Semantic rules: Towards discourse

Human Communication 1
Lecture 11

Contents
Most recently, we have seen
− Some semantic rules for English
− And how to apply such rules in the analysis of simple sentences.
Today we will
• Continue to look at semantic rules for English,
  − including rules for other syntactic categories and
  − discourses,
  − considering the consequences of these rules in terms of the models
  that make DRSs true or false, and
• Introduce the ANAPHORA CONSTRAINT
One theme will be circumstances in which we appeal to information not represented in our grammar.

Transitive verbs
Are like intransitive verbs, but with two referents, rather than one:

Using the rule twice
For a dog chased a cat, using the rule for _a_ twice gives:

Applying the transitive rule
Application of the transitive verb rule yields:

Exercises
With respect to which of the following models is the previous DRS true?
What properties must any model which makes the DRS true have?

Discourses

Syntactic rule: A discourse is a sequence of one or more sentences, each terminated by a full stop.

Semantic rule: In processing a discourse:
- process the first sentence inside a box;
- process the second and subsequent sentences inside the same box.

So, according to our grammar, discourses are like simple stories, told by a single speaker.

Exercise:
- This characterization of discourses is very simple-minded. Make a list of types of situations involving language which this characterization does and does not cover.

Our first discourse

dog(x) bark(x) cat(y) sleep(y) which yields:

Recall that when executing our indefinite noun-phrase rule we have to use a new referent unless otherwise instructed.

Proper names

The rule for PN goes like this:

NP becomes NP

name

name(x)

x

Reuse a referent, if you can. Otherwise introduce a new referent at the top of the box.

Note: rule is non-compositional: it does not require us to check what words/noun phrase introduced a referent we reuse. First attempt to capture intuition that occurrences of the same proper name within a discourse refer to the same individual. (Clearly not perfect - we will improve on it later.)

Applying proper names rule

Application of the proper name rule when there is no preceding context will result in something very similar to NPs involving a.

When there is a preceding context, we may be able to reuse a referent, if there is one.

Discourses and proper names

Pip ran. Pip barked.

Yields:

So both occurrences of Pip (or the discourse referent that they introduce) refer to the same individual.

An incorrect prediction

Things are not so good in the following example:

Etta ran. Pip barked.

What choices do we have for reusing a referent here? Just the one.

So, if we reuse it, we get:

What model is this true with respect to?
Some morals

The grammar gets things wrong depending on how we interpret reuse a referent if you can.
In some cases, we may want to ignore this instruction, using a justification such as:
“we assume different names to refer to different individuals”
Any time an exercise says something like
“make your assumptions explicit”
you should indicate situations where you do not examine
the consequences of some choice,
and how your decision might be justified.
Note how we exploit our understanding of words and sentences in deciding whether or not to reuse a referent.

Translating the

Compare this rule with that for PNs:

Reuse a referent, if you can.
Otherwise introduce the referent at the top of the box.
What is the prediction for this discourse?
a dog barked. the dog ran.

Pronouns

Here is the semantic rule for pronouns:

You must reuse a referent.

What does this predict for the following discourses:
1. Etta barked. she ran.
2. Etta barked. he ran.
3. she barked.

More morals

Remember that our models don’t “know” anything about what is usually or typically the case in the “real world”.
They are just collections of facts.
Therefore the following are possible models:

We need to be aware of each occasion on which we appeal to information outside the grammar to justify a choice between possible analyses.
We will see how to encode conventions about the use of pronouns to indicate gender later in the course.

Yet more problems

Consider the following sentences/discourses:
– Etta caught the bird. A dog chased a cat. the dog caught the cat.
What prediction do we make for the referent associated with the bird, the dog and the cat?

The anaphora constraint (a)

Two expressions CO-REFER if they refer to the same individual.
Which of the following statements are true?
– In Mary loves her, her can co-refer with Mary.
– In She loves Mary, she can co-refer with Mary.
There seems to be a prohibition in these cases against having two references to the same individual within the same sentence
Two definitions:
• The kinds of conditions seen in DRSs so far are ATOMIC CONDITIONS.
• The referents that a condition is associated with are the ARGUMENTS to that condition.
The anaphora constraint (b)

We introduce the following rule about DRSs:

In constructing a DRS, a referent cannot appear more than once in the arguments to an atomic condition.

We will call this the ANAPHORA CONSTRAINT.

Some consequences:

- A pronoun cannot occur within the first sentence of a discourse.
- A proper name occurring in the first sentence of a discourse always introduces a new referent.
- In the discourse Mary loved Etta. Etta loved her.
  either Mary and Etta refer to different individuals in a model,
  or the individual known as Mary has two names, the other being Etta

Summary

Today, we have

- looked at more semantic rules,
- analysed simple discourses and
- introduced the anaphora constraint.

Note that we have covered all but two semantic rules from Chapter 10 of the book.

Next time we will

- look at the remaining semantic rules:
  namely those for if and every and
- start discussing ambiguity in natural languages.

Exercises

1. Consider the "consequences" listed on the last but one slide. How would you go about arguing that they are true given our grammar?

2. How many ways can you interpret the following discourse?
   Etta chased a stick. She caught it. Pip chased her.
   What assumptions do you have to make to allow our grammar to produce only the interpretations that you get?

3. What would you need to add to the grammar to interpret the following discourses?
   Patsy loved Liam. She married him. A journalist got the scoop.
   Are the interpretations which the grammar then allows just those which you think these discourses have?