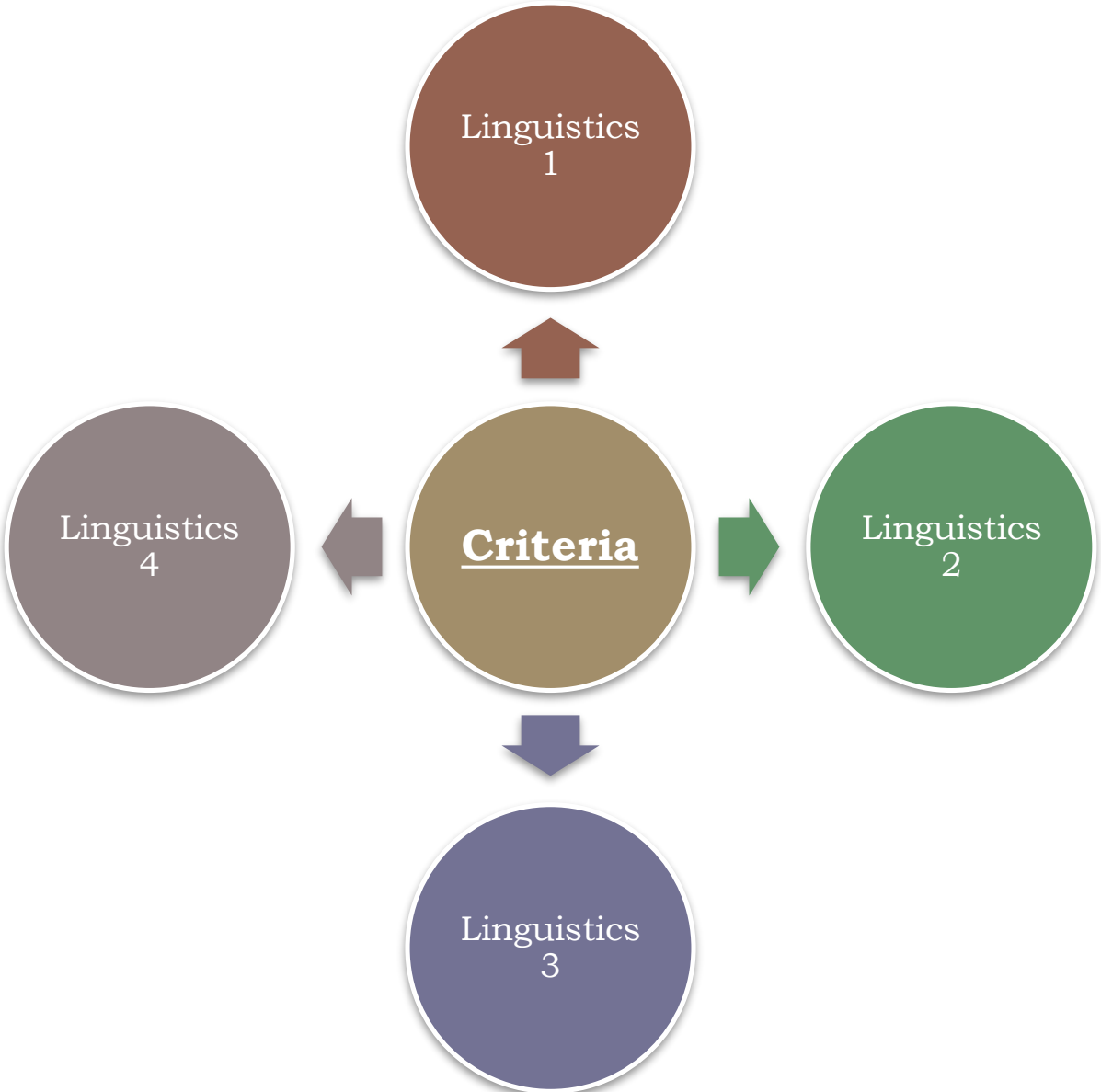
Lecture 3

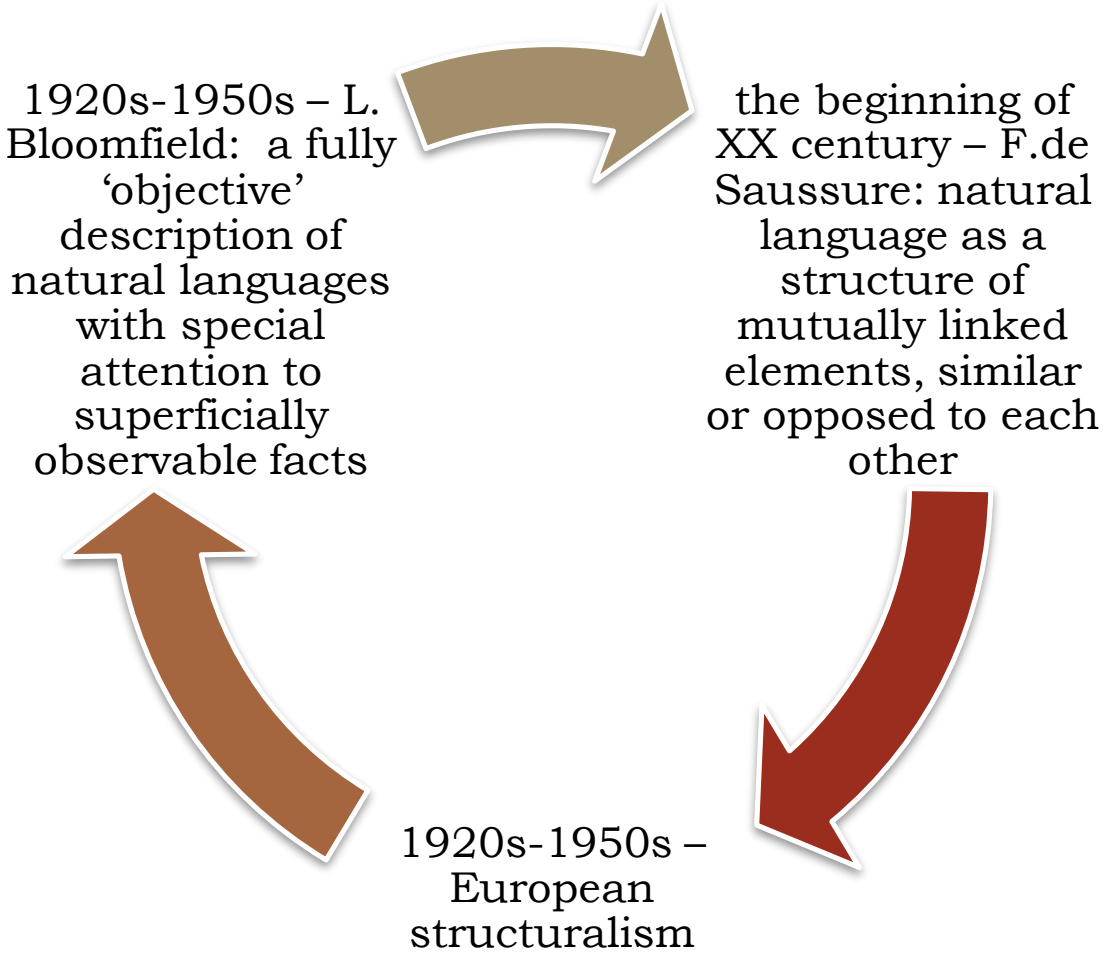
Outline

- Historical Outline.
- Phrase Structure (Constituency).
- The Meaning – Text Theory.

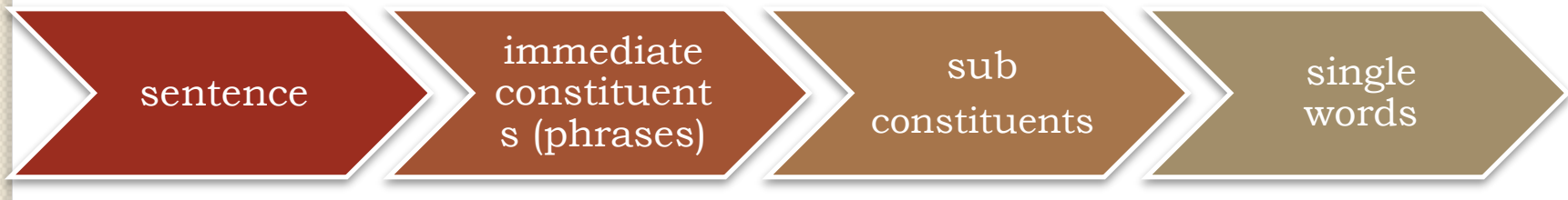
Historical Outline



Historical Outline



Phrase Structure (Constituency)



Contribution of N. Chomsky

The generative grammars produce strings of symbols, and sets of these strings are called **formal languages** (texts).

The phrase structures were formalized as **context-free grammars (CFG)** and became the basic tool for description of natural languages.

The idea of **independent syntax** arose and the problem of natural language processing was seen as determining the syntactic structure of each sentence composing a text.

Syntactic structure of a sentence was identified with the so-called **constituency tree**.

Contribution of N. Chomsky

great generality, mathematical elegance, and wide applicability of generative grammars

used not only for description of natural languages, but also for specification of formal languages, such as those used in mathematical logic, pattern recognition, and programming languages

transformational grammars aimed to better accommodate the formal tools to natural languages

mainly English-oriented and explained how to construct an interrogative or negative sentence from the corresponding affirmative one, how to transform the sentence in active voice to its passive voice equivalent, etc.

The Meaning – Text Theory (MTT):

Multistage Transformer & Government Patterns

oversimplifications and **inadequacies** of the early Chomskian linguistics

The Meaning – Text Theory (MTT):
Multistage Transformer & Government Patterns

- In late **1960s** in **Russia**
- **I. Mel'čuk, Yu. Apresian**: deep and consistent descriptions of several languages of different families, Russian, French, English and German among them, were constructed and introduced to computational practice.

The Meaning – Text Theory (MTT):

Multistage Transformer & Government Patterns

Language is a multistage, or multilevel, transformer of meaning to text and vice versa

Some inner representation corresponds to each level, and each representation is equivalent to representations of other levels

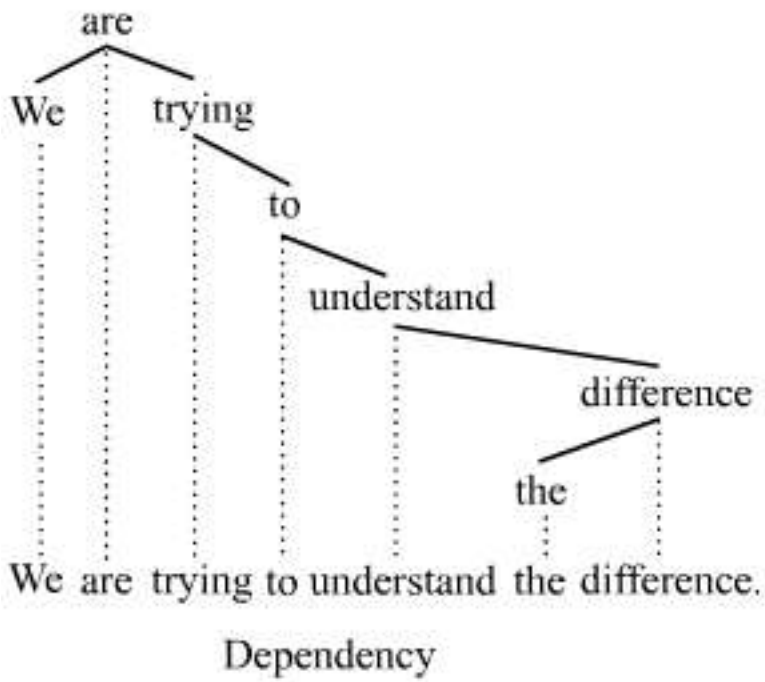
Surface morphologic, deep morphologic, surface syntactic, deep syntactic, and semantic levels, as well as the corresponding representations, were introduced into the model

The Meaning – Text Theory (MTT):
Multistage Transformer & Government Patterns

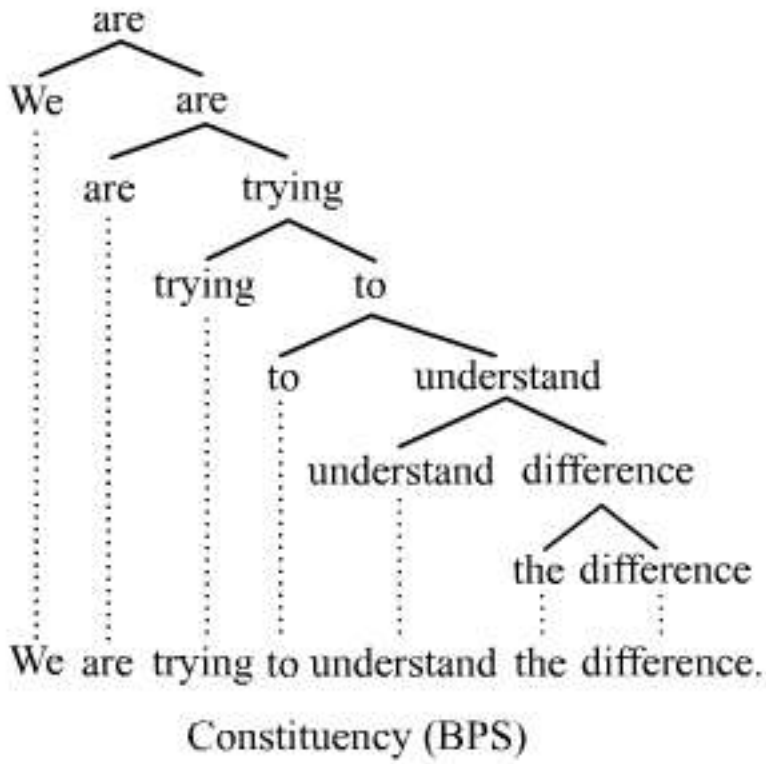
- "… Up to the present, the proper description of the word order and word agreement in many languages can be accomplished easier by means of the MTT. Moreover, it was shown that in many languages there exist *disrupt and non-projective constructions*, which cannot be represented through constituency trees or nested structures, but ***dependency trees*** can represent them easily …" [pp. 49-50]

Dependency Tree

- Lucien Tesnière, 1950's

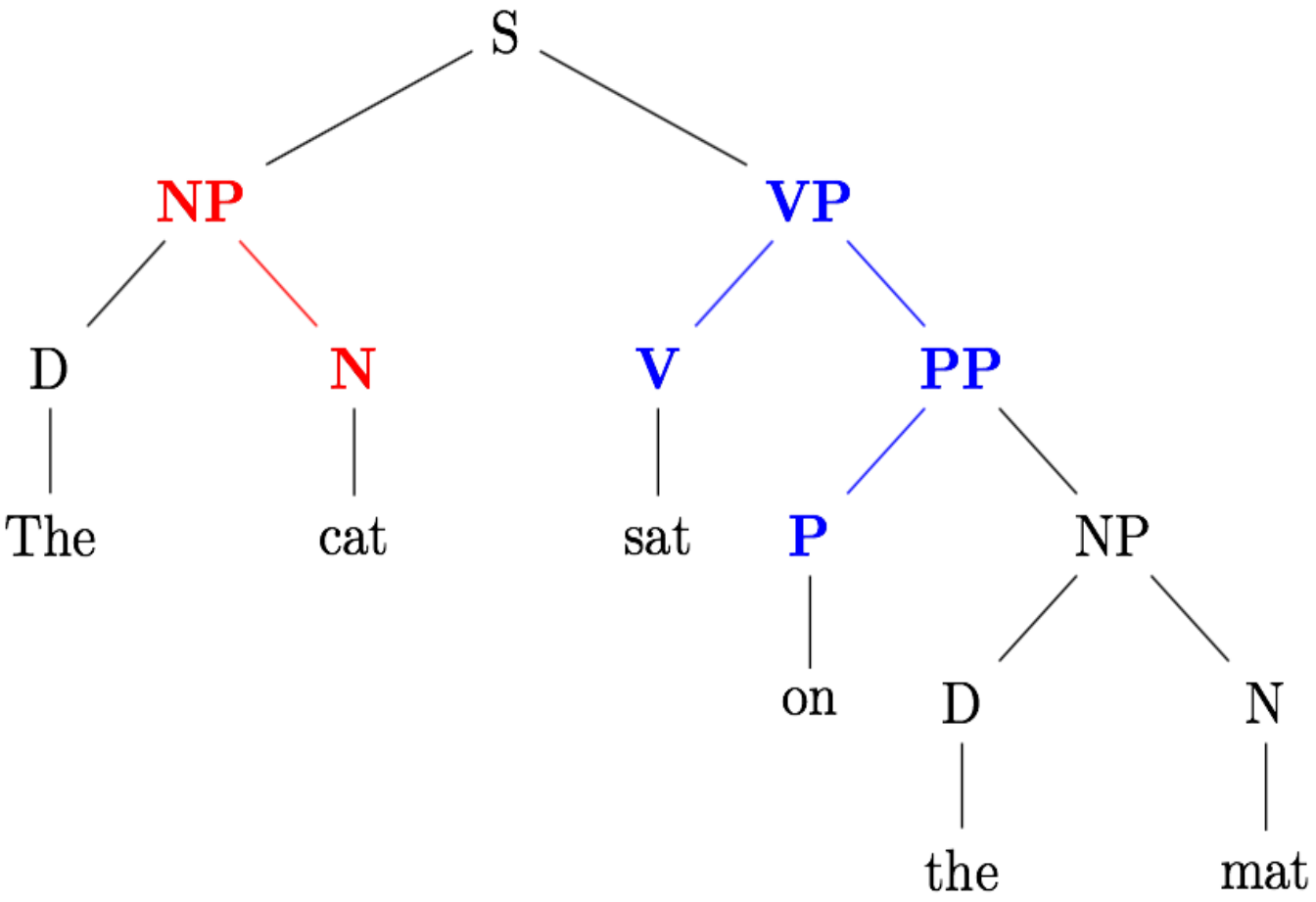


Dependency



Constituency (BPS)

Dependency Tree



References

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Time to Practise