Meaning 4.2: Semantics 3 — Simple predication, definite descriptions and transitive verbs

May 18, 2020

Bringing our take-homes again to lecture...

Assumption 1: Meaning is truth-conditional.

Assumption 2: Meaning is compositional.

Model architecture: based on set theory.

Basic units: elements/individuals, ordered pairs, sets

TRUTH CONDITIONS

Operations/relations: membership $\in$, intersection $\cap$, union $\cup$, subset $\subseteq$, superset $\supseteq$

COMPOSITIONALITY

Model-theoretic semantics — intuition

Here is the logic:

(i) We use language to talk about things in the world; so, we create a model universe to represent these things. We represent things in the world by things in the model.

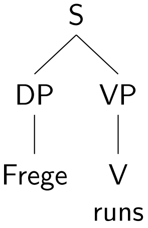
(ii) When we talk about things in the real world, we are often making reference to them directly or speaking about relations between them; these relations are modeled by operations on the things in the model (which represent things in the world).

(iii) We observe the behavior of things in the model and operations on those things; ideally, it should reflect how meaning works in language.

Simple predication — from last time

For a sentence S with daughter nodes DP and VP from left to right, $[\![S]\!] =$ true iff $[\![DP]\!] \in [\![VP]\!]$

‘Frege runs’



$[\![\text{Frege}]\!] = f$

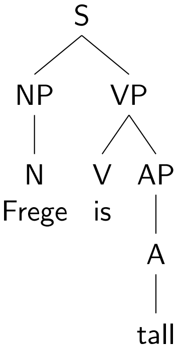
$[\![\text{run}]\!] = \{x\text{: } x \text{ runs}\}$

The sentence is true iff f is a member of the set of runners.

Mathematically, true iff
$[\![\text{Frege}]\!] \in [\![\text{run}]\!]$
i.e. iff $f \in \{x\text{: } x \text{ runs}\}$

Simple predication

‘Frege is tall’



$[\![\text{Frege}]\!] = f$;

$[\![\text{tall}]\!] = \{x\!: x \text{ is tall}\}$;

$[\![\text{is}]\!] =$ vacuous in meaning (note that some languages don’t even use a copula for these constructions)

The sentence is true iff Frege the individual belongs to the set of tall people.

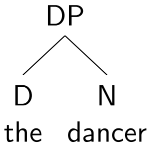
$[\![\textit{Frege is tall}]\!] =$ true iff $[\![\text{Frege}]\!] \in [\![\text{tall}]\!]$

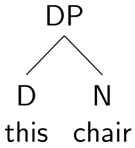
The meaning of a DP when it is DP $\rightarrow$ D NP

Definite NPs (which are DPs) are **referential**. They refer to entities; so, this means they are like names and should be elements/individuals in our model.

(i) The dancer is going to the barre.

(ii) This chair broke.





But, from before, we know that bare nouns (N) denote a set of individuals, like adjectives and intransitive verbs.

Semantics of definite determiners

The N daughter of a referential DP **describes** the entity the DP refers to; it is a set in our model.

The D daughter of a referential DP **picks out a contextually salient individual** of the group of entities which have the property of N; it is an individual in our model (and it is a member of the set above).

Omitting details of this particular composition (in any semantics class you will certainly go over this), the denotation of *the dancer* is

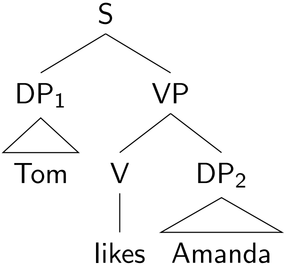
$[\![\text{the dancer}]\!] = \text{contextually salient individual } d \text{ such that } d \in [\![\text{dancer}]\!]$

$[\![\text{this chair}]\!] = \text{contextually salient individual/thing } c \text{ (being pointed to) such that } c \in [\![\text{chair}]\!]$

Semantics of transitive verbs

Transitive verbs denotes a set of ordered pairs of two individuals.

$[\![\text{like}]\!] = \{\langle x, y\rangle\text{: } y \text{ likes } x\}$



A transitive sentence S that consists of DP_1, V, DP_2 is true iff $\langle [\![DP_2]\!], [\![DP_1]\!]\rangle \in [\![V]\!]$

which is equivalent to saying S is true iff $\langle [\![\text{Amanda}]\!], [\![\text{Tom}]\!]\rangle \in \{\langle x, y\rangle\text{: } y \text{ likes } x\}$

Closing notes

Note the following:

(i) Again, we start with truth conditions of the lexical items and use rules to compose them to have more complex truth conditions.

(ii) At the sentence level we always reach a set of truth conditions that together are necessary and sufficient for the truth of the sentence.

(iii) The syntax provides us with semantic structures which **can** compose; they have the right types.

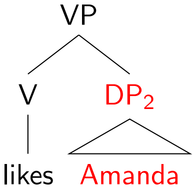
(this idea is prominent in contemporary linguists; most semantics is type-driven and that is how composition is done now.... the idea is that only things of the right types can compose, and the syntax for the most part only puts things of the right type together)

End of this video's material. Rest is for your curiosities.

(De)composition

Let's break the transitive verb down to see how the composition works.

Step 1:



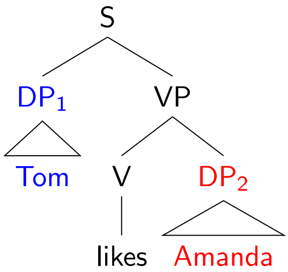
$$[\![\text{likes Amanda}]\!] = \{\langle [\![\text{Amanda}]\!], y\rangle \colon y \text{ likes } [\![\text{Amanda}]\!]\} =$$

set of individuals who like Amanda

Note: the complex meaning $[\![\text{likes Amanda}]\!]$ (on the left of $=$ sign) is a **composition** of the meanings of its parts $[\![\text{Amanda}]\!]$ and $[\![\text{like}]\!]$ (on the right of the $=$ sign); this new unit has **truth conditions** determined by the truth conditions of its parts. Last, the type of VP is again a set of individuals... so, in essence *likes Amanda* behaves like an intransitive verb. Cool.

(De)composition

Step 2:



$$[\![\text{Tom likes Amanda}]\!] = \text{true iff } [\![\text{Tom}]\!] \in [\![\text{likes Amanda}]\!] =$$

$$[\![\text{Tom}]\!] \in \{\langle [\![\text{Amanda}]\!], y\rangle\text{: } y \text{ likes } [\![\text{Amanda}]\!]\} =$$

$$\langle [\![\text{Amanda}]\!], [\![\text{Tom}]\!]\rangle \in [\![\text{likes}]\!] =$$

$$\langle [\![\text{Amanda}]\!], [\![\text{Tom}]\!]\rangle \in \{\langle x, y\rangle\text{: } y \text{ likes } x\}$$

Food for thought

Think about transitive verbs as functions which take two variables, and then intransitive verbs, adjectives and nouns as functions which take one variable. The variables they take are individuals, so once a transitive verb combines with its first argument, it has one variable left to specify, leaving it to be a function of the same type of adjectives, nouns and intransitive verbs. This is how people model these things in the modern research.