NOR: NEITHER DISJUNCTION NOR PARADOX

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1. INTRODUCTION

Bivalent coordination constructions involving a negative first conjunct and a second conjunct introduced by *nor* such as the examples in (1)a (henceforth NEG-*nor* constructions) can be described as disjunctions ((1)b) or as conjunctions ((1)c), due to the logical equivalence of ¬ [p ∨ q] and [¬p] & [¬q].

(1) a. *Leo ate neither the rice nor the carrots.*
Leo didn't eat the rice nor did he eat the carrots.
Leo has never eaten rice nor has he eaten carrots.
b. *The following does not hold: Leo ate the rice or the carrots.* ¬ [p ∨ q]
c. (*Leo didn't eat the rice*) AND (*Leo didn't eat the carrots*) [¬p] & [¬q]

Based on an observation made by Lechner (2000) for German *weder-noch* 'neither-nor' coordinations, this squib will argue that cases of NEG-*nor* coordination can be constructed (in both German and English) where the logical equivalence does not hold. More specifically, I will show that in certain contexts, negation takes narrow scope with respect to a quantifier embedded in the first conjunct, rather than scoping over the entire coordination. I will conclude that only a conjunction structure such as (1)c, with independent negation in each conjunct, allows for an element in one conjunct to take scope over negation without scoping out of its conjunct.

2. THE PROBLEM

In both English and German, the negative element of the first conjunct can appear embedded in the first conjunct (cf. (2); (2)a is Lechner's (4)).[1]

(2) a. *Peter hat weder das Theorem verstanden*
Peter has neither the theorem understood
noch konnte Maria dem Beweis folgen
nor could Mary the proof follow
'Neither has Peter understood the theorem, nor could Mary follow the proof.'

b. *Leo hasn't ever/has never been to Canada, nor has Julia met the queen.*

[1] Since some speakers do not allow CP/IP coordination, with *neither* embedded in the first conjunct, I use mostly examples with *not* or *never* in English. This does not affect the argument.

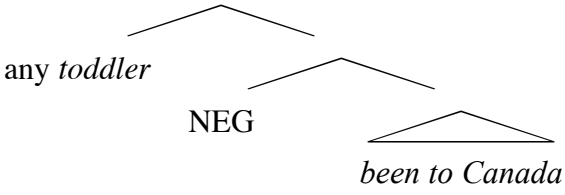
As Lechner points out, if one assumes a disjunction structure, a paradox arises when we look at cases such as (3) ((3)a is Lechner's (6)) where the subject of the first conjunct is a negative polarity item (NPI). Under the assumption that NPIs must be c-commanded by negation (see below for a more detailed discussion on where NPIs licensing takes place), the ungrammaticality of these cases indicates that the negation in the first conjunct is below the subject.

(3) a. **Auch nur einer hat weder das Theorem verstanden*
Even one has neither the theorem understood
noch konnte jemand dem Beweis folgen
nor could somebody the proof follow
'Neither has only a single person understood the theorem, nor could somebody follow the proof.'

b. **Any toddler has never been to Canada, nor has Leo met the Queen.*

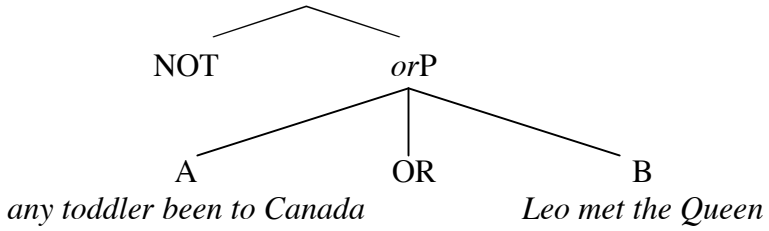
To exclude these sentences, at the point where NPI licensing takes place, the structure of the first conjunct in (3)b must be roughly as in (4).

(4)



If, however, the negation associated with *neither* is below the subject, a paradox arises under a disjunction structure of NEG-*nor* coordinations. As shown in (5),[2] under a disjunction structure, negation must take scope over the whole coordination, otherwise the meaning would be [¬p] ∨ [¬q], which is not what NEG-*nor* constructions can mean.

(5) Disjunction structure



[2] It is not relevant for this squib whether coordinations are analyzed as binary or ternary branching structures. For simplicity, I represent them as ternary branching structures.

If (5) is the structure where NPI licensing takes place, a problem arises for examples such as (3). Since negation must take scope over the whole coordination, it would necessarily be in a position where it c-commands the subject of the first conjunct. Hence, under the structure in (5), it would be predicted that NPIs embedded anywhere in the coordination should be licensed. As shown in (3), this is not correct.

Before concluding, however, that a disjunction structure creates a paradox, we have to consider (and reject) an alternative analysis for (3). A crucial assumption in the set up of Lechner's paradox was that the structure in (5), which is the structure required to express the correct meaning of NEG-*nor* constructions, is also the structure where NPI licensing takes place. An alternative (which was pointed out to me by Y. Sharvit) would be to assume that NPI licensing takes place at a different level. More specifically, following the common view, NPI licensing could be assumed to take place at the surface (s-)structure level, which is essentially the structure in (4). At this level, an NPI in subject position of the first conjunct is not c-commanded by negation, and hence (3) would be excluded in the same way the sentence **Any toddler has never been to Canada* is. But what about the meaning of NEG-*nor* constructions under this view? As pointed out above, these constructions cannot mean: [¬p] ∨ [¬q]. The only way to make sure that we arrive at the correct meaning (namely (5)) would therefore be to assume an obligatory process of across-the board NEG-raising. This hypothetical derivation of (3) is illustrated in (6).

(6) a. (*Any toddler* NOT *been to Canada*) OR (NOT *Leo met the queen*) s-structure
➠ NPI licensing: *

b. NOT [(*Any toddler* t_{NOT} *been to Canada*) OR (t_{NOT} *Leo met the queen*)] LF
➠ ¬ [p ∨ q]

While this derivation could account for examples such as (3) (assuming one's theory allows for such a process of obligatory NEG-raising to create the right meaning), I will show that Lechner's paradox remains if we look at the scope properties of negation in NEG-*nor* constructions. The argument is simple. A structure such as (5)/(6)b makes the prediction that at the level where the structure is interpreted, negation should take widest scope. The examples in (7) and (8) show that this is not correct. First, universally quantified subjects in negative sentences such as (7)a can be interpreted with wide or narrow scope with respect to negation (provided the right intonation is used). Crucially, the same ambiguity is found when (7)a is the first conjunct of a NEG-*nor* coordination (cf. (7)b). Similarly, examples such as (8)a where the subject is an existential quantifier are typically considered to be unambiguous—i.e., the subject cannot be interpreted within the scope of negation. The same holds again for coordinations (cf. (8)b), that is, only the wide scope interpretation of the existential is available.

(7) a. *Everyone didn't talk to the king.* ∀ » ¬ /¬ » ∀
b. *Everyone didn't talk to the king nor did they/anyone/John call the queen.*
∀ » ¬ /¬ » ∀

(8) a. *Someone didn't talk to the king.* ∃ » ¬ /*¬ » ∃
b. *Someone didn't talk to the king nor did they/anyone call the queen.*
∃ » ¬ /*¬ » ∃

The facts in (7) and (8) are highly problematic for the disjunction analysis proposed above. While NPI licensing could be seen as a surface structure phenomenon, quantifier scope cannot. In order for the coordination to be interpreted correctly (i.e., as ¬ [p ∨ q] and not as [¬p] ∨ [¬q]), negation must scope out of both conjuncts and take scope over the entire coordination. However, the scope properties of quantifiers show that negation takes scope under the subject of the first conjunct.

Since on the disjunction representation, any operator that takes scope over negation must take scope over the entire disjunction, the final piece of the argument is to exclude a derivation for (7)b and (8)b where the low scope readings of negation arise as the result of quantifier raising (QR). More specifically, one might suggest that the wide scope of the quantifiers originating in the first conjunct in (7)b and (8)b is the result of QR of these quantifiers to a position above negation after NEG-raising has applied. A QR analysis of this sort, however, can be excluded on the following grounds. As argued in Ruys (1992) (see also Fox 1995), although non-across-the board QR is possible in principle, this form of movement is only licensed when the moved quantifier binds a variable in the second conjunct. This illustrated in (9).

(9) a. *A student likes every professor and hates the dean.* *every » a
b. *A student likes every professor$_i$ and hates his$_i$ assistant.* every » a

Now, if the wide scope interpretation of the first conjunct quantifiers in (7)b and (8)b were the result of non-across-the-board QR of these quantifiers above the raised negation, these constructions should allow (in fact, require) a bound variable in the second conjunct—i.e., a variable bound by the quantifiers originating in the first conjunct. As shown in (10), however, a bound variable interpretation as indicated is impossible in NEG-*nor* constructions.

(10) a. **Everyone$_i$ didn't talk to the King nor did he$_i$ meet the queen.*
b. **Every politician$_i$ didn't lie nor did his$_i$ secretary accept a bribe.*

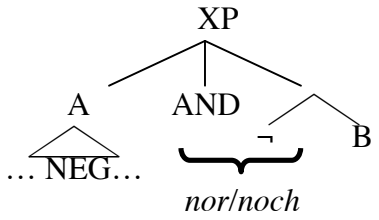
Thus, the quantifiers in the first conjunct in (7)b and (8)b do not take scope over the whole coordination and therefore Lechner's paradox does indeed exist for NEG-*nor* coordinations if they are analyzed as disjunctions. In the next section, I will show that the paradox disappears if NEG-*nor* coordinations are analyzed as conjunctions.

3. THE SOLUTION

In the previous section, we have seen that the first conjunct of a NEG-*nor* coordination shows exactly the same NPI licensing and quantifier scope properties as the same sentence would if it was not part of a coordination. This represents a problem for a

disjunction structure which requires that the negation embedded in the first conjunct scopes out of that conjunct, in fact, out of the whole coordination. I would like to suggest that these problems (and some other puzzles) can be solved if NEG-*nor* coordinations are analyzed as conjunctions rather than as disjunctions. The basic structure is given in (11).

(11) Conjunction structure



The structure in (11) represents NEG-*nor* coordinations in which the first conjunct is a negative statement—that is, a sentence including a negative element such as *neither, not, never* (see below for other *nor* contexts). A crucial difference between (11) and the disjunction structure in (5) is that in the conjunction structure, the meaning of the coordination does not impose a particular scope requirement on the negation in the first conjunct. Hence, negation can be embedded anywhere in the first conjunct throughout the derivation. This immediately explains the NPI-licensing and scope properties discussed in the previous section. Since there is no requirement that NEG must scope out of the first conjunct to derive the correct interpretation, there is no need for negation to move at all. Thus, in sentences such as (3) (see (12)a), the negation does not c-command the NPI at any level, and hence, NPI licensing fails (no matter where NPI licensing is assumed to take place). If, on the other hand, the NPI is c-commanded by negation as in (12)b,c, the structure is, of course, fine.

(12) a. (*Any toddler* NEG *been to Canada*) AND (NOT *Leo met the queen*)
➠ NPI licensing: *

b. *Leo has never seen any beavers, nor has Julia met the queen.*
(*Leo* NEG *seen any beavers*) AND (NOT *Julia met the queen*)

c. *Neither has any toddler ever been to Canada, nor has Leo met the queen.*
(NEG *any toddler ever been to Canada*) AND (NOT *Leo met the queen*)

Furthermore, the scope properties in (7)b and (8)b are correctly predicted to be parallel to the scope properties in simple clauses involving the same elements. That is, whatever process allows ambiguity in (7)a (i.e., whether this is assumed to be reconstruction of the subject under negation or movement of negation above the subject) will also allow ambiguity in (7)b. Similarly, whatever blocks ambiguity in (8)a will block it in (8)b.

The second crucial difference between (5) and (11) is the meaning assigned to the coordinator introducing the second conjunct. As shown in (11), I assume that English *nor* and German *noch* are syntactically and semantically complex, consisting of the actual

coordinator—namely 'and'—and the negation 'not'.[3] This has also been suggested by Huddleston and Pullum (2002:1308ff) in light of examples such as (13). In (13)a, the sentence introduced by *nor* is an independent sentence (i.e., not part of a coordination from which across-the-board NEG-raising could apply), and in (13)b, the first conjunct is a positive statement which cannot be in the scope of negation. Hence these examples cannot be analyzed as involving disjunction structures.

(13) a. *He was one of those people who can't relax. Nor did he have many friends.*
b. *The hotel had good views and a private beach; nor were these its only attractions.*

The examples in (13), together with the scope facts discussed above, then provide strong evidence for the claim that *nor* constructions always correspond to conjunctions.[4]

Finally, a second puzzle noted by Lechner (2000) for German NEG-*nor* constructions provides evidence for the structural decomposition of *nor* and the structure in (11). As shown in (14)a, in sentential *entweder-oder* 'either-or' coordinations, the second conjunct can be a full verb second (V2) complement. That is, the constituent after *or* is a full CP with some XP occupying Spec,CP and the finite verb in C. Crucially, NEG-*nor* constructions cannot embed a full V2 complement under *nor*; rather, the finite verb has to immediately follow *noch* This is shown in (14)b vs. (14)c (Lechner's (3) and (2), respectively).

(14) a. *Entweder hat Peter das Theorem verstanden*
Neither has Peter the theorem understood
oder Maria konnte dem Beweis folgen
or Mary could the proof follow
'Either Peter has understood the theorem, or Mary could follow the proof.'

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[3] More specifically, I assume that *and* and *not* are merged at PF and spell-out as the single items *nor/noch*. One might ask why, under this account, the coordinators in English and German appear to be (at least in part) morphologically related to disjunctions rather than conjunctions (cf. *either-or—neither-nor*; *entweder* 'either'—*weder* 'neither'). I have to assume here that this similarity is accidental. Although the etymology of *nor* is not entirely clear, the *Oxford English Dictionary* suggests that *nor* is probably the shortened form of *nother* 'neither'. If this is the case, the similarity between *or* and *nor* would indeed be accidental. Further support comes from the cross-linguistic distribution of these coordinators. As pointed out in Haspelmath (To appear), a morphological similarity between *neither-nor* coordinators and disjunctions is not a general property of languages. For instance, the Latin *neither-nor* coordinator is clearly related to a conjunction (cf. *que* 'and'; *ne-que – ne-que* 'neither-nor'). On the other hand, in Dutch and many other languages, there is no morphological relation at all between *neither-nor* coordinators and other coordinators (see Haspelmath To appear for further details).

[4] Although the claim that *nor* is simply the spell-out of *and+not* correctly predicts that cases such as (13) should exist, it should also be pointed out that the distribution of *nor* is more limited than the distribution of *and not* or *but*. In particular, the use of *nor* in constructions without a preceding negative sentence is rather exceptional and restricted to special contexts (in contrast to *and not* or *but*; cf. *John left but/and did not turn off the stove; *John left nor did he turn of the stove*). Thus, the distribution of *nor* is subject to further semantic and pragmatic constraints which cannot be provided here.

b. **Weder hat Peter das Theorem verstanden*
Neither has Peter the theorem understood
noch Maria konnte dem Beweis folgen
nor Mary could the proof follow
'Neither has Peter understood the theorem, nor could Mary follow the proof.'

c. *Weder hat Peter das Theorem verstanden*
Neither has Peter the theorem understood
noch konnte Maria dem Beweis folgen
nor could Mary the proof follow
'Neither has Peter understood the theorem, nor could Mary follow the proof.'

If *noch*—like *oder*—were a simple coordinator, this fact would be puzzling. However, under the structure in (11), we can provide an explanation. Recall that *noch* is syntactically complex, consisting of the actual coordinator *and* plus negation. We can then assume that the negation part of *noch* is generated in Spec,CP. Under this assumption, Spec,CP is occupied in (14)b,c (i.e., examples such as (14)c do, in fact, involve a full V2 second conjunct) and no other XP can move to this position.

Lastly, the assumption that *noch* decomposes into *and* plus *not*, with the negation part occupying Spec,CP in sentential coordinations, also correctly predicts that *weder-noch* coordinations can never involve C'-coordination. The examples in (15) illustrate this point. Let us start with (15)a which involves across-the-board movement of the object to Spec,CP. Coordination can then either be seen as C' coordination (i.e., coordination below the moved object) or as CP-coordination with deletion of the object in Spec,CP in the second conjunct. In *weder-noch* coordinations, on the other hand, this form of coordination is impossible (cf. (15)b). Under the structure for *noch* suggested here, this follows: Since Spec,CP is occupied by the negative part of *noch*, movement of the object to this position is blocked and the example would violate the across-the-board movement constraint. ((15)c shows that the sentence is fine without across-the-board movement.)

(15) a. *Wen hat Hans angerufen oder wird er bald besuchen*?
Who has John called or will he soon visit
'Who did John call or will he visit soon?'

b. **Wen hat Leo weder/niemals angerufen noch wird er jemals besuchen*?
Who has Leo neither/never called nor will he ever visit
'Who has Leo never/neither called, nor will he ever visit?'

c. *Hans hat den Peter weder/niemals angerufen*
John has the Peter neither/never called
noch wird er ihn jemals besuchen.
nor will he him ever visit.
'John has neither/never called Peter, nor will he ever visit him.'

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