

# Semantics and pragmatics

## LING 200: Introduction to the Study of Language

Hadas Kotek



February 2016

# Outline

- 1 Semantics & Pragmatics
- 2 Meaning and truth conditions
  - Meaning and truth conditions
  - Semantic relations
  - Word meanings
- 3 Entailment and presupposition
  - A return to entailment
  - Presupposition

Slides credit: Jessica Coon, Rebecca Starr

# Semantics & Pragmatics

Both **semantics** and **pragmatics** are concerned with **linguistic meaning**

- **Semantics:** Linguistic meaning that is independent of the context in which the sentence is spoken
- **Pragmatics:** Linguistic meaning that is dependent on context

➡ **Our goal:** model semantic knowledge

- ... model the knowledge we have about what utterances *mean*. To know what a sentence means, is to know its *truth conditions*

# Truth conditions

## Truth conditions

To know the **meaning** of a sentence is to know the *conditions under which it is true*, known as “truth conditions”

Truth conditions are...

- ... what it would take for the sentence to be true or false, what the world would need to be like in order for the sentence to be true or false
- ➡ **Note:** we don't have to know *whether* the sentence is true or false to know its truth conditions
- (1) a. It snowed 4 centimeters in Toronto yesterday.  
b. A gallon of pure maple syrup weighs 11 pounds.  
c. The smallest city park in the U.S. is in Texas.

## Semantic knowledge

We know that some sentences are **equivalent** (synonymous):

- (2) a. Anya is next to Allison.  
b. Allison is next to Anya.
- (3) a. Sarah is taller than Tim.  
b. Tim is shorter than Sarah.

We know that some sentences **contradict** each other:

- (4) a. Anya is next to Allison.  
b. Allison is not next to Anya.
- (5) a. Sarah is taller than Tim.  
b. Tim is taller than Sarah.

## Semantic knowledge

### Some sentences **entail** each other:

- (6) a. John saw Dana and Chris. *entails...*  
b. John saw Dana.
- (7) a. The king was assassinated. *entails...*  
b. The king is dead.

### Other sentences merely **imply** each other:

- (8) a. Allison did some of the homework. *implies...*  
b. Allison did not do all of the homework.
- (9) a. Emma said Ryan is either at home or in the office. *implies...*  
b. Emma doesn't know where Ryan is.

## Semantic knowledge

### Remember these?

- (10) Dr. Ruth discussed sex with newspaper editors.
- Dr. Ruth [ discussed [ sex with newspaper editors ] ].
  - Dr. Ruth [ [ discussed sex ] [ with newspaper editors ] ].

- ➡ This *structural ambiguity* fell in the domain of syntax
- Roughly: put the same words together in different ways, and you get different meanings

### There's also *lexical ambiguity*

- (11) Dave bought a bat.

# Compositionality

## Principle of compositionality:

The meaning of a sentence is determined by the meanings of the words it contains and the way they are syntactically combined.

## Compositionality is at the heart of the ambiguities we've been discussing:

- (12) Dave bought a bat.
- (13) Dr. Ruth discussed sex with newspaper editors.
- Dr. Ruth [ discussed [ sex with newspaper editors ] ].
  - Dr. Ruth [ [ discussed sex ] [ with newspaper editors ] ].

- But sometimes we need to know more than just the meaning of the words and the structure of the sentence to get the full meaning...



## Remember...

### Principle of compositionality

The meaning of a sentence is determined by the meaning of the words that it contains and the way they are syntactically combined.

**Q:** What is the meaning of a sentence?

**A:** The meaning of a sentence is its **truth conditions**

In other words: To know the meaning of a sentence is to know *under what conditions it is true (or would be) true*

We don't have to know if it is actually true!

## Extensions and intentions

- The **intension** of a sentence = its meaning = its truth conditions
- The **extension** of a sentence in a given situation = its truth value (**True** or **False**) in that situation

# Possible worlds



- Semanticists and philosophers often talk about **possible worlds**, of which the *actual world* is just one. . .
- **Possible world:** For each way the world *could have been* there is a distinct possible world

# Possible worlds

## For example...

- There is a possible world where Mitt Romney is president of the U.S.
- There is a possible world in which I cancelled this lecture today
- There is **no** possible world in which  $2 + 2 = 5$ 
  - ▶ Possible worlds must be *logically possible* ways the world could have turned out to be

# Truth conditions

One of the red X's is below the blue Y.

|   |   |   |   |
|---|---|---|---|
| X |   | Y | Z |
| Y | Z | X |   |
| X |   | Z | Y |
| Y | Y | X |   |
| X | X |   | Y |

*True!*

# Truth conditions

The blue Y is to the left of a black Y.

|   |   |   |   |
|---|---|---|---|
| X |   | Y | Z |
| Y | Z | X |   |
| X |   | Z | Y |
| Y | Y | X |   |
| X | X |   | Y |

*True!*

# Truth conditions

The blue Y is adjacent to a black Z.

|   |   |   |   |
|---|---|---|---|
| X |   | Y | Z |
| Y | Z | X |   |
| X |   | Z | Y |
| Y | Y | X |   |
| X | X |   | Y |

*False!*

# Truth conditions

One of the blue Y's is above a red X.

|   |   |   |   |
|---|---|---|---|
| X |   | Y | Z |
| Y | Z | X |   |
| X |   | Z | Y |
| Y | Y | X |   |
| X | X |   | Y |

???

*Presupposition failure* —  
We'll come back to this



# Semantic relations

## Truth conditions

Knowledge of the truth conditions of two sentences guarantees knowledge of the **semantic relations** between them.

### Semantic relations:

- entailment
- equivalence / synonymy
- contradiction
- presupposition

# Semantic relations

## Entailment

$S_1$  entails  $S_2$  if and only if every possible situation in which  $S_1$  is true is also a situation in which  $S_2$  is true.

➡ We know that *if*  $S_1$ , then automatically  $S_2$

There are different possible sources of *entailment*

## Sources of entailment

Entailment may be due to the meaning of **logical words** (*and, or, not, ...*)

- (14) a. Veronica saw Jon and Tyler. *entails...*  
b. Veronica saw Tyler.

Entailment may be due to the presence or absence of **modifiers**

- (15) a. I worked at home yesterday. *entails...*  
b. I worked yesterday.

## Sources of entailment

### Entailment may be due to a **syntactic transformation**

- (16) a. Ian devoured the pizza. *entails...*  
b. The pizza was devoured.

### Entailment may be due to semantic relations between **words**

- (17) a. The spy assassinated the king. *entails...*  
b. The king died.

# Word meanings

We need to know about the meanings of words in order to understand relations like *entailment*...

## Logical words

Meanings of *logical words* like *and*, *or*, *not*, and *every* can be given very precise definitions.

## Content words

The meanings of non-logical words (content words) are more difficult to pin down—we run the risk of confusing *linguistic* knowledge with *encyclopedic* or *real-world* knowledge.

# Content words

Haberdasher (noun)

Mirriam-Webster

- a person who owns or works in a shop that sells men's clothes
- a person who owns or works in a shop that sells small items (such as needles and thread) that are used to make clothes



# Linguistic knowledge

- **Encyclopedic knowledge** is knowledge about facts about of the world (e.g. what a **haberdasher** is)
- **Linguistic knowledge** is knowledge about *semantic relations* between content words; for example that **The thief killed the haberdasher** entails that **The haberdasher is dead**

# Predicates

## Predicates:

Predicates are lexical heads with their complements (if any) —VPs

- *know French; be from Montreal; run the marathon*
- *be under the red X; be bald; be about spaceships*
- *be an elephant; be a student of physics; be tired*

**Q:** What is the meaning of a predicate?

**A:** The meaning of a predicate is the conditions under which it applies to entities



# Predicates

To know the meaning of a predicate is to know...

... under what conditions it applies (or would apply) to any given entity

... what the world must (or would have to be) like for it to apply to any given entity

... in what kinds of logically possible situations (“possible worlds”) it applies to any given entity

- The **intension** of a predicate = its meaning = the conditions under which it applies to entities
- The **extension** of a predicate in a given situation = the set of entities it applies to in that situation

# Extension and intension

(18) The green line [is a metro line in Montreal].



*Extension in actual world = True*

(The extension of a proposition is a truth value)

# Extension and intension

(19) [be a metro line in Montreal]



*Extension in actual world =  
{ blue line,  
green line,  
orange line,  
yellow line }*

(The extension of a predicate is the set of entities it applies to)

# Entailment

- Back to the notion of **entailment**...

Recall...

- (20) a. The thief killed the haberdasher. entails...  
b. The haberdasher is dead.

## Some things we know right away...

- If (20a) is true, then (20b) must necessarily be true
- We know this even without knowing any facts about the world or about propositional logic—this is part of what the words *killed* and *dead* mean
- If (20a) is **false**, we can't necessarily conclude anything about (20b)

# Entailment

## Important:

- The relation of entailment is given to us just by the meaning, independent of context: we don't have to check any facts about the world in order to know that (20a) entails (20b)

- Entailment can come from the meanings of words:

- (21) a. Vlad ate an apple.  
b. Vlad ate fruit.

entails...

- **Hyponymy:** *apples* belong to the set of things that are *fruit*

# Entailment

- Entailment can also come from syntactic operations, like *passivization*:

(22) a. Vlad ate an apple. entails...  
b. An apple was eaten by Vlad.

- Note that these sentences stand in a relation of **mutual entailment**:  
(22a) entails (22b)... But (22b) also entails (22a)

(23) a. An apple was eaten by Vlad. entails...  
b. Vlad ate an apple.

- This means that these sentences are **synonymous**, or **equivalent**: there is no possible world where one is true and the other is false

# Presuppositions

## Presuppositions:

In conversation, speakers often consider certain background assumptions to be **shared** between the conversation participants—or at least talk as if they are. These background assumptions are **presuppositions**.

- (24)
- a. Did Gillian stop smoking?
  - b. The king of France is bald.
  - c. He's even more gullible than you are.
  - d. Unicorns appeared in the lecture hall again.

# Presupposition

- (25) a. Did Gillian stop smoking? presupposes...  
b. Gillian used to smoke.
- (26) a. The king of France is bald. presupposes...  
b. There is a king of France.
- (27) a. Unicorns appeared in the lecture hall again. presupposes...  
b. Unicorns appeared in the lecture hall once before.



# Presupposition

- Sometimes speakers are wrong in taking certain assumptions to be shared among the conversation participants. . .

(28) A: I'm back in town!  
B: Great. . . but I didn't know you were gone.

(29) A: Meet me in the bar in Leacock at 5:00.  
B: There is no bar in Leacock.

▶ Unlike the relationship of *entailment*, *presupposition* relies on context: presupposition falls in the domain of **pragmatics**

- Entailments do not survive negation:

- (30) a. We will meet in the bar in Leacock. *entails...*  
b. We will meet in Leacock.
- (31) a. We will **not** meet in the bar in Leacock. *does not entail...*  
b. We will meet in Leacock.

- Presuppositions survive (*project past*) negation:

- (32) a. We will meet in the bar in Leacock. *presupposes...*  
b. There is a bar in Leacock.
- (33) a. We will **not** meet in the bar in Leacock. *still presupposes...*  
b. There is a bar in Leacock.

# Presupposition

## Presupposition triggers

- There are many constructions (words or syntactic patterns) that **trigger** certain presuppositions.
- For example, **factive verbs**:

- (34) a. I **realized** she is a doctor.  
b. I didn't **realize** she is a doctor. *both presuppose...*  
she is a doctor
- (35) a. I **regret** eating that carrot cake.  
b. I don't **regret** eating that carrot cake. *both presuppose...*  
I ate that carrot cake.

# Presupposition

## Presupposition triggers

- **Clefts**, which we have learned about as a constituency test, also trigger presuppositions:

- (36) a. It was my phone that burst into flames.  
b. It wasn't my phone that burst into flames. *both presuppose...*  
something burst into flames

# Presupposition

## Presupposition triggers

- **Temporal (time word) clauses:**

- (37) a. She called me before she went to dinner.  
b. She didn't call me before she went to dinner. *both presuppose...*  
she went to dinner

# Presupposition

## Presupposition triggers

- **Change of state:**

- (38) a. It has stopped raining.  
b. It hasn't stopped raining.  
it was raining at some point before

*both presuppose...*

# Summary

## Entailment

- **A** entails **B** if whenever **A** is true, **B** is also true.
- Entailments disappear under negation.

## Presupposition

- Presuppositions are the background assumptions we make about the “common ground” shared between conversation participants.
- Presuppositions survive (project past) negation.

## For next time...

- **Assignment 4** due today.
- **Assignment 5** posted, due March 9.
- ▶ Enjoy reading week!