Topics in Computational Linguistics — Grammar Engineering —

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http://lingo.stanford.edu/courses/05/ge/
Modification: Types and features

- Enable PPs to modify either nominal phrases or verbal phrases
- Account for order of modifiers and heads
- Avoid spurious ambiguity for phrases with two modifiers
- Distinguish modifier PPs from complement PPs
PP Modifiers

- Decide whether head is SPR-saturated
  Does the PP attach to S and NP, or to VP and N-bar?
- Decide whether head or modifier does selection
  If head selects, then worry about how to allow both PPs and adjs
  If modifier selects, then add abstract pos type: modable
Order of modifier and head

- Have two modifier rules (unavoidable)
- Constrain \texttt{HEAD} value for each modifier daughter
  Requires additional abstract \textit{pos} types: \texttt{premodifier}, \texttt{postmodifier}
  Requires multiple inheritance for the type \texttt{adv}
Candidate grammar: VP/N-bar attachment

Positive

- Correct grammaticality results
  
  *The cat chased that fierce dog.*

Negative

- Spurious ambiguity
  
  *The fierce dog near the cat barked.*
Spurious ambiguity

- Consider restricting pre-head modifiers to modify only word, not phrase
  Undergenerates: *the fierce fierce dog*
- Consider attachment of post-head modifiers to NP/S, not Nbar/VP
NP/S attachment for (post-head) modifiers

Positive

• Still correct grammaticality for these data sets
• No spurious ambiguity

Potential Negatives

• Asymmetry for adverb attachment
  The dogs quickly left.
  The dogs left quickly.

• Asymmetry for adjectival modifiers (eventually)
  The dogs angry at the cats bark.
  The angry dogs bark.

• Difficult semantics: scope
  No dogs near the cat bark.
Other alternatives, using VP/N-bar attachment

- Add boolean feature $\neg \text{PM}$
  1. Modifier-head-rule says head-dtr must be $[\neg \text{PM} -]$, but mother is unmarked (enabling *fierce fierce dog*)
  2. Head-modifier-rule says mother is $[\neg \text{PM} +]$  
  3. Other rules preserve the $\neg \text{PM}$ feature from head-dtr to mother

- Use additional types to distinguish “nuclear” vs. “extended” phrases
  Leads to additional complexity in the phrase type hierarchy
Prepositional phrases: Modifiers or complements?

**Modifiers**
- Iteration within a phrase
  
  *The dog barked near the cat on Monday near the office.*
- Transparent semantics

**Complements**
- Obligatory co-occurrence
  
  *The dog gave the cat.*
- Idiosyncratic selection of preposition
  
  *The dog gave the cat at that aardvark.*
- Opaque (unpredictable) semantics
  
  *The dog belongs to the boy.*