Harmonization of Dependency Trees

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Harmonization of Dependency Tree Style

- Universal Dependencies
  - Solved problem?
  - Almost. But not completely.

- Transformations sometimes needed for learnability experiments

- Transformations trivial?
  - Not necessarily...
Two known Russian historians
Danish Dependency Treebank

In an authoritarian regime

mod

mod

mod

mod

nobj

sp

adp

det

an

adj

nc

noun

Harmonization of Dependency Trees
During celebrations criticized

Adpositions
Adpositions

in diesem Jahr kommen in this year come

APPR PDAT NN VVINF
ADP DET NOUN VERB

MO OC
NK NK

det obl

case xcomp

Harmonization of Dependency Trees
Adpositions

Lahore in closed

Harmonization of Dependency Trees
Ельцин считал что стране нужен экономист

Yeltsin realized that by-country needed economist
hasta que se fijen los comicios

Subordinate Clauses

Harmonization of Dependency Trees
Verb Groups

 Una sala ha dovuto essere sgomberata a room has had to-be evacuated

 Harmonization of Dependency Trees
Verb Groups

Op_grond_van kan bijvoorbeeld worden vastgesteld of
Based-on can for-example be determined whether

Prep_N_Prep V Adv V V Conjunction
ADP NOUN ADP AUX ADV AUX VERB SCONJ

Harmonization of Dependency Trees
Coordination: Mel’čuk [en]
Coordination: Mel’čuk [de]

Äpfel, Orangen und Zitronen
äpplen, apelsiner och citroner
リンゴとオレンジとレモン
ringo to orenji to remon
Coordination: Mel’čuk [tr]

Harmonization of Dependency Trees
Coordination: Prague [cs]

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 jablka, pomeranče a citróny
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Harmonization of Dependency Trees
Coordination: Prague [te]
Coordination: Half-Prague [ro]

Harmonization of Dependency Trees
ябълки, портокали и лимони
jabălki, portokali i limoni
Coordination: Half-Stanford [da]

æbler, appelsiner og citroner
Coordination: Tesnière [hu]

Harmonization of Dependency Trees
Interaction of Structures in Prague

vlaky do a z Prahy nebo od Liberec
trains to and from Prague or from Liberec
Interaction of Structures in Prague

vlaky trains

do a z Prahy

nebo od Liberec

trains to and from Prague or from Liberec
Interaction of Structures in Prague

vlaky do a z Prahy nebo od Liberec
trains to and from Prague or from Liberec
Interaction of Structures in Prague

- vlaky (trains)
- to
- a
- and
- from
- Prahy (Prague)
- nebo (or)
- od (from)
- Liberec

Harmonization of Dependency Trees
Interaction of Structures in Prague

VLAKY DO A Z PRAHY NEBO OD LIBERCE TRAINS TO AND FROM PRAGUE OR FROM LIBEREC
Interaction of Structures in Prague

trains to and from Prague or from Liberec

Harmonization of Dependency Trees
Interaction of Structures in Prague

vlaky do a z Prahy nebo od Liberce

trains to and from Prague or from Liberec
Interaction of Structures in Prague

vlaky do a z Prahy nebo od Liberec
trains to and from Prague or from Liberec
Interaction of Structures in Prague

Trains to and from Prague or from Liberec.
Interaction of Structures in Prague

Trains to and from Prague or from Liberec.
Round-Trip: Shared Dependents

Harmonization of Dependency Trees
Round-Trip: Nested Coordination

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jablka a hrušky nebo citróny
apples and pears or lemons
```

Harmonization of Dependency Trees
Round-Trip: Auxiliary Verbs

he could have seen her

Pred
Sb
he

AuxV
aux
nsubj

Obj
have

aux

Obj
seen

Obj
her

root

obj

???
Phrase vs. Dependency Trees

Harmonization of Dependency Trees
Phrase vs. Dependency Trees

- **Phrase trees**
  - Usually do not mark the **head**
  - May not mark the **function** of the constituent in the superordinate constituent
Phrase vs. Dependency Trees

- Phrase trees
  - Usually do not mark the **head**
  - May not mark the **function** of the constituent in the superordinate constituent

- Dependency trees
  - Do not show **nonterminals** (phrase types)
    - Nor any other phrase-level features
  - Do not show “how the sentence is generated” (order, recursion, **proximity** of constituents)
Example

Harmonization of Dependency Trees
Dick Darman, call your office.
Prague Tectogrammatical Layer: Ellipsis

He will meet Mary today and (he) (will meet) Clara tomorrow
he will meet Mary today and (he) (will) (meet) Clara tomorrow