(1) a student of Physics with long hair

1 On differences between Complements and Adjuncts

1.1 Semantic Arguments

Each N′ denotes a semantic property. To attribute (1) to someone is to attribute two properties to them - one of studying Physics and another of having long hair.

On the other hand, (2a, b) both involve only one property attribution: that of being a student in (2a) and that of studying Physics in (2b).

(2) a. John is a student.
   b. John is a student of Physics.

Note that the post-copular1 NPs contain only one N′ each. On the other hand, (1) contains two N′s and involves two property attributions.

- In some cases, PPs are quite unambiguously either adjuncts (with long hair) or complements (of Physics). In most cases, however, PPs don’t so wear their complement/adjunct status on their sleeves. Consider the ambiguous (3).

(3) a student [of high moral principles]
   a. a person who studies high moral principles
   b. a student who has high moral principles

This ambiguity can be characterized in structural terms: on the reading in (3a), the PP of high moral principles is a complement of student, while on the reading in (3b), the PP of high moral principles is an adjunct. A similar point is made by (4).

(4) a. Arguments [with Tim] are often pointless. (complement)
   b. Arguments [with few premises] are often pointless. (adjunct)

1be is also called the copula. a post-copular NP is an NP that follows the copula.
Evidence for the proposal that *with Tim* in (4a) is a complement and that *with few premises* in (4b) is an adjunct comes from the contrast in (5).

(5)  a. Arguments [with Tim] [with few premises] are often pointless.
     b. *Arguments [with few premises] [with Tim] are often pointless.

1.2 Syntactic Arguments

(6) Phrase Structure Rules for Noun Phrases
   a. N'' → D N' (Determiner Rule)
   b. N' → N' PP (Adjunct Rule)
   c. N' → N (PP) (Complement Rule)

One consequence of these rules that we saw last time is that a complement must precede an adjunct.

(7)  a. a student [of Physics] [with long hair]
     b. *a student [with long hair] [of Physics]

These rules have other consequences too. Note that the adjunct rule is recursive i.e. in principle, it could apply an arbitrarily large number of times. On the other hand, the complement rule is not recursive i.e. it can apply only once. These predictions are borne out:

(8)  a. a student [with long hair] [with short arms]
     b. *a student [of Physics] [of Chemistry]

Further, unlike complements which have to precede adjuncts, adjuncts can be freely reordered with respect to each other.

(9)  a. a student [with long hair] [with short arms]
     b. a student [with short arms] [with long hair]

1.2.1 Co-ordination

Complements can be co-ordinated with other complements.

(10) a student [of Physics] and [of Chemistry]

Likewise, adjuncts can be co-ordinated with other adjuncts.

(11) a student [with short arms] and [with long hair]

But adjunct PPs and complements PPs cannot be co-ordinated.

(12) a. *a student [of Physics] and [with short arms]
     b. *a student [with short arms] and [of Physics]

Since a students of Physics and professors with long hair are both N’s, our analysis predicts that it should be possible to co-ordinate them.

(13) the [ [students of Physics] and [professors with long hair]]
1.2.2 Extraposition

Adjuncts are less tightly bound to the head noun than complements. This can be seen by the fact that it is possible to extrapose adjuncts PPs but not possible to extrapose complement PPs.

(14)  a. (?) A student came to see me yesterday [with long hair].
     b. * A student came to see me yesterday [of Physics].

1.2.3 Preposing

Complements and Adjuncts behave differently with respect to preposing.

(15)  a. [What branch of Physics] is Jack a student of?
     b. * [What kind of hair] is Paco a student with?

(Note that Complements and Adjuncts go in opposite directions with respect Extraposition and Preposing.)

1.3 Co-occurrence Restrictions

Heads place significant restrictions (i.e. subcategorise) on what can appear as their complement.

(16)  a. a student of Physics
     b. * a boy of Physics
     c. * a girl of Physics
     d. * a teenager of Physics
     e. * a goth of Physics

No similar restrictions are imposed on adjuncts.

(17)  a. a student with long hair
     b. a boy with long hair
     c. a girl with long hair
     d. a teenager with long hair
     e. a goth with long hair

Generalisation: heads are more closely related to their complements than to their adjuncts. Subcategorisation restrictions hold only between a head and its complement, not between a head and its adjuncts.

1.4 Some more examples

Complements:

(18)  a. your reply [to my letter]
     b. the attack [on Starr]
     c. the loss [of the ship]
d. Joan’s disgust [at Tamara’s behavior]
e. his disillusionment [with life]

Adjuncts:

(19) a. the book [on the table]
b. the advertisement [on the television]
c. the fight [after the match]
d. his resignation [because of the scandal]
e. a cup [with a broken handle]

1.5 Non-PP Complements and Adjuncts

So far we have only considered cases of PP complements and adjuncts. Can other kinds of phrases also be complements/adjuncts of nouns?

Complements: It seems that only PPs and full clauses (Ss) can be complements of nouns.

(20) a. the suggestion [that we should abandon ship]
b. the demand [for him to resign]
c. the question [whether euthanasia is ethical]

On the other hand, a much wider range of phrases can occur as adjuncts e.g. temporal NPs, APs, and Relative Clauses.

(21) a. the [ \[NP\] abolition of taxes] \[NP\] next year]
b. the [ \[NP\] students of Physics] \[AP\] absent from class]
c. the [ \[NP\] king of England] \[S\] who abdicated]

The greater freedom found with adjuncts reflects the fact that fewer restrictions are imposed by a head on its adjuncts than on its complement.

1.6 Complex NPs

What happens when the PP complement or adjunct itself contains a non-trivial NP (i.e. an NP with internal structure)?

(22) a. an advocate of the abolition of indirect taxation
b. a woman with an umbrella with a red handle
c. his dislike of men with big egos

How can we account for the ambiguity of (23)?

(23) a woman with three children with ginger hair
2 Prenominal Modifiers

Nouns can have three different kinds of prenominal (i.e. preceding the noun) modifiers:
Determiners: a
Attributes (Prenominal Adjuncts): Cambridge
Complements: Physics

(24) a [Cambridge] [Physics] student

We already have the following two phrase structure rules:

(25) a. N'' → D N' (Determiner Rule)
   b. N' → N' PP (Adjunct Rule)
   c. N' → N (PP) (Complement Rule)

In addition, we will add the following two rules:

(26) a. N' → NP N' (Adjunct Rule)
   b. N' → (NP) N (Complement Rule)

Consider the two readings of (24):

(27) a. a student of Physics in Cambridge
   b. a student of Cambridge Physics (as opposed to New York Physics)

The case of (27b) is somewhat straightforward so we can set it aside for now.
As for (27a), we know from our discussion on postnominal modifiers that in (27a), of Physics is a complement and in Cambridge is an adjunct. If we want to maintain maximal structural symmetry between (24) and its postnominal version in (27a), we are led to the following structure for the reading of (24) paraphrased by (27a).

(28)

2.1 Evidence for the above tree

- Ordering: We know that complements have to be closer to the head than adjuncts while adjuncts can be more freely reordered with respect to each other.

Note that Cambridge and Physics cannot be reordered. Physics has to be closer to the head noun.

(29) a. a [Cambridge] [Physics] student
b. * a [Physics] [Cambridge] student

Co-ordination: Prenominal adjuncts cannot be co-ordinated with prenominal complements.

(30)  
  a. * several [[Physics] and [Cambridge]] students  
  b. * several [[Cambridge] and [Physics]] students  
  c. several [[Physics] and [Chemistry]] students  
  d. several [[Cambridge] and [New York]] students

Also since both Physics student and Cambridge Physics student are N’s, they can both be co-ordinated with another N’.

(31)  
  a. a Cambridge [hockey player and Physics student]  
  b. a [hockey player and Cambridge Physics student]

Recursion: The attribute/adjunct rule is recursive, the complement rule is not. This means that we can have an arbitrarily large number of attribute/adjuncts but only one complement.

(32)  
  a. * a Physics Economics Agriculture student  
  b. a [Cambridge] [middle class] student  
  c. a [middle class] [Cambridge] student

2.2 The Prenominal/Postnominal Parallel

In general, for most postnominal structures, whether they involve complements or adjuncts, we can produce corresponding prenominal structures.

(33)  
  a. i. the ban [on controversial art] (Complement)  
     ii. the [controversial art] ban  
  b. i. recruitment [of personnel] (Complement)  
     ii. [personnel] recruitment  
  c. i. the shop [on the corner] (Adjunct)  
     ii. the [corner] shop  
  d. i. the lady [of iron] (Adjunct)  
     ii. the iron lady

However, there is a difference - only nominals can occur in the preverbal position. Unlike postnominal modifiers which could be PPs, prenominal modifiers can only be NPs or adjectives. Not all postnominal modifiers can be paraphrased by prenominal modifiers:

(34)  
  a. the carrot [on the pan]  
  b. * the [on the carrot] pan  
  c. * the [pan] carrot

Further the meaning of a prenominal modifier, esp. if it is an adjunct, can differ substantially from the postnominal PP version.

2Also participles as in ‘the eaten apple’.
A book kept on the coffee-table is not the same thing as a coffee-table book.

3 Adjectival Premodifiers

So far, we have only considered nominal attributes. Where do adjectives fit into the picture?

(36)  a. a [really excellent] book
       b. a [patently obvious] lie

For the most part, adjectival premodifiers are like NP premodifiers. We can handle them by adding the following rule:

(37) \( N' \rightarrow AP N' \) (Adjunct AP Rule)

Points to consider:
* recursiveness
* Ambiguity of cases like:

(38) an English teacher
       a. someone who teaches English
       b. someone who teaches, and who is English