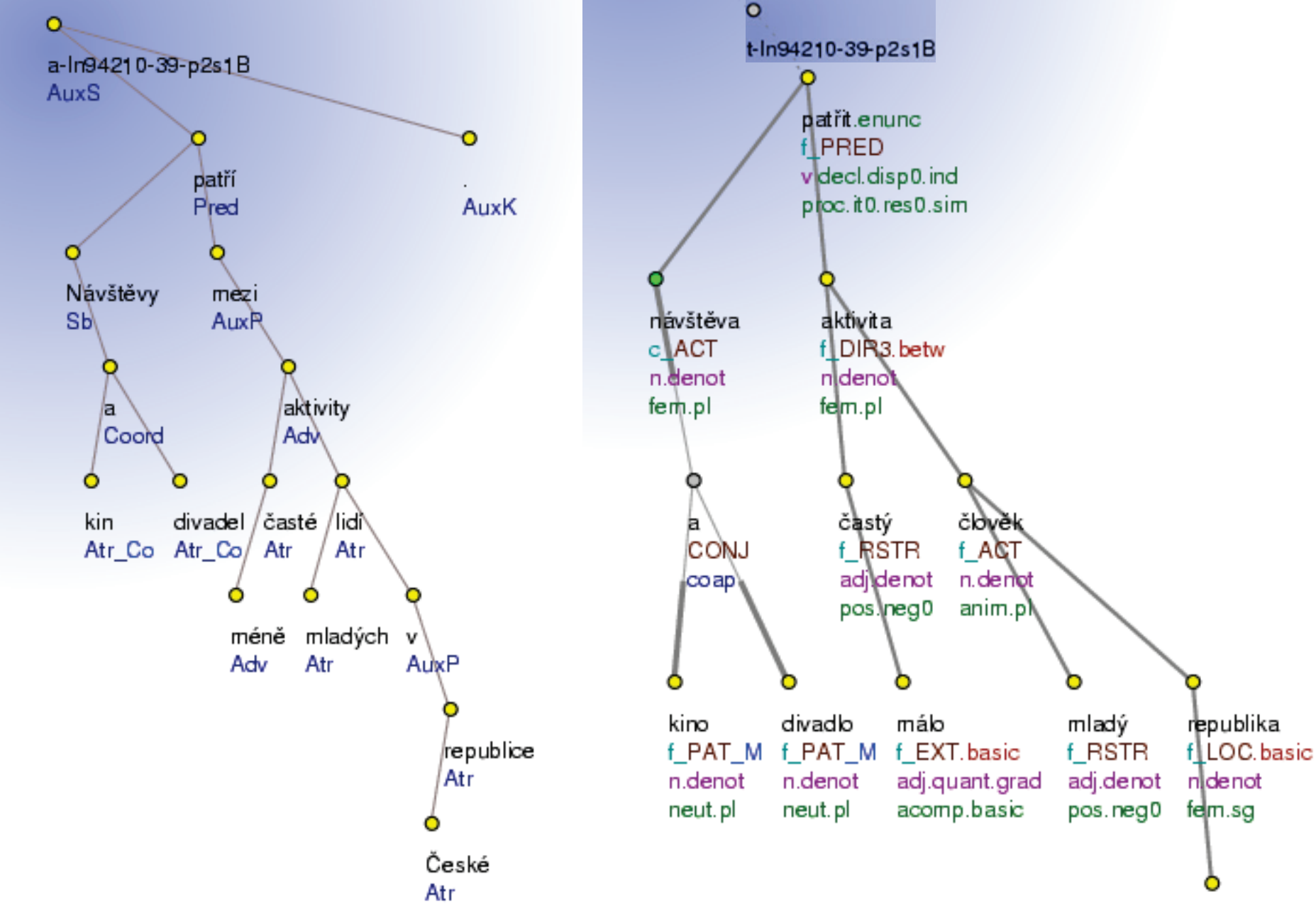
PDT: Division of the data into training and test sets



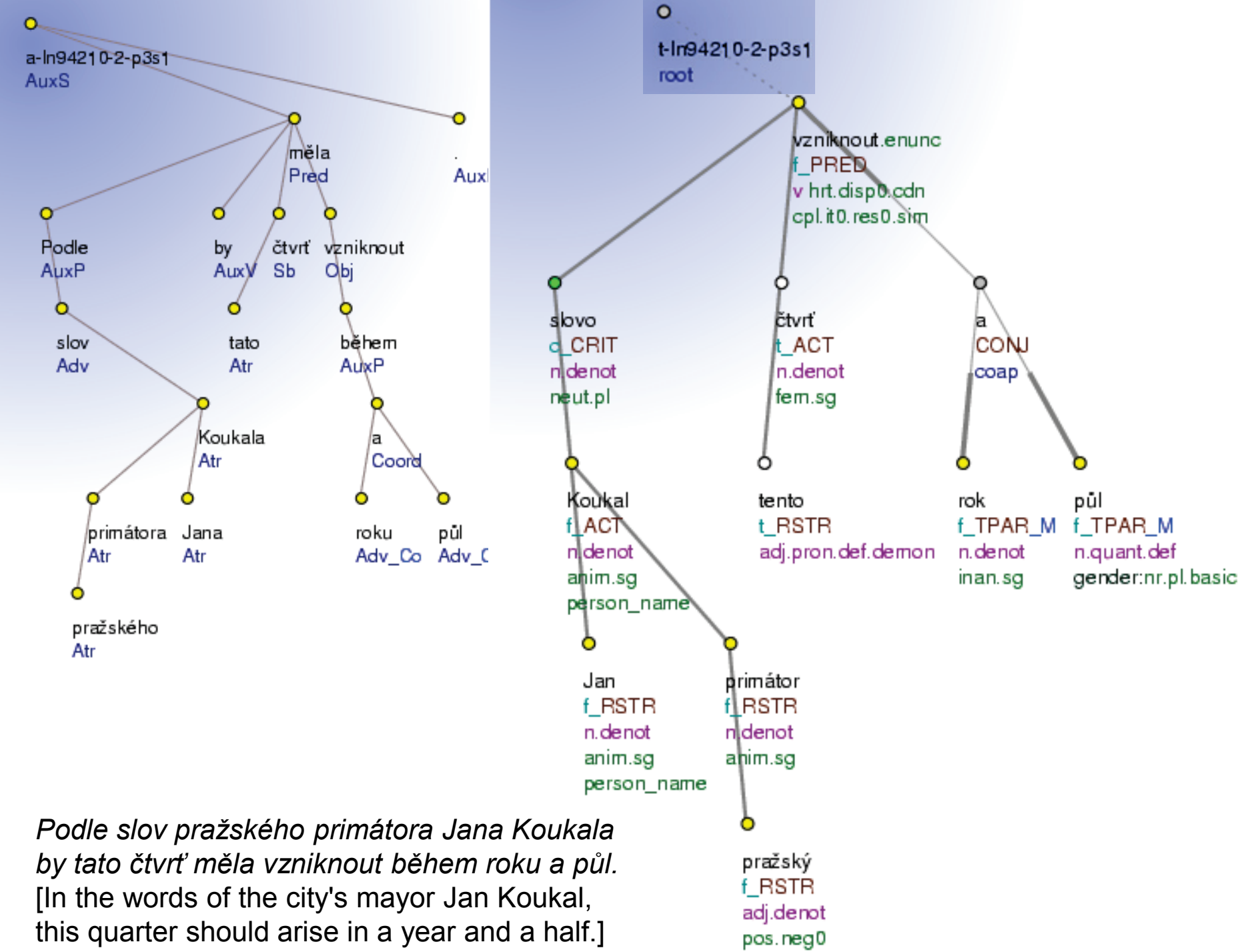
PDT: Number of tokens from the particular sources




t-ln94210-39-p2s1B
root
patřit.enunc
f_PRED
v.decl.disp0.ind
proc.it0.res0.sim
návštěva
c_ACT
n.denot
fem.pl
aktivita
f_DIR3.betw
n.denot
fem.pl
a
CONJ
coap
častý
f_RSTR
adj.denot
pos.neg0
člověk
f_ACT
n.denot
anim.pl
kino
f_PAT_M
n.denot
neut.pl
divadlo
f_PAT_M
n.denot
neut.pl
málo
f_EXT.basic
adj.quant.grad
acomp.basic
mladý
f_RSTR
adj.denot
pos.neg0
republika
f_LOC.basic
n.denot
fem.sg
Český
f_RSTR
adj.denot
pos.neg0

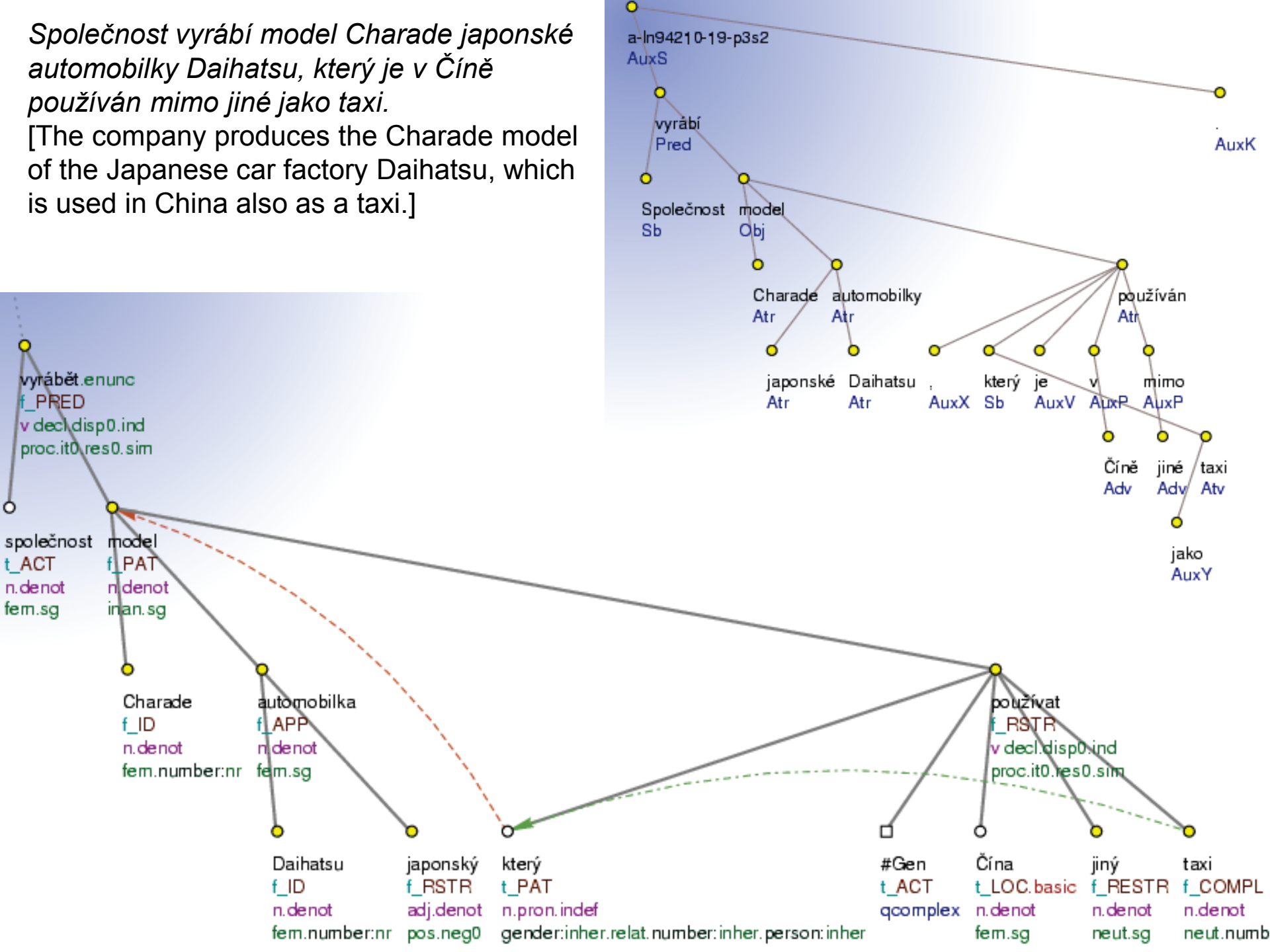


Návštěvy kin a divadel patří mezi méně časté aktivity mladých lidí v České republice.
[Attending cinemas and theaters belongs to less frequent activities of young people in the Czech republic.]



Podle slov pražského primátora Jana Koukala by tato čtvrť měla vzniknout během roku a půl.
[In the words of the city's mayor Jan Koukal, this quarter should arise in a year and a half.]

Společnost vyrábí model Charade japonské automobilky Daihatsu, který je v Číně používán mimo jiné jako taxi.
[The company produces the Charade model of the Japanese car factory Daihatsu, which is used in China also as a taxi.]



Differences between FGD and PDT

Differences between FGD and PDT

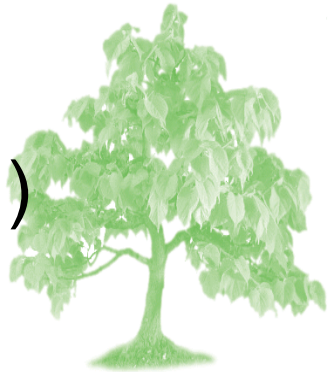
FGD	PDT
• tectogrammar/deep syntax	• t-layer (tectogrammatical l.)
• surface syntax	• a-layer (analytical l.)
• morphematics	• m-layer (morphological l.)
• morphonology	• w-layer (word layer)
• phonology	

structural layers

reasons

- analysis vs. synthesis/generation ⇨ richer information
- technical reasons (financial, temporal restrictions, implementation)

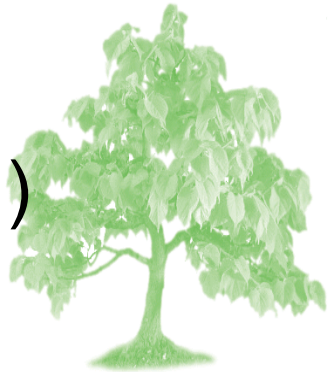
Differences between FGD and PDT (cont.)



morphematics (FGD) vs. *m-layer* (PDT)

- morphemes for individual words are grouped
- grammatical categories ~ morphological tags
- annotated text is divided into sentences

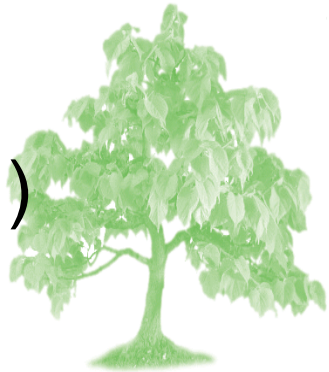
Differences between FGD and PDT (cont.)



structural layers

- technical root
- connecting constructions for coordination and apposition in PDT

Differences between FGD and PDT (cont.)



1. *surface syntax* (FGD) vs. *a-layer* (PDT)

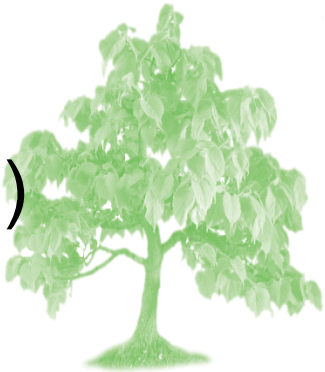
- each token of m-layer is represented by a node
  (incl. prepositions, auxiliary verbs, punctuation, …)

(vs. units corresponding to formemes)

⇨ edges for non-dependency relations
(other than coordination/apposition)

- function words (e.g., auxiliary verbs) usually below respective lexical words
- exception: prepositions, subordinating conjunctions as parents of lexical words

Differences between FGD and PDT (cont.)



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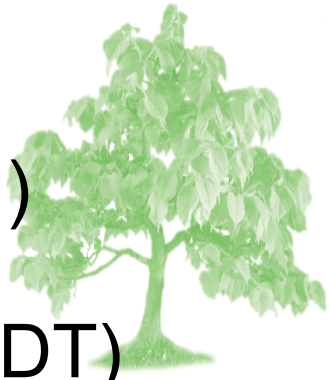
⇨ edges for non-dependency relations
(other than coordination/apposition)

- function words (e.g., auxiliary verbs) usually below respective lexical words
- exception: prepositions, subordinating conjunctions as parents of lexical words

- ellipses: elided words are not restored at a-layer

⇨ a word modifying an elided word as a child of the 'lowest' ancestor

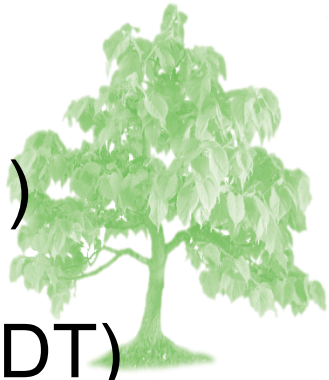
Differences between FGD and PDT (cont.)



2. *deep/tectogram*. syntax (FGD) vs. *t-layer* (PDT)

- core vs. periphery
  - specific constructions (direct speech, comparison)
- edges for non-dependency relations
  - syntactically unclear expressions
  - list structures
  - phrasemes
- info on the (non)realization in the surface sentence (is_generated)

Differences between FGD and PDT (cont.)



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  - syntactically unclear expressions
  - list structures
  - phrasemes
- info on the (non)realization in the surface sentence (is_generated)
- topic-focus articulation
- coreference
  - relative/ interrogative pronouns, personal pronouns (3rd person)
  - grammatical control, complement

Other treebanks: Prague dependency family

Prague Dependency Treebank

Other treebanks: Prague dependency family

Czech:

Prague Dependency Treebank and Discourse Treebank

1.0 (2001); 2.0 (2006); 2.5 (2011); 3.1 (2013)

http://ufal.mff.cuni.cz/pdt2.5/

Czech Academic Corpus 1.0 (2006), 2.0 (2008)

http://ufal.mff.cuni.cz/rest/CAC/doc-cac20/cac-guide/eng/html/index.html

- morphological annotation (652 000 tokens, 32 000 sentences)
- analytical annotation (493 000 tokens, 25 000 sentences)
- both written and spoken language
- manually annotated

Czech Legal Text

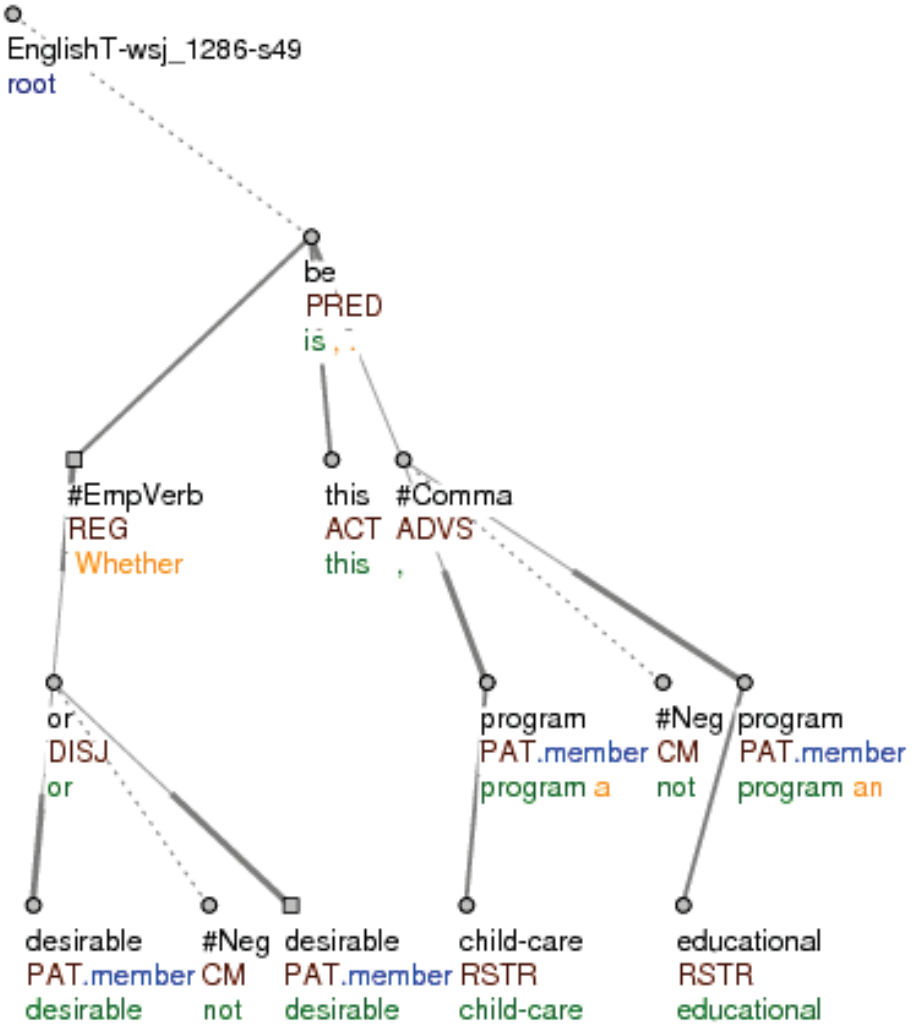
Prague Dependency Treebank of Spoken Czech (morphological)

http://ufal.mff.cuni.cz/pdtsc1.0/en/index.html

Other treebanks: Prague dependency family

Prague English Dependency Treebank 1.0 (2009)

- texts from the Wall Street Journal (Penn Treebank III)
- adaptation of the PDT-like annotation scheme to English
- tectogrammatical annotation
- 12 440 annotated and checked trees



Whether desirable or not,
this is a child-care program,
not an educational program.
(Wall Street Journal 1286/49)

Other treebanks: Prague dependency family

Prague Czech-English Dependency Treebank 1.0 (2004)

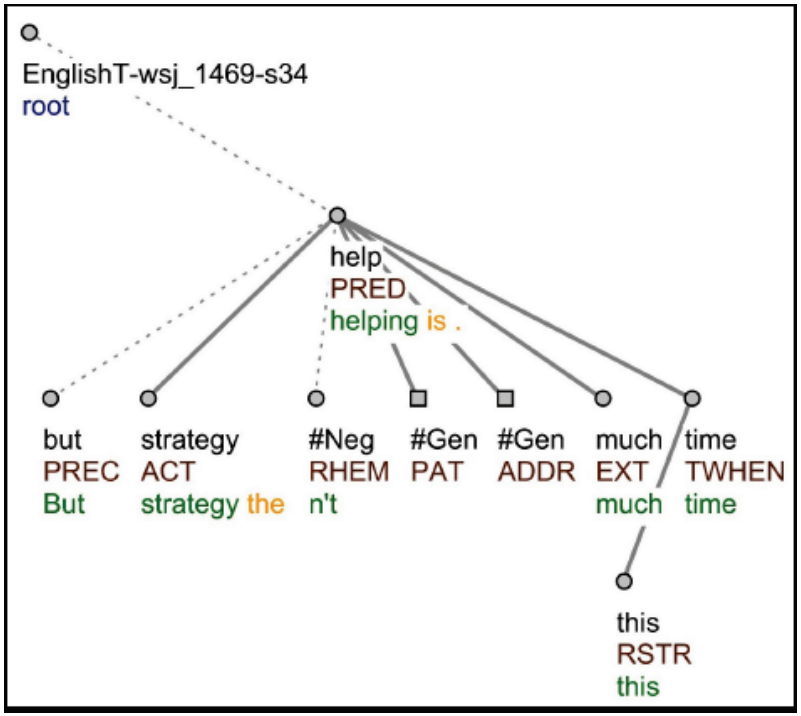
- Penn Treebank data (Wall Street Journal, 21 600 English sentences)
- human translators
- automatic conversions of Penn Treebank annotation into PDT-like annotation scheme (m-, a- and t-layers)
- plain text from Reader's Digest 1993-1996 (50 000 sentences)

- test data:
  - 515 sentence pairs
  - manually annotated on tectogrammatical level, Czech and English
  - retranslated from Czech to English by 4 different translation companies

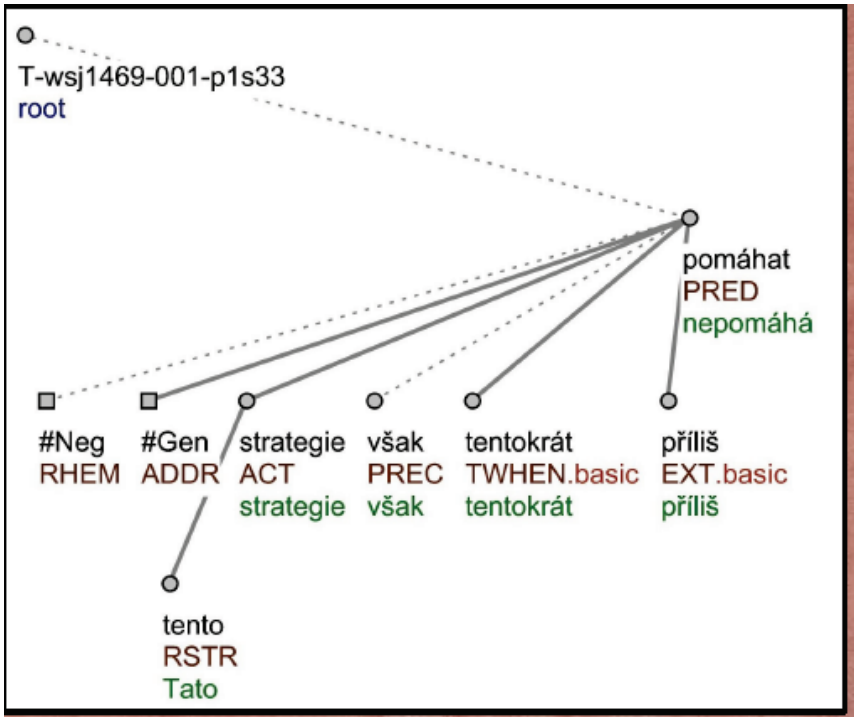
Other treebanks: Prague dependency family

Prague Czech-English Dependency Treebank 2.0

- Penn Treebank data
- manually annotated data (49 000 sentences)
- http://ufal.mff.cuni.cz/pcedt2.0/

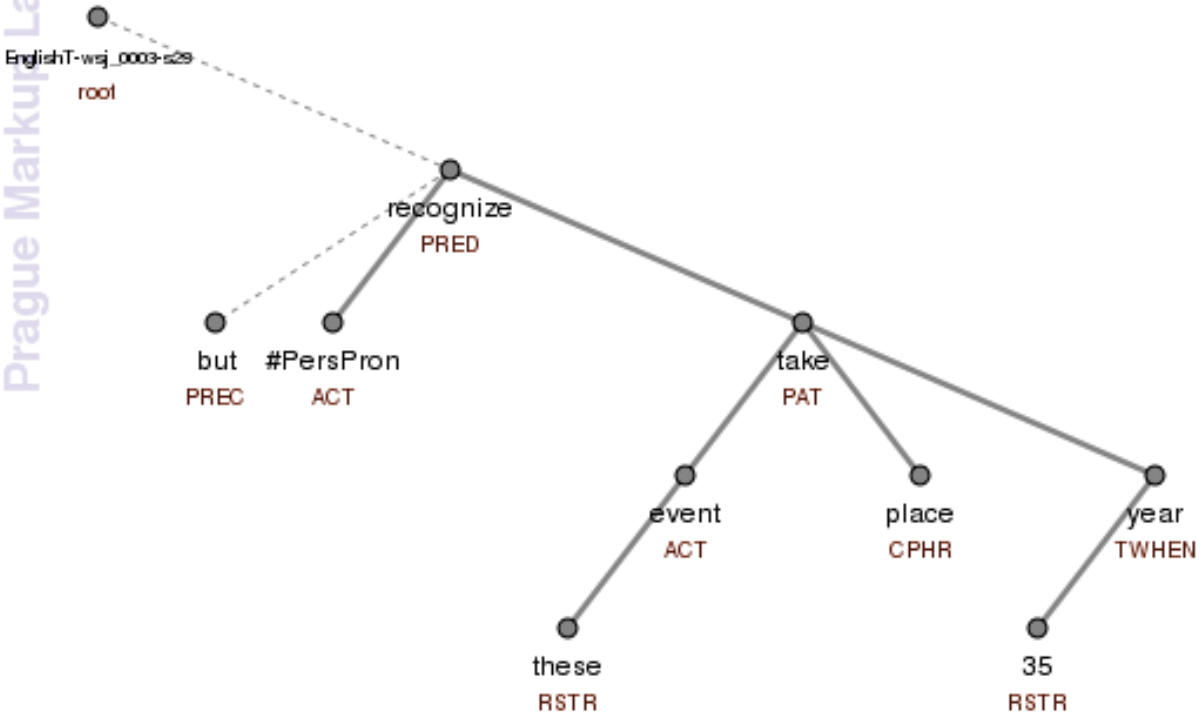


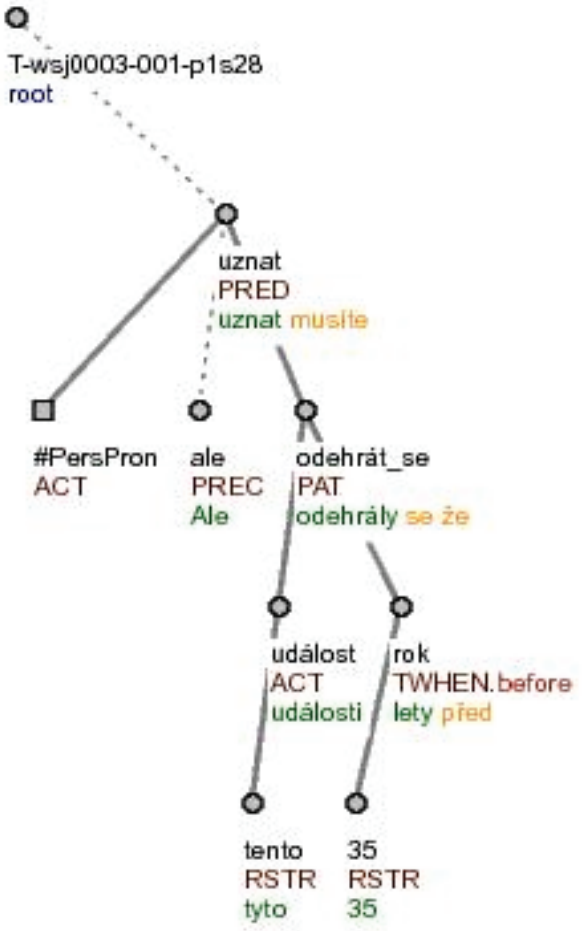
But the strategy isn't helping much this time.



Tato strategie však tentokrát příliš nepomáhá .

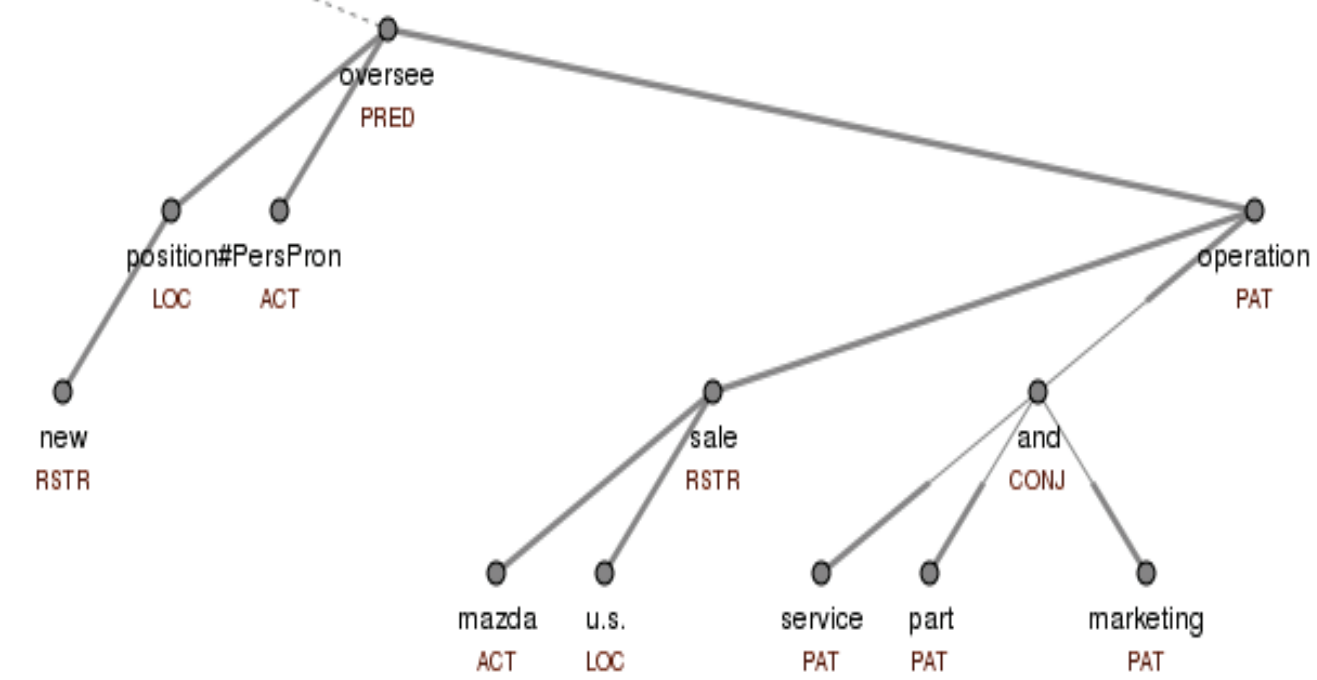
Prague Czech-English Dependency Treebank

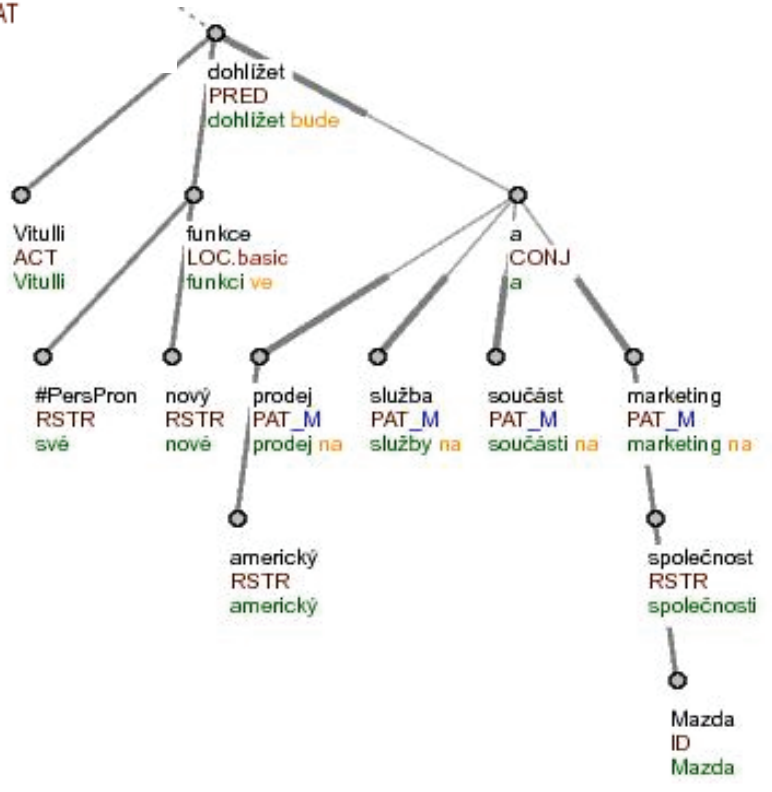




Ale musíte uznat, že se tyto události odehrály před 35 lety.

*But you have *-1 to recognize that these events took place 35 years ago.*



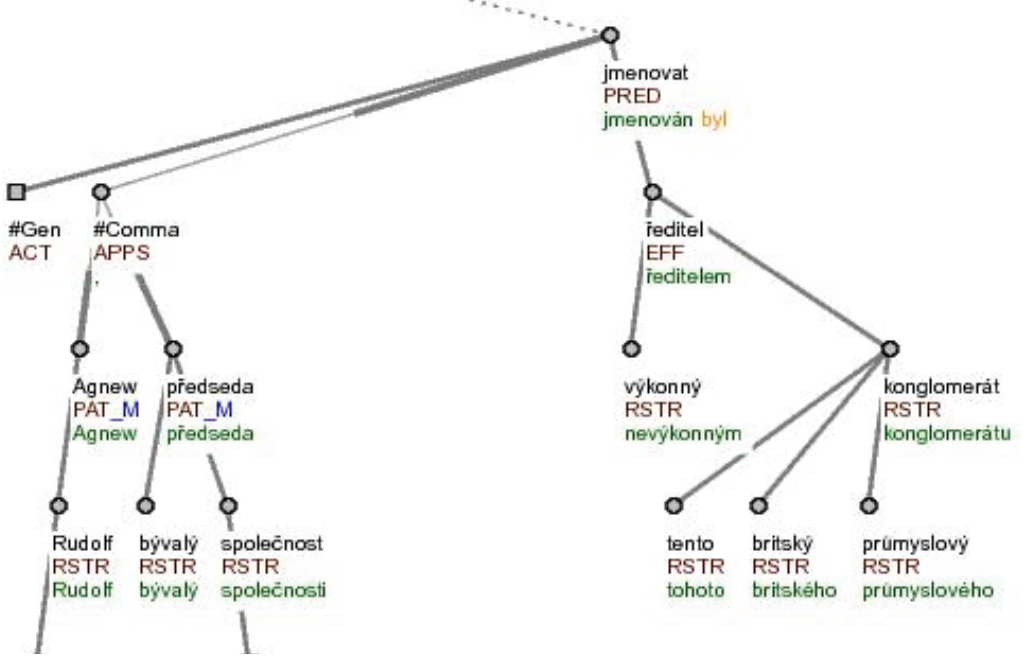


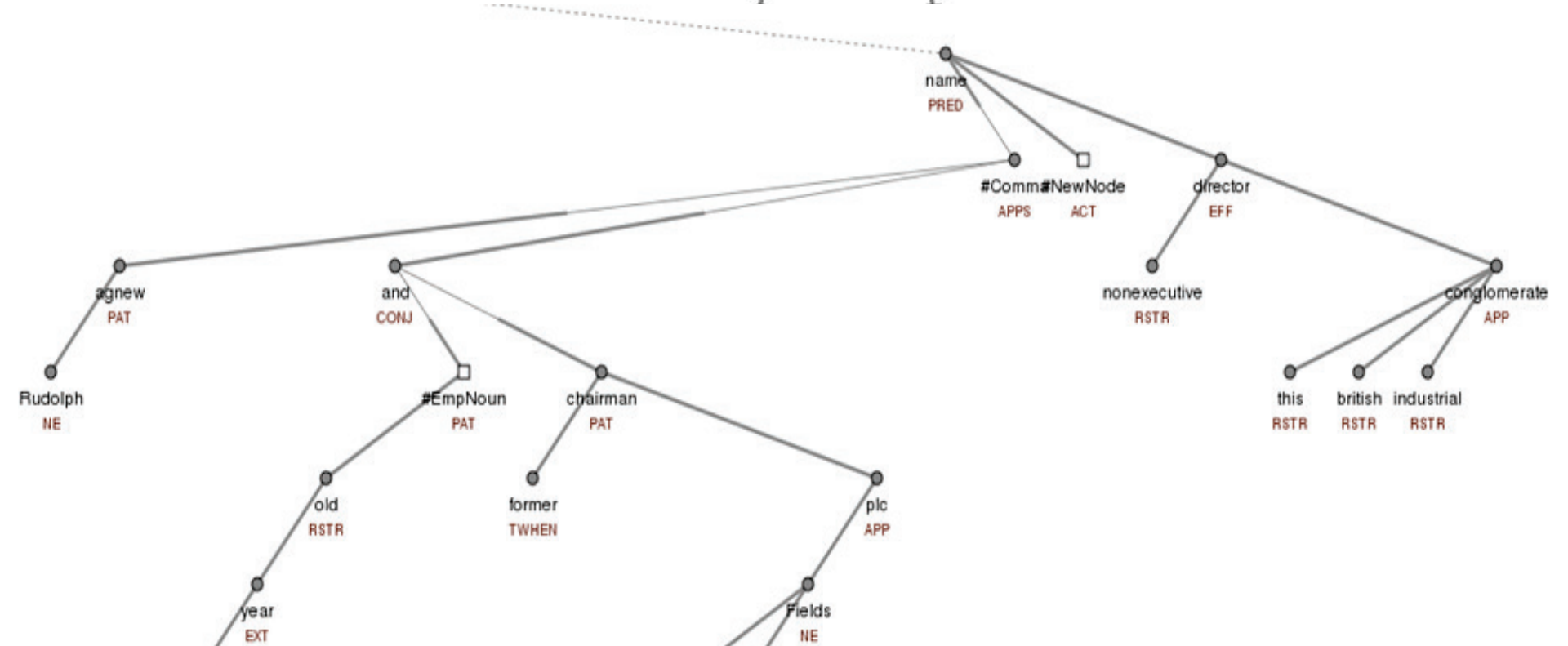
In the new position he will oversee Mazda 's U.S. sales, service, parts and marketing operations .

Vitulli bude ve své nové funkci dohlížet na americký prodej, služby, součásti a marketing společnosti Mazda.

Pětapadesátiletý Rudolf Agnew, bývalý předseda společnosti Consolidated Gold Fields PLC, byl jmenován nevýkonným ředitelem tohoto britského průmyslového konglomerátu.

*Rudolph Agnew , 55 years old and former chairman of Consolidated Gold Fields PLC , was named *-1 a nonexecutive director of this British industrial conglomerate.*





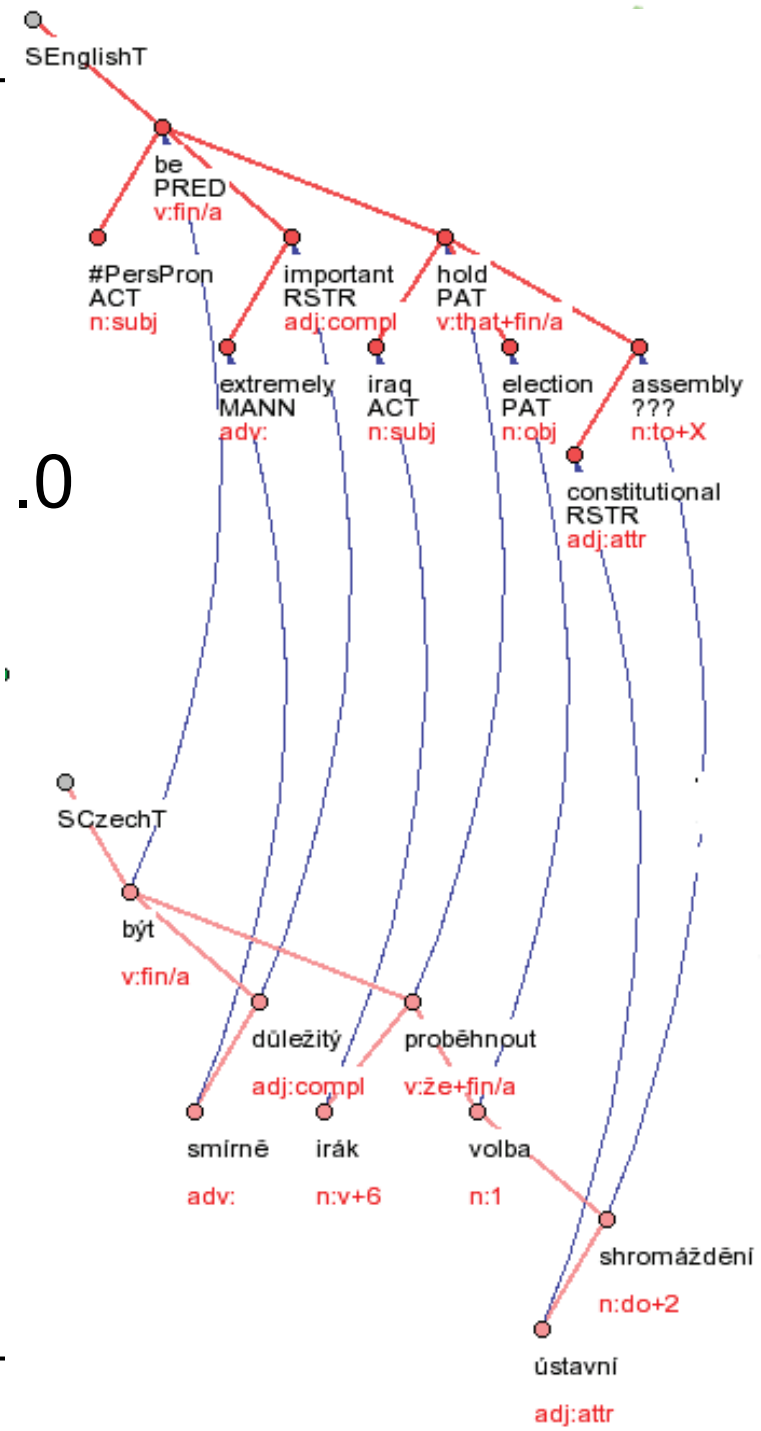
Other treebanks: Prague dependency family

Czech-English Parallel Corpus 1.0

(~15.0 M parallel sentences)

http://ufal.mff.cuni.cz/czeng/

- collected automatically
- annotated automatically
- European laws, subtitles, technical documentation, electronic books, newspapers, …



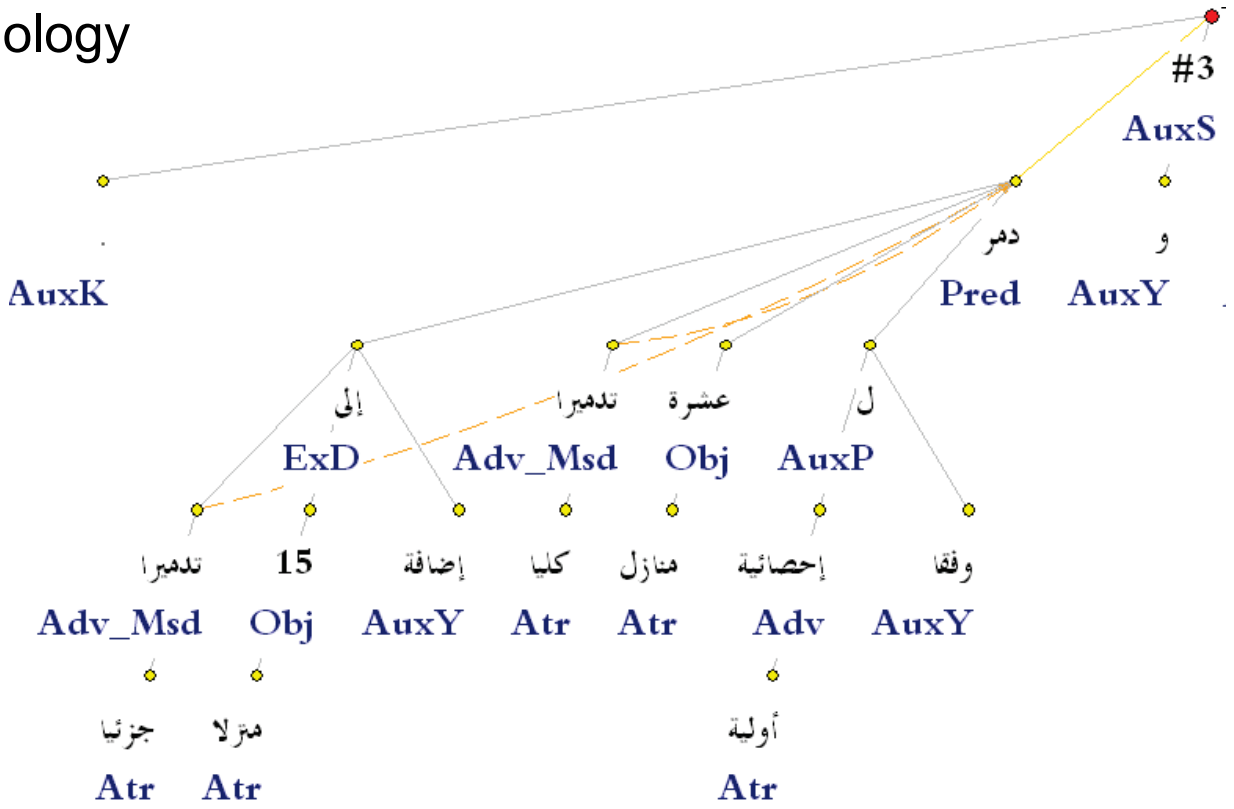
It is extremely important that Iraq held elections to a constitutional assembly.

Other treebanks: Prague dependency family

Prague Arabic Dependency Treebank 1.0 (2004)

http://ufal.mff.cuni.cz/padt/PADT_1.0/docs/index.html

- Functional Arabic Morphology
- analytical layer
  (about 130 000 tokens)
- tectogrammatical layer

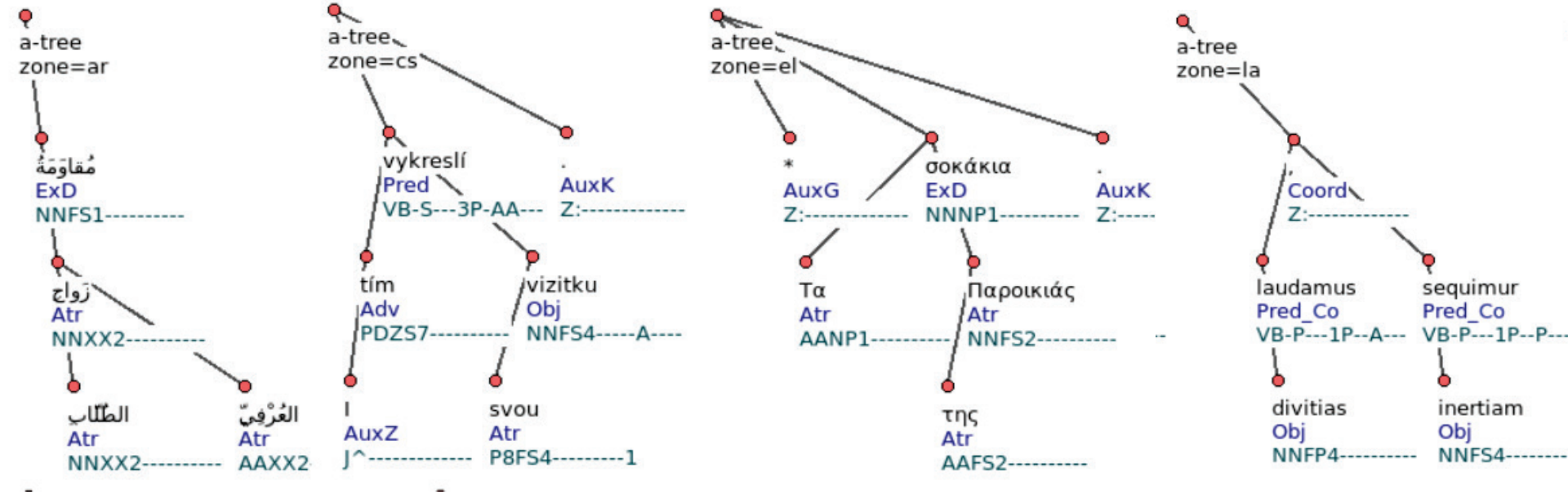


Other treebanks: Prague dependency family

HamleDT ~ a compilation of existing dependency treebanks (or dependency conversions of other treebanks), transformed so that they all conform to the same annotation style

36 languages, 42 treebanks in HamleDT 3.0 (2015)

http://ufal.mff.cuni.cz/hamledt/



Other treebanks: Prague dependency family

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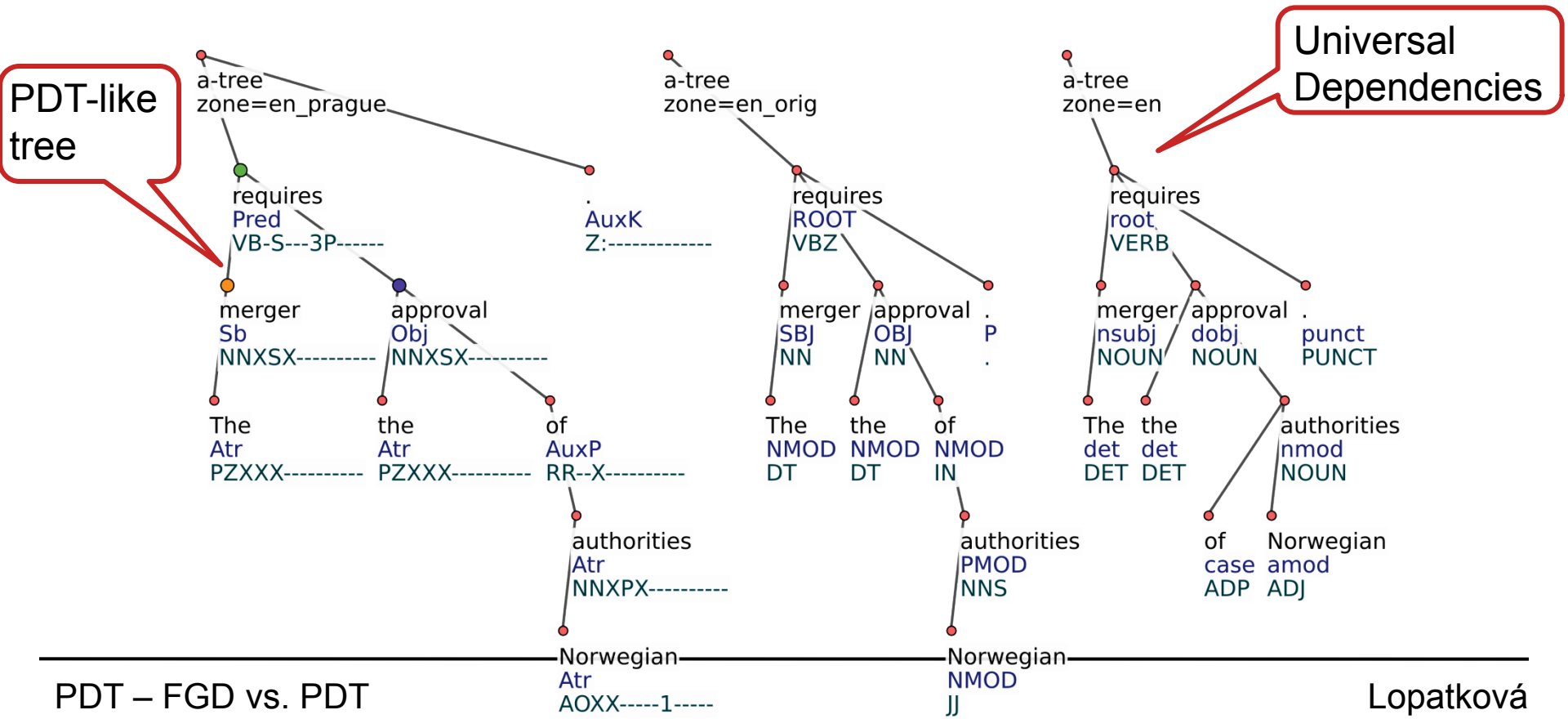
(or dependency conversions of other treebanks),
transformed so that they all conform to the same annotation style



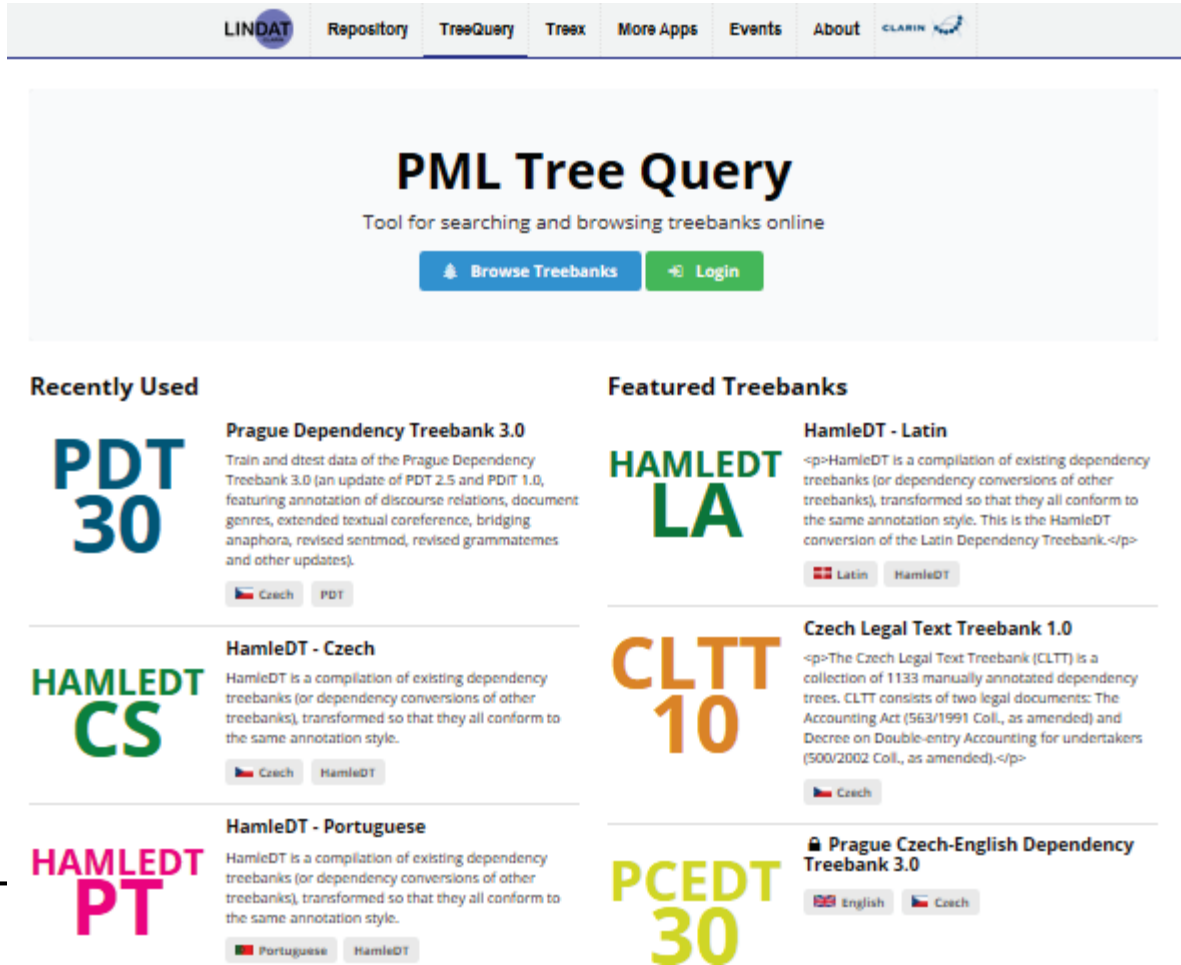
How to access / obtain dependency treebanks

- as a web service

  https://lindat.mff.cuni.cz/services/pmltq/#!/home

  LINDAT/Clarin Repository

  PML-TQ search tool



How to access / obtain dependency treebanks

- as a web service

  https://lindat.mff.cuni.cz/services/pmltq/#!/home

  LINDAT/Clarin Repository

  PML-TQ search tool

  more stable, quick

- via Tred instalation

  PML-TQ search tool

  graphical interface for creating queries (practical lectures)

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- Sgall, P., Hajičová, E., Panevová, J. (1986) *The Meaning of the Sentence in Its Semantic and Pragmatic Aspects.* Reidel, Dordrecht.
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