



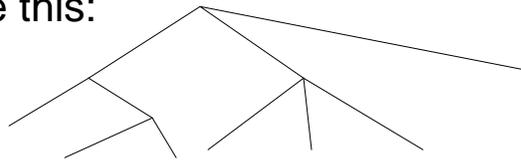
An Animated and Narrated Glossary of
Terms used in Linguistics
presents

Tree



Basic idea

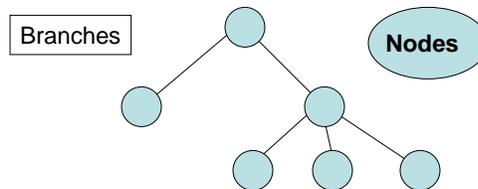
- A **tree** is a mathematical object, more specifically, it is a topological object.
- A **tree** is made up of nodes (entities) and arcs/branches (relations), and usually looks like this:





Nodes and Branches

- A **node** is the ending point of a branch, and is often where two or more branches meet.
- A **branch** is any line that connects two nodes.

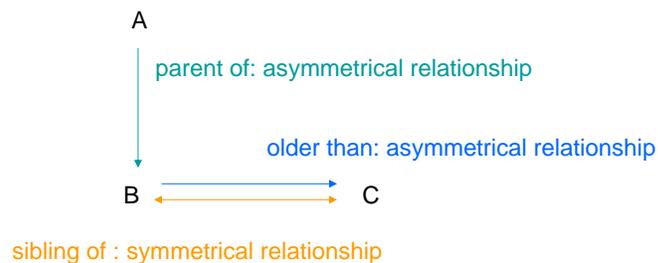


Slide 3



Directedness

- The relationship between any two connected nodes can be symmetrical or asymmetrical.

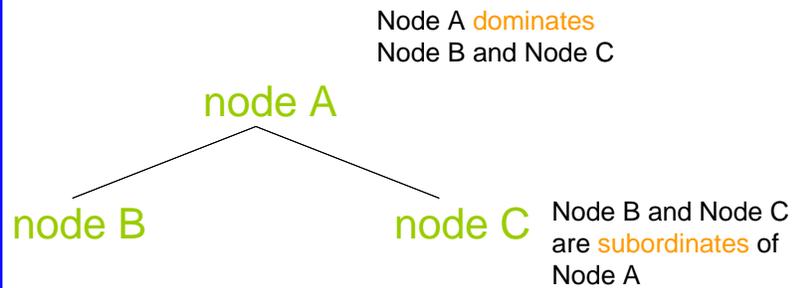


Slide 4



Domination

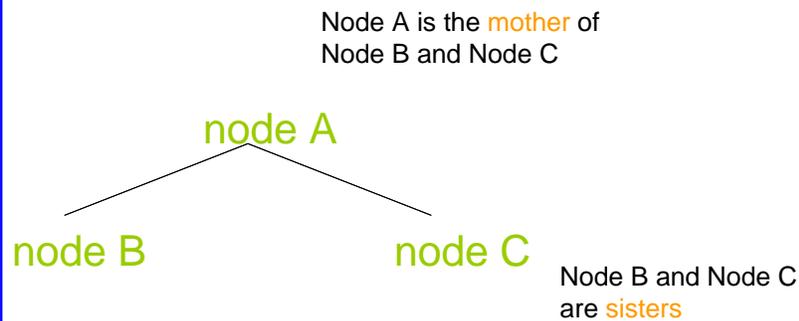
- Domination is typically indicated from top-to-bottom.



Slide 5



Domination

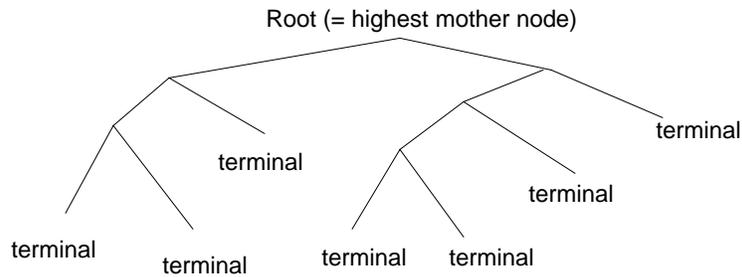


Slide 6



Roots and terminals

- The topmost node that is undominated is called a **root**.



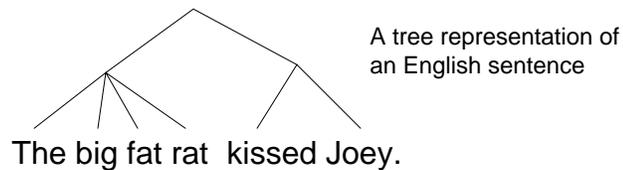
- The bottommost nodes that do not have any subordinates are called **terminals**.

Slide 7



Trees in linguistics

- Trees are often used linguistics. For example,

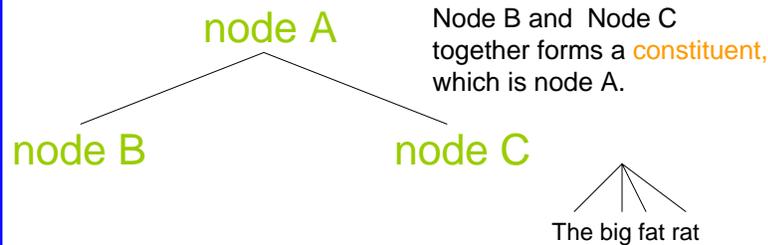


- ... is made up of two parts. This sentence can be represented as a tree.

Slide 8

Constituency

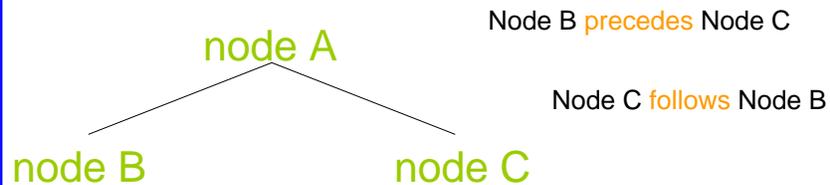
- Constituency (grouping) can be indicated using domination.



Slide 9

Temporal order

- Temporal order typically indicated from left-to-right.

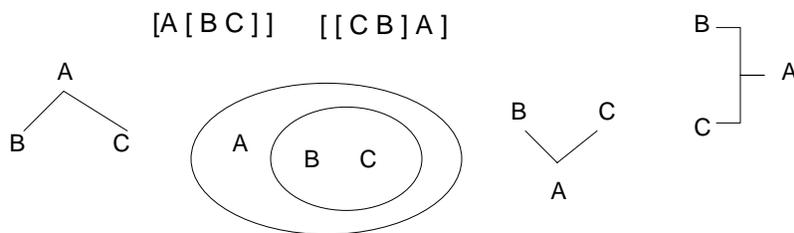


Slide 10



Notational variants

- Trees can be drawn in many ways as long as the structural relationships are the same.
- The following are all notational variants of the same tree.



Slide 11



Trees and graphs

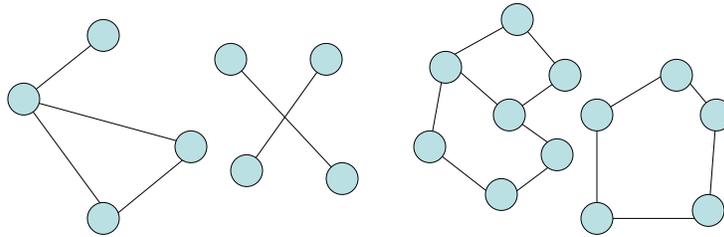
- Not all objects that are made up of branches and nodes are called trees, but all trees are made up of branches and nodes.
- Objects made of branches and nodes, but are not trees are called **graphs**. In fact, trees are special kinds of graphs.

Slide 12



Trees and graphs

- In trees, nodes cannot be linked to form a cycle.
- Also, branches are not allowed to cross.
- Hence the following representations are not trees.



Slide 13



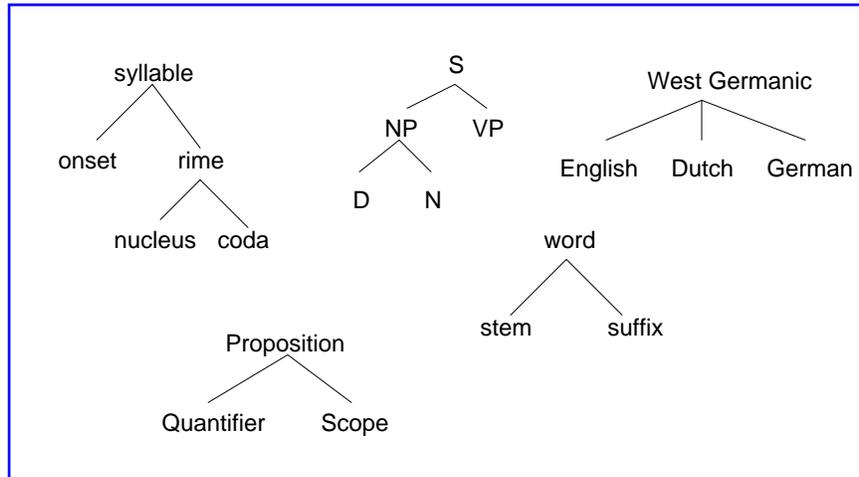
Trees

- Trees are good for expressing various kinds of relationships, especially those that involve **constituency** and **hierarchy**.
- They are used in **syntax**, **phonology**, **semantics**, **genealogy of languages** and many other linguistic domains.
- Trees are also widely used in other areas outside of linguistics.

Slide 14



Some trees in Linguistics



Slide 15



Further reading

Gross, Jonathan L. and Jay Yellen (2006) *Graph Theory and its Applications*, 2nd edition. Boca Raton: Chapman & Hall/CRC.

Lovász, László, József Pelikán and Katalin Vesztegombi (2003) *Discrete Mathematics: Elementary and Beyond*. New York: Springer.

Slide 16



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The End

Wee, Lian-Hee and Winnie H.Y. Cheung (2009)
An animated and narrated glossary of terms used in Linguistics.
Hong Kong Baptist University.