HSSP: Introduction to Linguistics

Week #4: Semantics

Today

Semantics is the study of meaning in language. Some things we will learn today:

- The meanings of sentences are determined by the meanings of their parts and the way that they are combined.
  - o The meaning of a larger structure is built from smaller units
  - o Sentences can sometimes have more than one meaning
- Adjectives can change the meaning of a phrase in several different ways
- Sometimes other factors also participate in determining the meaning of an utterance, for example – *focus*.

1   The meaning/structure correspondence

A basic starting point of generative grammar: there are <u>infinitely</u> many sentences in any natural language, and the brain is finite, so linguistic competence must involve some finite means for specifying an infinite class of sentences. That is a central task of **syntax**.

Semantics: A speaker of a language knows the meanings of those infinitely many sentences, is able to understand a sentence s/he has never heard before or to express a meaning s/he has never expressed before. So there must also be a finite way of specifying the meanings of the infinite set of sentences of any natural language.

A central principle of formal semantics is that the relation between syntax and semantics is compositional.

<u>The Principle of Compositionality</u>: The meaning of an expression is a function of the meanings of its parts and of the way they are syntactically combined.

We can describe ambiguities using **tree diagrams** or by using bracketing to express what parts of a word combine together first. We can also use trees to express how **words** combine together to create larger structures like **phrases** and **sentences**.

The newspaper headline: *Man eating piranha mistakenly sold as pet fish* is 4-ways ambiguous!
<u>Exercise</u>: *Can you give paraphrases of all the different meanings?*

a. _____.

b. _____.

c. _____.

d. _____.

2 Adjectives and their meaning

Adjectives can be classified according to how they contribute to the meaning of a phrase.

(1) My pet is a *grey* cat
(2) The conductor is a *Polish* immigrant

Adjectives like *grey*, *Polish*, *square, hairy, …* are called **intersective**.
They imply that the noun has the property described by the adjectives.
If my pet is a grey cat, then my pet is *grey* AND my pet is *a cat*.

Now consider (3)-(5):
(3) George is a *former* president
(4) This is a *fake* diamond
(5) Sue is a *likely* winner (of the race)

Adjectives like *former*, *fake*, *likely*, *certain, …* are called **non-intersective**.
They imply that something is *not* as the adjective describes.
If George is a former president, then it is not the case that George is former and George is a president.

Finally, consider (6)-(7):
(6) a. Ella is a *tall* 3-year-old.   (7) a. My 5-year-old nephew built a tall snowman.
    b. Michael is a *short* basketball player.   b. The frat boys built a tall snowman.

Adjectives like *tall*, *large*, *clean*, *sharp*, *safe* are called **relative-intersective**.
They depend on the context to define their meaning. The *standard* that they are defined against might change in different environments.
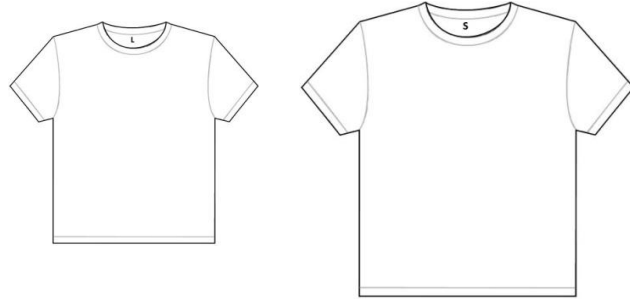
Exercise: *Are the adjectives in these sentences intersective or non-intersective?*

1. Howard is a *criminal* lawyer.

2. Sue is a *true* believer.

3. John is a *polite* student.

4. Bill is a *skinny* boy.

5. Mary is a *good* friend.

6. This car is a *red* Volkswagen.

7. T.Rex was a *carnivorous* dinosaur.

8. This is *counterfeit* money.

3 Meaning is determined by structure

The meaning of an utterance depends not on the linear order of its parts but rather on its structure.

(1) a. A small large <u>shirt</u>
    b. A large small <u>shirt</u>
(2) a. An alleged English <u>baron</u>
    b. An English alleged <u>baron</u>

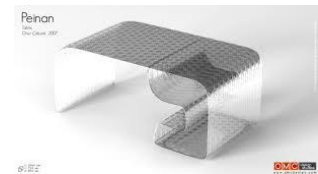**<u>Exercise</u>**: *Which shirt is (1a) and which one is (1b)?*
Do we know if the Baron in (2a) is English? How about in (2b)?

(3) a. An <u>answer</u> that is common that is wrong
    b. An <u>answer</u> that is wrong that is common

<u>Exercise</u>: *What kind of answers does (3a) refer to? How about (3b)?*

Tables normally cost: $200
Plastic tables normally cost: $50

(4) a. An [[expensive <u>table</u>] made of plastic] costs $_____.
    b. An [expensive [<u>table</u> made of plastic]] costs $_____.

<u>Exercise</u>: *How much do the tables in (4a) and (4b) cost?*

4 Focus

When we produce a sentence, some words are *<u>stressed</u>* and some words are *<u>unstressed</u>*.
<u>Exercise</u>: *Say aloud the sentences in (1). Which word is most strongly stressed?*

(1) a. John kicked Mary.
    b. John gave a cat to Bob.
    c. John read a book about bats.

Generalization: _____.

Consider now (2) and (3). **<u>Exercise</u>**: *What is surprising about (2)-(3), given what we saw in (1)?*

(2)   Who kicked Mary?   (3)   What did John do to Mary?
       John kicked Mary.   John kicked Mary

Exercise: *What part of the sentence is most strongly stressed in (4) and (5)?*
(4)   I didn't see a grey dog. I saw a brown dog.
(5)   A farmer came into the store, not a truck driver.

Conclusion: stress falls by default on the last word in a sentence (1), but can shift to a different word for emphasis (2)-(5).

The part of the sentence that is emphasized is said to be in *focus*.

By default, no one part of the sentence is more emphasized that any other part of the sentence. The entire sentence is in focus = **broad focus**, (1).

(1')   [John kicked MARY]_FOCUS
         [John gave a cat to BOB]_FOCUS
         [John read a book about BATS]_FOCUS

When a sentence is an answer to a question, only the part of the sentence that is answering the question is emphasized. Only part of the sentence is in focus = **narrow focus**, (2)-(3).

(2)   Who kicked Mary?   (3)   What did John do to Mary?
        [JOHN]_FOCUS kicked Mary.   John [kicked]_FOCUS Mary

(2') has narrow focus on *John*; (3') has narrow focus on *kicked*.

When something in the sentence is being contrasted with something else, only that part is emphasized (*grey ↔ brown*, *a farmer ↔ truck driver*) = contrastive focus, (4)-(5).

(4')   I didn't see a [GREY]_FOCUS dog. I saw a [BROWN]_FOCUS dog.
(5')   [A farmer]_FOCUS came into the store, not [a truck driver]_FOCUS.

Sometimes, focus affects whether a sentence is <u>true</u> or <u>false</u> in a given context:
(6)   a. Grandma only gave a BUNNY to Maryanne.
        b. Grandma only gave a bunny to MARYANNE.

Exercise: *Can you paraphrase (6a) and (6b)?*

(6a):_____.

(6b): _____.

Are (6a) and (6b) true or false in the following scenarios?
<u>Scenario 1</u>: Grandma gives Maryanne a bunny. She gives Florence a bunny and a necklace.
<u>Scenario 2</u>: Grandma gives Maryanne a bunny and a necklace. She gives Florence a bunny.

5   Intonation, semantics, and structure

In addition to stressing different words when we produce a sentence, we can use intonation to group the words in a sentence together in different ways. This is called _intonational phrasing_.

Intonational phrasing can disambiguate bracketing:

(7)   Put the dog in the basket on the star.
       a. Put [the dog in the basket] on the star.
       b. Put the dog [in the basket on the star].

Exercise: _Paraphrase the two readings in (7a) and (7b). How would you say the sentence so as to unambiguously convey each reading?_
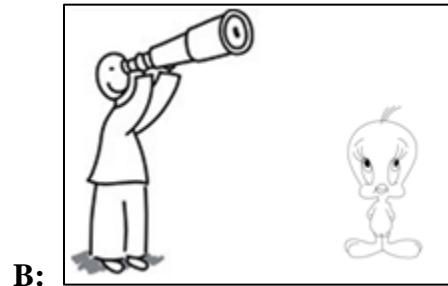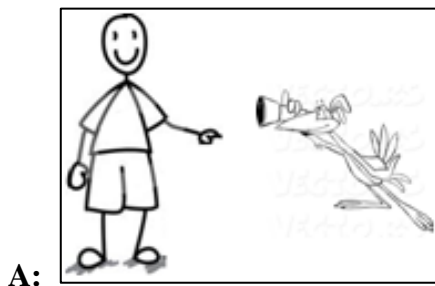
(8)   Tom or Bill and Demetrius went to the party.
       [[Tom or Bill] and Demetrius] went to the party.
       [Tom or [Bill and Demetrius]] went to the party.

Exercise: _Paraphrase the two readings in (8a) and (8b). How would you say the sentence so as to unambiguously convey each reading?_

Sentences like (9) are also ambiguous.

(9)   a. Fred saw [the bird with the telescope]: Fred saw the bird that had the telescope.
       b. Fred saw [the bird] [with the telescope]: Fred used the telescope to see the bird.

We will call the (a) examples **noun modification** and the (b) examples **verb modification**. Intonation can help **disambiguate** the meaning of an otherwise ambiguous sentence. Claim: you would say the following sentence differently to refer to picture A vs. B.

A: B:

Published data (Snedeker & Trueswell 2003):

Ex. test sentence:
(10)   Tap the frog with the flower.

Noun modification:

Verb modification:

Exercise: Look at the slides on the screen; how would you say them to make them unambiguous?

Result: Listeners correctly determined whether the speaker intended to convey noun modification or verb modification in ~70% of trials.

Explanation: The speaker says the **same words** whichever interpretation he intends to convey, but the <u>way</u> he says those words, i.e. his **intonation**, differs.

To figure out the intended interpretation, listeners pay attention to speakers' intonation.

Certain words are produced longer/shorter or followed by a longer/shorter pause, depending on interpretation:

(11)   a. *N mod:* Tap the frog …… with the flower.
         b. *V mod:* Tap …… the frog with the flower.

Intonational differences reflect syntactic bracketing: the long pause after *frog* in (11a) groups *[tap the frog]* together to the exclusion of *[with the flower]*; the long pause before *the* in (11b) groups *[the frog with the flower]* together to the exclusion of *[tap]*.