Introduction to Language

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Lecture 6: Oct. 15 2013

The midterm is next week!! (Oct 22, 7pm)

Location: In this room!

Help Labs:
1. Thursday, Oct. 17, 6pm to 7pm, AP 120
2. Monday, Oct. 21, 1pm to 2pm, MP 134
3. Monday, Oct. 21, 6pm to 7pm, SS 1072

Extended Office Hours on Oct. 22, 11 to 3
(No tutorial on Tuesday)

Semantics and Pragmatics

One of the oldest sub-fields of linguistics, and one that makes connections to other fields like philosophy, math, logic, literature, and psychology is **semantics**.

‣ The formal study of meaning in language.

A closely related sub-field is **pragmatics**. Pragmatics also deals with meaning, but specifically how meaning depends on language-external context.

1. How do we model the meaning of words and sentences?
2. How can we say one thing but mean something else?

Verbing words: Syntax and Semantics

You probably noticed that some words in English can function as two or more grammatical categories. In a sense, a single word can be **lexically ambiguous**.

English can create verbs directly from nouns (and sometimes adjectives).

‣ We call this **zero derivation**
‣ friend (n.) → friend (v.)
‣ box (n.) → box (v.)
‣ host (n.) → host (v.)
‣ Google (n.) → Google (v.)
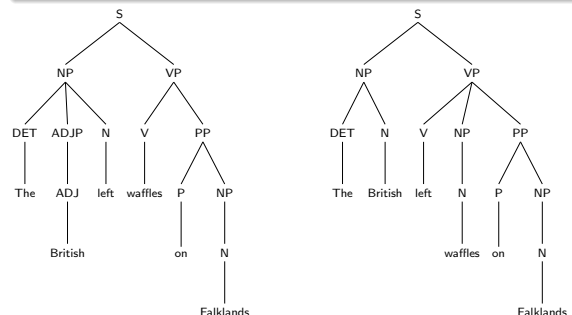‣ access (n.) → access (v.)

Verbing words

‣ "I like to **verb** words" – a verb
‣ "use them as **verbs**" – a noun
‣ "it got **verbed**" – a verb
‣ "**Verbing** weirds language" – a noun
‣ "Verbing **weirds** language" – a verb (from an adjective)

Verbing words

This can lead to sentences that are **semantically ambiguous**:

‣ The British left waffles on Falklands

Semantics

What does it mean for a word to mean something?

Recall:

Words are conventional signs: arbitrary sequence of **sounds** connected to a mutually agreed upon **meaning**.

▸ A word or phrase must be **about** something in order to have a meaning... must have a symbolic connection to something else.

All linguists agree that words are **pointers**.

▸ When we say a word, it **points** to something.

▸ But, there is some disagreement on what that **something** is.

What does it mean for a word to mean something?

Dictionary Definitions

One option is the *dictionary*.

▸ Mutually agreed upon definitions.

▸ A dictionary definition uses other words to describe and summarize the way in which the word is used.

There must be more to meaning.

We can't describe **every word** by using other words.

▸ "**cat** [kʰæt], noun. A small domesticated carnivorous mammal with soft fur, a short snout, and retractile claws."

▸ This is necessarily circular.

Meaning must involve a connection between language and something other than language.

What does it mean for a word to mean something?

Option 1: Language connects with concepts and ideas in the mind.

▸ The **cognitive approach** to meaning.

▸ Meanings are associated with **mental representations**.

• The meaning of the word **cat** for individuals is their **prototypical mental representation of a cat**.
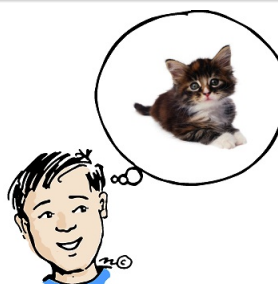
What does it mean for a word to mean something?

Option 2: Language connects with the world.

▸ The **referential approach** to meaning.

▸ A word points to real world things.

• The meaning of the word **cat** is the **set of all cats in the world**.

'**cat**' = *the set of all cats* =

Words and Phrases

Formal semantics is interested in more than just the meaning of individual words.
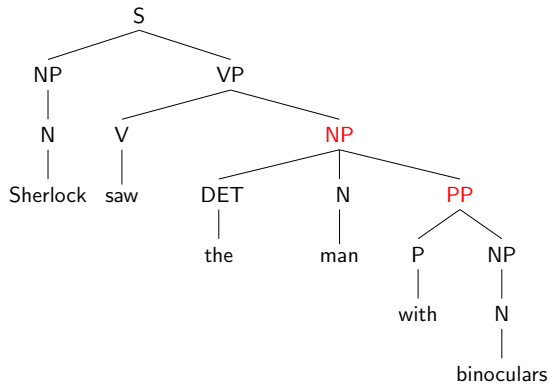
Semanticists are interested in how words combine together into sentences to create meanings.

▸ Referential Approach works better than Cognitive Approach

▸ We've already seen how important **compositionality** is to syntax.

▸ We get **structurally ambiguous** sentences: "Sherlock saw the man with binoculars."

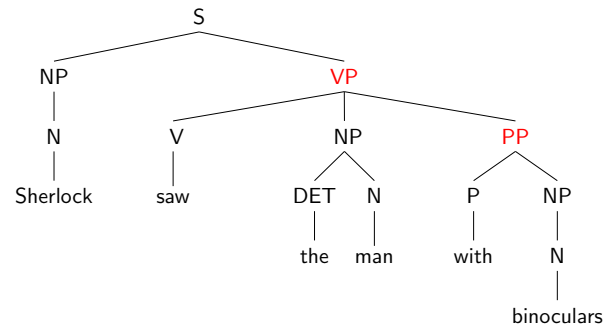• Depending on how syntactic constituents combine with each other, we can get different sentence meanings.

Words and Phrases

```
                  S
         ┌────────┴────────┐
        NP               VP
         │        ┌────────┴────────┐
         N        V               NP
         │        │        ┌───────┼───────┐
     Sherlock   saw      DET      N       PP
                          │        │    ┌───┴───┐
                         the     man   P      NP
                                        │       │
                                       with     N
                                                │
                                           binoculars
```

The man is using binoculars.

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Words and Phrases

```
                   S
          ┌────────┴────────┐
         NP               VP
          │       ┌─────────┼─────────┐
          N       V        NP        PP
          │       │      ┌──┴──┐    ┌──┴──┐
      Sherlock   saw   DET   N    P     NP
                        │     │    │      │
                       the   man  with    N
                                          │
                                     binoculars
```

Sherlock is using the binoculars.

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Words and Phrases

How do the meanings of words combine to make new meanings?

We need to know three things:

1. What individual words mean.
   - What things in the world do nouns, verbs, adjectives etc point to?
2. How words combine to create new, complex meanings.
   - What are the principles of semantic composition?
3. How the truth of a statement logically follows from the principles of composition.
   - Formal semanticists believe that **knowing what a sentence means, means knowing the conditions under which the sentence is true or false**.
   - We are looking for steps to predict whether a statement is true or not, under certain conditions, just from the individual word meanings and principles of composition.
     - Semantics is **truth conditional** in this sense.

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A Simplified Semantic Framework

The referential approach to meaning treats the meaning of a word is a pointer to something in the world.

- To analyze semantic compositions (i.e., sentence meanings), semanticists often start with imagined and simplified **worlds**, called **models**.
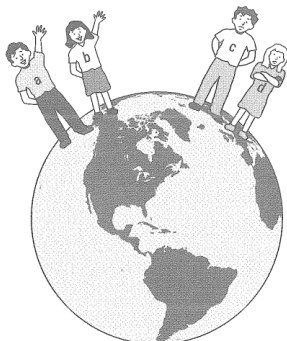
Models

A model is a simplified sketch of the world and contains:

- A few **individuals** (like *Arnold, Beth, Chris, Denise*).
- A few **properties** that these individuals can have.

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A Simplified Semantic Framework

Here's a model... a simplified world.

- Our model has four **individuals**...
  - *a* ('Arnold')
  - *b* ('Beth')
  - *c* ('Chris')
  - *d* ('Denise')
- And four **properties**
  - *S* ('smiles')
  - *F* ('frowns')
  - *B* ('is male')
  - *G* ('is female')

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What Individual Nouns Mean

Now that we have a model, we can start to investigate how words combine to form complex meanings.

We're going to start with four (proper) nouns:

- 'Arnold', 'Beth', 'Chris', 'Denise'

Proper nouns refer to individuals in the world

Our four names can refer to the four individuals in our model of the world.

- 'Arnold' → *a*
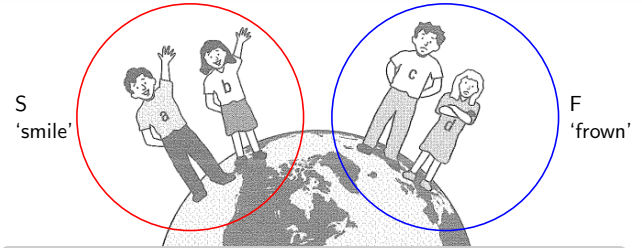- 'Beth' → *b*
- 'Chris' → *c*
- 'Denise' → *d*

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What Individual Verbs Mean

What does a verb point to in the world?

‣ A property!

‣ A property is something that holds of an individual or doesn't.

‣ Thus, verbs **point** to all the individuals who have a specific property.

What Individual Verbs Mean

The meaning of a verb is the set of individuals which share the property associated with the verb.

‣ 'smile' → {a, b}
  (those individuals with property S)

‣ 'frown' → {c, d}
  (those individuals with property F)

A Principle of Composition

Using a compositional rule

Now what we need is a compositional rule that can take **the meaning of a noun** and **the meaning of a verb** and get us **the meaning of a sentence**.

‣ *Where a sentence consists of the elements [Noun Verb], the meaning of the sentence is true only if the Noun refers to one of the individuals with the property described by the Verb in our model.*

This compositional rule provides a meaning for our sentence now:

‣ The meaning is either TRUE or FALSE depending on what's going on in our model.

Evaluating Truth-Conditions

The sentence **'Arnold smiles'** is **true** whenever a (the individual that **'Arnold'** refers to) is one of the individuals who has the property S (the set of individuals that **'smiles'** refers to).

The sentence would be false if a wasn't a member of the set of individuals that **'smiles'** refers to.

‣ For example, **'Chris smiles'** is **false** because c is not a member of the set {a, b}

‣ The sentence still has a meaning though!

Upshot: If you know the full set of circumstances where a sentence is **TRUE or FALSE**, you know what the meaning of the sentence is!
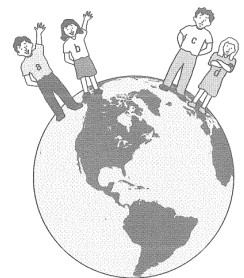
A simplified Semantic Framework

This approach to meaning might seem simple and intuitive.

‣ That's the beauty of the referential approach!

  • It captures something intuitive to us about the meaning of words.
  • Does not define the meaning of a word using other words.
  • Accounts for the meaning of sentences (compositionally).

The framework also gets us some nice results with specific aspects of language:

‣ **Conjunctions** (e.g., *and, or*)

‣ **Quantifiers** (e.g., *every, some, no*)

Conjunctions and Logical Connectors

Think about the circumstances under which this sentence is true.

‣ **Alex is in Vancouver and Derek is in Toronto.**

  • It must be true that **Alex is in Vancouver** and it must also be true that **Derek is in Toronto.**
  • If either of these statements is FALSE, say Alex is in fact in Toronto, than the whole sentence is FALSE.

If we treat sentences as having a meaning of TRUE or FALSE, we can easily explain the meaning of complex sentences that are formed with conjunctions like *and* and *or*.

Conjunctions and Logical Connectors

Conjunctions in language function like connectors in logic.

P	Q	$P \land Q$
TRUE	TRUE	TRUE
TRUE	FALSE	FALSE
FALSE	TRUE	FALSE
FALSE	FALSE	FALSE

A. is in Van.	D. is in Tor.	A. is in Van. and D. is in Tor.
TRUE	TRUE	TRUE
TRUE	FALSE	FALSE
FALSE	TRUE	FALSE
FALSE	FALSE	FALSE

A simplified Semantic Framework

So far, our framework works! We've got individuals and properties and that buys us a lot, including connectors!

- ‣ But what about what I said earlier?
- ‣ Common nouns (like 'cat') don't refer to a single individual! They refer to the whole set of cats!

The solution is kind of ingenious!

- ‣ If we **treat nouns just like verbs**, that is, have nouns also refer to sets of individuals with a specific property, then problem solved!
- ‣ If 'cat' referred to individuals with the property C and we had a model that includes 4 individual cats (e, f, g, and h)...
- ‣ Then: 'cat' → $\{e, f, g, h\}$ (or the set of individuals with property C)

A Simplified Semantic Framework

This approach allows for a nice analysis of **quantifiers** in human language.
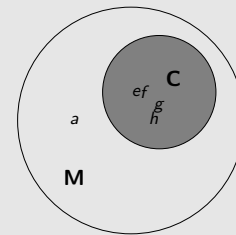
Quantifiers are words like:

- ‣ Every
- ‣ Some
- ‣ No

The meaning of sentences such as *Every cat is meowing*, *Some cats are meowing* and *No cats are meowing* can be represented as Venn-Diagrams.

A Simplified Semantic Framework

Every cat is meowing. = every individual with property C also has property M
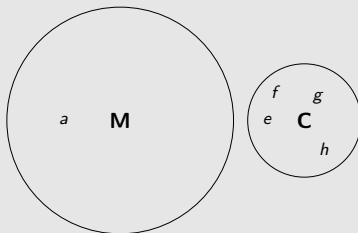

- ‣ 'cat' → $\{e, f, g, h\}$ (individuals with property C)
- ‣ 'is meowing' → $\{e, f, g, h, a\}$ (individuals with property M)

A Simplified Semantic Framework

No cats are meowing. = no individual with property C also has property M

- ‣ 'cat' → $\{e, f, g, h\}$ (individuals with property C)
- ‣ 'is meowing' → $\{a\}$ (individuals with property M)

A Simplified Semantic Framework

Some cats are meowing. = at least one individual with property C also has property M
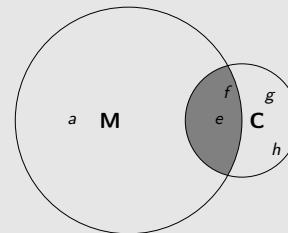
- ‣ 'cat' → $\{e, f, g, h\}$ (individuals with property C)
- ‣ 'is meowing' → $\{e, f, a\}$ (individuals with property M)

Pragmatics

Utterances In Context

Pragmatic is the study meaning in context... the meaning of things we actually say in conversation.
- We call the things we actually say **utterances**.
- Every time we speak, we are in a certain **context**.
  - A time.
  - A place.
  - Who we're with.
- Utterances can be **shaped by context** and utterances can **shape the context**.

Utterances In Context

Context shapes the meaning of utterances

Certain words in language depend on the external context of the conversation to have a meaning:
- **Indexicals**: Refer to speaker (*I*), hearer (*you*), the utterance location (*here*) and the utterance time (*now*).
- **Demonstratives** point to things in the context (*that, this, these, those*)
  - "**That** cat" depends on which cat I'm pointing to.
- **Third person pronouns** point to people/things in the context or previous utterances. (*he/him, they/them*).
  - $Alex_i$ loves **that cat**$_j$. **She**$_i$ dotes over **it**$_j$.

Utterances In Context

Utterances shape context

Certain words/phrases in language can shape the context and perform actions. We call these **speech acts**.
- **Assertive speech act** (commit to the truth)
  - "I affirm that..."
- **Expressive speech act** (expresses attitude)
  - "I regret that..."
- **Declarative speech act** (alters external context)
  - "I now pronounce you man and wife."
  - "I declare you innocent of all charges."

Utterances In Context

We speak most of our utterances in **conversation**.

All conversations have:
- **Conversational participants**
  - At least two: a speaker and a listener.
- **Conversational topic**
  - Two broad categories: *person-centred* and *world-centred*.
- **Conversational goal**
  - Two main goals: exchange information or establish/maintain social bonds.
- **Conversational strategy**
  - How do you develop the topic and reach the goal? You need a strategy: **make the best contribution you can** and make it at the best time.

Making the best contribution

Conversation is a **social interaction** and like all social interactions it follows certain **social conventions**.
- It's social convention not to slam a door while someone is sleeping.
- It's also social convention to **make the best contribution you can** to a conversation.
  - When you're engaged in a conversation each participant must cooperate in order to have a successful conversation.
  - **Cooperative Principle**: we assume the person we are speaking with is making the best contribution possible.

How to making the best contribution

Four **conversational maxims**:
1. The maxim of quality—be truthful
2. The maxim of quantity—be informative
3. The maxim of relevance—be relevant
4. The maxim of manner—be clear

These maxims should not be interpreted as advice for having a good conversation.
- We assume that these maxims are the **default** setting.
- Following the maxims is what leads to saying one thing, but **implying** something else.
- Leads to **Conversational Implicatures**

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The Maxim of Quality

In order to cooperate with who you're speaking with, we should be truthful.
- Avoid saying things that you believe are false.
- Avoid saying things that you lack evidence for.

Imagine reading a reference letter for a job in computer science that only says:

"Jones has beautiful handwriting and his English is grammatical."
- If the writer was following the maxim of quality, saying truthful things, we can assume that Jones has beautiful handwriting and his English is grammatical
- The statement also **implies** that Jones is no good at computer science, otherwise the person writing the letter would have said so.
- *A good personality < attractive < beautiful*

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The Maxim of Quality

Jess: *If she's so great why aren't YOU taking her out?*

Harry: **How many times do I have to tell you, we're just friends.**

Jess: *So you're saying she's not that attractive.*

Harry: **No, I told you she IS attractive.**

Jess: *But you also said she has a good personality.*

Harry: **She HAS a good personality.**

Jess: *[Throws hands up as if to say "Aha!"]*

Harry: **What?**

Jess: *When someone's not that attractive they're ALWAYS described as having a good personality.*

Harry: **Look, if you were to ask me what does she look like and I said she has a good personality, that means she's not attractive. But just because I happen to mention that she has a good personality, she could be either. She could be attractive with a good personality or not attractive with a good personality.**

Jess: *So which one is she?*

Harry: **Attractive!**

Jess: *But not beautiful, right?*

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The Maxim of Quantity

In order to cooperate with who you're speaking with, we should also be informative.
- Make your contribution as informative as is required.
- Don't make your contribution more informative than is required

Imagine Bill has 3 children and I said:

'I saw two of your children today.'
- How many of Bill's children did I see?
- Two according to the Maxim of Quantity, but I could have seen the third one as well and the sentence would have been true still.

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The Maxim of Relevance

In order to cooperate with who you're speaking with, we should also be relevant.
- Make your contribution relevant.
- Don't say irrelevant things.

Is Lucy coming to the party?

Sandra: 'Are you coming to the party on Friday?'
Lucy: 'I work the evening shift that night'
- If Lucy is following the Maxim of Relevance then her working the evening shift must be relevant to whether or not she can attend the party.
- She can't be in two places at once, therefore, she is **implying** that she isn't coming.
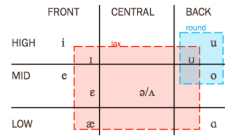
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Review Exercises

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Slide 43

Phonetic Symbols Provided:

		Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
Stops	vls	p			t		k	ʔ
	vcd	b			d		g	
Fricatives	vls		f	θ	s	ʃ		h
	vcd		v	ð	z	ʒ		
Affricates	vls					tʃ		
	vcd					dʒ		
Nasal	vcd	m			n		ŋ	
Approximants								
Glides	vcd	w				j		
Liquids								
Lateral	vcd				l			
Retroflex	vcd				ɹ			

Note: 'vls' = voiceless, 'vcd' = voiced

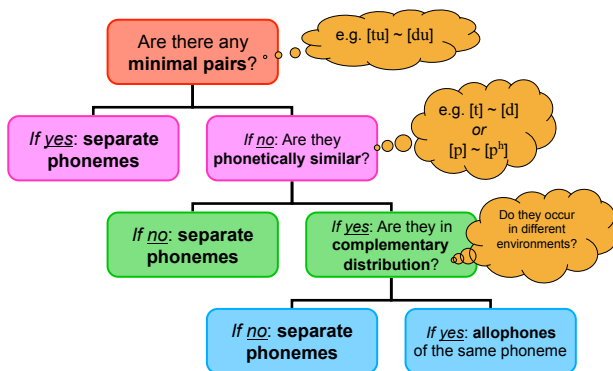|	FRONT	CENTRAL	BACK
HIGH	i	ɨ	u
	ɪ	ʊ	
MID	e		o
	ɛ	ə/ʌ	
LOW	æ		ɑ

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Slide 44

Phonemic/Phonetic Transcription

When you do phonetic transcription, you must include the four phonological processes we discussed:

‣ **Canadian Raising:** [aj]/[aw] → [ʌj]/[ʌw] / before a voiceless consonant

‣ **Flapping:** [t]/[d] → [ɾ] / Stressed Vowel ___ Unstressed Vowel

‣ **Nasalization:** Vowels → [+nasal] / before a nasal coda consonant

‣ **Aspiration:** Voiceless Stops → [+Aspirated] / being the only consonant in the onset of a stressed syllable.

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Phonology Problems

- Are there any **minimal pairs**? (e.g. [tu] ~ [du])
  - If _yes_: **separate phonemes**
  - If _no_: Are they **phonetically similar**? (e.g. [t] ~ [d] or [p] ~ [pʰ])
    - If _no_: **separate phonemes**
    - If _yes_: Are they in **complementary distribution**? (Do they occur in different environments?)
      - If _no_: **separate phonemes**
      - If _yes_: **allophones** of the same phoneme

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Slide 46

Morphology In Other Languages

By comparing words in a language, and finding which strings of sounds consistently have the same meaning, we can identify the morphemes of the language.

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Slide 47

Syntax Trees

‣ Start with grammatical categories.
‣ Build phrases.

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Slide 48

Mini Research Paper Part 1: Proposal, Outline, and Annotated Bibliography

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