

Composition and modification

1 Review of rules

(1) **Terminal Nodes (TN):**

If α is a terminal node, $\llbracket \alpha \rrbracket$ is specified in the lexicon.

(2) **Non-branching Nodes (NN):**

If α is a non-branching node, and β is its daughter node, then $\llbracket \alpha \rrbracket = \llbracket \beta \rrbracket$.

(3) **Functional Application (FA):**

If α is a branching node, $\{\beta, \gamma\}$ is the set of α 's daughters, and $\llbracket \beta \rrbracket$ is a function whose domain contains $\llbracket \gamma \rrbracket$, then $\llbracket \alpha \rrbracket = \llbracket \beta \rrbracket(\llbracket \gamma \rrbracket)$.

2 How to study the meaning of a part

Using the Principle of Compositionality, we can figure out the meaning of individual parts of sentences.

- (4) Kara **and** Tama sleep.
- (5) John likes **himself**.
- (6) Sarah swims **again**.

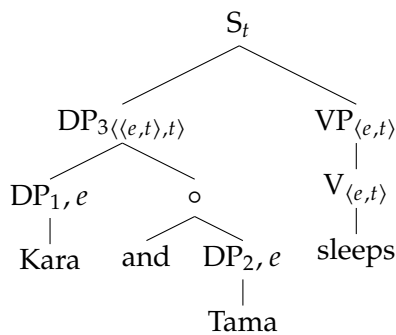
Step by step:

1. What does the whole sentence mean? Paraphrase without using the target part (in bold).
2. What is the structure of the sentence? Draw a tree.
3. Fill in semantic types. Use the Triangle Method if necessary.
4. Using your paraphrase from Step 1, work backwards to figure out the meaning of the target part (in bold).
 - Make sure the meaning you write for the target part is general: it should not include meanings which are contributed from other material in the sentence.
 - Remember that each λ should correspond to a variable in the return value. When you add a λ variable, make sure it's used.
5. Check that your final meaning matches the predicted type. Recompute the structure bottom-up to make sure it works. Make sure the meaning you proposed also works in other, similar examples.

Example:

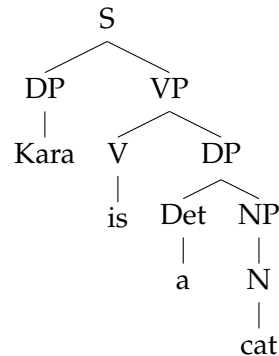
(4) Kara and Tama sleep.

First, to figure out the types. The important thing to note is that there is no plural “Kara+Tama” in D_e . This teaches us that the type of the DP “Kara and Tama” cannot be type e . The only other option (using the Triangle Method, using Functional Application) is type $\langle\langle e, t \rangle, t\rangle$. Our goal is to figure out a way to get (3) to mean $\text{Sleep}(\text{Kara}) \wedge \text{Sleep}(\text{Tama})$, i.e. the same as “Kara sleeps and Tama sleeps.”



3 Non-verbal predicates

(7) Kara is a cat.



Compositionality allows us to (a) use what we know and (b) work backwards.

(8) Kara sleeps and is a cat.

The semantics for conjunction developed in PS3 (hopefully) is only defined for conjunctions of equal semantic type.

- (9)
- a. Austin is a city and Austin is in Texas.
 - b. Austin is a city and is in Texas.
 - c. Austin is a city and in Texas.
 - d. * Austin is a city and Texas.

4 Modification

- (10)
- a. Kara is a black cat.
 - b. Kara is black and Kara is a cat.
- (11)
- a. Austin is a city in Texas.
 - b. Austin is a city and Austin is in Texas.

Each pair of sentences in (10a,b) and (11a,b) is truth-conditionally equivalent. We call such modifiers *intersective*.

Option 1: Intuitively, *black* modifies *cat*. Write a semantics so that $\llbracket \text{black} \rrbracket$ modifies $\llbracket \text{cat} \rrbracket$ through Functional Application.

(12) $\llbracket \text{black} \rrbracket =$

The disadvantage of this approach is that attributive adjectives (modifiers) and predicate adjectives have different semantics, although taking a predicate adjective $\langle e, t \rangle$ and converting it to its attributive form $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$ is easy: *IFS* (p. 193–195) and *EFS* (pp. 82–84) both describe this procedure.¹

Option 2: Introduce a new composition rule.

(13) **Predicate Modification (PM):** from H&K
If α is a branching node, $\{\beta, \gamma\}$ is the set of α 's daughters, and $\llbracket \beta \rrbracket$ and $\llbracket \gamma \rrbracket$ are both in $D_{\langle e, t \rangle}$, then $\llbracket \alpha \rrbracket = \lambda x_e . \llbracket \beta \rrbracket (x) \wedge \llbracket \gamma \rrbracket (x)$.

Now we can simply use the regular $\langle e, t \rangle$ denotations for *black* and *in Texas*.

5 Non-intersective modifiers

What about the following modifiers?

- (14) a. This is a fake diamond.
b. This is fake and is a diamond.
- (15) a. John is a short basketball-player.
b. This is short and is a basketball-player.
- (16) a. Obama is a former president.
b. * Obama is former and is a president.

¹The use of a systematic procedure for translating a meaning in one type into a corresponding meaning in another type is called *type-shifting*.