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Some Notes on Scope Ambiguities

Mina Sugimura

1. Introduction

The source of ambiguities in meanings, whether it is purely semantic or something else, is often hard to pinpoint. While it is rather straightforward to identify the ambiguities derived from syntactic structures, so-called scope ambiguities may constitute a problem for their source of ambiguities. The reason for this difficulty with scope lies in the possibility that the ambiguity in question is more attributed to semantic entailment than to different syntactic structures. In other words, it is often hard to differentiate “true” ambiguities from “prima facie” ambiguities.

The goal of this paper is to provide a closer examination of the scope issue, ultimately suggesting that scope ambiguities, as well as syntactic ambiguities, can be derived from different syntactic structures. I will first review two types of ambiguities: syntactic ambiguities and scope ambiguities. After showing how these two types of ambiguities are different in nature, I will briefly introduce May’s (1977) quantifier raising, in an attempt to show that scope ambiguities, as well as syntactic ambiguities, can be derived solely from different syntactic structures. I will then point out that scope ambiguities may potentially face a problem: apparent ambiguities might just be a product of entailment. Exploring a similar scope phenomenon in Japanese, I show that scope ambiguities are in fact theoretically well-motivated. This view enables syntax to deal with scope ambiguities as well as syntactic ambiguities, providing a unified treatment of ambiguities in general.
2. **Syntactic Ambiguities**

Syntactic ambiguities arise when a sentence has different ways of structure building; in other words, the sentence is ambiguous because of its syntactic structure. Consider, for example, the following sentence:

(1) Nanasa saw the bear with binoculars.

The sentence in (1) is two-way ambiguous: one interpretation that immediately arises is that Nanasa saw the bear by using binoculars. The other interpretation, although it is a fairy-tale-like interpretation, is that Nanasa saw the bear that had binoculars. These ambiguities in meaning are in fact derived from their corresponding syntactic structures illustrated in (2) and (3), respectively:

(2) *Interpretation that Nanasa saw the bear by using binoculars*
As shown in the structures above, the difference in meaning lies in the syntactic position of the modifier \textit{with binoculars}. In (2), on the one hand, the modifying phrase is attached to the VP, yielding the interpretation where \textit{with binoculars} describes the manner in which \textit{Nanasa saw the bear}. In (3), on the other hand, \textit{with binoculars} is modifying the NP, which in turn brings out the interpretation where \textit{the bear}, not \textit{Nanasa}, was using binoculars.

It thus seems that ambiguities derived from syntactic structures are rather straightforward to deal with; that is, different syntax yields different semantics. Obviously, \textit{with binoculars} as a VP-modifier is the more prominent interpretation in (1), which potentially masks the alternative reading. However, given an appropriate context, the other interpretation arises, although not salient. It might be that \textit{the bear} in (1) picked up a pair of binoculars left in the woods, perhaps thinking they were edible, and \textit{Nanasa saw the bear} just right then, for example. In that scenario, the other reading in (3) should be a lot easier to obtain. In the next section, we will see more complex cases of ambiguity, namely, scope ambiguities.
3. **Scope Ambiguities**

We have seen in the previous section that syntactic ambiguities arise from different syntactic structures. Scope ambiguities, however, cannot be detected from the surface structure of a sentence. Consider (4), for example:

(4) Every boy loves some girl.

It has been claimed in the literature that (4) is ambiguous. One interpretation is that for every boy, there is some girl he loves. On this interpretation, every boy loves some girl or other. Another interpretation is that there is some girl that every boy loves, where the girl that every boy loves is the same person. Notice that these two readings do not have their corresponding syntactic structures from which semantics can be derived. That is, there is only one syntactic structure available from the surface word order of (4), as illustrated below:

(5) **Structure of (4)**

Assuming traditionally that there is a one-to-one correspondence between syntax and semantics, we need to guarantee their corresponding syntactic structures for their semantic interpretations. Fortunately, we have such an operation called “quantifier raising”, proposed by May (1977), which creates appropriate semantic structures different from the surface structure of a sentence. Note that this operation applies after syntax sends off the surface structure of a sentence to phonology, which consequently guarantees the surface
word order of a sentence. In other words, quantifier raising applies purely for semantic reasons. Were this operation applied, targeting the quantifier phrase “every boy” to raise, we obtain (6):

(6) **QR**: every boy > some girl

(6) can roughly read, starting from the top left of the structure, ‘for every boy, there is some girl such that he loves her’, yielding the first interpretation. On this interpretation, *every boy* takes wide scope in linguistic terms. If, however, quantifier raising applies to (5), raising *some girl*, we alternatively obtain (7):
Again starting from the top left, (7) yields the interpretation that ‘for some girl, every boy is such that he loves her’, providing the second meaning of (4). On this interpretation, some girl takes wide scope.

With May’s quantifier raising, we have successfully generated appropriate semantic structures otherwise unavailable from the surface structure of a sentence. In the following section, we take a step forward and see how this treatment of scope ambiguities is well motivated from the semantic point of view.

4. Scope Ambiguities from Entailment

So far, I have simply assumed that scope ambiguity comes from different syntactic structures. This is a fairly standard assumption, and yet its theoretical motivation is worth questioning. Recall the example in (4) from the previous section, repeated below as (8):

(8) Every boy loves some girl.

We have seen that (8) has two interpretations, one of which requires the wide scope reading of every boy, whereas the other of which requires the wide scope of some girl.
Notice, however, that the wide scope reading of some girl entails the wide scope reading of every boy. If there is a popular girl and every boy happens to love the same girl, then it must also be true that for every boy, there is some girl that he loves. It just happens to be the case that the girl that every boy loves is the same one. If so, the two readings are not independent from each other, but rather one entails the other.

This is not very good news for us because if entailment is responsible for the apparent ambiguity, there is no need for different structures for each reading. Ideally, syntax and semantics correlate with each other, and the next section in fact attempts to argue for motivate scope ambiguities as a product of operation at the syntax-semantics interface.

5. Getting around the Problem

It has been widely reported in the literature (Bobaljik & Wurmbrand 2005; Nomura 2003, 2005; Sano 1985, Tada 1992 among many others) that nominative objects in Japanese, when equipped with the morpheme dake ‘only’, arguably show scope ambiguity. Consider (9):

\[(9)\] (a. John-wa salada-dake-ga tabe-rare-ru

John-TOP salad-only-NOM eat-can-PRES

‘John can eat only salad.’

**Interpretation 1 (only > can):**

It is only salad that John can eat.

(John can eat salad & it is not the case that John can eat things other than salad.)

**Interpretation 2 (can > only):**

It is possible for John to be able to eat only salad.

(John can eat salad & not things other than salad.)
b. John-wa salada-dake-o tabe-rare-ru
   John-TOP salad-only-ACC eat-can-PRES
   ‘John can eat only salad’

Interpretation 1 (only > can):
It is only salad that John can eat.
(John can eat salad & it is not the case that John can eat things other
than salad.)

Interpretation 2 (can > only):
It is possible for John to be able to eat only salad.
(John can eat salad & not things other than salad.)

What has been reported in the literature (Nomura 2003, 2005) is that the nominative object
in (9a) ambiguously takes wide or narrow scope over the stative predicate -rare, while the
accusative object in (9b) unambiguously takes narrow scope below -rare. However, as
has been pointed out in Sugimura (2012), if we consider these examples in terms of
entailment, we immediately run into the same problem pointed out in the previous section.
This is so because the wide scope reading of the nominative object necessarily entails the
narrow scope reading.

Fortunately, the same does not hold the other way round: the narrow scope reading does
not entail the wide scope. In other words, it is possible to isolate the wide scope reading of
the nominative object. This is because the wide scope reading would be false if John in (9),
for example, could eat things other than salad. To see this, consider (10):
The follow-up statement in (10a) and (10b) will contradict the wide scope reading but be consistent with the narrow scope reading because John can clearly eat other things than salad. Thus it is possible to show that the wide scope reading of the nominative object is unavailable by manipulating the context, which in turn proves that the sentence in (9a) is in fact ambiguous; the two readings are respectively detected by their truth-values.

In contrast, it is very difficult to isolate the narrow scope because the wide scope reading necessarily entails the narrow scope. Since the narrow scope reading is merely to say that ‘John is able (permitted, allowed etc.) to not eat non-salad things,’ it could simply be true if the wide scope interpretation is true: that is, if salad were the only thing he could eat, it is also true that he can eat salad and not other things. For this reason, I do not speculate any further about the obligatory narrow scope reading of the accusative object in (9b) reported in the literature and instead focus on scope of the nominative object. In fact, as Koizumi (1994; 1995) reports, the wide scope reading is also available under certain circumstances such as focused interpretations. Thus, the obligatory narrow scope of the accusative object requires further research.

Even if we leave aside the obligatory narrow scope of the accusative object, however, as long as there is an entailment relationship between the wide and the narrow scope, it is difficult to say that there are two different semantic interpretations, and that each
interpretation corresponds to a different syntactic structure. Although I do not have a direct answer to this problem, and it is beyond the scope of this paper, I would like to explore a possible way around this.

While there cannot be a situation where entailment does not hold in simple-clause-sentences like (9), Sugimura(2012) notes that it appears to be possible to set up two readings where neither of them entails the other, once we add another predicate such as the causative _sase._ Consider the following two scenarios:

(11) **Context A**
Andrea wants to control what her cat Midnight eats, but usually he just eats whatever he wants and not what Andrea wants. For some reason, she is only able to make Midnight eat bread. She cannot make him eat other things.

(12) **Context B**
Midnight usually eats all sorts of things at the same time. But Andrea is able to make Midnight only eat bread. She manages to make him not even look at fish.

Context A forces the wide scope reading of the object, whereas Context B the narrow scope reading. Both wide and narrow scope readings are in fact available with the sentence below:


   -TOP        -DAT   bread-only-NOM eat-CAUS-CAN-PRES

‘Andrea is able to make Midnight eat only bread’

**Interpretation 1 (only > can):**
It is only bread (and nothing else) that Andrea is able to make Midnight eat.

**Interpretation 2 (can > only):**
Andrea is able to make Midnight eat only bread without eating anything else.
A situation where *can > only* is true and *only > can* is false would occur if *Midnight* ate something other than bread (without eating anything else). A situation where *only > can* is true and *can > only* is false would also arise if the following story holds:

(14) **Situation: only > can is True & can > only is False**

Midnight eats all sorts of things, but usually he refuses to eat whatever Andrea wants to make him eat. Therefore, if she wants to make him eat fish, he eats bread, cheese, and everything else except fish. The one thing that Andrea can make Midnight eat whenever she wants to is bread. But he then always eats other things along with the bread, which Andrea did not try to make him eat.

In this situation, although it is only bread that Andrea can make Midnight eat, it does not guarantee that Midnight is able to eat only bread without eating anything else. Since he always eats things that Andrea did not try to make him eat, it is not the case that Andrea is able to make him eat bread without eating anything else. Hence, the two readings do not entail each other.²

From this, I conclude that deriving scope ambiguities solely from entailment is not as easy as it looks. Although the entailment issue exists in general for ruling out the wide scope of the accusative object, it does not stand in the way of ruling out the narrow scope of some nominative objects.

The same should hold for the earlier example *every boy loves some girl*: that is, it is possible to isolate the wide scope reading in a scenario where each boy loves each girl and no girl is loved by more than one boy. Thus, this sentence is also proven to be ambiguous, and the ambiguity should arise from the different semantic representations of the sentence. In fact, the Dutch linguist Eddy Ruys originally claims this and argues for the true nature of scope ambiguities. His reasoning is based on the fact that our linguistic intuition is not only limited to truth of a sentence but is also useful for falsity of a sentence.³ Assuming with Ruys, I end this section with the hope that scope ambiguities derived from different semantic representations are well-motivated from the semantic point of view.
6. Conclusion

I have discussed some major issues regarding scope ambiguities. I first pointed out how scope ambiguities seem to be hard to argue for because of the entailment problem. I then showed that it is in fact possible to detect independent readings by manipulating contexts. On the basis of this argument, I concluded that scope ambiguities are theoretically well argued for and that syntax and semantics consistently interact to yield ambiguities.

References


Notes

1 See Sugimura (2012) for cases where the wide scope reading suddenly disappears in the motion verb construction.

2 See Sugimura (2012) for some potential problem with this alternative.

3 This point is nicely summarized in Paul Elbourne’s (2011) Meaning: A Slim Guide to Semantics.