

# Modifiers

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When it comes to the grammatical categories familiar from grade school English class, two prominent examples which are not part of the fragment of English for which we know how to give a semantics are adjectives and adverbs. Today we'll talk about how these might be added to our language.

## 1. ADJECTIVES

A good way to set things up is by dividing adjectives into three categories, which can be roughly defined by looking at the following trios of sentences:

- 1a. Ralph's car is a yellow bus.
- 1b. Ralph's car is a Volkswagen.
- 1c. Ralph's car is a yellow Volkswagen.
- 1d. Ralph's car is yellow.
  
- 2a. Ralph is a former basketball player.
- 2b. Ralph is a teacher.
- 2c. Ralph is a former teacher.
- 2d. Ralph is former.
  
- 3a. Bob is a tall midget.
- 3b. Bob is a basketball player.
- 3c. Bob is a tall basketball player.
- 3d. Bob is tall.

Adjectives which display the pattern exemplified by 'yellow' are called *intersective*, those which display the pattern exemplified by 'former' are called *non-predicative*, and those which display the pattern exemplified by 'tall' are called *subsective*.

### 1.1. *Intersective adjectives*

Intuitively, (1a) is true if and only if Ralph’s car is both yellow and a bus. The question is how we preserve this intuition in our semantics.

One way to do this is to slightly complicate our view of VPs. We are accustomed to treating VPs like “is hungry” and “is a book” as simple parts of our lexicon, getting as their semantic value a set of individuals. But we can’t treat VPs like “is a yellow bus” like this. Why not?

Instead we can separate out “is hungry” into two parts: the copula, “be”, and the adjective (Adj) “hungry.” Though the details on how this is implemented in the text will have to wait until our discussion of relative clauses, the basic idea is that just as we permit “be” to combine with an Adj to form a verb phrase, we also permit it to combine with certain noun phrases to form a VP. Among those noun phrases will be those which combine an Adj with an Nc, as in “yellow bus.” For intersective adjectives, the semantic value of the noun phrase will be the intersection of the semantic value of the Nc and the semantic value of the Adj:

$$\llbracket \text{Adj Nc} \rrbracket = \llbracket \text{Adj} \rrbracket \cap \llbracket \text{Nc} \rrbracket$$

and the VP gets this semantic value by pass-up.

### 1.2. *Non-predicative adjectives*

Obviously, this treatment will not generalize to non-predicative adjectives like ‘former’. It’s important to see that there are two distinct reasons for this:

- (i) There appears to be no such thing as the set of former things.
- (ii) Even if there were, we could not let  $\llbracket \text{former basketball player} \rrbracket$  be derivable from  $\llbracket \text{former} \rrbracket$  and  $\llbracket \text{basketball player} \rrbracket$  since it is possible that  $\llbracket \text{N1} \rrbracket = \llbracket \text{N2} \rrbracket$  but that  $\llbracket \text{former N1} \rrbracket \neq \llbracket \text{former N2} \rrbracket$ . This is another way of saying that ‘former’ appears to create a non-extensional context. Can you see why?

Point (i) shows that we need to make the semantic value of ‘former’ something other than the set of former things. A natural suggestion here is that we treat ‘former’ as standing in the same relation to Adj’s and Nc’s as ‘not’ and ‘necessarily’ stood to sentences: i.e., as a predicate operator.

Point (ii) shows that ‘former’ is more like ‘necessarily’ than like ‘not’: it must operate on the intension, and not the semantic value (extension) of the Nc or Adj with which it combines.

How would you fill out the following lexical entry for ‘former’:

$[[\text{former Nc}]^{\mathcal{M}, w, i, g} = \dots$

The intension of an Nc like ‘basketball player’ will be a function from worlds and times to sets of individuals: the set of basketball players at that world and time. This will also be the sort of thing which is the intension of an intersective adjective like ‘yellow.’

By contrast, the intension of ‘former’ will be a function from functions from worlds and times to individuals to a function from worlds and times to individuals — just as the intension of ‘necessarily’ is a function from sentence intensions (which are functions from worlds and times to truth values) to sentence intensions.

(Note that in the text ‘former’ is treated as a member of the same syntactic category as ‘yellow’, but given a different type of intension. One might wonder then how we can explain the fact that ‘Bob is yellow’ is grammatical whereas ‘Bob is former’ is not. The idea is that this is to be explained by the uninterpretability of the tree corresponding to the latter, rather than by any separate syntactic rule.)

### 1.3. *Subsective adjectives*

Subsective adjectives like ‘large’ are in some ways the trickiest ones. On the one hand, we can’t treat them like intersective adjectives, since then we would have no explanation for the fact that 3a and 3b don’t entail 3c.

This might suggest that we should treat them as predicate modifiers, understanding ‘tall midget’ as meaning, roughly, ‘tall for a midget.’ We might then assign it an intension which is a function from predicate intensions to predicate intensions, just like ‘former.’ This runs into two problems.

The first is that this assimilation of ‘tall’ and ‘large’ to ‘former’ leaves us with no explanation for the fact that ‘Bob is tall’, unlike ‘Bob is former’, makes sense. One might try to explain this using the same sort of context-dependence discussed in connection with quantifier domain restriction; but, even if this explains which ‘Bob is tall’ does makes sense, it does not explain why ‘Bob is former’ does not.

The second is that sometimes ‘tall N’ does not mean the same as ‘tall for an N.’ An example from the text is

Joe built a tall snowman.

Here, intuitively, whether the sentence is true depends not just on the average height of snowmen, but also on who Joe is: the standards in play might be different depending on whether Joe is a college student or a 5 year old.

The treatment recommended in the text is basically to treat subjective adjectives as context-dependent intersective adjectives. A given use of ‘tall’ or ‘large’ will, depending on the context, pick out a different set: it might be the set of things which are tall for a midget, or the set of things which are tall for a snowman, or the set of things which are tall for a snowman built by a 5 year old. We then use the semantic rule described above in connection with intersective adjectives.

A philosophically important example of a subjective adjective: ‘good.’ The relevance of this point to ethics.

A worry about this treatment of adjectives: the sorites paradox. How context-dependence might help.

## 2. ADVERBS

Consider the following sentences:

- 4a. Kim kissed Lee passionately on the mouth.
- 4b. Kim kissed Lee passionately and Kim kissed Lee on the mouth.
- 4c. Kim kissed Lee passionately.
- 4d. Kim kissed Lee on the mouth.
- 4e. Kim kissed Lee.

Note that while no sentence on this list entails any sentence above it, every sentence on this list — with the exception of 90c/d — entails every sentence below it. This pattern — often called the ‘diamond pattern’ — is a general feature of the behavior of adverbs like ‘passionately’ and ‘on the mouth.’

(In grade school grammar, we separate adverbs and prepositional phrases into different categories. Though there are important differences between them, for our purposes we will let anything which (apparently) modifies a verb phrase, including some prepositional phrases, count as an adverb.)

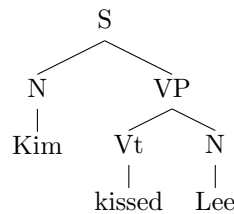
Since adverbs are, like adjectives, modifiers, we might look to our two categories of adjectives for guidance in seeing how to understand this pattern of entailments. When we do this, we find that adverbs seem to behave much more like intersective than like non-predicative adjectives:

- 5a. A dirty pink pig is in the garden.
- 5b. A dirty pig is in the garden and a pink pig is in the garden.
- 5c. A dirty pig is in the garden.
- 5b. A pink pig is in the garden.
- 5b. A pig is in the garden.

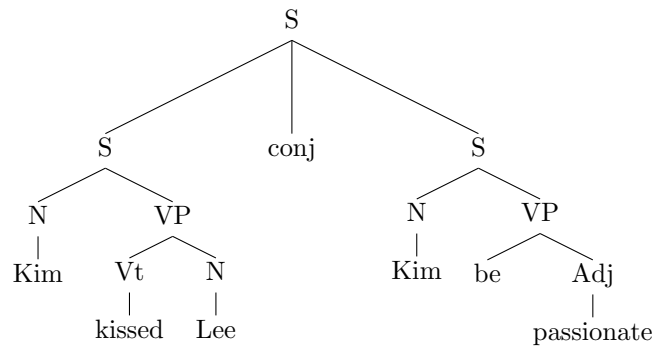
- 6a. An alleged former spy is in the garden.
- 6b. A former spy is in the garden and an alleged spy is in the garden.
- 6c. A former spy is in the garden.
- 6d. An alleged spy is in the garden.
- 6e. A spy is in the garden.

This suggests that adverbs (at least those used in the 4- sentences) should be assimilated to intersective adjectives. Perhaps, then, their semantic value should be a set of entities.

But this leads to a question: what, exactly, should we take these adjectives to be modifying? Consider the sentence “Kim kissed Lee”, which we can think of as having the tree



Now consider “Kim kissed Lee passionately.” Where should “passionately” be inserted in the tree? One might think that it should combine with the Vt; but `[[kissed]]` is not of the right type. Or we could treat this sentence as



but this won't work, since Kim can kiss Lee passionately even if neither Kim nor Lee is passionate. The same point shows that 'passionately' can't be understood as combining (via the rule for intersective adjectives) with the VP 'kissed Lee', since that is a set of individuals who kissed Lee — and Kim might be in that set, but fail to be in the intersection of that set with the set of passionate things, while “Kim kissed Lee passionately” is nonetheless true.

One prominent style of solution to this problem (which is due to the philosopher Donald Davidson) is to say that adverbs modify *events*. The idea is that a sentence like 4a has a logical form which is roughly like that of

$\exists e$  (e is a kissing of Lee by Kim & e is passionate & e is on the mouth)

The main virtue of this account is that it neatly predicts the diamond pattern, and appears to give the right truth conditions.

A philosophically interesting feature of the account is that it immediately commits us — given the truth of some sentences like the 4-sentences — to the existence of events, in addition to individuals, functions, and sets of individuals.

Even if most adverbs work like intersective adjectives, there appear to be some which work like non-predicative adjectives, as in

John allegedly ran the Boston Marathon.

Can this sentence be handled using an extension of the Davidsonian event-based semantics? Does it imply that there was an event which was an alleged running of the Boston Marathon? Is it strange to treat the 4- sentences as involving quantification over events, and this sentence as of a completely different form?