

LING 364: Introduction to Formal Semantics

Lecture 2

January 17th

Administrivia

- **Reminders**

- you should have already sent me an email

- *Name/Contact email/Year/Major/Background/*
 - *Relevant Background/*
 - *Why are you interested in natural language semantics?*

- this Thursday:

- *computer lab lecture*
 - *meet in the SBRI lab (Social Sciences 224)*

Administrivia

- **SWI-Prolog**

- *have you successfully installed SWI-Prolog on your computer?*
- <http://www.swi-prolog.org/>



Today's Topic

- Chapter 1:
 - **The Fundamental Question**
 - from the book:
 - What is Meaning? *Fundamentals of Formal Semantics*
 - P. Portner Blackwell 2005
- Short Quiz
 - @ 4:30pm
 - you have 15 mins
 - *hand it in at the end*

Formal Semantics

- Formal Semantics
 - (page 1) **Why formalize?**
 - can construct precise theories
 - precise theories are better
 - *“they don’t allow the theorists to fudge the data quite so easily as less precise theories do”*

Formal Semantics

- We all understand the rationale here
- But how would you encode the reasoning?

–Why formalize?

- can construct precise theories
- precise theories are better
 - “they don’t allow the theorists to fudge the data quite so easily as less precise theories do”*

Formal Semantics

- We all understand the rationale here
- But how would you encode the reasoning?

Example:

- let f be a function “formalize”
- $f(\text{theory}) = \text{precise_theory}$
- $\text{precise_theory} \prec \text{theory}$

“they don’t allow the theorists to fudge the data quite so easily as less precise theories do”

Simple past vs. present perfect

- (1) Mary **received** the most votes in the election
- (2) Mary **has received** the most votes in the election

- (so) Mary will be the next president
- **Idea**
 - (1) reports a past event
 - (2) reports a past event and a current “result”

 - present perfect
 - expectation...
 - (entailment)

Simple past vs. present perfect

- (3) Will Mary be able to finish Dos Passos' *USA* trilogy by the next club meeting? It's so long!
- Well, she has read *Remembrance of Things Past*, and it's even longer
- what's a "result" here?
 - expectation...
 - (entailment)
 - Mary has read a really long book before and therefore...

Question

- What is a Meaning?
 - difficult sometimes to pin down precisely
 - by reference to other words
 - foreign language: 犬 = “dog”

Question

- What is a Meaning?
- Example:
 - **important**
 - Merriam-Webster (sense 1):
 - marked by or indicative of **significant worth** or **consequence** : **valuable** in content or relationship

Question

- What is a Meaning?
- Example:
 - **important**
 - Thesaurus
 - Text: **1** having great meaning or lasting effect
 - <the discovery of penicillin was a very *important* event in the history of medicine>
 - **Synonyms** big, consequential, eventful, major, material, meaningful, momentous, significant, substantial, weighty
 - **Related Words** decisive, fatal, fateful, strategic; earnest, grave, serious, sincere; distinctive, exceptional, impressive, outstanding, prominent, remarkable; valuable, worthwhile, worthy; distinguished, eminent, great, illustrious, preeminent, prestigious; famous, notorious, renowned; all-important, critical, crucial

Question

- What is a Meaning?
- Meaning = Concept (or thought or idea)
 - “dog” maps to DOG
 - <word> maps to <concept>
- Problems
 - need to provide a concept for every meaningful piece of language
 - how about expressions “whatever”, “three”
 - need to map different expressions into same concept
 - twin earth experiment
 - DOG a shared concept?

Question

- What is a Meaning?
- Meaning = Concept (or thought or idea)
 - twin earth experiment
 - same except $H_2O = XYZ$
 - “water” refers to H_2O
 - “water” refers to XYZ
 - identical twins on the two earths don’t mean the same thing by the word “water”

Question

- What is a Meaning?
- Meaning = Concept (or thought or idea)
- Skip the “Meaning = Concept” definition
- reason the word “dog” means the same thing for you and me
 - not that we have the same mental constructs relating to the word
 - it’s because of our **intention** to apply the word “dog” to the same things out there in our environment

Truth Conditions

- The circle is inside the square
- Can draw a picture of scenarios for which the statement is true and the statement is false
- *truth-conditions* different from *truth-value*

Truth Conditions

- The circle is inside the square
- Proposition expressed by a sentence is its truth-conditions
- i.e. sets of possible worlds
 - dog
 - set of dogs
 - set of things that aren't dogs

Truth Conditions

- The circle is inside the square **and** the circle is dark
- and = set intersection
- Mary is a student **and** a baseball fan

Truth Conditions

– Mary **and** John bought a book

– and = set intersection ?

are Mary and John sets?

how about “and = set union”?

Truth Conditions

- The square is bigger than the circle
- The circle is smaller than the square

- Given two sentences, evaluate
 - Synonymous
 - Contrary
 - Entailment
 - Tautology: P or not P

Quiz

- 1. Does sleep entail snore?
- 2. Does snore presuppose sleep?
- 3. Given the statement “All crows are black”, give an example of a sentence expressing a tautology involving this statement?