

Topics in Computational Linguistics — Grammar Engineering —

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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 HEAD value for each modifier daughter
 - Requires additional abstract *pos* types: *premodifier*, *postmodifier*
 - Requires multiple inheritance for the type *adv*



Candidate grammar: VP/N-bar attachment

Positive

- Correct grammaticality results

The cat chased that fierce dog.

**The cat chased fierce that dog.*

Negative

- Spurious ambiguity

The fierce dog near the cat barked.

[[fierce dog] [near the cat]]

[fierce [dog [near the cat]]]



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 --PM
 1. Modifier-head-rule says head-dtr must be [--PM -], but mother is unmarked (enabling *fierce fierce dog*)
 2. Head-modifier-rule says mother is [--PM +]
 3. Other rules preserve the --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.

