Handout 1: Compositional Semantics[1]

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In semantics, we study *meaning*.

- Word meaning

(1) Dog, cat, book

'Dog' means 

'Cat' means 

'Book' means 

and 

We could study the meaning of *words*: *Dog* versus *cat*, for instance. However, we don't know much besides *dog* meaning "dog" and *cat* meaning something else. And it would be inconvenient in society if that wasn't always the case.

> Neurolinguists are starting to discover more about word meaning, for instance about *homonymy* and *polysemy*: Words that have the same form, but a *different* or *related* meaning. By measuring behavioral responses, they can show that lexical meaning is stored in connected networks. For instance, people who just heard *cat*, respond to *dog* quicker than to *book* (as they're semantically related). This suggests that semantic connections are stored in the brain.

- Sentence meaning

For the last 50 years, progress has been made in studying the meaning of *sentences*: What you're going to learn in syntax, goes hand in hand with what you're going to learn here. The starting point is that as speakers of English, we know that *John saw Mary* means something different from *Mary saw John*. We also know that *John saw Mary* is different from *Bill saw Mary*.

(2) Bill saw Mary.
(3) John saw Mary.

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[1] This handout is inspired by Alexander Williams's handouts presented in LING410: *Meaning and Grammar*, UMD Spring 2018.

(4) Mary saw John.

These three sentences are enough to explain the *principle of compositionality* (Montague 1970, 1973, among others): In semantics, it is generally assumed that the meaning of an expression depends on its syntactic parts. The first component is that different parts (for instance, *Bill* versus *John*) will result in a different meaning. The second component is that a different syntactic structure, (for example, *John* as a subject versus *John* as an object versus) will result in a different meaning.

Exercise
Explain how the *principle of compositionality* gives us different meanings for the following sentence pairs.

(5) a. The car is green.
b. The car is purple.

(6) a. Mary is a doctor.
b. Mary is not a doctor.

(7) a. John is boiling the rice.
b. John boiled the rice.

(8) a. The dog that chased the cat is brown.
b. The dog that the cat chased is brown.

In this class, we will discuss and discover sentence meaning by investigating how it is built up by its parts. We will do this by linking *sentence meaning* to *sentence structure*: Without syntax, the difference between (3) and (4), or (8a) and (8b) cannot be captured.

(3) John saw Mary.
[John [saw Mary]]
(4) Mary saw John.
[Mary [saw John]]

An important component of sentence meaning left out here is how sentences can be used. When I utter a sentence like 'It's cold in here', I can just state that fact (which we call the *literal meaning* of a sentence). However, by using this sentence I can also request an action from the addressee (i.e., to close the door or to turn on the central heating), which is called the *intended meaning*. Language use is the field of *pragmatics*, which will be discussed in the last class.

Before diving into the components of a sentence, the question arises what sentence meaning is. What does *John saw Mary* (or *Jan zag Marie* or *Ninom Irakli dainaxa*) stand for?

- It could stand for a *thought*, the thought of a boy, John, and a girl, Mary, and the boy saw the girl. If we want to fit this in with the principle of compositionality,

we need an understanding of what these thoughts are and how the parts of the thoughts can be combined.

- It could stand for something that happened *in the world*: An actual boy, John, saw an actual girl, Mary at some point in the past. For sentences like *John saw Mary*, a link between world and language seems to work well, but things complicate quickly, for instance with sentences like *John may have seen Mary* or *John saw Mary or Sue*.

Semanticist M. J. Cresswell in *the Autonomy of Semantics* (1982) presented (9) as "the most certain thing I know about meaning [and] perhaps [. . .] the only certain thing."

(9) "If we have two sentences A and B, and A is *true* and B is *false* [under the exact same circumstances], then A and B do not mean the same."

There thus seems to be a link between *truth* and *meaning*: At the very least, we can say that language can be used to say true and false things about the world. If I say *the earth is flat*, someone can disagree with me, and if I say *the earth is round*, someone can agree. So, at the very least, the meaning of a sentence determines what must be the case in the world *if the sentence is true*. That is, the meaning of a sentence must at least determine its *truth conditions* (Montague 1970, 1973, Davidson 1967, Larson & Segal 1995).

Truth conditions for the sentence *John saw Mary*:

(10) 'John saw Mary' is true if and only if John saw Mary.

Object language Metalanguage

Same for the sentence *Ninom Irakli dainaxa*:

(11) '*Ninom Irakli dainaxa*' is true if and only if Nino saw Irakli.

A note on the history: The mathematical logician Richard Montague viewed natural language as a formal language, the way logics are. As such, he believed that the study of language belonged to the field of mathematics, and not psychology. As you might know, this is not the view of a linguist like Noam Chomsky. In this class, we will explore the formal framework, as Montague's work has influenced modern semantics to a large extent. However, we will keep the cognitive perspective in mind and discuss objections at the end of the class.

Take-home message:
Compositional semantics – the study of how the meaning of an expression depends on its syntactic parts.
Syntax and semantics – sentence meaning is linked to sentence structure