

## Interclausal NEG Raising and the Scope of Negation

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**Abstract:** In this paper, we show that the syntactic analysis of one major type of NEG raising in Collins and Postal (2014) is inconsistent with the facts of negation scope revealed by Klima (1964) type tests for sentential negation. Two of the four original Klima tests plus three additional ones are discussed. We propose a novel alternative syntactic analysis, also involving NEG raising, that is consistent with the relevant tests, as well as with all the principles of NEG raising and NEG deletion proposed in Collins and Postal (2014). We suggest, further, that the newer analysis permits a more uniform overall conception of the various cases of NEG Raising.

**Keywords:** NEG raising, Klima tests, sentential negation, strict NPIs, confirmation tags, *neither*, *nor*, negative parentheticals, event semantics, De Morgan's Laws

### 1. Introduction

Collins and Postal (2014) (henceforth: CP2014) argue at length for the theoretical view that what was there called *Classical NEG Raising*, illustrated in (1a), is a phenomenon involving syntactic raising of a negative element, NEG, out of an embedded clause.

- (1) a. I don't think that Helen owns a new smartphone. =  
b. I think that Helen does not own a new smartphone.

We here suggest replacing the label *Classical NEG Raising* by the more transparent *Interclausal NEG Raising* (hereafter: INR). This captures what we take to be an essential feature of all instances of the phenomenon, namely, that a NEG raises from a position  $P_1$  in one clause to a position  $P_2$ , where  $P_1$  and  $P_2$  are not clause-mate positions.

It is necessary for the present discussion to distinguish three subtypes of INR, which we will call *standard cases* (SC), *negative quantifier* (NQ) cases and *cloud of unknowing* (CU) cases. SC INR is illustrated in (1a). That is, SC INR covers examples where the overt main clause NEG, which CP2014 took to be raised from the complement clause, occurs in a post-aux position.

The account of SC INR in CP2014 was a development of a tradition of ideas supporting a syntactic conception of this phenomenon tracing back to Fillmore (1963) and including Lakoff (1969), Horn (1971, 1972), Seuren (1974) and McCawley (1998). As noted in CP2014 p 4, support for the idea that INR was a syntactic phenomenon began to dissolve in the early seventies and was ultimately replaced by a consensus view that it was instead a semantic/pragmatic one. CP2014 reargued for the need of a syntactic account; see also Blanchette (2015).

Type NQ INR, illustrated in (2), is characterized by the presence of a negative quantifier DP or negative adverbial in the main clause:

- (2) No doctor expected that Sylvia would recover until June.

NQ examples were referred to as *composed quantifier* cases in CP2014. Both SC and NQ INR were extensively discussed in CP (2014).

CU INR, first attested in Horn (2014), is illustrated in (3):

- (3) I don't know/can't say that he has seen his mother in ages.

The CU terminology was based on the title of Horn (2014) and this variety of INR, unknown at the time of writing to the authors of CP2014, was hence not discussed therein. Contra Horn (2014), its INR character is argued in Collins and Postal (2015a) (based on island facts and the distribution of Horn clauses). The bulk of the present paper deals with SC INR. But we briefly discuss the other types in section 12, showing in particular how a newer analysis of SC INR permits a more uniform and more constrained treatment of INR in general.

Despite its overt presence in the main clause, the instance of NEG in (1a) appears to be understood on one reading as taking its scope in the complement clause. We say ‘on one reading’ because there is a distinct reading: (1a) can simply deny that the speaker has an opinion about Helen’s ownership of a smartphone, perhaps, because the speaker has never thought about the matter or is undecided about it. On the SC INR reading, cases like (1a) share a reading with those like (1b), that is, indicate that the speaker supposes that Helen does not own a smartphone.

The facts in (1) contrast with sentences not involving INR, like those in (4):

- (4) a. I didn’t state that she can afford a new smartphone.  
b. I stated that she cannot afford a new smartphone.

Here (4a) has no reading whatever under which it paraphrases (4b), hence no reading where the scope of the main clause NEG could be taken to be internal to the complement clause.

On the analysis of CP2014, the NEG in (1a) has raised syntactically from the embedded clause. That NEG then takes embedded clause scope because, like all other NEGs, it is interpreted in its position of origin; see section 3.

However, the claim that negation has embedded clause scope in sentences like (1a) conflicts with the fact that such sentences, on the INR interpretation, pass the tests first invoked in Klima (1964) for what he called *sentence negation* (henceforth, *sentential negation*). We

discuss the relation between these tests and claims about INR in section 3 below. But, just to indicate the issue, two such tests are illustrated in (5):

- (5)    a. They don't think that Helen owns a new smart phone, do they?  
      b. They don't believe that Helen owns a new smart phone and neither should you.

Both the presence of the grammatical positive tag question phrase in (5a) and that of the grammatical *neither* phrase in (5b) diagnose the presence of a preceding clause which manifests main clause negation scope. We consider the logic and factual basis of this claim in detail in section 3. Therefore, sentences like (5), on their INR interpretation, appear to illustrate a sharp conflict created by adoption of the CP2014 analysis of SC INR. More precisely, that analysis combines with the view that NEG's are interpreted at their point of origin to clash with the matrix clause scope of negation required by the Klima tests, shown in (5).

This paper proposes an alternative syntactic analysis of SC INR that is consistent with (i) all relevant tests (two of the four original Klima tests, plus three others), (ii) the meanings of the relevant sentences and (iii) the principles of NEG raising and NEG deletion proposed in CP2014.

The outline of the rest of this paper is as follows. Section 2 briefly reviews CP2014's analysis of SC INR, focusing on claims made about the scope of negation. In section 3, we illustrate how INR sentences behave with respect to five tests for sentential negation. In section 4, we discuss the interaction of these tests with negative quantifier DPs, providing additional support for the claims in section 3. Section 5 reviews the CP2014 syntactic representation of quantifier scope. Section 6 outlines our new analysis of type SC INR. Section 7 briefly disposes of a possible objection to that analysis. Section 8 relates the ideas of section 6 to a novel treatment of sentential negation. Section 9 considers in detail how the analysis of sections 6 and 8 determines the correct meanings for SC INR sentences. Section 10 addresses an apparent

semantic inconsistency (involving De Morgan's Laws) arising from the ideas in section 8 and offers a solution dissolving the inconsistency. Section 11 deals with the NEG deletions needed to sustain the analysis of section 6. Section 12 shows how the newer analysis of SC INR in section 6 dovetails with those of NQ and CU INR, discussed in CP2014 and Collins and Postal (2015a), permitting a previously unavailable generalization about INR. Section 13 shows how the newer analysis is consistent with the treatment of negative parentheticals found in CP2014, chapter 17. Section 14 is the conclusion.

## 2. Collins and Postal 2014 on SC INR

The CP2014 analysis of SC INR, illustrated in (1a), was very roughly as in (6):

- (6) I do NEG<sub>1</sub> think [that Helen <NEG<sub>1</sub>> owns a new smartphone]

On this analysis, NEG<sub>1</sub> originates in the embedded clause, and raises to the matrix clause. Of course, (6) leaves many points unspecified, in particular, the origin position of NEG<sub>1</sub>. While the higher occurrence of the raised NEG<sub>1</sub> is pronounced, that of its lower occurrence is not. We indicate such non-pronunciation here and throughout by the angled bracket notation <X>. On the analysis of CP2014, only the lower occurrence of NEG<sub>1</sub> is interpreted. We return to this assumption in the discussion of (15) below. An analysis like (6) accounts for the shared interpretation of (1a,b).

A variant of SC INR is illustrated in (7):

- (7) a. She doesn't think that the performance was half bad.  
b. She thinks that the performance was not half bad.

As in the pair in (1), (7a), which contains an overt main clause NEG, is a paraphrase of (7b), in which the only visible NEG is in the complement clause. But in addition, such cases also

manifest the so-called *strict* negative polarity item (NPI) *half bad*. This occurs in a clause not containing an overt occurrence of its putative licenser, the main clause NEG. Strict NPIs are those which have been taken to require local (clause-mate) licensers. The examples in (8) partially indicate the strict NPI property of *half bad*.

- (8) a. The movie was \*(not) half bad.  
b. Sylvia claimed that the movie was not half bad.  
c. \*Sylvia did not claim that the movie was half bad.

Many other examples of strict NPIs are given in CP2014, which takes the behavior of such NPIs to be a key piece of support for the syntactic nature of INR. When a strict NPI appears in the complement of verbs like *argue/claim/insist/proclaim/realize*, etc., which lack INR readings, ungrammaticality in general results if an overt NEG appears only in the main clause, as in (8c).<sup>1</sup> INR cases like (7) are then under analyses like (6) putatively good because the needed local NEG licenser originated in the complement clause.

Another subtype of SC INR involves what CP2014 refer to as *Horn clauses*. These are illustrated by the highlighted fronted phrases in examples like (9a,b):

- (9) a. They didn't believe that in any sense had she betrayed their confidence.  
b. Joan didn't expect that any of the foreign candidates would the dean approve of.

Pre-theoretically, a Horn clause is an embedded clause whose fronted phrase, based on an NPI, obligatorily gives rise to subject-aux inversion. Sentences like (9) are respectively equivalent interpretatively to the following:

- (10) a. They believed that in no sense had she betrayed their confidence.  
b. Joan expected that none of the foreign candidates would the dean approve of.

In (10a,b) the highlighted fronted phrases uncontroversially instantiate the *Negative Inversion* construction, one characterized by the necessary presence of subject-aux inversion.

CP2014 analyzes Horn clauses, e.g. (10a), as a sub-variety of a Negative Inversion clauses in which the NEG permitting Negative Inversion has raised into a main clause via INR. That is, (10a) was represented schematically as in (11):

(11) They did NEG<sub>1</sub> believe that [in <NEG<sub>1</sub>> SOME sense] had she betrayed their confidence.

Here, because of the covert NEG<sub>1</sub>, the fronted phrase [in <NEG<sub>1</sub>> SOME sense] requires subject-aux inversion in the embedded clause. Treating certain NPIs as underlying NEG structures, as in (11), is the only analysis we are aware of that can account for the fact that certain NPIs trigger Negative Inversion when fronted. Mainstream theories of NPIs, which analyze them as non-negative indefinites/existential quantifiers offer no account for sentences like (9), since expressions like *a man* or *some man* do not permit Negative Inversion.

That the NEG<sub>1</sub> contained in the fronted phrase in (10a) raises from the embedded clause to the matrix clause at first obscures the fact that that fronted phrase represents a regular Negative Inversion case. But considerable evidence for such a conclusion is presented in CP2014, especially in chapter 14 (see also Collins and Postal 2015). Much of that evidence has the form of parallelisms like (12b,d,e):

- (12) a. Francis might never recover.  
b. \*Never might Francis recover.  
c. They thought Francis might never recover.  
d. \*They thought that never might Francis recover.  
e. \*They did not think that ever might Francis recover.

That is, just as the modal *might* does not permit uncontroversial instances of Negative Inversion like (12b,d), it does not permit a Horn clause like (12e). This follows with no special stipulation from the CP2014 analysis under which (i) the fronted phrase in a Horn clause is a negative phrase and (ii) the NEG of the fronted phrase has raised into the containing main clause via SC INR. Otherwise, such parallels will just be mysterious accidents. We know of no mainstream account of NPIs based on an analysis of NPIs as non-negative indefinites/existential quantifiers that can account for these parallels.

Only a proper subset of predicate taking complement clauses, listed in (13), permit the NEG raising defining SC and NQ INR.

- (13) appear, advisable, advise, believe, choose, expect, feel, feel like, figure, guess (dialectal), imagine, intend, likely, look like, mean, plan, reckon (dialectal), recommend, seem, sound like, suggest, suppose, supposed, tend, think, turn out, want, used to.

These predicates were called *Classical NEG Raising Predicates* (CNRPs) in CP2014. Despite our switch here to the INR terminology, it seems harmless to guard the term CNRP. The vast majority of predicates taking complement clauses, specifically, *argue, claim, insist, proclaim, state, realize, understand*, permit no form of INR at all. Since the main clause NEG of non-INR cases like (4b) cannot, according to the CP2014 analysis, originate in the complement clause, the scope of that NEG cannot be in the complement clause. Under such assumptions, a subordinate clause strict NPI does not find its needed local licenser, accounting for the ungrammaticality of examples like (8c).

A parallel point to that made for strict NPIs holds for Horn clauses. Since the CP2014 analysis of these depends on the raising of a NEG from a complement clause into a main clause, Horn clauses should only be found in the complements of clauses based on predicates



sanctioning INR. Just that generalization was proposed in Horn (1975: 283; 1978: 169) and accepted in CP2014 chapter 14.5. Thus in general, replacement of the main predicates in (9a,b) by non-CNRPs yields ungrammaticality.<sup>2</sup>

- (14) a. \*They didn't state/testify that in any sense had she betrayed their confidence.  
b. \*Joan didn't predict/proclaim that any of the foreign candidates would the dean approve of.

As alluded to earlier, the analysis of INR in CP2014 requires the following assumption:

- (15) NEG Interpretation

An NEG is interpreted only in its position of origin.<sup>3</sup>

Put differently, a  $NEG_x$  originating in the structure  $[NEG_x K]_A$  functions to yield a denotation for constituent A which, in any model M, is the complement of the denotation of K in M. For a formalization of these semantic ideas, see CP2014: chapter 3. Consequently, raising of  $NEG_x$  out of its position of origin in A to some higher position has no effect on the semantics of A or of any other constituent.

Analyses such as (6) of INR examples like (1a) combine with condition (15) to generate the following claim:

- (16) The scope of the negation represented by  $NEG_1$  in analysis (6) of SC INR examples is internal to the complement clause.

We take the phrase 'scope of (the) negation' to refer to the syntactic sister of any occurrence of a NEG in its position of origin (that is, the position where it is interpreted).

The entailment in (16) is entirely consistent with traditional claims, which we have endorsed in CP2014 and in section 2 above, that a defining feature of SC INR cases like (1a) is

that the main clause NEG is, despite its surface position, understood as a complement clause NEG.

However, an ultimately fatal difficulty for an analysis like (6) has previously gone unnoticed. This difficulty arises from a variety of arguments linked directly to the various diagnostics/tests for negation scope first invoked in Klima (1964). While Klima argued that his tests diagnosed a purely syntactic property he referred to as *sentence negation*, it is not hard to show that they diagnose the scope of a negation, negative quantifier DP or adverbial.<sup>4</sup> And, unfortunately, neither CP2014 nor any other work to our knowledge has previously recognized that SC INR sentences are, contrary to (16), systematically diagnosed by the extended Klima tests as representing sentential negation, that is, having main clause negation scope for the post-aux NEG. The next section justifies this claim by considering two of Klima's proposed tests, as well as three others referred to jointly as the *extended Klima tests*.

### **3. The Extended Klima Tests**

#### **3.1. Background**

Klima characterized sentence negation as follows:

(17) Klima (1964: 270)

“Let's define as instances of sentence negation those structures which permit the occurrence of the either-clause (Section 15), the negative appositive tag (Section 16), and the question tag without not (Section 17).”

Pullum and Huddleston (2002: chapter 9) in effect take his tests to be diagnostics for what they call *clausal negation*, which they contrast with what they call *subclausal negation*. Instead of Klima's term here, we utilize the more colloquial *sentential negation*.

We do not appeal to either Klima's (1964) *either/too* or *not even* tests. While these may well be as relevant as the other tests we discuss, showing this involves complications which Klima did not deal with. The difficulties for the *either/too* test are well revealed in McCawley's insightful (1998: 604-610) discussion. Treating the issues raised by these tests would require lengthy discussion orthogonal to the goals of this paper.

In the rest of this section, we show that each extended Klima test diagnoses the main clauses of SC INR examples as representing sentential negation. But the CP2014 SC INR treatment of (1a) in (6) combines with condition (15) to determine that the matrix clause occurrence of NEG<sub>1</sub> is just not interpreted. Given that, the main clause should then behave just like cases containing no NEG at all. But such sentences systematically exhibit the relevant properties of sentential negation, indicating that the CP2014 analysis cannot be correct.

### 3.2. Confirmation Tags

One test for sentential negation proposed in Klima (1964: 263, 271) involves the possibility of following a declarative clause with a positive (NEG-free) confirmation tag question clause, and the impossibility of a following NEG-containing tag clause, as in:

- (18) a. Warren criticized his manager, didn't he/\*did he?  
 b. Warren didn't criticize his manager, \*didn't he/did he?

These data illustrate that a positive confirmation tag is only grammatical in association with an immediately preceding clause containing a NEG. A negative tag is ungrammatical under that circumstance. Actually, it would be possible to consider the properties of positive and negative confirmation tags as two distinct tests. To conserve space, we hereafter limit attention to the positive tag case and cite almost no further negative tags. While there are cases where neither

test yields a grammatical result, all cases of relevance to the present work are such that when the positive tag is ungrammatical, the negative one is grammatical, and vice versa.

While examples like (18) just show the sensitivity of confirmation tags to the presence or absence of a NEG, those like (19b,c) document a further condition on tag phrases. In the relevant class of cases, the determination of whether they are positive or negative is, as already noted in Klima (1964: 304-305), not affected by the properties of embedded clauses like Clause<sub>2</sub> in (19a).

(19) a. [Clause<sub>1</sub> ..... [Clause<sub>2</sub> ....]], tag?

b. They did not state that Warren criticized his manager, did they?

c. They stated that Warren did not criticize his manager, \*did they?

This means that the test not only diagnoses the presence of a NEG, but whether or not that NEG occurs in a main clause. We thus conclude:

(20) A positive confirmation tag is grammatical in the environment [Clause<sub>1</sub> ... [Clause<sub>2</sub> ...]] only if Clause<sub>1</sub> contains a NEG.

Statement (20) remains far from a sufficient condition for positive confirmation tags. For instance, Horn (1989 [2001]: 492) provided data like (21b):

(21) a. She can not attend can she?

b. \*She can (just) not attend can she?

Intuitively, the NEG in (21a) scopes over the modal, while the scope order is reversed in (21b). As in CP2014 (especially chapter 2), we take this to mean that the NEG occurs in a syntactic scope position higher than the modal in the first case, lower than the modal in the second.

Cases such as (21) and many others show that (20) reduces to a more general condition. This must indicate that in order for a sentence to qualify as an instance of sentential negation, the

NEG determining that property takes high scope in the matrix clause (see Stockwell, Schachter and Partee (1973: 248), Penka (2015), Payne (1985: 200) and Horn (1989 [2001]: 492-493).

Although it is impossible in this paper to provide full supporting data for all of the extended Klima tests, we believe that for current purposes one can generalize to all of them, as in (22a), which incorporates the same basic idea seen in (22b):

(22) a.  $NEG_1$  determines that a sentence S containing it is an instance of sentential negation only if  $NEG_1$  takes widest scope in the matrix clause of S.

b. Penka (2015)

“Second, as pointed out by Payne (1985), what these tests really seem to be sensitive to is whether negation is the operator taking widest scope.”

We observe that as indicated in (23), condition (22a) will determine that the element which fixes a clause as an instance of sentential negation will have a scope higher than that of the matrix predicate:

(23) a. Muntan   (2008: 79)

“The conclusion to be extracted from these examples is that it is only when negation takes scope above the matrix predicate that it qualifies as sentential.”

b. Penka (2015: 306)

“Following Acquaviva (1997), sentential negation can be defined as a negation operator having the main predicate in its scope.”

The extended Klima tests we cite all instantiate the following logic. They involve a situation in which a clause  $C_1$  is followed by a certain type of constituent, call it a *test phrase*. For the confirmation tag test, the test phrase is a positive tag. The test divides the class of clauses C preceding the test phrase into two subsets, those whose combination with the test phrase is

grammatical and those whose combination with it is ungrammatical. The test defines a clause  $C_1$  as manifesting sentential negation or not, depending on the necessary (but far from sufficient) condition that  $C_1$  contain a NEG. Moreover, if  $C_1$  contains a complement clause,  $C_2$ , whether or not  $C_2$  involves a NEG is irrelevant to the grammaticality of the different test phrases.

Focusing specifically on the tag question test, the crucial fact is that despite what CP2014 analysis (6) entails, putative SC INR cases like (1a) fail to differ from parallel non-INR cases. That is, their main clauses satisfy the positive confirmation tag test for sentential negation just like corresponding NEG-containing non-INR cases do. Thus, based on this test, SC INR main clauses manifest sentential negation. So there is no contrast between a case like (24a), based on a non-CNRP main verb, and one like (25a), based on a CNRP:

- (24) a. Warren doesn't understand that Sheila is a Martian, does he?
- b. Warren understands that Sheila is not a Martian, \*does he?
- (25) a. Warren doesn't believe that Sheila is a Martian, does he?
- b. Warren believes that Sheila is not a Martian, \*does he?

Confirmation tag examples containing strict NPIs (highlighted) and Horn clauses supporting the claim that SC INR cases behave like non-INR cases instantiating sentential negation are given in (26).

- (26) a. Warren doesn't think that Sheila has seen her mother in ages, does he?
- b. Warren doesn't think that Joan understands a single thing does he?
- c. Warren doesn't think that at any point did they hire a foreign doctor, does he?

Examples like (26) are important since in the framework of CP2014, the presence of the strict NPI or Horn clause in the embedded clause forces a NEG raising analysis. For example, in (26b), the NEG must raise from the embedded clause (where only it licenses the strict NPI) into

the matrix clause. And in (26c) the parallel raising is required to account for the fact that the fronted phrase satisfies the conditions on Negative Inversion. The examples in (26) show that even when a NEG raising analysis of main clauses with CNRPs is forced by the presence of strict NPIs or Horn clauses, those main clauses still pass the test for sentential negation.

Thus the tag question case already reveals the fundamental problem with the CP2014 account of SC INR. It predicts contrary to fact for (25a) and (26) that the positive tag is ungrammatical.

### 3.3. The Connective Adjuncts *neither* and *so*

A further test for sentential negation in Klima (1964: 261-262, 265-266, 271, 274-276) involved the distribution of what Pullum and Huddleston (2002: 786-787) call *connective adjuncts*, namely, *neither* and *so*. These link a preceding clause to a following conjoined one, typically manifesting verbal phrase ellipsis. Both *neither* and *so* are obligatorily preposed:

(27) a. That lawyer perjured himself and so/\*neither did that doctor.

b. That lawyer did not/didn't perjure himself and \*so/neither did that doctor.

Again, the choice of the relevant test phrase, *so* or *neither*, depends on whether a preceding clause manifests a negative element.

Once more, SC INR cases based on e.g. *think* exhibit no contrast with parallel cases based on non-INR main predicates, e.g. *realize*:

(28) a. Valerie doesn't realize that the minister will be arrested, and \*so/neither does Brian.

b. Valerie realizes that the minister will not be arrested, and so/\*neither does Brian

(29) a. Valerie doesn't think that the minister will be arrested, and \*so/neither does Brian.

b. Valerie thinks that the minister will not be arrested, and so/\*neither does Brian.

Examples involving strict NPIs or Horn clauses (in the INR cases), where the system of CP2014 forces posit of NEG raising, once again reveal that the CP2014 analysis type (6) gives wrong answers.<sup>5</sup>

- (30) a. Valerie doesn't believe that I told a living soul, and \*so/neither does Brian.  
b. Valerie does not think that in any sense was the minister disloyal and \*so/neither does Brian.

### 3.4. *nor*

Pullum and Huddleston (2002: 786) suggest that the behavior of the *nor* seen in examples like (31) parallels that of *neither*, and can also serve as an extended Klima test phrase, as in:<sup>6</sup>

- (31) a. \*Felicia wrote to the priest, nor did Greta.  
b. Felicia didn't write to the priest, nor did Greta.

And like previous tests phrases, *nor* is only sensitive to main clause post-aux negation, and there is no contrast between CNRPs and non-CNRPs:

- (32) a. Louise didn't swear that she saw a space alien, nor did Melissa.  
b. \*Louise swore that she did not see a space alien, nor did Melissa.
- (33) a. Mike doesn't expect that Lila will win, nor does Melissa.  
b. \*Mike expects that Lila will not win, nor does Melissa.

Supporting examples involving strict NPIs and Horn clauses are given in (34):

- (34) a. I don't think he has seen his mother in ages, nor does Valerie.  
b. Mike doesn't expect that for any reason would Lila backstab Greg, nor does Melissa.

### 3.5. Negative Parentheticals



A fourth test for sentential negation can be based on negative parentheticals; see Ross (1973), Cattell (1973) and CP2014, chapter 17. Examples include:

- (35) a. The senator protested vehemently, \*I don't think.  
b. The senator didn't protest vehemently, I don't think.

Once more the extended Klima test fails to differentiate SC INR cases from non-INR cases:

- (36) a. Lester doesn't assume that the visitor could be a space alien, I don't think.  
b. \*Lester assumes that the visitor could not be a space alien, I don't think.  
(37) a. Lester doesn't believe that the visitor could be a space alien, I don't think.  
b. \*Lester believes that the visitor could not be a space alien, I don't think.

Examples involving strict NPIs and Horn clauses are given below:

- (38) a. Karen doesn't believe that Sandra gave Marsha a single thing, I don't think.  
b. Karen doesn't believe that Mike has talked to a living soul about this, I don't think.  
c. Karen doesn't believe that under any circumstances would Mike do such a thing, I don't think.

### **3.6. Yes/No Clauses**

A fifth test for sentential negation based on a phenomenon noted in Ross (1973: 157) is seen in data such as:

- (39) a. Diana danced with Herman. Yes, I guess so/\*No, I guess not.  
b. Diana did not dance with Herman. \*Yes, I guess so/No, I guess not.

The test phrase *No, I guess not* can follow a clause only if it represents sentential negation. The test phrase *Yes, I guess so* is ungrammatical in that environment.

And as with previous tests, this one also fails to yield any contrast between CNRPs and non-CNRPs:

- (40) a. That doctor didn't assert that the disease was fatal. \*Yes, I guess so/No, I guess not.  
b. That doctor asserted that the disease was not fatal. Yes, I guess so/\*No, I guess not.
- (41) a. That doctor doesn't expect that the disease will be fatal. \*Yes, I guess so/No, I guess not.  
b. That doctor expects that the disease will not be fatal. Yes, I guess so/\*No, I guess not.

Examples showing that SC INR cases yield perfectly grammatical results under the *No, I guess not* test with complement clauses involving strict NPIs or Horn clauses are given below:

- (42) a. Valencia doesn't believe that Ernie has taken drugs in years. No, I guess not.  
b. That doctor doesn't believe that in any sense was Joan cured. No, I guess not.

To summarize, with respect to five distinct tests of the sort first introduced in Klima (1964), main clauses manifesting SC INR behave exactly as non-INR clauses having main clause sentential negation.

We note that certain of the tests can be combined, in particular, tag test phrases, *so/neither* test phrases and *nor* test phrases can collocate with following parenthetical and *No/Yes, I guess (not)* test phrases. When they do, the same failure of SC INR main clauses to contrast with main clauses clearly based on non-CNRPs is manifest, e.g.:

- (43) a. Victor didn't state that Roman had recently visited his cousin, and \*so/neither did Mike, I don't think.  
b. Victor didn't believe that Roman had visited his cousin in ages, and \*so/neither did Mike, I don't think.
- (44) a. Helen didn't realize that Irene had ever visited Venus; nor did Marsha. No, I guess not.

b. Helen didn't believe that at any time had Irene visited Venus; nor did Marsha. No, I guess not.

Again, the contrast between CNRP and non-CNRP main predicates predicted by the CP2014 analysis illustrated in (6) of SC INR cases fails to materialize.

### **3.7. Apparent Implication**

Syntactic SC INR analyses like (6) claim that the post-aux NEG occurring in the main clause originates in the associated complement clause. Since principle (15) claims that only origin positions of NEGs are semantically relevant, it follows that if the five tests really diagnose the semantically relevant syntactic locus of a NEG, no analysis like that in (6), which claims that the scope of negation in an SC INR sentence is located in its complement clause, can be correct.

Initially, this seems like a devastating counterargument against syntactic views of SC INR in general (not just against the particular one in CP2014). And it would potentially provide a powerful argument for theoretically alternative semantic/pragmatic approaches to INR such as that of Bartsch (1973), Gajewski (2007) and Romoli (2013). That follows since those systematically assume that the overt NEG in an SC INR case originates in, and is interpreted in, the main clause. Our goal in what follows is to show that while the conclusion that analyses of the form (6) are incorrect cannot be circumvented, there is a syntactic treatment of SC INR having the following properties: (a) it maintains all the many factual virtues of the treatment in CP2014 (e.g., accounting for island facts and the distribution of Horn clauses), (b) it characterizes sentential meanings correctly, (c) it is, unlike analyses of the form (6), consistent with all the extended Klima tests, and, lastly, (d) it is consistent with all the syntactic principles proposed in CP2014.

#### 4. Negative Quantifier DPs and the Extended Klima Tests

All the data related to sentential negation tests cited so far have involved the distribution of overt post-aux NEG's. However, as is well-known for the Klima tests (and holds for the other extended Klima tests as well), these tests also define sentential negation for negative DPs and negative adverbials. We document this very briefly for three tests, leaving the reader to verify that the claim holds for the others.

The confirmation tag, *neither* and negative parenthetical tests indicate the presence of sentential negation in such cases as:

- (45) a. Nowhere near two hundred people showed up, did they?  
b. No lawyer would accept that claim and \*so/neither would any judge.  
c. Not many lawyers would act in that way, I don't think.
- (46) a. Lucia never showed up, did she?  
b. Large packages rarely get lost and \*so/neither do small ones.  
c. Stan hardly spoke at the meeting, I don't think.

In all of (45) and (46), the negative quantifier DP or negative adverbial is overt in the clause determined to manifest sentential negation by the extended Klima tests.

Recall then our remark in connection with (19) above that Klima (1964: 304-305) had claimed that the mere presence of a NEG in a subordinate clause C was irrelevant to the sentential negation status of a main clause in which C is embedded. His wording was:

(47) Klima (1964: 305)

“The occurrence of not, no, nobody in subordinate clauses never entails sentence negation, as far as the main clause is concerned.”

However, stated in this flat way, the claim is essentially contradicted by Klima's (1964: 285-286, 303-304) own insightful observation that example (48a) was ambiguously equivalent to either (48b) or (48c):

- (48)    a. I will force you to marry no one.  
          b. I won't force you to marry anyone.  
          c. I will force you not to marry anyone.

That follows, since his critical observation was that the reading of (48a) equivalent to (48b) correlated with the fact that the main clause satisfied his tests for sentential negation, in particular, the possibility of a *neither* tag. Thus, despite the ambiguity of (48a), (49) is unambiguously interpretable only as (48b):

- (49)    I will force you to marry no one and neither will he.

So despite the fact that no one in (48a) is unquestionably a subordinate clause constituent, it manages to determine sentential negation for the main clause.

Moreover, the evidence to this effect from *neither* test phrases is not isolated. The same disambiguation of examples like (48a) is seen with the *nor* diagnostic:

- (50)    Her mother forced her to marry no foreigner. Nor did her father.

This can only be understood with the phrase *no foreigner* scoping in the main clause. Parallel facts are seen with the negative parenthetical, *Yes/No* and confirmation tag tests:

- (51)    a. They will force you to marry no one, I don't think.  
          b. They will force you to marry no one. No, I guess not.  
          c. They forced her to marry no one, did they?  
          d. They forced her to marry no one, didn't they?

In (51a,b) the addition of the extended Klima test phrase imposes the sentential negation reading of (48b). And in the confirmation tag cases (51c,d), the different scope readings are forced by the choice of tag. So (51c) represents only the high scope reading of *no one*, while (51d) represents only the low scope reading.

Several conclusions can be drawn from data of the type in (48). First, Klima's flat claim in (47) that quantifier phrases like *no* forms occurring in a subordinate clause can never determine sentential negation status for a main clause is false. Second, data like that in (48)-(51) show that beyond diagnosing the scope of NEG's as such, the extended Klima tests also diagnose the scope of negative quantifier DPs. More precisely, the tests diagnose the scope position of a negative quantifier DP (e.g., main clause vs. complement clause scope) and the scope position correlates with the interpretation of the sentence. So, if a main clause T satisfies the tests for sentential negation, then the main predicate of T is interpreted as under the scope of negation or of a negative quantifier. That is, T is grammatical in the presence of a diagnostic test phrase, only if a NEG or a negative quantifier DP takes main clause scope in S.

A third conclusion though is that there are genuine mysteries connected with Klima's disconfirmed claim. While not strictly true, (47) is nonetheless correct over a quite wide domain. As far as we know, it is always true for cases when the element in a subordinate clause is a post-aux NEG and not a negative quantifier DP. Second, (47) appears to be systematically true for all cases where the subordinate clause is finite:<sup>7</sup>

- (52) a. John likes nobody in the class, does he?  
b. \*You think that John likes nobody in the class, do you?

Further, the impossibility of high scope for negative quantifier DPs may hold even for nonfinite complements in cases where the negative phrase is an adverbial. For instance, (53) has no main clause interpretation for *never* and extended Klima tests are not satisfied:

- (53) Her uncle forced her to never contact her oldest son (\*did he?/\*and neither did her aunt/\*nor did her aunt/\*I don't think/\*No, I guess not).

We cannot offer anything like a real account of the constraints governing the scope properties just cited. However, in section 8 we do indicate how, under the novel conception of sentential negation we offer there, the fact that overt subordinate clause post-aux NEGs never take main clause scope (even in nonfinite clauses) reduces to a CP2014 principle constraining NEG raising, the Raising from Scope Position Condition.

A remaining issue involves the formulation of the extended Klima tests themselves. How are they to be formulated such that in most cases the presence of an overt subordinate clause NEG cannot satisfy the tests and determine main clause sentential negation but that in some cases, like (48a) on its reading (48b) it can. This critical issue for the current argument is a problem we can offer a solution to. But to do that, we need to briefly consider the syntactic representation of quantifier scope.

## **5. The Syntactic Representation of Quantifier Scope**

Before we can address the issue raised at the end of the previous section and prior to considering how to maintain a viable syntactic view of INR in the face of the extended Klima test data considered in sections 3 and 4, it is necessary to sketch the CP2014 representation of quantifier scope. The interested reader is referred to chapter 2 of that work for a fuller discussion.

The key assumption is that scope marking is no less syntactic than the marking of phrase structure, word order, categories, etc.

Specifically, the scope of quantifiers is represented syntactically by the presence of DPs in clausal scope positions. We follow May (1985, 1989) and assume that a scope position for a quantificational  $DP_i$  is of the form  $[_S DP_i S]$ . In these cases, the clause  $S$  contains a DP bound by  $DP_i = [_{DP} D_i NP]$  so that  $S$  is in effect the syntactic representation of an open sentence containing a variable bound by the quantificational  $DP_i$ .  $NP_i$  then denotes the restriction of the quantifier represented by  $D_i$ . So a DP in scope position will always have at least two distinct occurrences, a higher one in a scope position and a lower one in a non-scope position (an ‘argument’ position in some approaches). There can of course be several DPs in scope positions of a single clause, represented by successively embedded structures of the form:  $[_S DP_1 [_S DP_2 [_S DP_3 S]]]$ .

Since relative scope of quantifiers is in such representations indicated by the relative height of syntactic quantifier DP phrases, the fact that some quantifiers in a clause scope over others falls out from the representation. We need not concern ourselves with the details of the needed principles relating syntactic scope to the corresponding semantics; see e.g. Heim and Kratzer, (1998: chapter 7) for one approach.

We illustrate these ideas by considering the two readings of Klima’s key example (48a). In the framework of CP2014, negated existential quantifiers have the general structure in (54a), instantiated as in (54b) for the illustrative English case:

- (54) a.  $[_{DP} [_D \text{NEG SOME}] [_{NP} X ]]$   
       b. no boy =  $[_{DP} [_D \text{NEG <SOME>}] [_{NP} \text{boy} ]]$



Here the syntactic NEG is internal to the DP, with the existential quantifier represented by the form SOME. In the English case (54b), the NEG is realized as *no* while the SOME is covert.

In these terms, Klima's (48a) has the contrasting structures in (55):

- (55) a. <[[NEG <SOME>] one]><sub>1</sub> [I will force you to marry DP<sub>1</sub>]  
 b. I will force you [<[[NEG <SOME>] one]><sub>1</sub> [to marry DP<sub>1</sub>]]

A further purely notational convention of CP2014 is appealed to here. Rather than writing out in full both the scope and argument position occurrences of a scope-marking DP, the argument occurrence is schematically represented with a DP symbol coindexed with the scope occurrence.

A key fact of course is that the scope position occurrences of quantificational DPs are uniformly covert, as indicated by the angled brackets < > in (55). This fact might be the grounds for some skepticism as to the syntactic reality of phrases in syntactic scope positions. But Klima's (1964) documentation of the syntactic reality of scope in his examples like (48a) undermines the basis for such skepticism. As discussed in section 4, he documented that the high scope reading correlates with satisfaction of the Klima tests while the low scope reading does not. That provides a crucial argument for the reality of the main clause syntactic position of quantifier DPs whose argument position occurrences are in complement clauses, given that in the other cases, such tests diagnose the syntactic presence (or absence) of NEG in main clauses.

With this background, we are now in a position to propose an account of why an example like Klima's (48a) on one reading can satisfy the extended Klima tests. This will stipulate that such satisfaction with respect to a main clause C has as a necessary condition the presence in C of an instance of NEG or a negative quantifier DP.

In other words, we modify (22a) of section 3.3 to say:

- (56) A sentence S is an instance of sentential negation only if some NEG or negative quantifier DP takes widest scope in the matrix clause of S.

We will suggest in section 8 that this statement can be reformulated both more precisely and more generally. From this point of view, the extended Klima tests interact with whatever principles control the possible higher syntactic scopes of subordinate clause NEGs and negative quantifier phrases in subordinate clauses.

## **6. A Novel Analysis of SC INR**

Previous sections entail that the SC INR cases like (1a), repeated here as (57a), and the strict NPI case (57b) must, to account for the results of the extended Klima tests, contain a NEG that has scope (and is semantically interpreted) in the main clause:

- (57) a. I don't think that Helen owns a new smartphone.  
b. I don't think that Lauren knows jackshit about physics.

But to account for the overwhelming evidence for syntactic NEG raising detailed in CP2014 (based on strict NPIs, Horn clauses, islands and negative parentheticals), it is also necessary for us to postulate a NEG raised from the embedded clause.

Minimally then, (57b) needs to be represented so far as (58):

- (58) I do NEG<sub>1</sub> think that Lauren knows [NEG<sub>3</sub> SOME jackshit about physics]

NEG<sub>1</sub> is needed to account for the behavior of (57b) with respect to the extended Klima tests. NEG<sub>3</sub> raises to the matrix clause and accounts for the island effects documented in CP2014.

Although the idea that the main clause of a SC INR example involves at least one unraised main clause NEG conflicts with the CP2014 analysis in (6), that assumption as such is anything but original. It is the standard view of those who reject a syntactic view of INR, e.g. Bartsch (1973) and various later proposals influenced by that work. These include e.g. Horn (1978, 1989 [2001]), Horn and Bayer (1984), Tovenia (2001), Pullum and Huddleston (2002: 838-843), Larrivee (2004: 103-105), Gajewski (2005, 2007, 2011), Sailer (2005, 2006), Boskovic and Gajewski (2008), Homer (2010), and Romoli (2013); see the discussion in CP2014, chapter 1. Moreover, Klima (1964: 292-295) proposed an analysis independent of semantics in which an SC INR structure was represented by a main clause with an unraised NEG as well as a complement clause with a NEG which was in effect deleted (*absorbed* in his terminology). Further, the analysis of NQ INR cases in CP2014 also appeals to a main clause interpretable NEG, in fact, two; see section 12.

However, representation (58) does not yield a correct interpretation of (57b), one equivalent to (59a), but rather an erroneous interpretation equivalent to (59b).

- (59) a. I don't think that Lauren knows anything about physics.  
 b. I don't think that Lauren knows nothing about physics.

To rectify this general deficiency, we thus advance hypothesis (60):

- (60) Two NEG<sub>s</sub> originate in a SC INR main clause C. These NEG<sub>s</sub> are hence interpretable in C, and each scopes higher than the main predicate of C.

This motivates modifying structure (58) to:

- (61) I do NEG<sub>1</sub> [NEG<sub>2</sub> think that Lauren knows [NEG<sub>3</sub> SOME jackshit about physics]]]

This way of proceeding might at first glance seem paradoxical, given that, as seen earlier, an SC INR example like (57b) paraphrases one like (62), which has no overt main clause NEG and fails to satisfy any extended Klima test.

(62) I think that Lauren doesn't know jackshit about physics.

However, sections 8-10 below show that there is no actual paradox by indicating how the multiple interpretable NEG's posited for SC INR cases in (61) in general are semantically equivalent to structures, e.g. (62), containing no main clause NEG's at all.

## 7. A Possible Objection

Before continuing with the main theme, we address a possible objection. This would query whether it is viable to claim that a main clause double negation structure could satisfy the various extended Klima tests. In fact, independent of INR issues, there is strong evidence that such dual NEG structures can satisfy the relevant tests. In particular:

(63) a. Lasnik (1972: 8)

Not many girls don't like Rock Hudson, do they?

b. Not many of the demonstrators weren't arrested (and neither were many of the bystanders).

c. Not often do I not do my homework (I don't think).

d. Not many of the demonstrators weren't arrested. No, I guess not.

That is, Lasnik showed that a main clause with a negative subject and a post-aux NEG took a positive confirmative tag, one of the Klima tests for the presence of sentential negation. This was the only diagnostic Lasnik cited. But the others yield the same result as shown in (72b-d).

The examples in (63b-d) without the parenthesized test phrases were given in Lasnik (1972: 6) to show the existence of two origin loci for NEG in a single clause. The grammaticality of the Klima test phrases shows further that the presence of two NEG's in the same main clause does not interfere with the satisfaction by that clause of the extended Klima tests. So there is no basis for any claim that our dual NEG view of the main clauses of cases like (57b) would conflict with the properties of the extended Klima tests.

## 8. A New View of Sentential Negation

The hypothesis represented by schematic structure (61) above needs both elaboration and justification. The key issue raised by claim (60) and instantiations like (61) is the origin positions of the two matrix clause NEG's. From the viewpoint of CP2014, a possible proposal is that these occur in a structure like:

(64) I do [<sub>X</sub> NEG<sub>1</sub> [<sub>Y</sub> NEG<sub>2</sub> [<I> think that....]]]

In this representation, NEG<sub>1</sub> and NEG<sub>2</sub> would both be clausal constituent modifiers. In the framework of CP2014, nothing blocks such a structure since clauses and any other semantically appropriate constituent (e.g., quantifiers and predicates, but not proper names and definite descriptions, see Collins 2015) can be negated.

However, one weak argument against a representation like (64) is that it leads to a disjunction in the statement of the extended Klima tests, as we discuss below in (72) and (73). But we suggest another way to analyze the double negation found in SC INR sentences such as (57b). This is based on a new analysis of sentential negation (what Payne, 1985 calls *standard negation*).

In this novel view, the highest NEG in our dual NEG treatment of the main clauses of SC INR examples is a modifier of a negative event quantifier DP. This proposal elaborates concepts already invoked in Collins and Postal (2015b) and Collins, Postal and Yevudey (2015). These involve appeal to the ideas of event semantics; see e.g. Davidson (1967), Kim (1969), Maienborn (2011), Champollion (2011) and references therein.

To introduce these ideas briefly, consider (65):

(65) Claudia sang.

Ignoring reference to time, (65) is representable in predicate logic in terms of quantification over an event as in (66):

(66)  $\exists e.\text{sing}(e, \text{Claudia})$

“There is an event  $e$  such that  $e$  is a singing event by Claudia.”

Despite the terminology *event semantics*, one need not assume that for all sentences the variable bound by the existential quantifier of (66) would be limited to events proper. Rather, one can recognize a range of possibilities sometimes called *eventualities* (including both events and states). Maienborn (2011: 809) cites the following a propos remark:

(67) Kim (1969)

“When we talk of explaining an event, we are not excluding what, in a narrower sense of the term, is not an event but rather a state or process.”

We take the position that the existential quantifier in such a semantics has a syntactic basis, more precisely, corresponds to the interpretation of a syntactic DP. The syntacticization of the eventuality quantifier posits a covert syntactically present quantifier DP that existentially quantifies over events/eventualities. Within the framework of quantifier analysis sketched in section 4, this yields (68) as the structure of (65):

(68)  $[\text{Clause} <[\text{DP} [\text{D SOME}] [\text{NP E}]]>_5 [\text{Clause Claudia sang DP}_5]$

Here and from this point on, E in the representations of the relevant quantifier DPs stands for the noun *eventuality* and denotes a predicate of (or set of) eventualities. This representation is noncommittal as to the exact position of the argument position (variable) occurrence, that is, whether it is internal to the VP or not, which does not matter for current goals. The coindexing of the two DP occurrences indicates that the structure contains only a single quantifier DP with two occurrences. While as indicated in section 4, all quantifier DPs have covert scope position occurrences, a property of our syntactic version of event semantics quantifiers is that their in-situ (argument position) occurrences are also covert. So the syntactic forms of event semantics quantifiers are systematically invisible from the point of view of surface structures.

Turning from positive clause example (65), on the event semantics view, the corresponding negative example (69a) has a predicate calculus style semantic representation in (69b).

- (69) a. Claudia did not sing.  
 b.  $\neg \exists e.\text{sing}(e, \text{Claudia})$

“There is no event e such that e is a singing event by Claudia.”

We claim that the sentential negation in examples like (69a) arises in a negative eventuality quantifier DP of the form in (54a). Specifically, the quantifier phrase is a negative existential one. Like all other quantifier DPs, this will occur in a scope position as well as in its associated argument position, just as in the positive case (65). The representation of (69a) is then:

(70) Claudia did NEG<sub>1</sub> [<sub>Clause</sub> <[<sub>DP</sub> [<sub>D</sub> <NEG<sub>1</sub>> SOME] [<sub>NP</sub> E]]><sub>5</sub> [<sub>Clause</sub> Claudia sang <DP><sub>5</sub>]

Here the scope position of the quantifier DP is below the position of aux. NEG<sub>1</sub> raises from the quantifier DP to the post-aux position. The raising of NEG is obligatory.

Our appeal to NEG raising here is not an ad hoc posit in the present context. Rather, it is a highly motivated and extensively appealed to central aspect of the system of CP2014 (exploited also in Collins and Postal 2015a,b, Collins, Postal and Yevudey 2015). We note too that the NEG raising just discussed is not INR (since the origin position and the landing site of NEG are internal to the same clause). This illustrates the fact that in the framework of CP2014, INR is only a special case of a broader NEG raising phenomenon.

Against this background, we consider how to integrate a negative eventuality quantifier DP analysis of sentential negation with dual NEG structures like (61) for SC INR cases (which general assumption (60) imposes). Given the discussion of this section, structure (61) must evidently be modified to provide an eventuality quantifier DP treatment of NEG<sub>1</sub>, yielding:

(71) I did NEG<sub>1</sub> [<sub>X</sub> <[<sub>DP</sub> [<sub>D</sub> <NEG<sub>1</sub>> SOME] [<sub>NP</sub> E]]><sub>5</sub> [<sub>Y</sub> NEG<sub>2</sub> [<sub>Z</sub> think <DP><sub>5</sub> [that Lauren knows [NEG<sub>3</sub> SOME jackshit] about physics]]]]]

A remark on the position of NEG<sub>2</sub>, for which there are at least three a priori plausible origin positions. NEG<sub>2</sub> could be a clausal NEG, a verbal phrase NEG, or a verbal NEG. We can currently cite no good argument choosing between them and for present theoretical goals, no decision is required. In (71), NEG<sub>1</sub> originates internal to the eventuality quantifier DP, which itself is unpronounced, as indicated by the angled bracket notation <[<NEG<sub>1</sub>> SOME E]>. An issue that we will not discuss is whether other quantifier phrases (e.g. a temporal adverb like *often*) can intervene between [[NEG<sub>1</sub> SOME] E] and NEG<sub>2</sub> in (71), and if not, what principle would block that.



A piece of evidence for the negative eventuality quantifier analysis of sentential negation involves the statement of the five extended Klima tests. Earlier, in (56) we gave the following condition:

- (72) A sentence is an instance of sentential negation only if some NEG or negative quantifier DP takes widest scope in the matrix clause of S.

This formulation involves the disjunction ‘NEG or negative quantifier DP’. But reduction of sentential negation to the presence of a negative eventuality quantifier of the form [[NEG SOME] E] permits the following reformulation:

- (73) A sentence S is an instance of sentential negation only if a negative quantifier DP takes widest scope in the matrix clause of S.

The possibility of eliminating the disjunctive character of the statement of the extended Klima tests by replacing statement (56) by (73) is a modest argument in favor of the novel negative quantifier DP analysis of sentential negation.

More importantly, our analysis combines with a principle from CP2014 chapter 5 to explain the fact that post-aux NEGs in subordinate clauses can never determine sentential negation in dominating main clauses. The principle was stated (rather informally) as follows:

- (74) CP2014: 46

The Raising from Scope Position Condition

If  $XP_x$  has a scope position occurrence O and  $NEG_1$  raises out of  $XP_x$ ,  
then  $NEG_1$  raises from O.

Given this, consider the contrast between e.g. the good (75a) and the bad (75b, c):

- (75) a. They forced her to marry no one (did they?)  
b. They forced her not to marry anyone (\*did they?)

c. They forced her not to marry (\*did they?)

We already showed why (75a) can have a main clause scope for *no one*. Since no NEG raises out of the negative DP, condition (74) is irrelevant.

But for (75b), it is relevant. That follows since CP2014 analyzes the object DP in both (75a, b) as an original structure [ [NEG<sub>1</sub> SOME] one], with (75b) involving raising of NEG<sub>1</sub> out of the D and DP. There is no problem analyzing (75b) in these terms on a low scope reading since NEG<sub>1</sub> will then simply raise from a complement clause scope position to a position preceding *to* internal to the complement clause. But, to yield the barred high scope analysis of (75b), NEG<sub>1</sub> would have to raise out of a main clause scope occurrence and then somehow lower into the complement clause. There is though no reason to think any such constituent lowering is ever legitimate.

And now, under our novel negative eventuality quantifier DP analysis of sentential negation, the same argument blocks a main clause analysis of the scope of the NEG in (75c). In that case, to get the high scope and extended Klima test satisfaction, the negative eventuality quantifier DP would have to be in the main clause. But only the unknown NEG lowering (out of the main clause scope position of the eventuality quantifier DP) could yield the actual overt complement clause occurrence of NEG<sub>1</sub>.

Condition (73) invokes the phrase ‘negative quantifier DP’, which we have not defined. In CP2014 and successive works on negation including the present one, we have adopted common phrase structure ideas recognizing the categories defined by the labels D and DP. We suggest the following definition (where ‘projection’ is understood in the X’-theory sense; see Collins and Stabler (2016)).

(76)  $DP_x$  is a negative quantifier DP if and only if some projection of its D (e.g. that D itself or  $DP_x$ ) is modified by NEG.

Given this, a negative quantifier DP is one of the following form:

(77) a.  $[DP [D \text{ NEG } D] X]$

b.  $[DP \text{ NEG } [DP D X]]$

Cases like *no boy* analyzed as in (54b) above, fall under (77a). Cases like (78a) analyzed as (78b) fall under (77b):

(78) a. Not everyone who said anything was arrested.

b.  $[DP \text{ NEG } [DP [D \text{ every}] [NP \text{ one}]]]$

There is, incidentally, good reason to deny that the NEG in (78a) modifies the D *every*. Since *every*, a universal, is a decreasing operator with respect to the restrictive relative, the externality of the NEG allows for the grammatical NPI *anything* there. But, as Horn (1996) noted, if the NEG were a modifier of *every*, the result would be an increasing operator, rendering the NPI in (78a) anomalous.<sup>8</sup>

We recognize that there are a variety of cases satisfying the extended Klima tests where the viability of condition (73) is anything but evident. These include:

(79) a. Not before Friday will Ted arrive, I don't think. Nor will Jack.

b. Not after what you have done will she be happy, I don't think. Nor will Jack.

c. Not since last year has Jane been dating Jack and neither has Laura.

d. Not (just) because they were drunk were they arrested. No, I guess not.

e. Not if it snows can Luther expect to reach the peak and neither can Otto.

f. Not even if it snows can they count on there being good skiing, I don't think. (see

Collins 2015 on *not even*)

None of these cases manifest an *overt* negative quantifier DP. Our speculative hypothesis is that each nonetheless falls under (73) because there is a covert DP of that type. For instance, in (79a) this would involve taking *not before Friday* to have an analysis along the lines of:

(80) [<sub>At</sub> [<sub>D</sub> [<sub>D</sub> NEG<sub>1</sub> SOME] [<sub>NP</sub> TIME]> before] Friday

NEG<sub>1</sub> would raise out of the covert DP constituent into the containing constituent of which *before* is a part.

While we assume that (80) can serve as a model for many of the cases of (79), we cannot discuss such issues further in this paper.

## 9. Semantic Equivalences

With the event semantics reanalysis of sentential negation as background, we are now in a position to show how the double NEG treatment of SC INR cases analyzed as in (71) yields the appropriate readings. We repeat (71) as (81):

(81) I did NEG<sub>1</sub> [<sub>X</sub> <[<sub>DP</sub> [<sub>D</sub> <NEG<sub>1</sub>> SOME] [<sub>NP</sub> E]]><sub>5</sub> [<sub>Y</sub> NEG<sub>2</sub> [<sub>Z</sub> think <DP><sub>5</sub> [that Lauren knows [NEG<sub>3</sub> SOME jackshit] about physics]]]

Here NEG<sub>1</sub> negates the matrix clause quantifier SOME. NEG<sub>2</sub> negates a constituent Z dominating *think*,<sup>9</sup> while NEG<sub>3</sub> negates the covert quantifier SOME associated with the NPI *jackshit*. While NEG<sub>3</sub> raises to the matrix clause, it is interpreted in the embedded clause.

Our claim is that in a sense to be made precise, the negative force of NEG<sub>1</sub> in effect cancels that of NEG<sub>2</sub>. The remainder of this section shows how (81) yields the correct interpretation of (57b), namely, (82a), which has the semantic representation in (82b) (E is again the eventuality predicate):

(82) a. I think that Lauren doesn't know jackshit about physics.

b.  $\exists e[E(e) \wedge \text{think}(e, I, p)]$

Mapping (81) into PC yields the following argument: <sup>10</sup>

- |      |   |  |
|------|---|--|
| (83) | a. $\neg \exists e[E(e) \wedge \neg \text{think}(e, I, p)]$     | Translation of (81) into predicate calculus (PC) |
|      | b. $\forall e \neg [E(e) \wedge \neg \text{think}(e, I, p)]$    | Duality of $\forall$ and $\exists$               |
|      | c. $\forall e [\neg E(e) \vee \neg \neg \text{think}(e, I, p)]$ | De Morgan's Laws (see (88) below)                |
|      | d. $\forall e [\neg E(e) \vee \text{think}(e, I, p)]$           | $\neg\neg$ Elimination                           |
|      | e. $\forall e [E(e) \rightarrow \text{think}(e, I, p)]$         | Definition of $\rightarrow$                      |

However, the entailed interpretation of (81) in (83e) still fails to match the desired interpretation in (82b). But even though (82b) and (83e) are not logically equivalent, the desired equivalence can be derived given certain auxiliary assumptions.

Assume plausibly that there are eventualities. If so, then (83e) entails (82b). Suppose  $e_1$  is an eventuality. Then by (83e), it follows that  $\text{think}(e_1, I, p)$ , and from that it follows that (82b) is true.

We next need to justify the direction of entailment between (82b) and (83e). This would be assured if the domain of quantification for the existential quantifier in (82b) is restricted to one eventuality (that where  $\text{think}(e, I, p)$  is true). Necessarily then, every eventuality  $e$  will be such that  $\text{think}(e, I, p)$ . Logically, this can be modeled by adding a contextual predicate to (82b) and (83e), where the contextual predicate satisfies the formula:  $\exists e_1[[E(e_1) \wedge C(e_1)] \wedge \forall e[C(e) \rightarrow e = e_1]]$  ('There is a unique  $e$  which is an eventuality and which satisfies  $C$ ').

- |      |  |
|------|--|
| (84) | a. $\exists e[E(e) \wedge C(e) \wedge \text{think}(e, I, p)]$      |
|      | b. $\forall e[E(e) \wedge C(e) \rightarrow \text{think}(e, I, p)]$ |

If  $C$  is true of exactly one eventuality (an assumption not represented explicitly in (84)), then (84a,b) are logically equivalent (which we leave to the reader to verify).

How plausible is postulation of the contextual restriction C? It is certainly not a unique posit since it is uncontroversial that quantifiers may have implicit domain restrictions. Consider:

(85) A: Can we start?

B: Yes, everybody is here.

The response by B is not in general taken to mean everybody in the universe is here. Rather the actual interpretation is something like ‘everybody who we invited’, or ‘everybody who was expected’ is here (depending on the context of the exchange). There is an implicit domain restriction from the set of all people to a small subset of people. The relevant interpretation can be modeled as follows:

(86)  $\forall x[\text{person}(x) \wedge C(x) \rightarrow \text{here}(x)]$

How contextual restrictions like C would be represented syntactically is an intricate matter which we will not address here; see Elbourne (2015) and Collins(2015) for discussion.

We suggest then that our double NEG hypothesis about SC INR in (60), which motivates a structure like (81) for an INR example like (57b), can in fact be taken to yield the correct meaning. Moreover, this meaning is equivalent to that of a non-INR structure like (82a), whose main clause contains no NEG's at all and is thus equivalent to the meaning yielded by a CP2014 analysis, which posited no original main clause NEG's in such cases. A bit of support for this conclusion is provided by constructing a rough English paraphrase for (81) as in (87a):

(87) a. There is no situation where it is not the case that I think that

Lauren doesn't know jackshit about physics.

b. I think that Lauren doesn't know jackshit about physics.

Even though it is quite awkward, our judgment is that (87a) both entails and is entailed by (87b).

## 10. De Morgan's Law Revisited

Some evidence for the role of domain restriction in event quantification is supplied by the validity of De Morgan's laws in English. In logic, De Morgan's laws, see e.g. Stoll (1963: 19-20), determine equivalences between combinations of negation and the conjunction and disjunction operators. They can be represented as:

$$(88) \quad a. \sim (A \vee B) \Leftrightarrow (\sim A \wedge \sim B)$$

$$b. \sim (A \wedge B) \Leftrightarrow (\sim A \vee \sim B)$$

In a large range of cases, English post-aux instances of NEG can be shown to obey both (88a, b) and thus to represent what Zwarts (1996) calls *antimorphic negation*.

For example, (89a) is equivalent to (89b), illustrating principle (88a):

(89) a. Felicia didn't sing or dance.

b. Felicia didn't sing and Felicia didn't dance.

Similarly, (90a) is equivalent to (90b), illustrating (88b):

(90) a. Felicia didn't sing and dance.

b. Felicia didn't sing or Felicia didn't dance.

However, the negation represented by English negative quantifier DPs of the *no* type fails to obey both (88a,b). Even though (91a,b) are equivalent, (92a,b) are not. For example, Herman might have sung and Mary might have danced, but possibly no one did both. If so, (92a) would be true, but (92b) false.

(91) a. No student sang or danced.

b. No student sang and no student danced.

(92) a. No student sang and danced.

b. No student sang or no student danced.

In other words, the negative quantifier associated with the DP *no student* obeys the first De Morgan Law (88a), but not the second. In the negation literature, specifically Zwarts (1996), negative quantifier DPs like *no student* obeying only the correlate of (88a) are categorized as *antiadditive*.

The contrast between antimorphic and antiadditive instances of negation is relevant to the present work precisely because in the previous section we proposed that sentential negation involving a post-aux NEG as in (89) and (90), is rightly taken to originate in a negated existential eventuality quantifier DP. But given the preceding discussion, that means the relevant negation should only yield the antiadditive pattern, in which principle (88b) does not hold. But apparently English post-aux negation in general yields the antimorphic pattern satisfying both (88a,b). We now argue that this inconsistency is eliminable via the same sort of contextual restriction appealed to at the end of section 9.

To see how the apparent paradox alluded to above arises, we note that applying our negative quantifier DP view of sentential negation to the equivalence issue would yield a PC style representation in (93b) for (93a):

- (93) a. Donald didn't sing or dance.  
b.  $\sim\exists e[\text{sing}(e, \text{Donald}) \vee \text{dance}(e, \text{Donald})]$

It can be shown in PC that (93b) is equivalent to (94):

- (94)  $\sim\exists e.\text{sing}(e, \text{Donald}) \wedge \sim\exists e.\text{dance}(e, \text{Donald})$

In other words, adding an eventuality variable to the logical representation of a sentence does not invalidate (88a).

But consider (95a), represented as (95b):



- (95) a. Donald didn't sing and dance.  
 b.  $\sim\exists e[\text{sing}(e, \text{Donald}) \wedge \text{dance}(e, \text{Donald})]$

The problem is that (95b) is not equivalent to (96):

- (96)  $\sim\exists e.\text{sing}(e, \text{Donald}) \vee \sim\exists e.\text{dance}(e, \text{Donald})$

Suppose that there is no event where Donald both sang and danced. That does not preclude the possibility that Donald sang in some events and danced in some events. The logic is completely parallel to the logic of (91)/(92), which showed that the negative quantifier *no student* was not antimorphic.

The paradox is then that in fact English post-aux negation in general obeys both of De Morgan's laws.<sup>10</sup> However, adding an eventuality quantifier DP to the PC representations entails that the second De Morgan law should not hold.

We propose to add an additional assumption, allowing maintenance of a negative eventuality quantificational analysis of English standard negative sentences. The additional assumption, as in our discussion at the end of section 9, is that the eventuality quantifier ranges over a set consisting of a single contextually specified eventuality. So we again model this via a contextual predicate C true of one and only one eventuality (an assumption not represented in the formulae below):

On this analysis (97a) has the PC analysis (97b):

- (97) a. Susan sang.  
 b.  $\exists e[C(e) \wedge \text{sing}(e, \text{Susan})]$

Under this assumption, it is possible to show that English standard post-aux NEG cases obey both of De Morgan's laws, that is, again yield the actually observed antimorphic pattern. The problematic case (95a) now has representation (98b):

(98) a. Donald didn't sing and dance.

b.  $\sim\exists e[C(e) \wedge \text{sing}(e, \text{Donald}) \wedge \text{dance}(e, \text{Donald})]$

Since there is only one relevant event, (98b) entails and is entailed by (99):

(99)  $\sim\exists e[C(e) \wedge \text{sing}(e, \text{Donald})] \vee \sim\exists e[C(e) \wedge \text{dance}(e, \text{Donald})]$

We leave it to the reader to demonstrate the equivalence.

One way to think about C is that it limits the events considered to a particular time interval. So that in (100a), the claim is that Donald did not sing or dance on a particular occasion, e.g. at a particular party. And in fact, there are natural examples where pairs of sentences like those in (90) are not equivalent:

(100) a. John did not dance and sing at the same time/simultaneously

b. John did not dance or John did not sing.

In this example, (100b) entails (100a), but not vice versa. One assumption about this is that the phrases *at the same time* and *simultaneously* signal that C is true of more than one event.

## 11. NEG Deletion

Since only one of the three NEG's recognized in our new analysis of SC INR cases like (57b) is overt, we now briefly consider the specifics of the necessary NEG deletions in a typical case, e.g. (101a), which is related in certain ways to those like (101b,c):

(101) a. I don't believe that Hugh will understand a single thing.

b. I believe that Hugh will understand not a single thing.

c. I believe that Hugh will not understand a single thing.

In the framework of CP2014, the complement clauses of these examples would share an underlying structure essentially like (102). We label the constituents with X, Y, Z since the

precise syntactic identity of these constituents is not relevant to our claims. The structure of (101b), which does not manifest INR, is as follows:

(102) I believe that [<sub>X</sub> Hugh will [<sub>Y</sub> <[<sub>DP</sub> [<sub>D</sub> NEG<sub>3</sub> SOME][<sub>NP</sub> single thing]]><sub>6</sub> [<sub>Z</sub> understand DP<sub>6</sub>]]]

In (101b), there is no NEG raising or NEG deletion proper. The scope occurrence of DP<sub>6</sub> is regularly covert and the phrase appears overtly in the object position of *understand*. It is a regular feature of existential expressions like *a single thing* that the D SOME we posit is either null or perhaps appears as the indefinite article. The representation in (102) leaves out the positive event quantifier DP for convenience sake. We assume that in such a case, that quantifier would be directly lower than DP<sub>6</sub>, with its argument occurrence somewhere in Z.

In (101c), NEG<sub>3</sub> would raise from the scope position of its containing quantifier DP to a position right adjacent to the modal auxiliary, yielding:

(103) I believe that [<sub>X</sub> Herbert will NEG<sub>3</sub> [<sub>Y</sub> <[<sub>DP</sub> [<sub>D</sub> <NEG<sub>3</sub>> SOME][<sub>NP</sub> single thing]]><sub>6</sub> [<sub>Z</sub> understand DP<sub>6</sub>]]]

Although the scope occurrence of DP<sub>6</sub> is here a NEG raising remnant, it is still covert since all scope occurrences are. In effect, the raising of NEG<sub>3</sub> permits it to escape from the requirement that material internal to scope occurrences is uniformly covert.

Turn to the INR case (101a). Combining the analysis of the common structure of (101b,c) with our earlier novel proposal about type SC INR yields (104) as the basic structure of (101a) (various irrelevant details omitted):

(104) I do NEG<sub>1</sub> [<[<sub>DP</sub> [<sub>D</sub> <NEG<sub>1</sub>> SOME] [<sub>NP</sub> E]]><sub>7</sub> [ <NEG<sub>2</sub>> [ believe that [Herbert will [ <[<sub>DP</sub> [<sub>D</sub> <NEG<sub>3</sub>> <SOME>][<sub>NP</sub> single thing]]><sub>6</sub> [<sub>Z</sub> understand DP<sub>6</sub>]]]]]]]

The modification of the main clause structure of INR cases like (101a) we have proposed (one involving two original NEG<sub>s</sub>) need not lead to any modification of our view of the structure of its complement clause. For all variants of INR (see section 12), we assume that the structures proposed in CP2014 or Collins and Postal (2015a) for the relevant complement clauses remain correct. These were shown to capture key facts about island constraints, Horn clauses and parenthetical clauses (see section 13 for discussion of the latter). And so the structure of the embedded clause in (101c) is just what we would have posited in CP2014. That is, the embedded clause in (104) contains NEG<sub>3</sub> which undergoes raising into the matrix clause, just as in CP2014.

Of the three original NEG<sub>s</sub> in (101) only one, NEG<sub>1</sub>, is overt. In the framework of CP2014, this is attributed to a phenomenon of NEG deletion based on a primitive binary relation between phrases called NDEL. The interpretation of this relation is that its existence renders its second argument covert (unpronounced). The first argument of NDEL is called a *NEG deleter*; these are of two types, general and lexical, subject to partially different constraints. The latter type need not concern us here. A constraint on general NEG deleters is that they must embody the sort of semantics, non-increasingness, usually taken to be characteristic of possible NPI licensers in standard theories. The negative existential quantifier phrase DP<sub>7</sub> in (104) obviously satisfies this condition, which was imposed in CP2014: 72 by the *General NEG Deletion Condition*.

Combinations of NDEL pairs lead to the formation of objects called *NEG Deletion Chains*, sequences of phrases related by NDEL such that each member of the sequence except the final element bears the NDEL relation to the one that follows it. Each element in a NEG deletion chain except the initial one is a NEG.

It follows that in (104) a NEG deletion chain must be formed in which two of the three underlying NEGs are deleted. A priori there are a number of possibilities but we suggest that there is only one correct one, representable as follows, utilizing the convention of placing NEG deletion chains in ‘< >’.

(105) <[[NEG<sub>1</sub> SOME] E], NEG<sub>2</sub>, NEG<sub>3</sub>>

That is, we take NEG<sub>2</sub> to be the NEG deleter of NEG<sub>3</sub>, and the main clause negative eventuality quantifier DP to be the NEG deleter of NEG<sub>2</sub>. This set of NEG deletion relations satisfies (and is the only one in (104) which does) the requirement in CP2014 called the *NDEL C-Command Condition*. This determines that every NEG deleter c-commands the NEG that it deletes, stated below:

(106) The NDEL C-Command Condition

If NDEL(X, Y), then X c-commands Y.

It can be observed that the set of NDEL relations in (104) satisfies formulation (106).

Further, on the assumption that NEG<sub>3</sub> raises to the matrix clause, NEG deletion chain (105) satisfies what CP2014 p.72 called the *NDEL Clause-mate Condition* requiring the relevant deleted NEG to be a clause-mate of its NEG deleter. We do not represent the raised locus of NEG<sub>3</sub> in (104), but its position in the main clause would be c-commanded by NEG<sub>2</sub>.

In these terms, since NEG<sub>3</sub> originates in the embedded clause, the origin positions of NEG<sub>3</sub> and NEG<sub>2</sub> in (104) are not underlyingly clause-mates. However, if, as we posit, INR leads to the raising of NEG<sub>3</sub>, NEG<sub>2</sub> and NEG<sub>3</sub> will be clause-mates in the resulting structure. More precisely, this will result if NEG<sub>3</sub> raises out of the embedded clause into the main clause. It follows that even though we take the raised NEG<sub>3</sub> in cases like (101a) to be covert, its raising

nonetheless plays a key role in the overall analysis, since it is a requirement for the determination in general terms of that covert status.

Turn then to the deletion of NEG<sub>2</sub> by the negative quantifier expression DP<sub>7</sub>. This also satisfies the NDEL C-command Condition and the NDEL Clause-mate Condition.

Many questions about structures like (104) remain open. Consider (107):

(107) I don't not believe that Hugh will not understand a single thing.

Since INR is not obligatory with CNRP *believe*, what happens if NEG<sub>3</sub> in (104) does not raise? It may be that the grammatical (107) represents that structure. Example (107) would involve no NEG deletion. But suppose that as in (104) under our earlier account, DP<sub>7</sub> deletes NEG<sub>2</sub>, but with no other NEG deletion. That would yield (108a) with structure (108b):

(108) a. I don't believe that Hugh will not understand a single thing.

b. I do NEG<sub>1</sub> <NEG<sub>2</sub>> believe that Hugh will NEG<sub>3</sub> understand a single thing.

While grammatical, this is not a paraphrase of (101a) and thus should not have the same structure as the latter. Arguably then, some principle should, in any structure like (104), block the deletion of NEG<sub>2</sub> without the deletion of NEG<sub>3</sub>.

Fortunately, this is accomplished by a principle already invoked in CP2014, p. 75, called there the *NEG Deletion Evenness Condition*. This constraint, derived from a proposal of Szabolcsi (2004: 42), involves several complexities we cannot consider here. What it says for present purposes is that a NEG deletion chain cannot contain an odd number of deleted NEG<sub>s</sub>. But just that would be involved if (108) could be a realization of (104).

The same logic shows that (108) could also not be a realization of (104) in which NEG<sub>3</sub> is deleted but NEG<sub>2</sub> is not. The remaining possibility is that both NEG<sub>2</sub> and NEG<sub>3</sub> are deleted, which is just what we have proposed and which allows (101a) to have the correct interpretation.

One conclusion of the discussion of (101a)/(104) is the following. Although our newer analysis of such SC INR cases must, just as our former treatment in (6) did, recognize syntactic NEG raising, the overt main clause NEG in such examples turns out not to be the NEG raised from the complement clause of the CNRP. Rather, the overt NEG arises in a main clause negative eventuality quantifier DP.

## 12. Uniform Deletion of the Raised NEG

As far as we know, the newer analysis of cases like (101a) captures every fact that the analysis in CP2014, that schematized in (6), did. Moreover, beyond having the advantage of remaining consistent with the extended Klima tests, the newer treatment has a key additional virtue given that it embodies the property that the raised NEG is deleted. This combines with the analyses we have presented of two other types of INR cases to suggest a more unified view of the various subtypes of INR than was possible before.

To understand this claim, we need to say a few words about the two other analyses earlier designated NQ and CU INR. We stress though that it is not our intention here to justify these previous analyses, a task we believe was accomplished in the works we cite. Here we just wish to explicate their relevant properties.

First, in CP2014 chapter 16, cases like (109a), there called *composed quantifier cases*, were designated NQ INR structures in section 1. These manifest a main clause based on a CNRP which contains no post-aux NEG and were treated along the lines of (109b), yielding the NEG deletion chain in (109c):

(109) a. No one thinks that Alfred knows jackshit about physics.

b. [NEG<sub>1</sub> SOME one] [NEG<sub>2</sub> thinks] that [DP <[D <NEG<sub>3</sub>> <SOME>]] [NP jackshit]><sub>5</sub>  
[Alfred knows DP<sub>5</sub> about physics]]

c. <[NEG<sub>1</sub> SOME one], NEG<sub>2</sub>, NEG<sub>3</sub>>

In that work, we arbitrarily chose to view NEG<sub>2</sub> as a verbal NEG (instead of a verbal phrase or clausal NEG).

The posit of NEG<sub>3</sub> meets the requirement that a strict NPI like *jackshit* have a local ‘licenser’ (in standard terms) and was shown in addition to account for the fact that such cases are subject to a range of island constraints. The relevant fact here is that in an analysis like (109b), independently of any issues about extended Klima tests, the raised complement clause NEG is taken to be deleted.

Second, in Collins and Postal (2015a) we argued for an analysis of CU INR cases like (110a) of the shape in (110b), yielding the NEG deletion chain (110c):

(110) a. I don’t know that ever before have the media played such a major role.

b. I [NEG<sub>1</sub> know-NF] that [<NEG<sub>2</sub>> [[[<NEG<sub>3</sub>> ever] before] have the media played such a major role]]

c. <[NEG<sub>1</sub> know], NEG<sub>2</sub>, NEG<sub>3</sub>>

In (110b), NEG<sub>3</sub>, which accounts for the fact that the fronted phrase in the subordinate clause can satisfy the conditions on Negative Inversion, is deleted. NEG<sub>2</sub> is raised to the matrix clause and accounts for island effects found with this construction.

So, our newer analysis of SC INR structures, in which the raised NEG is always deleted, combines with our previous analyses of types NQ and CU INR to permit formulation of a new condition on NEG deletion in INR structures. We state this in two different variants, which we will not try to factually distinguish for now:



(111) The INR Obligatory NEG Deletion Condition

- a. If  $NEG_1$  raises from position P to a position Q, where P and Q are not clause-mate positions,  $NEG_1$  is deleted.
- b. If  $NEG_1$  raises from position P to a position Q in clause C, where P and Q are not clause-mate positions, there is a NEG deletion chain containing  $NEG_1$  whose initial element is a negative phrase found in clause C.

Version (111b) is the stronger statement because it not only requires the deletion of  $NEG_1$ , but its deletion in accord with the conditions on NEG deletion chains. These will determine that the main clause into which INR raises a NEG always contains a distinct NEG participating in a NEG deletion chain. But as our survey of INR types has indicated, under our various proposed INR analyses, this condition is systematically met.

Two of the three INR analyses we previously proposed already satisfied condition (111). And unlike our previous analysis of type SC INR, the newer one also satisfies (111). This reveals that the newer analysis permits a more uniform and more restricted view of INR. It can now be claimed that all instances of non-clause bound NEG raising result in the deletion of the raised NEG in a main clause containing a NEG.

### 13. Parentheticals Revisited

Chapter 17 of CP2014 presented an account of the structure of parenthetical expressions like (112a), and of particular interest here, of those involving negation like (112b, c):

- (112)
- a. Ruth would, I guess, invite lots of students.
  - b. Ruth would not, I don't guess, invite foreign students.
  - c. No professor would, I don't guess, invite foreign students.

Developing insights of Ross (1973), the account sought to explicate his observation that negative parentheticals such as (112b, c) are in general not possible with non-CNRPs predicates:

(113) Ruth wouldn't invite foreign students (\*I didn't assert/claim/concede/find out/judge/observe).

None of the verbs in the parentheses here are CNRPs.

Ross (1973: 136) noted an exception to the need for a CNRP in a negative parenthetical. Namely, if the parenthetical-forming verb is one of those with negative force, e.g. *deny*, *doubt*, *forget*, such are possible:

(114) Ruth would not, I didn't deny/doubt invite foreign students.

To account for the properties of parenthetical clauses, specifically for the restrictions on negative ones, CP2014, chapter 17, proposed a constraint called there the *Parenthetical Non-decreasingness Condition*. Since the actual formulation of that involved various complications related to our conception of the syntax of parentheticals and their relations to the main clause they modify, we cannot consider its detail here. It suffices to indicate that this condition restricted the semantics of a parenthetical clause. It required that the composition of the meanings of all the elements in it (e.g. subject, predicate, negation, adverb) yielded only certain types of function. These had to be non-decreasing in a specific restricted sense with respect to what we took to be the covert complement clause of the parenthetical clause, that covert clause being identical to the modified main clause.<sup>11</sup>

This condition determines that no grammatical parenthetical clause is in general possible if it contains one interpretable NEG or if it contains no interpretable NEG and a predicate with negative force. On the contrary, if a parenthetical contains two interpretable NEGs, or a predicate

with negative force and one interpretable NEG, the Parenthetical Nondecreasingness Condition is satisfied. These generalizations correctly draw such distinctions as the following:

(115) a. Love is complicated, I guess.

(No interpretable NEG, no predicate with negative force, result: increasing semantics)

b. Love is complicated, \*I denied/doubted/forgot.

(No interpretable NEG, predicate with negative force, result: decreasing semantics)

c. Love is complicated, I didn't deny/doubt/forget.

(One interpretable NEG, predicate with negative force, result: increasing semantics)

d. Love is complicated, no one denied/doubted/forgot.

(One interpretable NEG, predicate with negative force, result: increasing semantics)

e. Love is complicated, \*no one didn't deny/doubt/forget.

(Two interpretable NEG's, predicate with negative force, result: decreasing semantics)

These results provide basic support for the Parenthetical Nondecreasingness Condition.

But it remains to explicate how cases like (116) can be grammatical:

(116) a. Love is not, I don't believe, all that complicated.

b. Love is not, no one believes, all that complicated.

That is, each of (116a, b) seems at first glance to involve a parenthetical containing no predicate with negative force and only a single interpretable NEG. Why then are they grammatical? The answer in CP2014 appealed to INR, but in two different ways.

For SC INR parentheticals like (116a), the claim was that the parenthetical clause contained no interpretable NEG, since the overt NEG was raised from the covert complement clause of the parenthetical clause. That is, we invoked an analysis of the form in (6) above, so

that cases like (116a) were perfectly compatible with the Parenthetical Non-decreasingness Condition.

For type NQ INR parenthetical clauses like that in (116b), however, the result followed from the completely different analysis given in chapter 16 of CP2014 of cases like (109a), represented in (109b). That is, in addition to the NEG of the negative quantifier DP, we posited a distinct covert NEG, taken there, rather arbitrarily, to be a verbal NEG. The composition of these two NEG's then yielded increasing semantics, but in a different way from that in (116a). Since we have indicated that we maintain analyses such as that of NQ cases like (109b), the results of CP2014 in this regard are maintained.

Having rejected an analysis of SC INR cases along the lines of (6) in favor of one like the structure in (104), we need to show how the newer analysis, applied to cases like (116a), yields increasing semantics for the parenthetical clause to determine consistency with the Parenthetical Decreasingness Condition and hence grammaticality for the relevant parentheticals. But this is straightforward since, as gone over in sections 8-10, our newer analysis posits two NEG's in the main clause, one under the scope of the other. And we showed how the negative (decreasing) force of the lower one is cancelled. Therefore, the newer two NEG analysis of such cases is no less consistent with the Parenthetical Decreasingness Condition than the older analysis sketched in (6).

Notably, for the CU INR cases considered in Horn (2014), the situation is different. In Collins and Postal (2015a) we argued that these involve INR, albeit with a previously unknown class of main clause 'triggers' (we called CUPs 'cloud of unknowing predicates'). But we analyzed such cases as in (110) above, that is, with only a single main clause interpretable NEG. That means that such main clauses manifest decreasing semantics and should, therefore, fail to

form grammatical parentheticals. And just that failure was noted by Larry Horn (personal communication of April 19, 2014 to PMP), as indicated by:

- (117) a. I don't know/can't say that the council is prepared to support that proposal.  
b. \*The council is not, I don't know-NF/can't say, prepared to support that proposal.

Thus our INR analysis of the type CU INR cases Horn (2014) discovered is also entirely consistent with the Parenthetical Decreasingness Condition.

#### **14. Conclusion**

This paper has revealed a fatal flaw in the CP2014 syntactic analysis of type SC INR represented in (6) above, one that also existed unnoticed in all previous syntactic analyses of SC INR including Fillmore (1963), Lakoff (1969), Horn (1971, 1972), Seuren (1974) and McCawley (1998). All these analyses wrongly claim the scope of the supposedly raised NEG identified with the matrix post-aux NEG is internal to the complement clause. But the extended Klima tests show that there must be some NEG with matrix clause scope in type SC INR cases.

To solve the conflict between the CP2014 analysis and the extended Klima test results, we posited a new syntactic analysis of SC INR, one positing two distinct original NEG's in the main clauses of such examples. We have shown how to interpret the highest of the two NEG's in terms of a syntacticized view of event semantics, specifically, positing a negative quantifier DP containing that NEG. We have also argued that while this analysis in isolation wrongly claims that standard sentential cases should manifest antiadditive properties, with a plausible contextual restriction on the relevant variable, the actual stronger antimorphic pattern is logically derived.

We have, further, indicated how our novel syntactic INR treatment eliminates an asymmetry in the class of previous syntactic analyses of INR (SC INR, NQ INR and CU INR).

This permits the posit of condition (111), requiring that any NEG raised from an embedded clause into a main clause is deleted.

Lastly, we showed how our new treatment retains core results of CP2014 and Collins and Postal (2015a). Specifically, since the new analysis maintains the view that there is syntactic NEG raising, we are able to account for the fact that INR of all the SC, NQ and CU varieties manifests island effects and gives rise to Horn clauses. Furthermore, we showed how the new analysis accounts for the relevant range of negative parenthetical facts.

The bottom line is that although the extended Klima tests show that a syntactic analysis like (6) for SC INR cases is not viable, they do not more generally undermine syntactic NEG raising analyses of such cases. If the argument of this paper is correct, nothing in the hitherto ignored facts about the relation between extended Klima tests and INR lends any support to non-syntactic views of INR.

## Notes

1 This claim requires a major hedge. At least since Lindholm (1969: 153-154) there have been reports that some speakers accept some strict NPI cases structurally parallel to (8c). McCawley (1998: 596 and 603) cited:

- (i) a. The director didn't say that your performance was all that bad.
- b. I didn't claim that I'd finish the paper until Friday.

As discussed at length in CP2014, especially chapter 9, we attribute this to the fact that in such cases the strict NPI represents a negative quantifier with main clause scope and, under our view of these, sketched in section 4 below, that negative quantifier is represented by a syntactic DP from which its original NEG can raise in the main clause. Thus on the relevant readings,

there is no INR. The testable factual claim is that in every case like (i) where the main predicate does not allow INR, the scope of the negative quantifier DP associated with the strict NPI is in the main clause.

2       Horn's generalization faces a serious challenge from cases like (i), acceptable for some speakers:

(i)     Carol doesn't suspect that at any time did Stan betray his wife.

The verb *suspect* is not a CNRP. CP2014, chapter 14, section 5, attempts to defend Horn's claim by distinguishing between Horn clauses and those like that in (i), which it called *quasi-Horn clauses*. There we claimed that the key difference was that the quantifier DP fronted in (i) takes main clause scope, while in Horn clauses the scope of the corresponding fronted phrase is limited to the complement clause. In these terms, (i), like (i) of note 1, would not involve SC INR, but rather just NEG raising from the scope occurrence of the negative quantifier DP in the main clause. The implication is that some speakers allow the high scope analysis for some non-CNRPs, permitting not only quasi-Horn clauses but also the occurrence of some strict NPIs in the complements of non-CNRPs, as already in effect noted in CP2014: chapter 9.

3       We leave aside how to account for condition (15). In the Principles and Parameters/Minimalist frameworks, a raised NEG would be obligatorily reconstructed. That is, a moved NEG would form a chain whose head is deleted at the LF-interface (hence, only the tail of the chain would be interpreted).

4       Hereafter we avoid the clumsy disjunction 'quantifier DP or adverbial' and for better or worse take quantifier DP to cover negative adverbials like *never*, *not often*, etc. While minimally merely a notational convention, we suspect that the relevant adverbials in fact all have an included DP structure.

5 We observe that the fixed expressions *me too* and *me neither* also function as extended Klima tests and have the same consequences as to the scope facts for SC INR clauses as those for full *so/neither* cases:

- (i) a. Jennifer agreed with that. Me too/\*Me neither.  
b. Jennifer did not agree with that. \*Me too/Me neither.
- (ii) a. Jennifer doesn't think the movie was half bad. Me neither/\*too.  
b. Jennifer doesn't believe that at any time did Ted sell drug. Me neither/\*too.

6 Use of *nor* as a diagnostic for clausal negation must, however, exclude a certain class of positive sentences from consideration. That follows, because Horn (1989 [2001: 257] noted that for many speakers examples like the following are grammatical (though not for the present authors):

- (i) He was upset about it. Nor was she totally thrilled herself.

Apparently for the relevant speakers, it suffices if the clause preceding *nor* manifests some kind of negative implicature. For (i) this implicature would probably be something like 'He was not thrilled about it'. Compare (ii) where no such implication holds:

- (ii) \*He was thrilled about it. Nor was she pleased herself.

7 Consider the following paradigm:

- (i) a. Carol suspects that at no time did Stan betray his wife (\*and neither did Vanessa/\*I don't think).  
b. At no time did Carol suspect that Stan betrayed his wife (and neither did Vanessa/I don't think).  
c. Carol doesn't suspect that at any time did Stan betray his wife (and neither did Vanessa/I don't think).



Here, the extended Klima test phrases in (ia) are rightly blocked by condition (47). But (ib), manifests sentential negation. So when Negative Inversion raises a phrase from a finite clause, it allows (in the account of CP2014 p. 140, requires) main clause scope for the negative phrase originating in the finite subordinate clause. Example (ic), from note 2, and the example in note 1, were cited as constructions (strict NPIs or Horn clauses) normally not allowed in the complements lacking local NEG's of non-CNRPs which are nonetheless grammatical for some speakers. In our terms, cases like (ic) involve high scope negative quantifier DPs from which the defining NEG has raised out (in the main clause). Thus (ic) would have a structure along the lines of (ii).

- (ii) Carol do NEG<sub>1</sub> [[<NEG<sub>1</sub>> SOME] time]<sub>5</sub> [<Carol> accept [that at DP<sub>5</sub> did Stan betray his wife]]

The generalization covering cases like (ib,c) would be roughly (iii):

- (iii) While it is in general impossible for the scope and argument occurrences of a negative quantifier DP K to span a finite clause, that is possible if the NEG defining K ends up overtly in the higher clause, either via Negative Inversion, as in (ib), or via NEG raising from a scope occurrence, as in (ic).

8 Contra analysis (78b), both Hoeksema (1996: 156-157) and Horn (1996) claim that the NEG in cases like (78a) is internal to D. Hoeksema justified the assumption via the claim the internal position of NEG rightly blocked what he took to be the impossibility of associating an exceptive phrase with DPs like that in (78a). But the factual claim is just wrong:

- (i) a. Now the morally good choice takes account of everyone including yourself, not everyone except yourself. In considering an abortion, ...

([en.wikibooks.org/wiki/Contemporary\\_Educational\\_Psychology/Chapter\\_3:\\_Student\\_Development/Moral\\_Development](http://en.wikibooks.org/wiki/Contemporary_Educational_Psychology/Chapter_3:_Student_Development/Moral_Development) )

b. But, I have met many, and now I know that not everybody except Atheists is stupid, as it seems the pattern of thought is around here. ...

[ravingatheists.com/forum/archive/index.php/t-13123.html](http://ravingatheists.com/forum/archive/index.php/t-13123.html)

Horn's (1996: 28) reaction to the NPI licensing anomaly resulting from his D-internal view of the position of NEG in cases like (78a) was the following bizarre remark:

- (i) "It appears that the downward or negative property of only or not all with respect to one argument position is somehow illicitly extended to the inappropriate (UE) argument."

But sanctioning 'illicit extensions to inappropriate arguments' would eliminate the testability of claims. How can an extension be illegitimate, presumably meaning 'violates a grammatical condition', and still yield a grammatical output? If such appeals are allowed, how can any claim which clashes with data be falsified?

9 In the PP/Minimalist framework, NEG<sub>2</sub> in (81) would be adjoined to vP.

10 The reasoning in (83) closely parallels that appealed to in CP2014, section 16.7, to account for semantic equivalences between cases such as that of the NQ structure in (ia) and the non-INR case in (ib):

- (i) a. No doctor believed that their lawyer knew jackshit<sub>A</sub> about that.  
b. Every doctor believed that their lawyer did not know jackshit<sub>A</sub> about that.

11 The generalization that English post-aux NEG<sub>s</sub> determine antimorphic negation is not true of so-called *contrastive negation* cases:

- (i) a. Rachel has not bought beer but rather wine.

b. Rachel has bought not beer but rather wine.

Here (ia) is equivalent to (ib) and plausibly relates to the latter via NEG raising. In the latter and arguably in the former, the scope of negation is internal to the complex object DP. The NEG does not license NPIs external to that DP and extended Klima tests are not satisfiable:

(ii) a. Rachel has not bought beer but rather wine (\*in months).

b. Rachel has not bought beer but rather wine (\*and neither has Louise).

So cases like (ia) cannot be analyzed such that the post-aux NEG originates in a negative eventuality quantifier DP.

12 However, as noted in CP2014: 244-245, n. 6, there is an issue here with the definition of *non-decreasing*, which must be restricted to belief worlds. See also the discussion in Collins and Postal (2015a: 28-29).

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