

# INTERVENTION EFFECTS FOR INVERSE SCOPE READINGS: A DRT ACCOUNT

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Negated sentences with a universally quantified subject are usually interpreted with a wide scope of the negation. Consequently, sentences of the form *Every N not VP* and *Not every N VP* should behave very similarly. I discuss a contrast between the two types of sentences with respect to their NPI-licensing potential and their possible discourse continuations. I propose a DRT account of the discourse continuation facts that corroborates a representational theory of NPI licensing.

Which readings are available for sentences of the form *Every N not VP* is one of the big puzzles in natural language semantics (see for example Horn 1989). In this paper I do not attempt to solve it, but rather add to the puzzle. I discuss two sets of data with respect to which sentences of the form *Every N not VP* diverge from the allegedly synonymous sentences of the form *Not every N VP*.

## 1. Introduction

Sentence (1) has the two readings sketched in (2). In the so-called *inverse scope reading* (ISR) in (2-a) the universal quantifier is interpreted in the scope of the negation. It is widely assumed that this is the most natural reading for sentences of this type. The second reading, the so-called *surface scope reading* (SSR) in (2-b), respects the surface order of the quantifier and the negation.

- (1) *every-not*: Every student hasn't met a friend at the party.  
(readings: (2-a), (2-b))
- (2) a. inverse scope reading:  $\neg\forall x[\text{student}(x) \rightarrow \exists y[\text{friend}(y) \wedge \text{meet}(x, y)]]$   
b. surface scope reading:  $\forall x[\text{student}(x) \rightarrow \neg\exists y[\text{friend}(y) \wedge \text{meet}(x, y)]]$

I will not address the issue of why the ISR is the preferred reading for *every-not* sentences. Instead, I compare *every-not* sentences with sentences of the form *Not every N VP* as in (3). In *not-every* sentences the negation must take scope over the universal quantifier, i.e. they are paraphrases of an ISR of *every-not* sentences.

- (3) *not-every*: Not every student has met a friend at the party. (reading: (2-a))

I now turn to two phenomena that show a difference between *not*-every sentences and the ISR of *every-not* sentences: NPI licensing and reference to abstract objects.

## 2. NPI Licensing

Negative polarity items (NPIs) are expressions such as *ever*, *any* that are excluded from simple affirmative sentences. Instead they preferably occur in negated sentences, but can also be licensed in a number of contexts that are not negative in an obvious way, such as in the scope of *few*. A number of NPIs, such as *any* and *ever*, may occur in the scope of *not every*. This is shown in (4).

- (4) *not*-every: Not every student has met any friends at the party. (reading: (2-a))

Since *not*-every sentences can be used as paraphrases for the ISR of an *every-not* sentence, we would expect that NPIs are also licensed in this constellation. However, a *not*-every sentence with an NPI cannot have an ISR.

- (5) *every-not*: ?? Every student hasn't met any friend at the party.  
reading: (2-b); (unavailable reading: # (2-a))

The unavailability of the ISR in (5) is parallel to the so-called *intervention effect*, in which a universal quantifier cannot take scope between a negation and an NPI. This is shown in (6), which lacks the otherwise prominent reading  $\neg > \forall > \exists$ .

- (6) ??Kim didn't give any apple to every teacher.  
readings:  $\forall > \neg > \exists$ ,  $\neg > \forall > \exists$ ; unavailable readings<sup>1</sup>: #  $\neg > \forall > \exists$

The NPI is blocked if the universal takes scope between the negation and the NPI. This parallelism justifies speaking of an intervention effect in (5) as well.

### 2.1. Is There an Intervention Effect?

A reviewer suggested that the unavailability of the ISR with an NPI in (5) may be due to the fact that the ISR is an instance of metalinguistic negation. Luckily there is a way to test this. Horn 1989 showed that metalinguistic negation does not license NPIs. There are NPIs which are not sensitive to intervention effects — in particular verbal NPIs.<sup>2</sup> If there is a metalinguistic negation in the ISR of *every-not* sentences, these NPIs should be excluded as well. I switch to German examples to make this point because I could not collect enough native speaker judgments on the corresponding English data.

The German verb *scheren* (*care (for)*) is an NPI. It cannot occur in a simple affirmative sentence as in (7-a). In (7-b) the NPI is excluded with a clausemate positive

<sup>1</sup>All readings in which the NPI is not in the scope of the negation are, of course, equally excluded.

<sup>2</sup>Klooster 1993 discusses this group of NPIs in some detail. I am grateful to Jack Hoeksema (p.c.) for emphasizing that not all NPIs are subject to intervention effects.

polarity item *ziemlich* (*quite*). Since PPIs are possible in sentences with a metalinguistic negation (Horn 1989, p.297), this shows that *scheren* is not licensed by a metalinguistic negation. (7-c) illustrates that *schert* is not sensitive to intervention effects since it is licensed even in the immediate scope of the universal quantifier.

- (7) a. Merkel schert sich \*(nicht) um die Bierpreise.  
Merkel cares REFL not about the prices for beer  
b. Merkel schert sich nicht (\*ziemlich) um die Bierpreise.  
Merkel cares REFL not quite about the prices for beer  
c. Kein Politiker schert sich um jede Gesellschaftsschicht.  
no politician cares REFL about every social class. ( $\neg > \forall > \text{NPI}$ )

Having established the non-sensitivity of *scheren* to intervention effects, we can turn to the original examples with the ISR. In German inverse scope readings are possible with a fronted universally quantified NP under a certain intonation. Assuming this intonation, we get the contrast in (8). The sentences in (8-a) and (8-b) show the same pattern as the English examples in (4) and (5) respectively, i.e. there is an intervention effect on the ISR of a *every-not* sentence. If we use the NPI *scheren* instead, the NPI is licensed even in an inverse scope reading.

- (8) a. Nicht alle Politiker machen sich jemals Gedanken um soziale  
not all politicians make REFL ever thoughts about social  
Gerechtigkeit. (reading:  $\neg > \forall > \text{NPI}$ )  
justice  
‘Not all politicians have ever thought about social justice’  
b. \*Alle Politiker machen sich nicht jemals Gedanken um soziale  
all politicians make themselves not ever thoughts about social  
Gerechtigkeit. (not available:  $\# \neg > \forall > \text{NPI}$ )  
justice  
c. Alle Politiker scheren sich nicht um soziale Gerechtigkeit.  
all politicians care themselves not about social justice  
(reading:  $\neg > \forall > \text{NPI}$ )

The data in (8) show that the ISR of *every-not* sentences is not an instance of metalinguistic negation. They also illustrate that a theory of NPI licensing needs to differentiate between NPIs that show intervention effects and those that don’t.

## 2.2. Previous Approaches

The huge body of literature on NPIs notwithstanding, the licensing conditions for NPIs are still not fully understood. In particular, there are syntactic, semantic and pragmatic approaches. I will argue that the standard theories cannot distinguish between the *not-every* sentences and the ISR of *every-not* sentences.

Since the two sentences are synonymous, they should have the same semantic representation, which corresponds to (2-a). This means that the contrast between (4)

and (5) cannot be based on this representation. Both sentences also have the same entailment properties, i.e. the NPI is in a downward-entailing context, which is the basic licensing condition in the entailment-based approach of Ladusaw 1980.<sup>3</sup>

It is also hard to find a pragmatic difference between the two sentences. Both sentences share the implicature that some students met a friend and that some students did not. Consequently the mechanism of indirect licensing by a negative implicature assumed in Linebarger 1987 makes the same prediction for both examples.

It seems impossible to derive the intervention effect in (5) by looking at the relevant sentences as a whole. Taking the notion of “intervention” seriously, a reasonable analysis runs as follows: One has to assume that the NPI licensing is determined at the first relevant semantic operator. Then, *not every student* in (4) defines its scope as the domain for NPI licensing. Since it is downward-entailing (scale reversing, ...), the NPI is licensed. Under an ISR for (5), however, the scope of *every student* is the domain for NPI checking. This domain is not downward-entailing, which accounts for the unavailability of the ISR.

While this is a viable approach, it is not clear whether the proponents of the respective theories would be willing to include the necessary structural notions. Furthermore whatever approach to intervention effects one adopts, the theory must be flexible enough to allow for NPIs that are not sensitive to those effects.

### 3. Discourse Continuations

In this section I discuss another type of data that shows a difference between *not-every* sentences and *every-not* sentences. The data stem from a different empirical domain: reference to abstract objects. Abstract entities (events, propositions, ...) can be the antecedent for pronouns in discourse (Asher 1993). I show that there occurs an additional abstract discourse referent in the ISR of *every-not* sentences. This discourse referent is introduced between the negation and the universal quantifier. However, it is absent from *not-every* sentences.

Discourse referents introduced in the scope of negation are normally not accessible as antecedents for pronouns outside the scope of this negation (Kamp and Reyle 1993), see (9-a). Such a pronominal reference is possible if there is a continuation with a modal or hypothetical context, as in (9-b). This modal subordination allows us to “skip” the outmost negation and gives access to discourse referents in its scope.

- (9) a. Pedro doesn’t own [a donkey]<sub>i</sub>. He calls it<sub>\*i</sub> Emma.  
b. Pedro doesn’t own [a donkey]<sub>i</sub>. He would call it<sub>i</sub> Emma.

To apply this to the data with universally quantified subjects, I use appositive *which* relative clauses. There, the relative pronoun typically refers to abstract entities from the main clause. With a continuation in the indicative, (10), there is no

<sup>3</sup>This problem was noted in connection with intervention effects of the type in (6) in Jones 1996.

difference between the two antecedent clauses: *which* refers to the situation in which some visitors did not get presents.

- (10) Every visitor didn't get a present/ Not every visitor got a present,  
 a. #which was very expensive. (*which* = every visitor got a present)  
 b. which was a bit unfair. (*which* = some visitors didn't get a present)

An irrealis continuation allows for modal subordination as in (9-b). A continuation of the *every-not* sentence in (11) can refer to a situation in which every visitor received a present, i.e. (11-a). This continuation is unavailable in (12).

- (11) Every visitor didn't get a present, ...  
 a. which would have been very expensive. (*which* = every v. got a p.)  
 b. ??which would have been a bit unfair. (*which* = some v. didn't get a p.)  
 (12) Not every visitor got a present, ...  
 a. #which would have been very expensive. (*which* = every v. got a p.)  
 b. ??which would have been a bit unfair. (*which* = some v. didn't get a p.)

This contrast can be accounted for by assuming an additional abstract discourse referent, written as  $p$ , which can serve as the antecedent in (11). This referent is not present in (12). This results in the DRSs in (13), using the linear notation for DRSs.

- (13) a. DRS for (11):  $[\neg[p|p : [x|\text{visitor}(x)] \Rightarrow [y, e|\text{present}(y), \text{get}(e, x, y)]]]$   
 b. DRS for (12):  $[\neg[\emptyset|[x|\text{visitor}(x)] \Rightarrow [y, e|\text{present}(y), \text{get}(e, x, y)]]]$

Since modal subordination allows to skip the highest negation, the DRS in (13-a) provides an antecedent for *which*, but the DRS in (13-b) does not.<sup>4</sup>

#### 4. A DRT-based Account of NPI Licensing

I propose a representational account of NPI licensing.  $K$  is an *NPI-licensing DRS* iff it occurs in a condition of the form  $\neg K$  or  $K \Rightarrow K'$ .<sup>5</sup> An NPI must occur in a DRS that is embedded in an NPI-licensing DRS. Different types of NPIs impose different conditions on the distance between the NPI and its NPI-licensing DRS: Verbal NPIs (*scheren* in (7)) must be licensed within the clause in which they are contained. For other NPIs we need a notion of distance defined by the number of DRSs that are accessible from the NPI but (i) still contained in the same NPI-licensing DRS and (ii) have a non-empty universe. Weak NPIs (*any, ever*) allow for at most one intervening DRS; strong NPIs (*lift a finger*) do not permit any intervening DRS at all.

(14) shows the DRSs for (4) and for the hypothetical ISR of (5). The NPI's semantics is underlined.

<sup>4</sup>I refrain from committing myself to the concrete nature of  $p$ . It would be a state in classical DRT, a proposition in SDRT, or a situation in other variants.

<sup>5</sup>Since  $\neg K$  is equivalent to  $K \Rightarrow \text{false}$ , there is just one characterization of an NPI-licensing DRS.

- (14) a. DRS for (4):  $[\neg[\emptyset][x|\text{student}(x)] \Rightarrow [y, e|\text{friend}(y), \text{meet}(e, x, y)]]$   
 b. DRS for (5):  $[\neg[p|p : [x|\text{student}(x)]] \Rightarrow [y, e|\text{friend}(y), \text{meet}(e, x, y)]]$

In both DRSs the restrictor of the universal quantifier ( $[x|\text{student}(x)]$ ) is an intervener (which correctly excludes strong NPIs). In (14-a) this is the only intervener, as the negation takes scope over a DRS with an empty universe. Consequently, the NPI is licensed in (4). In (14-b) the DRS following the negation contains the abstract discourse referent  $p$  in its universe. Therefore, this DRS is a second intervener. This violates the locality requirement of the NPI, and the intervention effect is derived.

## 5. Conclusion

I discussed two contrasts between *not-every* sentences and the inverse scope reading of *every-not* sentences: their NPI-licensing potential and their possible discourse continuations. Using DRT I derived both phenomena from the presence of an additional discourse referent in *every-not* sentences.

Intervention effects are a notorious problem for semantic and pragmatic accounts of NPIs. The DRT account incorporates semantic insights but provides an appropriate notion of locality, which is necessary to account for intervention effects.

While I distinguish three types of NPIs, I assume a single characterization of the licenser: the first box in an implication. This is a simplification, but it provides a uniform theory of NPI licensing for the core data. Differences among the types derive from restrictions on the NPI's depth of embeddedness in its licensing DRS.

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