

Keywords and Key Ideas in Lectures 1-5

Lecture 1. Introduction to formal semantics and compositionality

The Principle of Compositionality

Formal semantics, Model-theoretic semantics

The structure of NPs with restrictive relative clauses: why restrictive relative clauses must combine with common noun phrases (CNP), not with complete noun phrases like *the boy*

Phrasal and sentential conjunction: why compositionality demands that phrasal conjunction not be transformationally derived from sentential conjunction

Lecture 2 plus Lecture 4. Formal semantics in Logic and Linguistics. Syntax and semantics of Predicate Logic. Semantics of Adjectives and Relative Clauses. Limitations of First-Order Predicate Logic for Natural Language Semantics.

Note: you are not responsible for the technical details of the semantic interpretation of predicate logic nor for “Part I” of Homework 1. You *are* responsible for being able to do all the problems in Part II of the homework and problems that are just like them (but no harder).

First-order predicate logic, and statement logic (which is a subpart of predicate logic)

See also the supplementary handouts: Basics of Set Theory, Basics of Statement Logic, Basics of Predicate Logic, Laws of Quantifiers.

The predicate calculus (PC) as a formal language (what that means, but not all the details.)

Syntax, semantics: what these terms mean in logic

Interpretation of an expression α in a model M : $\|\alpha\|^M$

Lexical ambiguity vs. structural ambiguity (Section 3, pp 3-4 of Lecture 2.)

In “Predicate Logic (I)”: Predicates, terms, and formulas/statements/sentences. Open vs. closed formulas. The *scope* of a quantifier. Free variables and bound variables.

Translating English sentences into first order predicate logic.

In “Quantifier Laws”: Laws of quantifier negation, laws of quantifier distribution (relative to $\&$ and \vee), some of the laws of quantifier movement. You are responsible for knowing Laws 1 – 8, and knowing enough about laws 9-16 to know that you have to be very careful about ‘moving’ quantifiers.

Important strategy in translating sentences with quantifiers: if at all possible, keep the quantifier, its common noun phrase restrictor, and its associated $\&$ or \rightarrow , as close together as possible. For instance: think of “Every student VP” as corresponding to a formula $\forall x (\text{Student}(x) \rightarrow \text{VP}(x))$, and think of “Some student VP” as corresponding to a formula $\exists x (\text{Student}(x) \& \text{VP}(x))$. Of course you still have to figure out what to do when the quantified phrase isn’t the subject, or when there is a relative clause as well as a noun, etc. But remember to associate \forall with \rightarrow and \exists with $\&$, and be able to say *why* the opposite combinations don’t express what we mean by *every student*, *some student*.

In Lecture 4: Syntactic categories and semantic types. Type e , type t , type $e \rightarrow t$, and type $\langle e, e \rangle \rightarrow t$. Semantics of predicate-forming *a* and e-type-NP-forming *the*. The iota operator.

Semantics of relative clauses.

Compositional semantics of NPs containing adjectives and relative clauses. (More complete in Lecture 6.)

Limitations of first-order predicate logic in compositional interpretation of English syntax (see especially handout Lecture 4, section 3, to be discussed in Lecture 6).

Lecture 3. Lexical semantics and formal semantics. Case Study I: The Dynamics of Adjective meanings.

Model structures and natural language metaphysics

Meaning postulates

Regarding a sentence or text as a theory, with ‘axioms’ from at least three sources:

- (i) the compositional semantics of the sentence structure (formal semantics)
- (ii) meaning postulates associated with lexical items (lexical semantics)
- (iii) background knowledge and contextual information (formal pragmatics)

Adjectives: intersective, subsective, nonsective, privative

Vagueness and context-dependence

Why an adjective like *skillful* is not intersective

Why an adjective like *tall* may seem to be non-intersective but can be argued to be intersective though vague and context-dependent. (Semantic arguments, and the distribution of *for*-phrases and *as*-phrases.)

Lecture 5. Semantics of the genitive construction, types, and sorts.

Types, sorts

Relational nouns (“transitive common nouns”)

Lexical relations, contextual relations

Two theories of where “free contextual relations” come into the structure of possessive constructions like *Mary’s team*

Arguing compositionally: the argument from *Mary’s former mansion*

Lexical meaning-shifting and type-shifting principles. (more on this later)

Lecture 6. A Mini-Fragment of English.

“Fragment”

Syntactic categories and semantic types

Direct model-theoretic interpretation vs. interpretation via translation into a logical language.

Syntactic and semantic rules.

Two types for NPs: referential and predicative. (Quantificational NPs will come later.)

Relative clauses, semantics of (review).

What we can and can’t do with just predicate logic (continued from Lecture 4.)

Quantifier scope ambiguity

Review of what we’ve done so far.