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Scope of Logical Operators and Indirect Binding

Shinsuke Homma

The following paradigm shows a difference between such universal quantifiers as every and all on one hand and such 'existential quantifiers' (as they have been called) as any, many, and indefinite NPs on the other, with respect to their scope interaction with negation. (Kroch (1974), Linebarger (1980), etc.)

(1) a. Everyone didn’t invite John. (NOT > EVERY, EVERY > NOT)
   b. John didn’t invite everyone. (NOT > EVERY, *EVERY > NOT)

(2) a. *Anyone didn’t invite John.
   b. John didn’t invite anyone.

(3) a. Many people didn’t invite John. (*NOT > MANY, MANY > NOT)
   b. John didn’t invite many people. (NOT > MANY, MANY > NOT)

(4) a. A girl didn’t invite John. (*NOT > A, A > NOT)
   b. John didn’t invite a girl. (NOT > A, A > NOT)

I have assumed that the scope interaction in (1) is accounted for in terms of the structural relation of the relevant operators at LF, while in (2-4) the wide scope of negation is encoded in terms of Indirect Binding of Haik (1984) (or Unselective Binding of Heim (1982)).

Negation of 'existential quantifiers' as in (2-4) and the cases of Indirect Binding share the following significant properties. First, just like X must c-command Y at S-Structure in order for X to indirect-bind Y, the negation operator not must c-command any, many, and a at SS in order to negate them. Thus anyone, many people, and a girl in (2-4) cannot be negated when they appear in the subject position, which the negation operator does not c-command at S-Structure. Secondly, while any-phrase does not have to c-command a pronoun in order to be coindexed with it, the pronoun has to be in the c-command domain of the negation operator that c-commands and hence licenses any.
(5) a. *Mary is not teasing everyone; because she hates him.
    b. Mary is not teasing anyone; because she hates him.
    c. *Mary is not teasing anyone, because she hates him.

This coindexation possibility is on a par with that of 'donkey sentences' as Haik (1984) has discussed.

(6) a. Everyone who owns a donkey likes it.
    b. *Everyone who owns a donkey came, and Mary bought it.

Turning to the so-called any thesis, I have argued for the univocal any analysis, treating any uniquely as an indefinite expression that is semantically a free variable. In this regard, I have assumed 'free choice' any to be another instance of 'polarity' any bound by the abstract universal operator, which Heim (1982) has called 'invisible necessity operator'. This assumption makes it possible to account for why 'free choice' any apparently must take scope wider than other logical expressions, when it appears in the subject position, while ordinary quantifiers like every may take narrower scope.

(7) a. Every dog doesn't like catnip. (ambiguous)
    b. Any dog doesn't have one tail.

    (FC-ANY > NOT, *NOT > FC-ANY)

The negation operator in (7b) cannot take scope wider than the FC-Any because its scope can never be wider than the abstract universal operator which I assume to lie under the head of CP and thus behave on a par with such sentential operators as Q and IF.

(8) [cp A [ip any dog [i doesn't [vp........]]]]