



Enhancing Dependency Parsing: Insights from Non- Projective Parsing, Beam Search, & Error States

- Anders Luong
- Jamie Mersh
- Daniel Nyström
- Daniel Purgal

Project overview

Language	Tagging Accuracy	Unlabeled Attachment Score
English	0.8879	0.6644
Swedish	0.9085	0.5997
Polish	0.9078	0.6601

- Baseline – Syntactic Parsing
- Extensions
 - Beam-search with error states
 - Supports non-projective sequences

Background

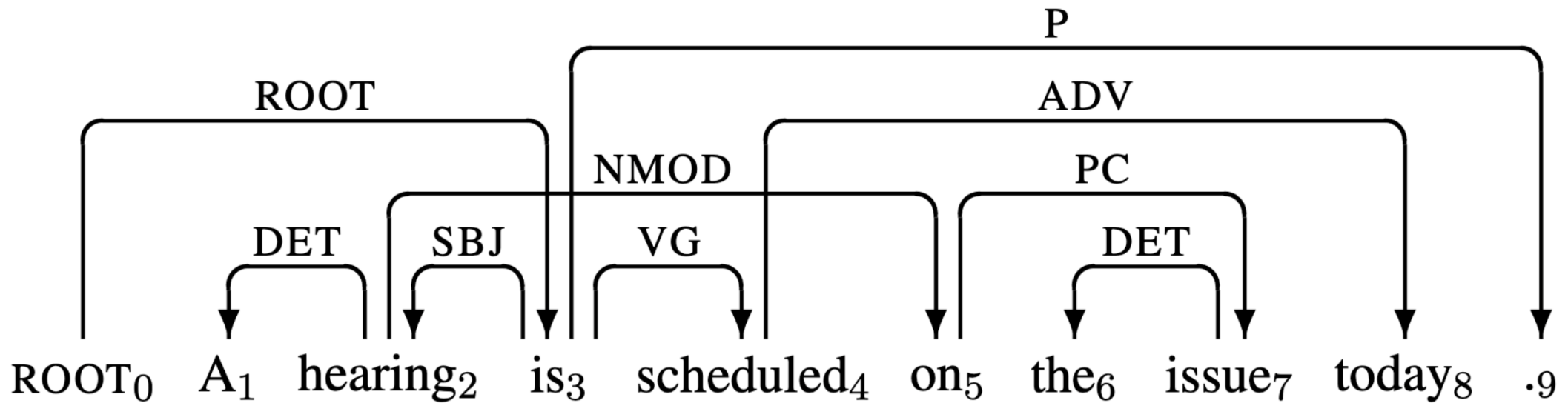


Dependency
parsing

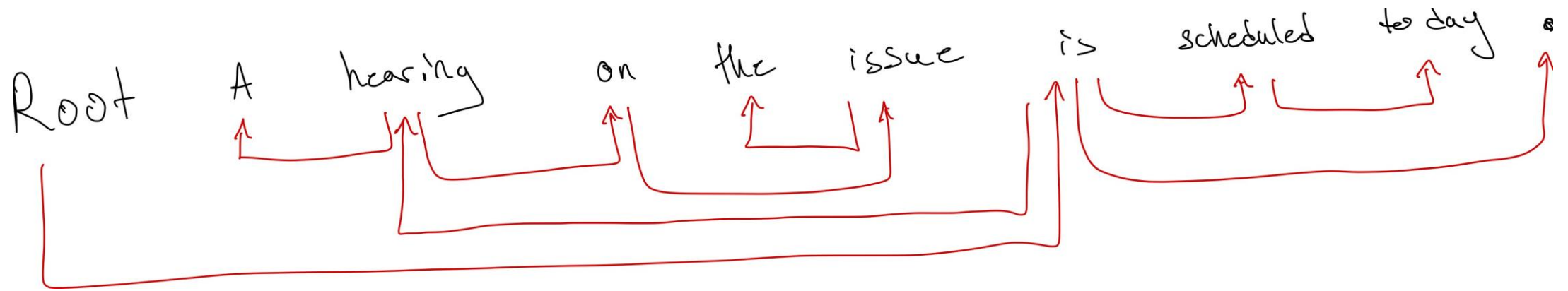
Projectivity

Beam
search

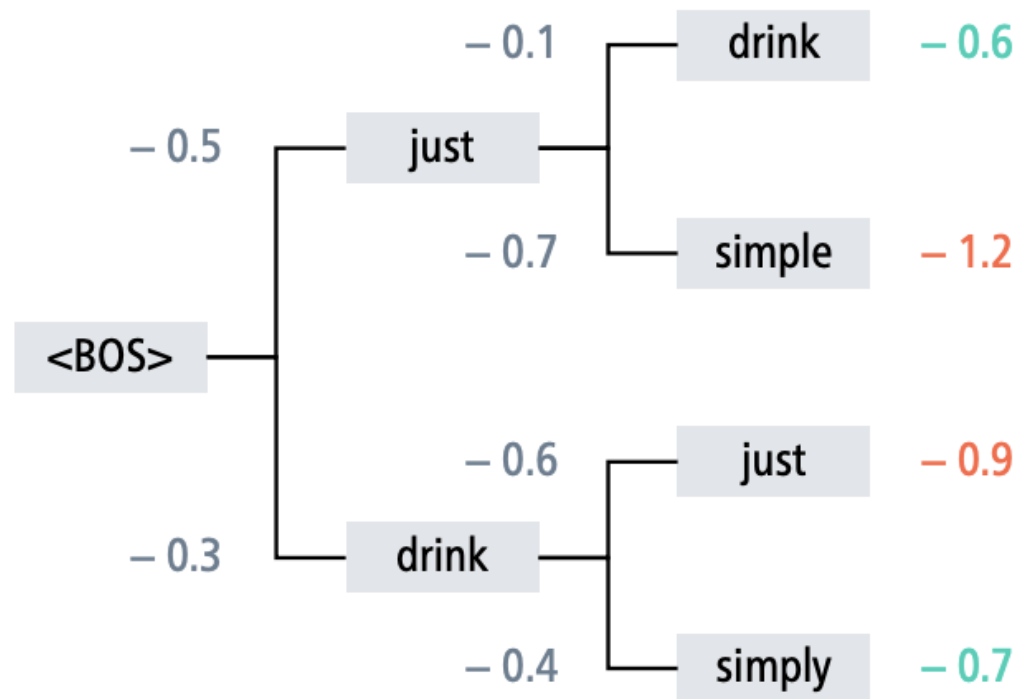
Dependency parsing & Projectivity



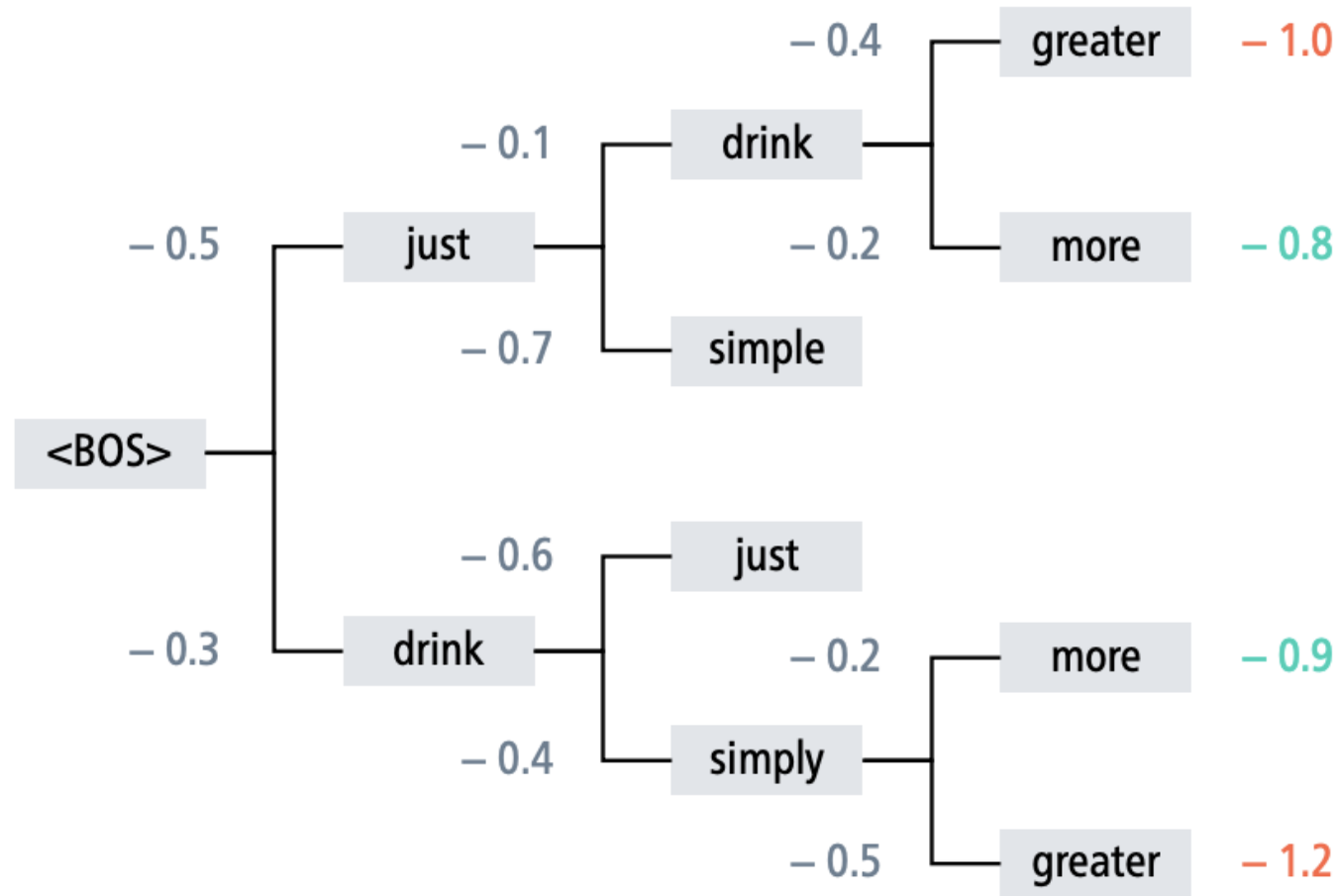
Projective



Beam search



Beam search



Method

Beam search

- Error states

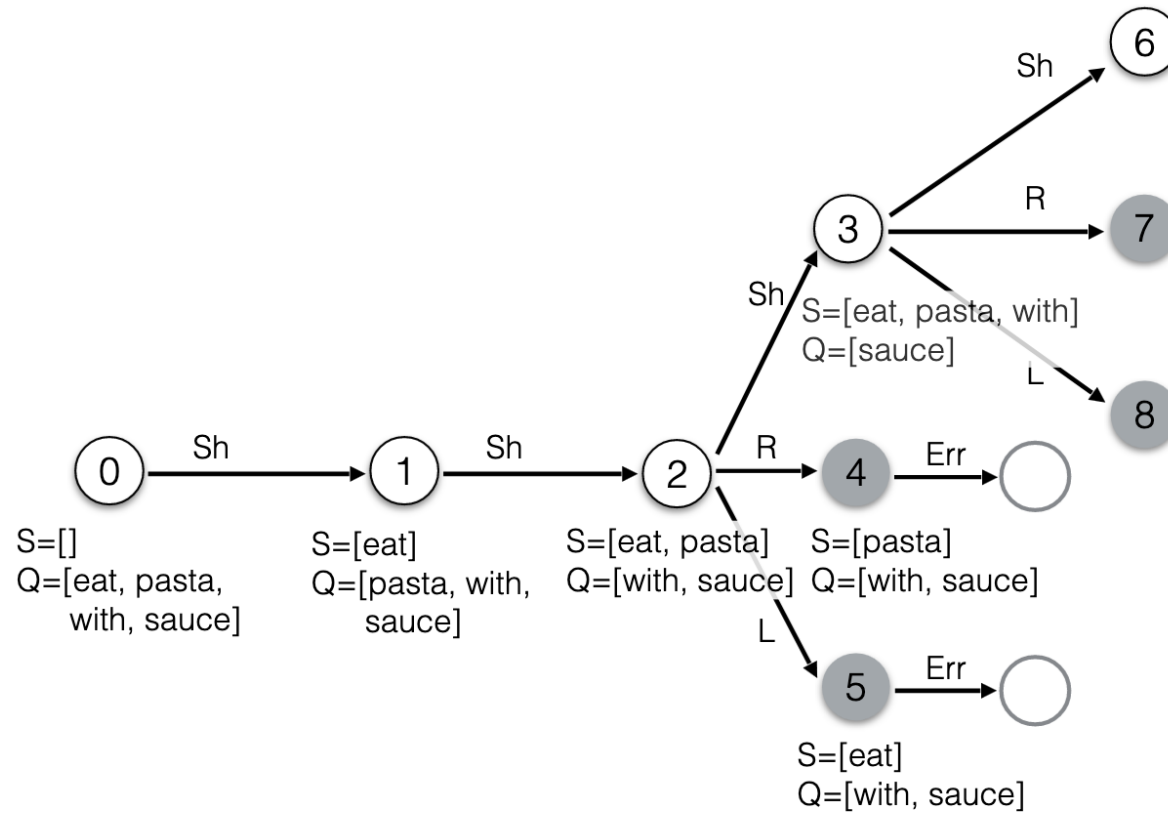
[Vaswani & Sagae \(2016\)](#)

Non-projective parsing

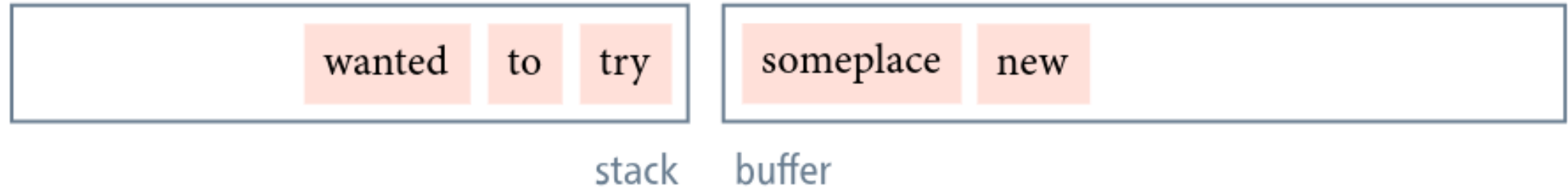
- Swap function
- Projective word order

[Joakim Nivre. \(2009\)](#)

Method – Error States

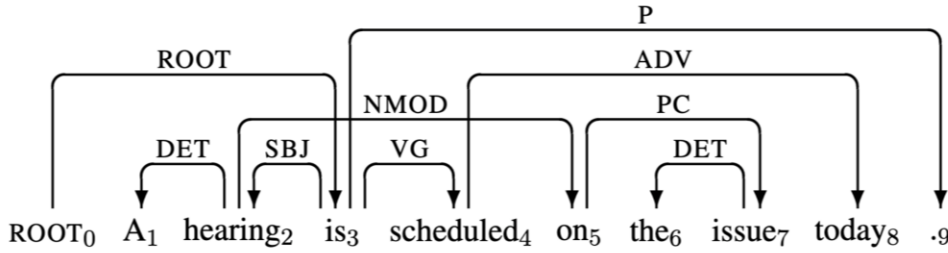


Method – Swap



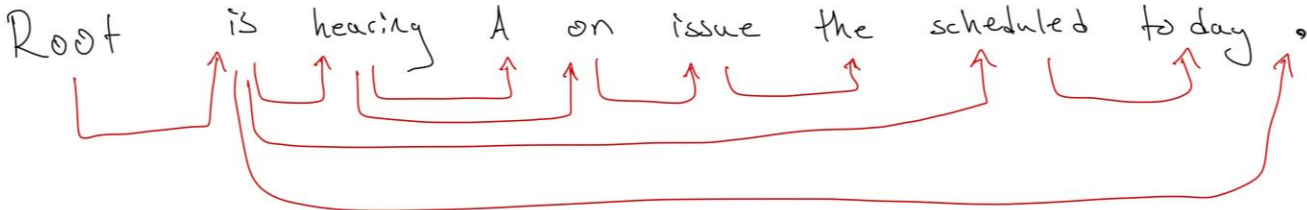
Method – Projective Word Order

Original order (non-projective):



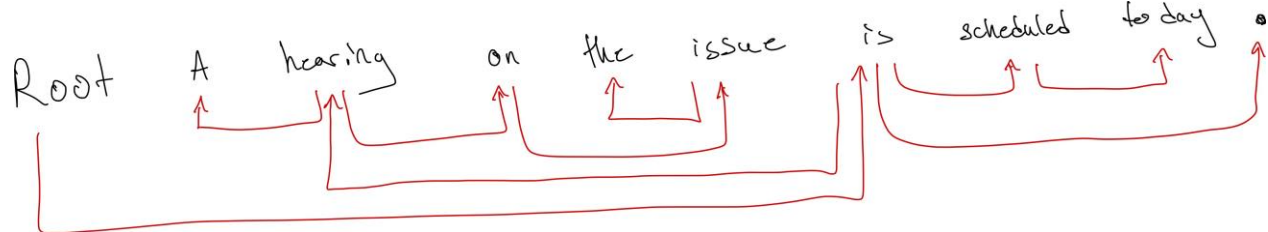
[Joakim Nivre. \(2009\)](#)

Parents First:



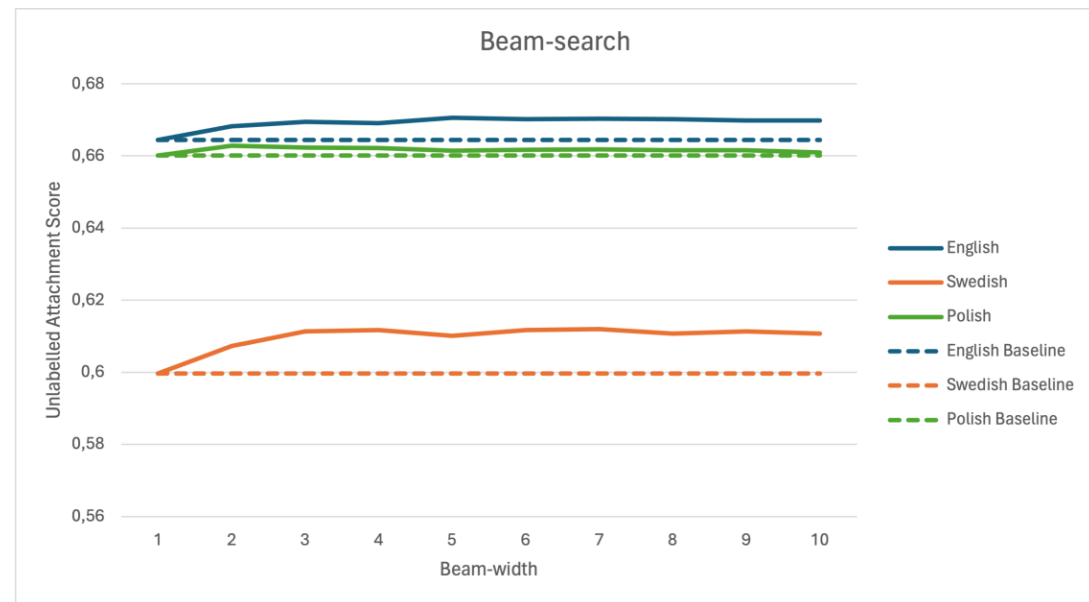
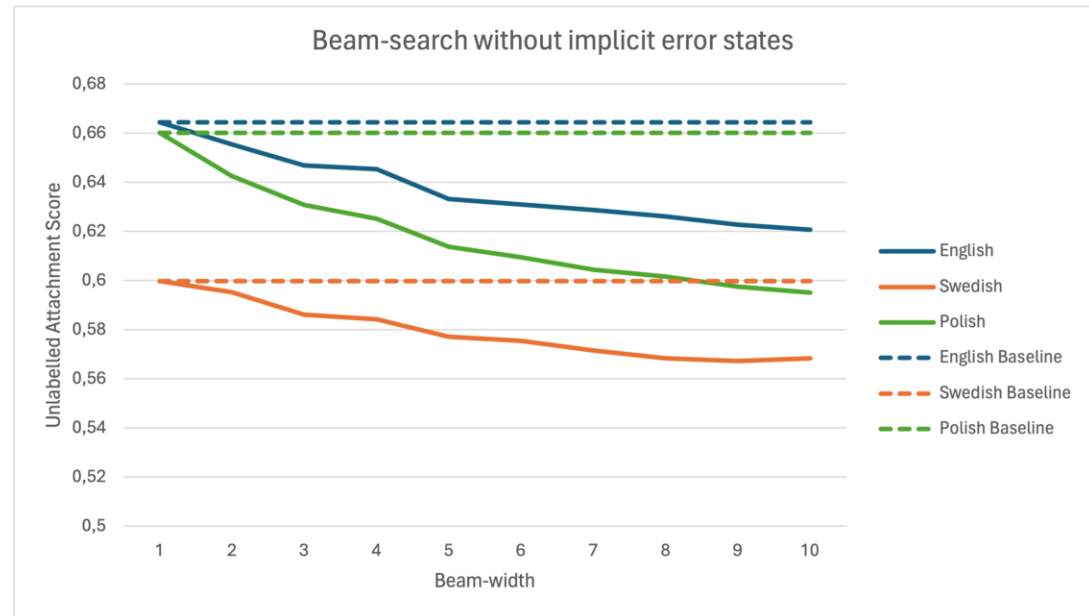
self > left_child > right_child

Traverse:

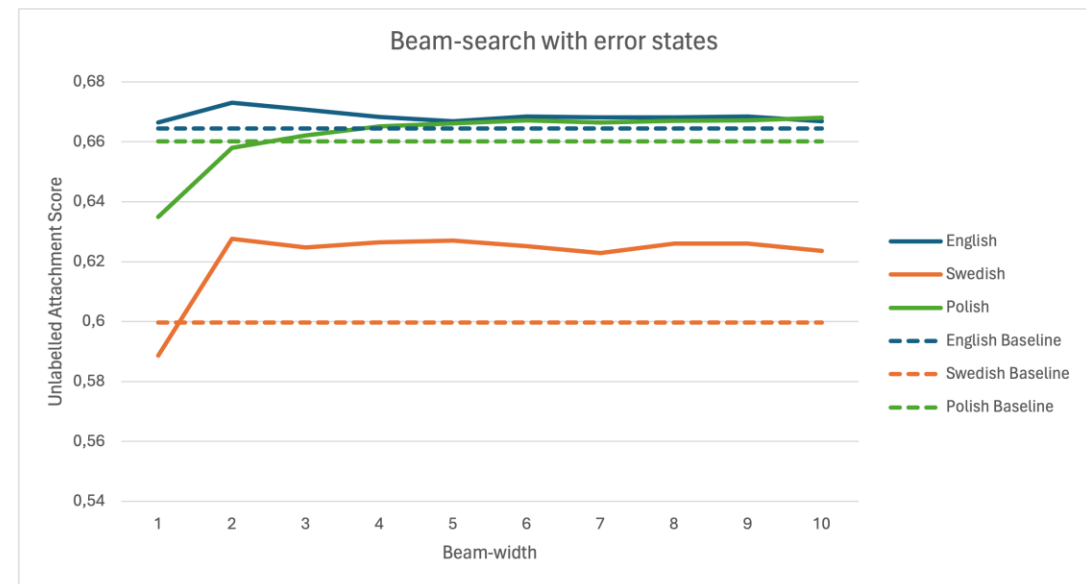
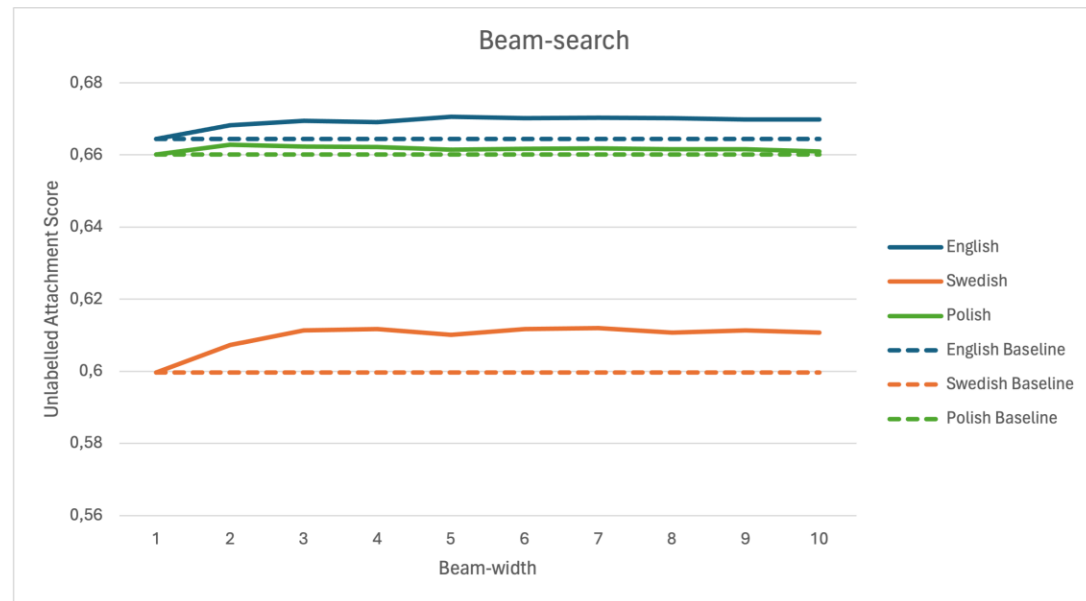


left_child > self > right_child

Beam Search Results



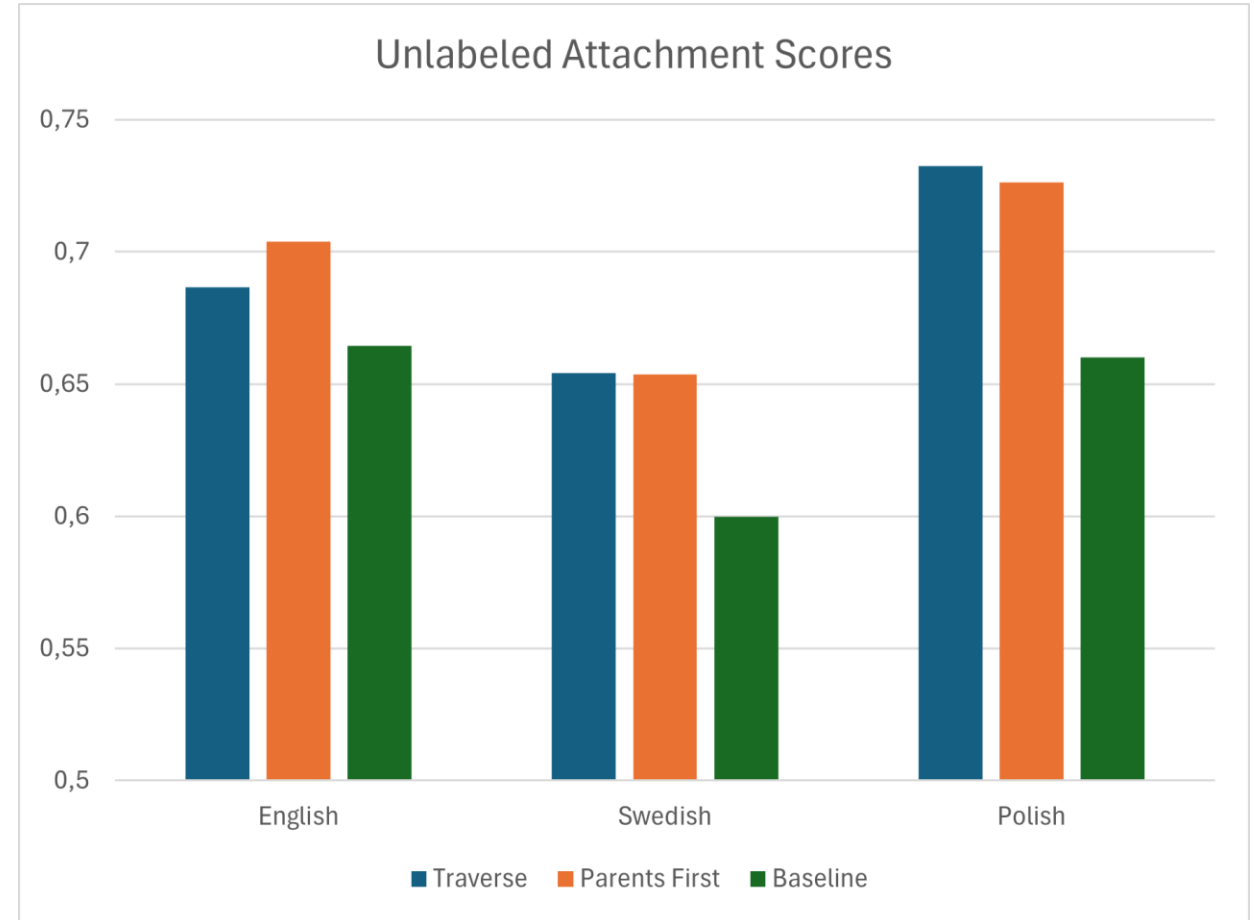
Beam Search Results



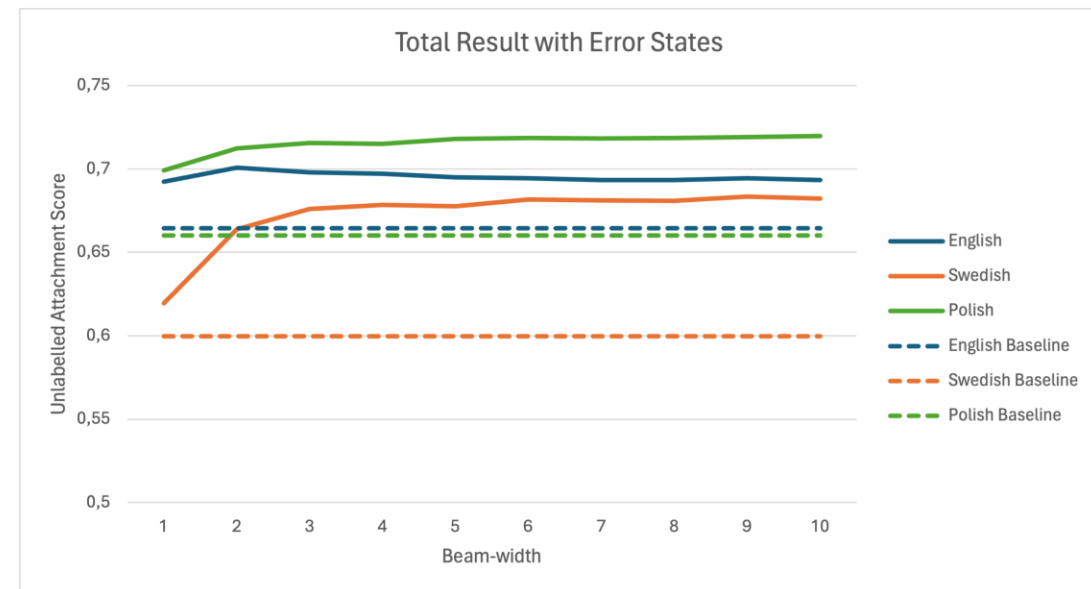
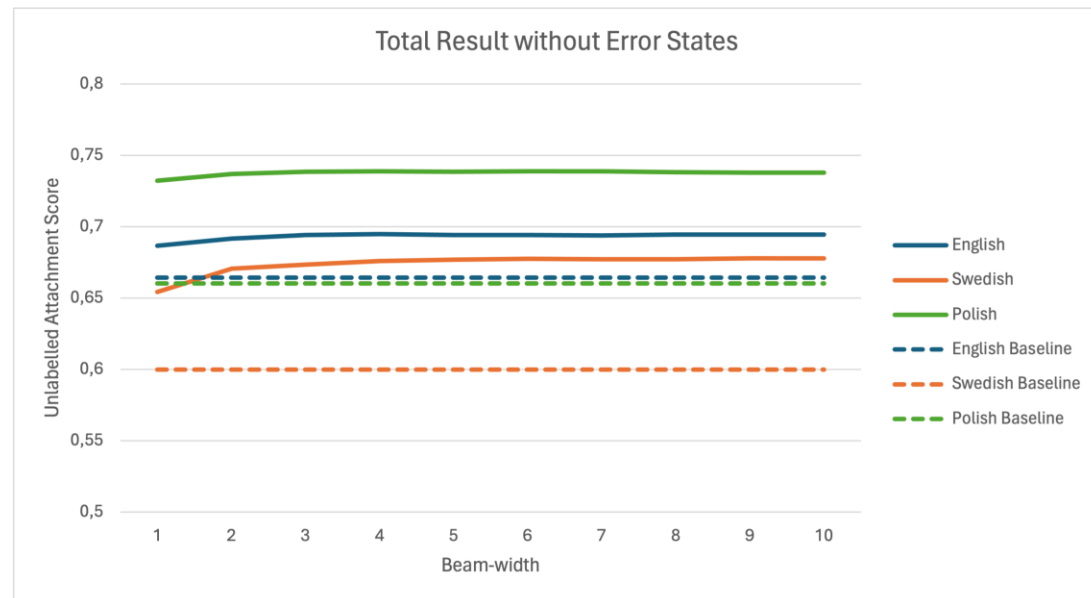
Non-projective results

Unlabeled Attachment Score

Language	Traverse	Parents First	Baseline
English	0.6865	0.7038	0.6644
Swedish	0.6542	0.6535	0.5997
Polish	0.7323	0.7262	0.6601



Combining everything



THANKS FOR
LISTENING

