Syntax in Universal Dependencies

Daniel Zeman

April 13, 2023
Same Annotation
• Same things annotated same way across languages...
• ... while highlighting different coding strategies
Manning’s Law

The secret to understanding UD is to realize that the design is a very subtle compromise between approximately 6 things:

1. UD must be satisfactory on linguistic analysis grounds for individual languages.
2. UD must be good for linguistic typology, i.e., providing a suitable basis for bringing out cross-linguistic parallelism across languages and language families.
3. UD must be suitable for rapid, consistent annotation by a human annotator.
4. UD must be easily comprehended and used by a non-linguist, whether a language learner or an engineer with prosaic needs for language processing. ... it leads us to favor traditional grammar notions and terminology.
5. UD must be suitable for computer parsing with high accuracy.
6. UD must support well downstream language understanding tasks (relation extraction, reading comprehension, machine translation, ...)

It’s easy to come up with a proposal that improves UD on one of these dimensions. The interesting and difficult part is to improve UD while remaining sensitive to all these dimensions.
Same Thing Same Way

George killed the dragon

PROPN VERB DET NOUN
Same Thing Same Way

George killed the dragon

Mharaigh Seoirse an dragan

Syntax in Universal Dependencies

Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies  Core vs. Oblique
Same Thing Same Way

George killed the dragon

Mharaigh Seoirse an dragan

Jorge mató al dragón
Same Thing Same Way

George killed the dragon

Mharaigh Seoirse an dragan

Jorge mató a el dragón

Syntax in Universal Dependencies
Same Thing Same Way

George killed the dragon

Mharaigh Seoirse an dragan

Jorge mató a el dragón

Draka zabil Jiří
Same Meaning ≠ Same Construction!

He killed the dragon

PRON VERB DET NOUN
Same Meaning ≠ Same Construction!

He killed the dragon

The dragon was killed by him

Syntax in Universal Dependencies
Same Meaning ≠ Same Construction!

He killed the dragon.

The dragon was killed by him.

His killing of the dragon.
Same Meaning ≠ Same Construction!

He killed the dragon

The dragon was killed by him

His killing of the dragon

The dragon that was killed
The king summoned Vishnusharma and said, "having-summoned provāca said Vishnusharma."
राजा विष्णुशर्मान का आहूयाच प्रोवाच

**NOUN**

VerbForm=Conv

VerbForm=Fin

VerbForm=Fin

VerbForm=Fin

VerbForm=Fin
Syntax Tour
Outline

1. Same Annotation
2. Syntax Tour
3. Copula
4. Prague Dependency Trees vs. Universal Dependencies
5. Core vs. Oblique
The cat could have chased all the dogs down the street.

```
DET NOUN AUX AUX VERB DET DET NOUN ADP DET NOUN PUNCT
```
The cat could have chased all the dogs down the street.

• Content words are related by dependency relations
The cat could have chased all the dogs down the street.

- Content words are related by dependency relations
- Function words attach to closest content words
• Content words are related by dependency relations
• Function words attach to closest content words
• Punctuation attach to head of phrase or clause
The cat could have chased all the dogs down the street.

Not “dependency” in the strictly syntactic sense!
The dog was chased by the cat.

Кучето се преследваше от котката.
The dog was chased by the cat.
The dog was chased by the cat.

Кучето беше преследвано от котката.
The dog was chased by the cat.
## Dependents of Clauses (Verbal or Not)

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## Dependents of Verbs, Adjectives and Adverbs

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## Dependents of Nominals

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<tr>
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<td></td>
<td></td>
<td>clf</td>
</tr>
<tr>
<td>flat</td>
<td></td>
<td></td>
<td></td>
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The American singer Johnny Cash, an icon of country music.

Syntax in Universal Dependencies
Coordination

- Coordinate structures are headed by the first conjunct
  - Subsequent conjuncts depend on it via the conj relation
  - Conjunctions depend on the next conjunct via the cc relation
  - Punctuation marks depend on the next conjunct via the punct relation
But Some Languages Might Prefer the Opposite

- Coordinate structures would be headed by the last conjunct
  - Preceding conjuncts would depend on it via the `conj` relation
  - Conjunctions would depend on the preceding conjunct
  - Punctuation marks would depend on the preceding conjunct
Multiword Expressions

<table>
<thead>
<tr>
<th>Relation</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>fixed</td>
<td><em>as well, by and large, according to, more than</em></td>
</tr>
<tr>
<td>flat</td>
<td><em>president Havel, New York, four thousand</em></td>
</tr>
<tr>
<td>compound</td>
<td><em>phone book, dress up</em></td>
</tr>
<tr>
<td>goeswith</td>
<td><em>not with standing, with out</em></td>
</tr>
</tbody>
</table>

- UD annotation **almost** does not permit “words with spaces”
  - Multiword expressions are analyzed using special relations
  - The **fixed**, **flat** and **goeswith** relations are always head-initial
  - The **compound** relation reflects the internal structure

- Words with spaces allowed in exceptional cases:
  - Vietnamese (spaces delimit syllables, not words)
  - Numbers (“1 000 000”)
  - Possibly other approved cases, e.g. multi-word abbreviations
## Other Relations

<table>
<thead>
<tr>
<th>Relation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>parataxis</td>
<td>Loosely linked clauses of same rank</td>
</tr>
<tr>
<td>list</td>
<td>Lists without syntactic structure</td>
</tr>
<tr>
<td>orphan</td>
<td>Orphans in ellipsis linked together</td>
</tr>
<tr>
<td>reparandum</td>
<td>Disfluency linked to (speech) repair</td>
</tr>
<tr>
<td>dep</td>
<td>Unspecified dependency</td>
</tr>
<tr>
<td>root</td>
<td>The single syntactically independent element of the sentence</td>
</tr>
</tbody>
</table>
Language-specific Relation Subtypes

- Language-specific relations are subtypes of universal relations added to capture important phenomena.
- Subtyping permits us to “back off” to universal relations.

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<td>acl:relcl</td>
<td>Relative clause (the boy who lived)</td>
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<td>compound:prt</td>
<td>Verb particle (dress up)</td>
</tr>
<tr>
<td>nmod:poss</td>
<td>Possessive nominal (Mary’s book)</td>
</tr>
<tr>
<td>obl:agent</td>
<td>Agent in passive (saved by the bell)</td>
</tr>
<tr>
<td>cc:preconj</td>
<td>Preconjunction (both ... and)</td>
</tr>
<tr>
<td>det:predet</td>
<td>Predeterminer (all those ...)</td>
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Copula
Outline

1. Same Annotation
2. Syntax Tour
3. Copula
4. Prague Dependency Trees vs. Universal Dependencies
5. Core vs. Oblique
Nonverbal Predicate and Copula

• Some languages use a copula verb:

Ivan is the best dancer.

• Some languages use a copula pronoun:

Ivan – to najlepszy tancerz.
Ivan – it best dancer.
Nonverbal Predicate and Copula

• Some languages use a copula verb:

```
Ivan is the best dancer .
```

• Some languages omit the copula:

```
Иван лучший танцор .
```
```
Ivan best dancer .
```
• Some languages use a copula verb:

Ivan was the best dancer.

• Some languages use it only in some tenses:

Иван был лучшим танцором.
Ivan was best dancer.
Copula Verbs: We Are Restrictive!

- *To be* is copula:

  
  Ivan is the best dancer.

- *To become* is not copula:

  Ivan became the best dancer.
Once Copula, Always Copula!

- This is parallel with Russian:

\[
\text{nsubj} \\
\downarrow \\
\text{cop} \\
\downarrow \\
\text{det} \\
\downarrow \\
\text{amod} \\
\downarrow \\
\text{punct}
\]

Ivan is the best dancer.

- This is also parallel with Russian:

\[
\text{nsubj} \\
\downarrow \\
\text{cop} \\
\downarrow \\
\text{advmod} \\
\downarrow \\
\text{case} \\
\downarrow \\
\text{punct}
\]

Ivan is today in Moscow.
• This is parallel with Russian:

Well, Almost…

Ivan is today in Moscow.

• But not with this in English:

There is a dancer in Moscow.
Clauses and Copula

- A clause can be the subject:

  The problem is that he is missing.

- A clause can be the nonverbal predicate:

  The problem is that he is missing.
Prague Dependency Trees vs. Universal Dependencies
Simple Clauses

George killed the dragon yesterday.
Monica will give me the book on Monday.
Osobně věřím v úspěšnost mise.

Personally I-believe in success of-mission.

Syntax in Universal Dependencies

Same Annotation Syntax Tour Copula

Core vs. Oblique 30/106
the American singer Johnny Cash, an icon of country music
Coordination

Syntax in Universal Dependencies
Analysing DNA will explain the causes.
The study estimates that it would take four minutes.
I hate to put a little pressure on you.
She has been charged with trying to kill her daughter.
Adnominal Clauses

the attacks that briefly took down popular websites
• In Czech, modal verbs are not considered auxiliary
  ⇒ modal verb + infinitive = 2 clauses!

And this parents must know.
Modal Verbs

- In English UD, modal verbs are considered auxiliary
  ⇒ modal verb + infinitive = 1 clause!
- Analytical layer in PCEDT is estimated automatically from the tectogrammatical layer
  ⇒ modals come out as adverbial modifiers there.
She entered the room sad.
Vstoupila do místnosti smutná.

She-entered in room sad.
She declared the cake beautiful.
Nonverbal Predicates with Copulas

Ivan is the best dancer.

Syntax in Universal Dependencies

Same Annotation Syntax Tour Copula

Core vs. Oblique
Locative Predicates with Copulas

Ivan is today in Moscow.

Syntax in Universal Dependencies
Same Annotation Syntax Tour Copula
Core vs. Oblique
A delegation from the Agency is in Iran.
English Existential Clauses

There is a dancer in Moscow.
Ivan himself became the best dancer.
Fixed Multiword Expressions

According to data

Vzhledem k nákladům in-view of expenses

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula

Core vs. Oblique

48/106
Vstoupili jsme, utěšuje se Pfaff, do nové dekády.

"Entered we-have, comforts himself Pfaff, in new decade."

Diagram:

- Root: oblique (obl)
- Punctuation: parataxis
- Auxiliaries: aux, punct
- Nouns: nsubj, obj
- Adjectives: amod
- Cases: case
- Adverbs: adv
- Prepositions: pred
- Tenses: auxg, auxv, auxx
- Verbs: root

Syntax in Universal Dependencies: Same Annotation, Syntax Tour, Copula

Prague Dependency Trees vs. Universal Dependencies: Core vs. Oblique

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Risk Management  
Phone 212-902-3724  
Fax 212-428-1181
Core vs. Oblique
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I gave her a book.

**Syntactic Structure**

```
PRON  VERB  PRON  DET  NOUN
```

**Diagram**

```
root  
/   
|    
|    
| nsubj 

<table>
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I  gave  her  a  book

**Dependency Labels**

nsubj  | obj  | iobj  | det

**Universal Dependencies**

I (nsubj) gave (root) her (obj) a (iobj) book (det).
I gave her a book.

I gave a book to her.
He loaded the wagon with hay.
He loaded the wagon with hay

He loaded hay on the wagon
UD is NOT about Semantic Roles!

Syntax in Universal Dependencies
Manning’s Law – What If We Do Semantic Roles?

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It’s easy to come up with a proposal that improves UD on one of these dimensions. The interesting and difficult part is to improve UD while remaining sensitive to all these dimensions.
UD Avoids Argument-Adjunct Distinction!

I gave her a book on Monday.

I gave a book to her on Monday.
Avoiding an Argument-Adjunct Distinction

• From the guidelines:
  • Subtle, unclear, and frequently argued over
  • Questionable as a categorical distinction
  • Best practical solution is to eliminate it

BUT:
• Cannot be eliminated completely
• Some people/data have it and want to keep it
• It aligns well with traditional grammars
  ⇒ there is now a relation subtype obl:arg

AND
• I will argue that
  • Core-oblique distinction is unclear and argued over too
  (Though I will not propose to discard it.)
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• AND I will argue that
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So What Is Core and Why?

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies  Core vs. Oblique
Community Confusion

- UD v1 guidelines took core-oblique for granted

- English (simplified):
  - Bare noun phrase $\Rightarrow$ core argument (nsubj, obj, iobj)
  - Prepositional phrase $\Rightarrow$ oblique argument or adjunct (obl)

- Other languages: not necessarily! (Spanish, Japanese)
- But some people simply took the English rule…
- Manning's law: non-linguists!
- Clash with traditional terminology
- Grammars of German, Czech etc. define prepositional objects
- But these are not necessarily core…
- Yet some people took their national definition of object…
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  - But these are not necessarily core...
  - Yet some people took their national definition of object...
Language-specific Coding Strategy

• Idea:
  • Oblique arguments are marked similarly to adjuncts (prepositions, certain morphological cases...)
  • Core arguments are marked differently
    • ⇒ easy for annotators and non-linguists!

• Why are core arguments special?
  • They tend to be targeted by grammatical rules
    • Passivization
    • Control verbs
    • Reflexives
    • ...

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies
Language-specific Coding Strategy

- Core vs. oblique is not defined in traditional grammar
- How shall we define it?

Andrews, 2007 (In Shopen: Language Typology)

Identify primary transitive predicates
We need semantic roles for this! (One-time only.)

- Actor/agent = function $A$
- Undergoer/patient = function $P$

Note the way they are coded
Note other grammatical rules that target them
Generalize to other predicates with same coding and rules
Then define:

- function $A$ $\Rightarrow$ nsubj
- function $P$ $\Rightarrow$ obj
• Core vs. oblique is not defined in traditional grammar
• How shall we define it?

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  • Note other grammatical rules that target them
  • Generalize to other predicates with same coding and rules

• Then define:
  • function A ⇒ nsubj
  • function P ⇒ obj
Transitive Predicates in English

John \textit{kills} Mary (primary transitive)

\begin{itemize}
  \item root
  \item agent
    \begin{itemize}
      \item John
    \end{itemize}
  \item patient
    \begin{itemize}
      \item Mary
    \end{itemize}
\end{itemize}

\textit{PROPN VERB PROPN} (primary transitive)
Transitive Predicates in English

- John kills Mary (primary transitive)
- John loves Mary (generalized transitive)
Transitive Predicates in English

- **Primary transitive:**
  - John \(\text{kills}\) Mary
  - Root: John \(\text{nsubj}\) \(\text{kills}\) \(\text{Mary}\)

- **Generalized transitive:**
  - John \(\text{loves}\) Mary
  - Root: John \(\text{nsubj}\) \(\text{loves}\) \(\text{Mary}\)
Passivization in English

Mary is killed by John

Mary is loved by John
Subject Control in English

John wants to kill Mary

John wants to love Mary

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies
Object Control in English

Ann made John kill Mary

PROPN VERB PROPN VERB PROPN

Ann made John love Mary

PROPN VERB PROPN VERB PROPN
Some Problems

- Some temporal adjuncts are bare noun phrases
  - *I work the whole week.*
  - *I work every Friday.*

- At least it cannot passivize:
  - *The whole week is worked by me.*
  - *Every Friday is worked by me.*

- But...
Some Problems

- Some transitive verbs cannot passivize
  - *John has a new car.*
  
  - *A new car is had by John.*
  
  - *Friday does not suit me.*
  
  - *I am not suited by Friday.*
Some Problems

• Some transitive verbs cannot passivize
  • *A new car is had by John.
  • *I am not suited by Friday.

• Some prepositional verbs can passivize
  • Ben can be relied on.
  • *A new car is had by John.
  • *I am not suited by Friday.

• Some transitive verbs cannot passivize
  • John has a new car.
  • *A new car is had by John.
  • *I am not suited by Friday.

• Some prepositional verbs can passivize
  • You can rely on Ben.
  • *A new car is had by John.
  • *I am not suited by Friday.

• Some transitive verbs cannot passivize
  • John has a new car.
  • *A new car is had by John.
  • *I am not suited by Friday.

• Some prepositional verbs can passivize
  • You can rely on Ben.
  • *A new car is had by John.
  • *I am not suited by Friday.
Bare Temporal Adjuncts: Any Other Criteria?

- I work the whole week.
- I work every Friday.

English has a fixed word order; adjuncts are less fixed than objects:
- I work every Friday in Paris.
- I work in Paris every Friday.
- I spend every Friday in Paris.
- *I spend in Paris every Friday.

Unlike objects, adjuncts cannot be replaced by pronouns:
- Where do you spend this Friday? I spend it in Paris.
- Where do you work this Friday? *I work it in Paris.
Tentative Summary?

- The borderline is inherently fuzzy
- No universally applicable and exact algorithm
- Better described in terms of probability
Tentative Summary?

- The borderline is inherently fuzzy
- No universally applicable and exact algorithm
- Better described in terms of probability

- Core coding *not favored by adjuncts*
- Oblique coding *similar to most adjuncts*
- Passivization etc. may help...
- ... but does *not* work as *strict criterion*
Tentative Summary?

- The borderline is inherently fuzzy
- No universally applicable and exact algorithm
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- Core coding not favored by adjuncts
- Oblique coding similar to most adjuncts
- Passivization etc. may help…
- … but does not work as strict criterion

- Semantic roles needed when starting a new language
- Argument-adjunct might help with exceptions
  - Although we managed to explain the whole week without it
Intransitive Predicates

• Just one core argument
  • We already “know” how to find out if there are two

• ⇒ function $S$
  • Regardless of semantic role:
    • *John runs.*
    • *John sleeps.*
    • *John falls.*
    • *John relies on me.* ... intransitive because *on me* is not a core argument!

• Then define:
  • function $S \Rightarrow \text{nsubj}$
Ditransitive Predicates

- Three core arguments: nsubj, obj, and iobj
- Which one is iobj? Language-specific rules. English: the one closer to the verb (i.e., the GOAL semantic role).
- **NEW in 2023:** iobj can be used even if obj is not present

```
I gave her a book
PRON VERB PRON DET NOUN
```

- Passivization:
  - *She was given a book by me.*
  - *A book was given her by me.*
Ditransitive Predicates

- Three core arguments: 
  - nsubj
  - obj
  - iobj

- Which one is iobj? Language-specific rules. English: the one closer to the verb (i.e., the GOAL semantic role).

- **NEW in 2023**: iobj can be used even if obj is not present
  
  $I$ gave $her$ a $book$

- Fronting in questions:
  - *What* did I give *her*?
  - *Who* did I give a *book*?
Ditransitive Predicates

- Three core arguments: nsubj, obj, and iobj
- Which one is iobj? Language-specific rules. English: the one closer to the verb (i.e., the GOAL semantic role).
- **NEW in 2023**: iobj can be used even if obj is not present

Andrews (2007): the status of the notion of ‘indirect object’ is problematic and difficult to sort out. The top priority is to work out what properties recipients and themes do and do not share with P arguments of primary transitive verbs.
Jorge mató a el dragón

PROPN VERB ADP DET NOUN

El dragón fue matado por Jorge

DET NOUN AUX VERB ADP PROPN

Jorge lo mató

PROPN PRON VERB

(El) fue matado por Jorge

PRON AUX VERB ADP PROPN
Jorge compró un libro

El libro fue comprado por Jorge

Jorge lo compró

(El) fue comprado por Jorge
Spanish Transitive Clauses

- **nominal**
  - Case=Nom
  - bare NP
  - pre-verb
  - cross-ref on verb
  - declarative clause ← agreement

- **VERB**
  - Voice=Act(,Pass)
  - (ADP)
  - (or bare NP)
  - post-verb

- **nominal**
  - Case=Acc

Syntax in Universal Dependencies
Spanish Adjunct Exceptions

El trabaja toda la semana

He works whole the week

Subiremos a el tren a las cinco

We-will-board to the train at the five
Spanish Ditransitive Clauses

Pedro le dio un libro a Isabel
Pedro her gave a book to Isabel

PROPN PRON VERB DET NOUN ADP PROPN
Spanish Ditransitive Clauses

Pedro le dio un libro a Isabel
Pedro her gave a book to Isabel

Un libro fue dado a Isabel por Pedro
A book was given to Isabel by Pedro
Jiří zabil draka

Drak byl zabit Jiřím
Czech Transitive Clauses

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies

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Czech Adjunct Exceptions

Pracuje celý týden
He-works whole week

Vertex: root

Case=Acc

Core vs. Oblique
Czech Ditransitive Clauses

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies

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Zuzka pomohla Martinovi s úkolem.

Zuzka helped Martin with homework.

Martinovi bylo pomůženo s úkolem.

Martin was helped with homework.
Monotransitive with Genitive?

Novináři musí dbát zásad objektivity.

NOUN VERB VERB NOUN Case=Nom Case=Gen Case=Gen

Musí být dbáno zásad objektivity.

VERB AUX ADJ NOUN NOUN Case=Gen Case=Gen
Monotransitive with Instrumental?

Karel hýbal nábytkem
Karel moved furniture

Case=Nom
Case=Ins

Nábytkem bylo hýbáno
Furniture was moved

Case=Ins
Gender=Neut
Number=Sing

Syntax in Universal Dependencies
Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies  85/106
They relied on the director’s decision.
There is a core-oblique scale:

- Nom > Acc > Gen, Dat > Ins > preposition

Where is the borderline?
• There is a core-oblique scale:
  • Nom > Acc > Gen, Dat > Ins > preposition

• Where is the borderline?

• UD Czech 1.0: object = argument
  • Nom, Acc, Gen, Dat, Ins, ADP > “adverbial”
• There is a core-oblique scale:
  • Nom > Acc > Gen, Dat > Ins > preposition

• Where is the borderline?

• UD Czech 1.0: object = argument
  • Nom, Acc, Gen, Dat, Ins, ADP > “adverbial”
• UD Czech 2.1–2.5: bare NP > PP
  • Nom, Acc, Gen, Dat, Ins > ADP + adjuncts
There is a core-oblique scale:
- **Nom > Acc > Gen, Dat > Ins > preposition**

Where is the borderline?

- UD Czech 1.0: object = argument
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- UD Czech 2.1–2.5: bare NP > PP
  - Nom, Acc, Gen, Dat, Ins > ADP + adjuncts
- UD Czech 2.6 (May 2020):
  - Nom, Acc > Gen, Dat, Ins, ADP + adjuncts
Tentative Summary 2

- There is a core-oblique scale:
  - Nom > Acc > Gen, Dat > Ins > preposition

- Where is the borderline?

- UD Czech 1.0: object = argument
  - Nom, Acc, Gen, Dat, Ins, ADP > “adverbial”

- UD Czech 2.1–2.5: bare NP > PP
  - Nom, Acc, Gen, Dat, Ins > ADP + adjuncts

- UD Czech 2.6 (May 2020):
  - Nom, Acc > Gen, Dat, Ins, ADP + adjuncts
  - ⇒ No ditransitives in Czech!
  - (Exception: učit “to teach” takes two Acc.)
Basque Transitive Clauses

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies

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Basque Transitive Clauses

Ekaitzak itsasontzia hondoratu du
Storm ship sunk it-has-it
Case=Erg Case=Abs

(Niri) ardoa gustatzen zait
(Tom-me) wine pleasing me-is-it
Case=Dat Case=Abs

Syntax in Universal Dependencies
Same Annotation Syntax Tour Copula Prague Dependency Trees vs. Universal Dependencies
Basque Intransitive Clauses

**Example 1:**

- **Subject:** Gizona
- **Verb:** hil
- **Auxiliary:** da
- **Case:** Abs

Translation: The man died.

**Example 2:**

- **Subject:** Urak
- **Verb:** irakin
- **Auxiliary:** du
- **Case:** Erg

Translation: Water boiled.
Basque Ditransitive Clauses

(Nik) (zuri) liburua eman dizut
(l) (you) book given I-have-you-it

Case=Erg  Case=Dat  Case=Abs

Zezenak saihetsa pitzatu zidan
Bull rib cracked it-has-me-it

Case=Erg  Case=Abs

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies
Basque Ditransitive Clauses

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies

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Basque Causative Applied to Dative Subject

- Zopa
- izugarri
- gustatzen
- zaio
- mutilari

- NOUN
- ADV
- VERB
- AUX
- NOUN

- Case=Abs
- Voice=Act
- Case=Dat

- obj
- advmod
- aux
- nsubj

- obj
- advmod
- aux
- nsubj:caus
- iobj:agent

- NOUN
- ADV
- VERB
- AUX
- NOUN

- Case=Erg
- Case=Abs
- Voice=Cau
- Case=Dat

- Goseak
- zopa
- izugarri
- gustatuerazi
- zion
- mutilari

- Hunger
- soup
- greatly
- made-pleasing
- it-has-it-it
- to-boy
Yidiŋ Transitive Clauses

A diagram showing the structure of transitive clauses in Yidiŋ.

- **root**
- **nsubj**
- **obj**

Structure:
- **nominal**
  - Case=Erg
  - Case=Nom
  - bare NP
- **VERB**
- **nominal**
  - Case=Abs
  - Case=Acc
  - bare NP
“I, (who) was slapped by the woman, laughed”
“I, (who) was slapped by the woman, laughed”

The coreferential (and elidable) NP must have S or P function.
Yidiɲ “Dative” Adnominal Clauses

“Яна (who) was laughing, was slapped by the woman”

The coreferential (and elidable) NP must have S or P function.
“I, (who) was slapping the woman, laughed”

Original P is now oblique and original A is now S.
Tagalog Transitive Clauses

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies
Magaalis ang babae ng sa sako
Will-take the woman rice from sack

Aalisin ng babae ang bigas sa sako
Will-take woman the rice from sack
Tagalog Locative Voice ⇒ Ditransitive!

Aalisan Will-take

VERB

Voice=Lfoc

ng

ADP

Case=Gen

babae woman

NOUN

Case=Gen

ng

ADP

Case=Gen

bigas rice

NOUN

Case=Gen

ang from-the

ADP

sako sack

NOUN

Case=Nom

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies  

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Tagalog Benefactive Voice ⇒ Ditransitive!

Ipagaalis ng babae ng bigas ang bata
Will-take woman rice for-the child

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies
Plains Cree Transitive Clauses

Syntax in Universal Dependencies

Same Annotation  Syntax Tour  Copula  Prague Dependency Trees vs. Universal Dependencies
Direct-Inverse Voice in Plains Cree

Animacy hierarchy: 1st person > 3rd person
Direct-Inverse Voice in Plains Cree

Animacy hierarchy: 1st person > 3rd person
Should we set nsubj > obj?
Direct-Inverse Voice in Plains Cree

Syntax in Universal Dependencies  
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The theme (not the recipient) is indirect object because it is not cross-referenced on the verb (it is inanimate, while the verb references an animate object).
Syntax in Universal Dependencies

Summary

- Universal Dependencies
  - Unified annotation for all languages
    - Language-specific extensions
  - Content words higher than function words ... better parallelism
  - Clauses – nominals – modifier words
  - Core arguments vs. oblique dependents

https://ufal.cz/courses/npfl075