More on anaphora

PHIL 43916
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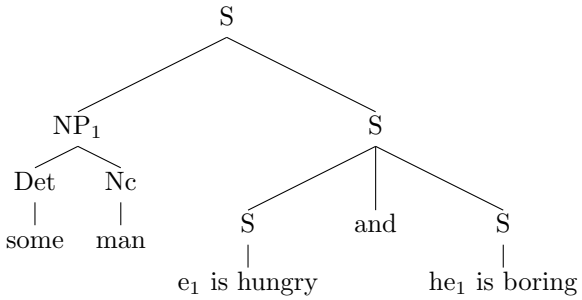
1. Restrictions on quantifier movement

On the theory we've been developing, it looks like we would treat the sentence

Some man is hungry and he is boring.

as having the structure



This seems to get the right truth conditions for the sentence. To obtain them, we have to think of 'some man' as moving out of the first conjunct of the sentence.

This leads us to expect the same behavior from universally quantified expressions; but we don't find this. In fact, sentences like

Every man is hungry and he is boring.

aren't even grammatical.

One might think that the puzzle here is about 'every.' But a plausible case can be made that the puzzle is really about 'some' (and 'a'). This is based on patterns of wh-movement (the movement of interrogative words) in question formation.

Consider the following pairs:

John gave me a gift.
What did John give me?

John gave me a gift and Bob napped.
*What did John give me and Bob napped?

John gave me a gift which Bob liked.
*Who did John give me a gift which liked?

The last two examples seem to illustrate constraints on wh-movement: you can't have movement out of conjuncts, or out of relative clauses like 'which Bob liked.' But it also seems like 'every' can't move out of these 'islands.' We already saw an illustration of the first point. But consider the pair of sentences

Fido has a bone in every corner of the house.
Fido has a bone which is in every corner of the house.

The first, but not the second, seems to be ambiguous. Why is this?

Indefinites like 'some' and 'a', by contrast, can move out of relative clauses. Consider

I talked to everyone who was in a dorm on South Quad.

2. Discourse anaphora

One might think that we can explain these differences between 'every' and 'a' at the level of syntactic theory, via rules governing movement. But indefinites exhibit other, related behaviors which are difficult to account for semantically. This is that indefinites seem, unlike 'every', to be able to bind pronouns in different sentences. Compare:

A man knocked on my door. He was rude.
*Every man left. He was in a hurry.

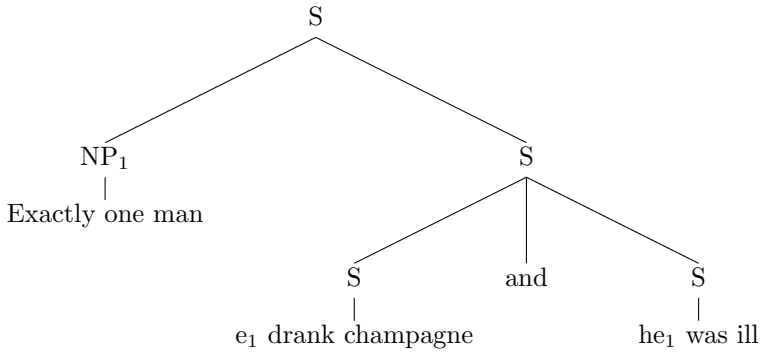
Can we make sense of the first pair of sentences using our mechanism of movement and quantified noun phrases c-commanding pronouns?

One might think that we could handle this case by, in effect, thinking of a discourse, or conversation, as a long conjunctive sentence. Then we could explain the first case above via quantifier movement, treating 'he' in the second sentence as bound.

But this doesn't work for other cases. Consider (an example from Gareth Evans)

Exactly one man drank champagne. He was ill.

Does this have the truth conditions which would be assigned to



Here 'he' seems to be anaphoric on 'exactly one man', but not bound by it.

How can we understand this? One idea is that 'he' here is functioning as a definite description, and that *which* definite description it expresses depends on the expression it is anaphoric on. Here it might be 'the man who drank champagne.' This appears to give us a way to understand the sense in which an expression might be anaphoric but not simply functioning as a bound variable (or as inheriting the semantic value of a c-commanding NP).

To develop this theory, we would need to give systematic rules for determining which definite description should give us the interpretation of the pronoun.

3. Donkey anaphora

Another problematic sort of case is exemplified by

Every man who owns a donkey beats it.

We should expect this sentence to have two readings, corresponding to the two scope assignments to the quantifiers. What are the two readings? Does either get the truth conditions of the sentence right?

We get similar phenomena with uses of indefinites in the antecedents of conditionals:

If Bob owns a donkey, he beats it.

In either case, it is difficult to see how to get the correct truth conditions by treating 'it' as a variable bound by 'a donkey.'

We could try the strategy mentioned above, and treat 'it' as expressing a definite description. The obvious choice here would be something like 'the donkey he owns.' Would this give us the correct truth conditions?

The problems to which donkey anaphora give rise have been one motivation for dynamic approaches to semantic theory, according to which the semantic values of expressions depend on earlier features of the discourse. Here's one way in which this idea might help with donkey anaphora. (For more details on competing dynamic approaches, see the extra reading on the web site by Jeff King.)

We can treat unbound pronouns, like the one in

A man knocked on my door. He was rude.

as free variables. So, translating this sentence into the syntax of the predicate calculus, the interpretation would be something like

$\exists$x (x is a man & x knocked on my door). x was rude.

The 'x' in the second sentence is not in the scope of any quantifier, and hence is not bound. The idea is that we can assign it by looking at the sentence which precedes it. Informally we can think of this sentence as setting the value of 'x' to be the set of things which make the parenthetical sentence true, and that the second sentence is true if one of these things makes it true.

Note also that this seems to give the right treatment of cases like

Exactly one man drank champagne. He was ill.

How might this help with donkey anaphora? We might formalize the sentence as a conditional as follows:

$\forall$x (x is a man & $\exists$y (y is a donkey & x owns y)) $\rightarrow$ x beats y

Note that in this formula the occurrences of 'x' and 'y' in the consequent are free — they are not in the scope of either quantifier. So you should clearly distinguish the above sentence from both of:

$\forall$x $\exists$y ((x is a man & y is a donkey & x owns y) $\rightarrow$ x beats y)
$\exists$y $\forall$x ((x is a man & y is a donkey & x owns y) $\rightarrow$ x beats y)

both of which plainly give the wrong truth conditions for the target sentence. How do we interpret the free variables in the consequent? A simplified version of the basic idea is

that the conditional is governed by the following rule: the antecedent outputs a set of sequences of objects which, assigned to 'x' and 'y', make the antecedent true. The conditional as a whole is true if every such sequence also makes the consequent true.

One worry that you might have about this account is that it requires that every man beat *every* donkey he owns. This might be the right treatment of our donkey sentence. But, as King points out, it does not seem quite right for the parallel sentence

> Every man who had a credit card paid with it.

How would you modify the above sketch of a dynamic account to handle this? Does the modification run into other problems?

Another problem for this sort of treatment of pronouns as free variables whose value is given by the discourse, which King points out, is that it seems to say the wrong thing about discourses like

> A man broke into Sarah's apartment. Scott believes he came in the window.

at least if we understand the belief attributed by the second sentence to be a general belief about whoever broke in rather than a belief about the particular individual who broke in.