Neg-Raising in an Underspecified Semantics Framework

Manfred Sailer, Universität Göttingen, Germany

manfred.sailer@phil.uni-goettingen.de

In neg-raising (NR) a negation in the matrix clause is understood as negating the complement clause. Such readings are only possible with certain matrix predicates such as *believe, think, want,* so-called *NR predicates* (NRP). For illustration, (1-a) can either mean that it is not the case that I think Peter will come, or it can be seen as expressing the same idea as (1-b).

(1)   a.   I don't think Peter will come.   b.   I think Peter will not come.

We will argue that in (1), the negation is syntactically realized in the matrix clause, but that it can take scope either in the matrix or in the embedded clause. Frameworks of *underspecified semantics* (Pinkal, 1996) provide the necessary ingredients to model this as an instance of *scope ambiguity*. Here, we will use *Lexical Resource Semantics* (LRS, Richter and Sailer (2004)).

More Data   Horn (1978) presents arguments against a syntactic derivation of the NR reading of (a) from an underlying representation such as (b). Nonetheless, some NPIs (such as *lift a finger*) which normally require a clause-mate negation may occur in the complement clause of NRPs (see (2)). Crucially, (2-b) only has the interpretation in which the embedded sentence is negated. This can be taken as an argument that, in NR constellations, such NPIs are still licensed under a negation within the same clause.

(2)   a.   Pat won't/ *will lift a finger to help you.
        b.   I don't think/ *claim that Pat will lift a finger to help you.

Horn (1978) points out that something similar to neg-raising occurs in infinitival constructions. This is particularly clear for so-called coherent verbs in German: they form a cluster together with their infinitival complement, and a modifier can be interpreted semantically as modifying either the entire cluster or the embedded verb (Bech, 1955). Our analysis will capture this parallelism directly by treating NRPs semantically in the same way as German coherently embedding verbs.

(3)   (dass) Chris das Buch nicht kaufen kann.   It is not the case that C. can buy the book
        that   Chris the book not   buy   can.   Chris is able/entitled to [not buy the book]

Horn also shows that NR is possible if the matrix clause contains items such as *none* (see (4)). The example contains an NPI (*until . . .*) of the strict type illustrated in (2), which enforces a NR reading. This reading can be paraphrased as: all of my friends think that I won't finish until the 21st century. In this reading, however, the negation is, again, clause-mate to the NPI.

(4)   None of my friends think [that I'll finish until the twenty-first century]. (Horn, 1978, p. 148)

Additional support for a "lower" negation comes from the fact that it is not possible to have an NPI in both the matrix and the embedded clause in NR. Within one clause, however, a weaker NPI can raise the acceptability of a stronger NPI (see (b)).

(5)   a.   *I don't believe at all that Pat will finish this book until next year.
        b.   I don't claim that Pat will *(ever) lift a finger to help his colleagues.

The NR negation must take wide scope in the embedded clause. In particular, it outscopes the quantifier in the subject position, licenses an NPI in subject position (6), and it cannot license a very strict NPI such as Dutch *voor de poes zijn* (*to be trifled with*), which requires a clause-mate VP-internal negation.

(6)   a.   I don't believe that several senators are communists (Horn, 1978, p. 181)
        b.   I don't think that anyone at all is allowed to leave. (Klooster, pear)

(7)   a.   Ze is *(niet) voor de poes.   b. * Ik geloof niet dat ze voor de poes is.
             She is not   for   the cat   I   believe not that she for   the cat   is
             'She is not to be trifled with.' (van der Wouden, 1995)

Previous Approaches   Syntactic analyses of NR have been refuted by argumentation as those referred by Horn or, most recently Klooster (pear). Klooster (2003), following Progovac (1994), assumes an abstract negative operator in the COMP position of the complement clause of some predicates. This analysis requires to postulate that the abstract operator in COMP is interpreted as negation, whereas the overtly present negation is not. Furthermore, special licensing conditions for the NRP are required to restrict its distribution to negated sentences. For an entailment-based approach to NPI licensing (Ladusaw (1980), among others) van der Wouden (1995) shows that the entailment behavior of NRPs is not in line with their NPI licensing behavior. Finally, Horn manages to provide a pragmatic characterization of NRPs in terms of scalar implicatures, but his approach is not connected to an explicit syntax-semantics interface.

Sketch of the Analysis   We represent the NR data as an instance of a syntax-semantics mismatch: the negation is contributed by a syntactic element of the matrix clause, but semantically interpreted within the embedded clause. Frameworks of *underspecified semantics* are especially designed for this kind of "scope ambiguity". Our analysis will combine the following independent assumptions: First, strict NPIs must be in the (immediate) scope of a negation operator in the logical form of the smallest clause in which they are contained. Second, NRPs are analyzed semantically parallel to coherently constructing verbs in German: the relative scope of an adjunct to the NRP and the constant contributed by the NRP (such as believe$'$) is left underspecified. Third, negation, in contrast to other modifiers, does not require that the head it adjoins to be in its scope.

These last two assumptions will ensure that NR is possible, but only occurs with a particular set of matrix predicates and a particular kind of modifier. These assumptions can be expressed directly in the framework of *Lexical Resource Semantics* (LRS, Richter and Sailer (2004)) without introducing special devices or additional features.

Conclusion   We could only sketch how intriguing properties of NR follow directly once Horn's observation of the parallelism between coherently constructing verbs and NRPs is interpreted as an instance of scope ambiguity.

Our approach accounts for the semantic combinatorics, but it does not provide an explanation for why some predicates allow for NR. If Horn is correct, the class of NRP candidates can be defined in pragmatic terms. We can assume that this characteristics is taken as motivation of the language learner to chose a semantic specification for some predicates which leads to a NR properties.

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