• The spanning tree assumption in dependency parsing
  • Every token is a node of the dependency tree
  • MWEs handled in preprocessing (if at all)

• Transition-based dependency parsing
  • Transition system for deriving dependency trees
  • Model for scoring possible transitions
  • Algorithm for finding the optimal transition sequence

• What if we give up the spanning tree assumption?
Transition-Based Parsing with Multiword Expressions
Joakim Nivre, Uppsala University

- **Parser configuration**
  - A buffer of input tokens
  - A stack of tree nodes
  - A set of dependency arcs

\[
\begin{align*}
\text{Shift:} & \quad (S, w|B, A) \implies (S|[w], B, A) \\
\text{Chunk:} & \quad (S|u, w|B, A) \implies (S|[u|w], B, A) \\
\text{Right-Arc:} & \quad (S|u|v, B, A) \implies (S|u, B, A[u \to v]) \\
\text{Left-Arc:} & \quad (S|u|v, B, A) \implies (S|v, B, A[v \to u])
\end{align*}
\]