Wide Scope Indefinites

The Genealogy of a Mutant Meme

or: how Tanya Reinhart rendered an innocent observation difficult to understand, and how a generation of linguists managed to get it wrong

Imagine a linguist considering (1):

(1) John owns a sofa

While pondering the meaning of (1), our imaginary linguist finds that it is true in case John owns a sofa. This causes him to hypothesize that (1) can mean that John owns a sofa. That is, he hypothesizes that our linguistic competence assigns (1) a semantic interpretation that can be represented as (2a):

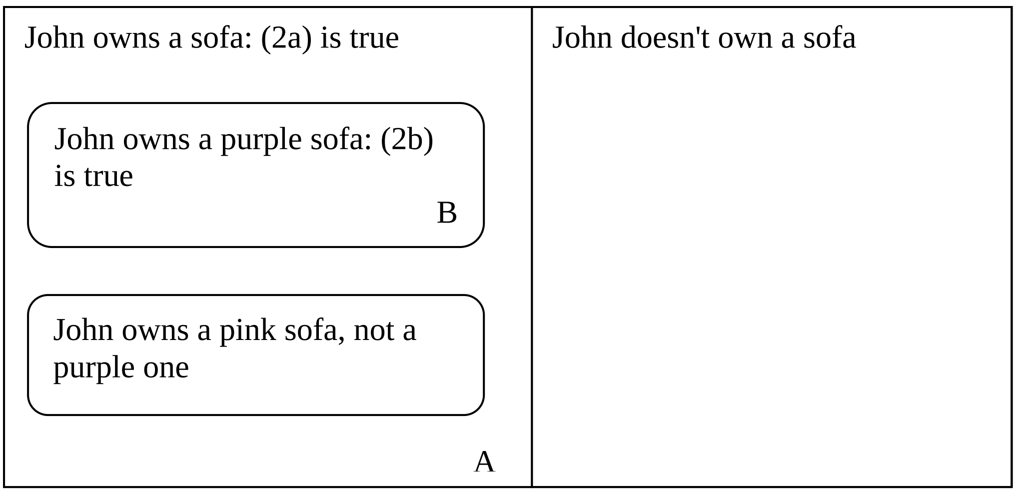
(2) a $\exists x$ [**sofa'**(x) $\wedge$ **own'**(**john'**,x)]

Pondering the meaning of (1) a little longer, our diligent colleague discovers that he judges it true in case John owns a purple sofa. Unaware of Zwicky and Sadock's (1975) discussion of privative oppositions, he concludes that (1) must be ambiguous. Apparently, our linguistic competence can also assign (1) the interpretation given in (2b):

(2) b $\exists x$ [**sofa'**(x) $\wedge$ **purple'**(x) $\wedge$ **own'**(**john'**,x)]

Few linguists would be enthousiastic about this hypothesis. Why is that? We would probably explain to our imaginary friend that (2a) is sufficient as a theory of the meaning of (1), because (2b) is just a special case of (2a). We might even draw him a diagram:

(3)



Box A in (3), we might explain, represents the set of situations in which John owns a sofa. Clearly, this set includes the set of circumstances in which he owns a purple one, box B. By claiming that (1) means (2a), we claim it is true in all the situations in A. Thereby, we automatically predict it is true in all situations in box B; there is no need make this prediction again by attributing (1) the reading (2b) as well.

Instead of providing this clear explanation, we could instead have chosen to explain the same point in a considerably more confusing manner. To say that the set of circumstances that verify (2b) are a subset of those that verify (2a), is to say that whenever (2b) is true, (2a) is true: (2b) *entails* (2a). When two readings are postulated in order to describe the set of situations where a sentence is true, but one reading entails the other, the entailing reading is superfluous: the complete set is described by the entailed reading.

Why is the second explanation more difficult to follow? I suspect it is because we are accustomed to thinking of entailment in the opposite way. Surely, when B entails A, we do not need to state A separately: doesn't it follow automatically from B? So, when one postulated reading entails another, shouldn't it be enough to simply postulate the *entailing* reading, and let the *entailed* reading … be entailed?

In 1976, Tanya Reinhart was arguing that scope relations always mirror relations of c-command at Surface Structure. She faced some apparent counterexamples, like Chomsky's *everyone in the room knows at least two languages*. Consider (4) as a representative case:

(4) every man loves some woman

a $\forall x\ [\ \mathbf{man'}(x) \rightarrow \exists y\ [\ \mathbf{woman'}(y) \wedge \mathbf{love'}(x,y)\ ]]$

b $\exists y\ [\ \mathbf{woman'}(y) \wedge \forall x\ [\ \mathbf{man'}(x) \rightarrow \mathbf{love'}(x,y)\ ]]$

Sentence (4) is true in case for every man there is a woman he loves, as stated in (4a). And (4) is true in case there is a woman such that every man loves her: (4b). In (4b), the indefinite *some woman* has wide scope; if this counts as a separate reading, it violates the s-structure c-command condition. But (4b) describes a subset of the cases (4a) describes: if for every man, there is some woman that he loves, then, through some unhappy circumstance, this just may turn out to be the same woman for every man. So Reinhart chose not to count these "wide scope indefinite" readings. She couched her explanation in terms of entailment:

> "... most putative examples of such ambiguities which are discussed in the literature are ones where one interpretation entails the other..." [Reinhart 1976:193]

(4b) entails (4a): our intuitions regarding (4) are fully described by the entailed reading (4a). It didn't take long for Reinhart's explanation to be misunderstood.

In 1977, Robert May was arguing that scope relations do not always mirror s-structure c-command relations. Cases like (4) might count as evidence, if it were not for Reinhart's entailment gambit. May countered with (5):

(5) everyone convinced someone

a $\forall x \, \exists y \, \mathbf{convinced'}(x,y)$

b $\exists y \, \forall x \, \mathbf{convinced'}(x,y)$

Although (5b) does not reflect s-structure c-command, it does describe some situations that verify (5). May argued that (5b) cannot be dismissed with the entailment argument, because (5b) is not entailed by (5a). True, but the entailment we are looking for is the one in the opposite direction. Since (5b) entails (5a), (5b) can be disregarded.

The curious thing is: if May's counterexample had been valid, Reinhart's own example would have been a counterexample to her claim. May's example (5) shows the same entailment relations as (4) and Chomsky's example. This detail did not escape the next author to fall into the "direction of entailment" trap.

In 1982, James Huang argued that scope relations mirror s-structure c-command. Reinhart's argument might have suited his purpose, but he felt it was flawed. Huang provides the same quote from Reinhart cited above, and then points out that this argument does not apply to "the very case [(4)] at hand" (p. 128), because the s-structure order of the quantifiers (4a) does not entail the inverse order (4b) at all. But it wasn't Reinhart who had been, inexplicably, confused; it was Huang who had been led down the garden path. The inverse order does entail the s-structure order, and therefore the inverse order may be disregarded.

Meanwhile, in 1979, Reinhart had acquired a fellow-traveler. Robin Cooper was concerned about examples in which indefinites not merely took inverse scope: they appeared to scope out of known scope and extraction islands. The wide scope reading for the indefinite *a producer I know* in (6b) violates every rule of civilized quantifier behavior:

(6) Mary dates every man who knows a producer I know

a $\forall x \, [[\mathbf{man'}(x) \wedge \exists y \, [\mathbf{producer\text{-}I\text{-}know'}(y) \wedge \mathbf{know'}(x,y)]] \rightarrow \mathbf{date'}(\mathbf{mary'},x)]$

b $\exists y \, [\mathbf{producer\text{-}I\text{-}know'}(y) \wedge \forall x \, [[\mathbf{man'}(x) \wedge \mathbf{know'}(x,y)] \rightarrow \mathbf{date'}(\mathbf{mary'},x)]]$

Cooper suggested that, even though (6) is true in the situations described by (6b) (there is a particular producer I know, such that Mary dates every man who knows him), (6) really only has the narrow scope interpretation (6a). He wrote:

> "There seems to be no reason *a priori* for us to suppose that the English sentences are ambiguous between a wide-scope and a narrow scope reading since the narrow scope

> reading will always give truth in those worlds where the wide scope reading gives truth." [Cooper 1979:142]

Reinhart's riddle repeated, but with a twist. Although Cooper was not confused over the relevant direction of entailment, his example (6) does not serve to illustrate it. The wide scope reading (6b) does not entail the narrow scope reading (6a). If there is one producer who Mary dates every man who knows him, it does not follow that Mary dates every man who knows any producer.

Why the mistake? One possible explanation is this: Cooper was too well-trained as a logician. It must have been so firmly rooted in his mind that $\exists y \forall x \varphi$ entails $\forall x \exists y \varphi$, that he unthinkingly mis-recognized (6) as such a case. It took an untrained eye to spot the mistake (Ruys 1992). Prediction: find another discussion of the same subject, by another linguist with an interest in logic, and we might see the mistake repeated.

Unfortunately, this prediction is not exactly borne out by the historical record. In 1981, Donka Farkas was ready to accept that the scope of indefinites is not restricted by extraction islands. She constructed this variation on Cooper's example:

(7) Jon dates every girl who knows a diplomat in Washington

It seems that the indefinite *a diplomat in Washington* can scope out of the CNPC island, and take wide scope relative to *every girl who...* (as in (6b)). Farkas needed to protect the wide scope reading of her example against an entailment attack, arriving in the form of the following admonition (based on Kempson 1979):

> "... if one of the two interpretations of an allegedly ambiguous sentence entails the other, the sentence should be pronounced unambiguous and should be given only the entailed, "weak" interpretation." [Farkas 1981:63]

So far, so good. But Farkas went on to claim that in her example, it is the narrow scope reading for the indefinite that entails the wide scope reading. If so, the entailment admonition directs us to accept only the wide scope interpretation. Therefore, we must allow the indefinite to scope out of the island.

The reasoning is impeccable, the conclusion is probably true as well, but the premise is wrong. Cooper had mistakenly claimed that in examples like these, the wide scope reading entails the narrow scope reading. Farkas now claimed that there is an entailment in the opposite direction; but this is equally incorrect. The narrow scope reading, along the lines of (6a), does not even entail that there are diplomats in Washington, let alone that there are diplomats in Washington such that Jon dates every girl who knows them. In fact, there is no entailment in either direction in either of these examples; so far, we have not seen a case of an indefinite scoping out of an island where the entailment argument could be invoked.

Whatever its explanation, it seems likely that Cooper's unhappy choice of example helped cause the next "direction of entailment" victims.

In 1982 – but the work dates back at least to 1980 – Fodor & Sag were also interested in showing that indefinites can produce readings as if they scope out of extraction islands. Examples like (6) might support this view, if Cooper's entailment escape route could be closed off. They paraphrased Cooper's position as follows:

> "...a sentence with interpretation I_1 (e.g. narrow scope of the indefinite in [(6)]) may be understood by a hearer as if it had interpretation I_2 (e.g. wide scope of the indefinite in [(6)]) just in case (i) I_1 entails I_2, and (ii) the hearer has empirical knowledge (or belief) which renders inapplicable to the real world all entailments of I_1 other than I_2." [Fodor & Sag 1982:371/2]

Like May and Huang, Fodor & Sag have the relevant order of entailment reversed. Like May, they provide what they feel is an example not subject to the entailment objection:

(8) Mary dates at least five men who know a producer I know

Example (8), like (6) and (7), is true in situations described by the wide scope reading for the island-embedded indefinite, *a producer I know*. Fodor & Sag argue this reading cannot be explained away, since (8) does not obey condition (i): in (8) I_2 (wide scope) entails I_1 (narrow scope). True, and this is precisely why the wide scope reading *can* be explained away as a special case of the narrow scope reading.

Thus, with unwitting altruism, Cooper and Fodor & Sag proved each others points. Cooper had provided an example of an island escaping indefinite which cannot be explained away with Cooper's entailment reasoning; Fodor & Sag provided one which can.

Today, Reinhart's entailment observation is usually well understood, and considered valid. But sometimes, it still manages to confuse.

In 1994, Dorit Abusch faced the question whether a plural indefinite scoping out of an island can be understood distributively. After having provided, earlier in the paper, an excellent explanation of the entailment issue, she claimed that wide scope distributivity was possible:

(9) every critic who reviewed two books by Henry Miller panned them

a $\exists Y\ [\mathbf{book\text{-}by\text{-}HM'}(Y) \wedge 2(Y) \wedge \forall x\ [[\mathbf{critic'}(x) \wedge \forall y{\in}Y\ \mathbf{reviewed'}(x,y)] \rightarrow \mathbf{panned'}(x,Y)\ ]]$

b $\exists Y\ [\mathbf{book\text{-}by\text{-}HM'}(Y) \wedge 2(Y) \wedge \forall y{\in}Y\ \forall x\ [[\mathbf{critic'}(x) \wedge \mathbf{reviewed'}(x,y)] \rightarrow \mathbf{panned'}(x,y)\ ]]$

Abusch felt that (9) has the reading given here as (9b): there is a set of two books by Miller, such that for each book y from this set, whoever reviewed y, panned y. This is in addition to the generally accepted "wide scope non-distributive" reading (9a). However, the alleged distributive reading entails the non-distributive reading, and the example fails.

And finally, in a 1995 manuscript, an author well aware of the *petite histoire* of wide scope indefinites made the same mistake Abusch had made, but this time in order to prove the opposite point. He claimed that (10) does not allow the wide scope distributive reading (10b), but only the wide scope non-distributive reading (10a) (Ruys 1995).

(10) If three relatives of mine had died in the fire, I would have inherited a fortune.

a $\exists Y$ [**relative-of-mine'**$(Y) \wedge 3(Y) \wedge [\ \forall y \in Y$ **die'**$(y) \rightarrow$ **I-inherit-a-fortune**' **]]**

b $\exists Y$ [**relative-of-mine'**$(Y) \wedge 3(Y) \wedge \forall y \in Y\ [$ **die'**$(y) \rightarrow$ **I-inherit-a-fortune**' **]]**

Unfortunately, the entailment argument works both ways. Since (10b) entails (10a), it is just a special case of (10a), and it cannot be proven *not* to exist.

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