Scope economy and the head movement of negation

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In this paper, I show that:

• Negation is able to undergo head movement on its own
• The head movement of negation has semantic effects
• It is constrained by principles of scope economy
• Evidence comes from Negative Auxiliary Inversion, a phenomenon present in some varieties of North American English

Roadmap:

• Negative Auxiliary Inversion (NAI)
• Syntax of NAI constructions
• Constraints on the movement of negation
• Competing analyses
• Extending the analysis

1 Negative Auxiliary Inversion

(1) Didn’t everybody go to the party. (WTE; Foreman, 1999)

‘Not everybody went to the party.’

• Declarative, receives the falling intonation of a declarative
• Clause-initial negated auxiliary or modal, followed by a quantificational or indefinite subject

The corresponding non-inverted construction is often also possible:

(2) Everybody didn’t go to the party. (WTE; Foreman, 1999)

1.1 Who has it?

Attested in:

• African American English (AAE) throughout North America
• Appalachian English (AppE) in Appalachia
• West Texas English (WTE) in Texas

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1 With each documented example, I cite the variety of English it is associated with and the original source of the example. In the case in which no source is provided, the examples are from original fieldwork. Abbreviations: AAE – African American English, AppE – Appalachian English, SE – Standard English, WTE – West Texas English.
Attested examples exhibiting negative inversion in varieties of white speakers:

Map credit: Yale Grammatical Diversity Project (http://microsyntax.sites.yale.edu)

1.2 Interpretation

- Foreman (1999, 2001) observes that for West Texas English, sentences exhibiting negative auxiliary inversion are unambiguous; negation always has wide scope over the subject.
- The non-inverted counterpart is attested to be ambiguous.

(3) a. Didn’t everybody go to the party.  
    b. Everybody didn’t go to the party.

1.3 Subject restriction

✓ Quantificational subjects, as we’ve seen in (50)

✗ Specific or referential subjects.

Some quantificational, non-specific subjects are ruled out:

(5) a. *Didn’t some people come.  
    b. *Didn’t few people live there then.

(4) a. *Didn’t Jack go to the party.  
    b. *Wouldn’t I do that.  
    c. *Didn’t the teachers go to the party.

Figure 1: The subject distribution for negative auxiliary inversion in WTE

Possible subjects
✓ everybody
all the NP
five NP
more than three NP
a NP
many NP
any NP
no NP

Impossible subjects
✗ Jack (proper names)
you (pronouns)
the NP
their NP
some NP
few NP

2 It is not known to this author whether these interpretation facts hold for negative auxiliary inversion constructions in other varieties. Further research needs to be done.
3 Specific or referential subjects appear to be possible in certain emphatic contexts. See Horn (2013) for more information.
Empirical observations concerning the interpretation of negative inversion and their non-inverted counterparts:

<table>
<thead>
<tr>
<th>Interpretation</th>
<th>Noninv. constr.</th>
<th>NAI</th>
</tr>
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<tr>
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<tr>
<td>some NP</td>
<td>unambiguous (¬ low)</td>
<td>*</td>
</tr>
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<td>*</td>
</tr>
</tbody>
</table>

*Speakers report that the interpretation in which negation scopes over the numeral five receives an idiomatic interpretation.

Judgment pair due to [Foreman, 2001].

The determinant a can be specific. Ambiguity is present only when a has a non-specific reading.

Figure 2: The interpretation of subjects with available counterparts

- **Correlation** of negative auxiliary inversion with presence of ambiguity in non-inverted counterparts:
  
  - the types of subjects that give rise to ambiguity in a non-inverted sentence are the types of subjects that are possible in negative auxiliary inversion
  
  - the types of subjects that do not give rise to ambiguity in a non-inverted sentence are incompatible with negative auxiliary inversion

- Observe that negation always has **wide scope** in negative auxiliary inversion constructions

2  Syntax of Negative Auxiliary Inversion

The sentence containing NAI and its non-inverted counterpart are related

Non-inverted counterpart:

(6) TP
didn’t everybody
didn’t vP
go

- Movement of the subject to canonical position
- Negation in usual position [[Pollock, 1989]]

Negative auxiliary inversion construction:

(7) TP
didn’t everybody
didn’t vP
go

- Movement of negation over canonical subject position

2.1 Position to which negation raises

- A higher negative projection available in all varieties which allow negative inversion (following [Foreman, 1999, 2001])
• It is above $T^0$ and below $C^0$.

• It is not semantically negative; logical sentential negation lives in $Neg_1^\circ$, as it does in English varieties lacking this construction.

• Assumption: semantic scope has a corresponding configuration in the (overt or covert) syntax.

• $Neg_2$ is the position to which negation raises to undergo QR.

• Difference between NAI and inverse scope of ‘Everybody didn’t go...’:

(10) a. NAI:

    $Neg_2^\circ$P

    didn’t

everybody
to vP
didn’t everybody

b. Inverse scope of non-inverted counterpart:

    $Neg_2^\circ$P

    didn’t
everybody
to vP
didn’t everybody

- Movement of negation is overt
- Movement of negation is covert

• Difference between inverse scope and surface scope of ‘Everybody didn’t go...’:

(11) a. Inverse scope: Numeration contains both $Neg_1$ and $Neg_2$

b. Surface scope: Numeration contains only $Neg_1$

2.1.1 Why is movement not as high as $C^0$?

• Given its similarity to yes-no question formation, we might expect NAI to involve $T^0$ to $C^0$ movement of negation.

(12) Yes-no question:

a. Didn’t everybody go to the party? (SE, WTE)

b.

    $C^0$ [INTR.]

didn’t
everybody
to $T^0$
didn’t
everybody
to vP
didn’t
everybody
to ...
• Movement cannot be as high as C° because NAI can be embedded below an overt complementizer:

(13) a. She loves the fact (that) don’t nobody like her. (WTE & AAE: Foreman [1999])

b. CP
   C° that
   Neg°P
   Neg° don’t
   TP
   nobody
   T° ... vP ...

2.1.2 Why is the projection negative?

• NAI is restricted to sentences containing negation

(14) a. *Will everybody fit in that car. (WTE)
    b. Won’t everybody fit in that car. (WTE)

• Sentential negation must move and must be in its -n’t form

(15) a. *Will everybody not fit in that car. (WTE)
    b. *Will not everybody fit in that car. (WTE)
    c. Won’t everybody fit in that car. (WTE)

• More evidence for why the projection must be negative in section 3.3.3

3 Restricting the movement of negation

• We will restrict the movement of negation in order to account for the subject restriction

• NAI is only compatible with subjects with which negation interacts scopally

• When NAI is possible, negation always has scope over the subject

• Intuition: NAI is only allowed for sentences that are scopally informative

3.1 Parallel structures in elided sentences (Fox 2000)

• Subject restriction is reminiscent of Fox (2000):

(16) a. Some boy admires every teacher. Mary does, too. [∃ » ∀, *∀ » ∃]
    b. Some boy admires every teacher. Some girl does, too. [∃ » ∀, ∀ » ∃]

• Definite subjects like Mary do not give rise to ambiguity. When elided sentence is unambiguous [16a], antecedent is also unambiguous

• Quantificational subjects like some do give rise to ambiguity. When elided sentence is ambiguous [16b], antecedent remains ambiguous

• Elided sentences force parallel structures

• Intuition: Inverse scope is only allowed for sentences that are scopally informative

• Build on Fox’s (2000) Principle of Scope Economy:
  − Movement of a scope-bearing element over another is allowed only if it has a semantic effect

• Fox’s Principle of Scope Economy gives us inverse scope

• We need a similar principle for NAI, for overt movement
3.2 Modified Principle of Scope Economy

(17) Modified Principle of Fox (2000)’s Scope Economy
A scope-shifting operation can **overtly** move \( O \) from a position in which it is interpretable only if the movement crosses XP and \( \langle O, \text{XP} \rangle \) is not scopally commutative.

\[
\langle O, \text{XP} \rangle \text{ is scopally commutative if for every model, and for every } \phi \in D \langle e, \tau \rangle, \\
\llbracket O \rrbracket(D \langle \tau, \tau \rangle) \equiv \llbracket \text{XP} \rrbracket(\lambda x \phi(x)).
\]

- We start out with the non-inverted counterpart
- Overt movement of negation is allowed only if it is scopally informative

3.3 Accounting for subject restriction

3.3.1 ✗ Specific or referential subjects

(18) a. * Didn’t Jack go to the party. (WTE)
   b. Jack didn’t go to the party. (WTE)

(19) Post-movement \[\llbracket \text{Neg} \rrbracket([\llbracket \text{Jack} \rrbracket(\lambda x \phi(x))]) \]
\[= \llbracket \text{Jack} \rrbracket(\lambda x [\llbracket \text{Neg} \rrbracket(\phi(x)))\]

- Only one scope-bearing element is present

(20) Post-movement \[\neg \text{go}'(j) \]
\[= \neg \text{go}'(j)\]

✗ Overt movement of negation is ruled out because it is not scopally informative

3.3.2 ✓ Quantificational subjects

(21) a. Didn’t everybody go to the party. (WTE)
   b. Everybody didn’t go to the party. (WTE)

(22) Post-movement \[\llbracket \text{Neg} \rrbracket([\llbracket \text{everybody} \rrbracket(\lambda x \phi(x))]) \]
\[= \llbracket \text{everybody} \rrbracket(\lambda x [\llbracket \text{Neg} \rrbracket(\phi(x)))\]

- Two scope-bearing elements are present

(23) Post-movement \[\neg \forall x [\text{person}'(x) \rightarrow \text{go}'(x)] \neq \forall x [\text{person}'(x) \rightarrow \neg \text{go}'(x)]\]
✓ Overt movement of negation is allowed because it is scopally informative

3.3.3 Accounting for lack of ‘positive’ auxiliary inversion

(24) a. * Will everybody go to the party. (WTE)
   b. Won’t everybody go to the party. (WTE)

- Only one scope-bearing element is present

✗ Overt movement will be ruled out because it is not scopally informative

(25) a. * Can everybody go to the party. (WTE)
   b. Can’t everybody go to the party. (WTE)

- Two scope-bearing elements are present: can and everybody

✓ Overt movement will be possible because it will be scopally informative

- Modified Principle of Scope Economy prediction:

(26) a. Can everybody go to the party. \[\phi \triangleright \forall, *\forall \triangleright \phi\]
   b. Didn’t everybody go to the party. \[\neg \phi \triangleright \forall, *\forall \triangleright \neg \phi\]

- Need to appeal to the property of \( \text{Neg}_{2}^{\triangleright} \) projection to rule out (26a)
   - The movement is ruled out because can is not licensed in the \( \text{Neg}_{2}^{\triangleright} \) projection

3.3.4 Problematic quantificational subjects

- Recall that certain quantificational subjects are not possible in NAI constructions
\( \times \text{Some} \)

(27) a. * Didn’t some people come. (WTE)
   b. Some people didn’t come. (WTE)

Because it is quantificational, we expect the same distribution as with other quantifiers:

(28) Expected distribution:
   a. Didn’t some people come. \( [\neg \exists, \exists \rightarrow \neg] \)
   b. Some people didn’t come. \( [\neg \exists, \exists \rightarrow \neg] \)

(29) Attested distribution:
   a. * Didn’t some people come.
   b. Some people didn’t come. \( [*\neg \exists, \exists \rightarrow \neg] \)

- \textit{Some}, being a PPI, cannot be in the immediate scope of negation
  (Szabolcsi as cited in Iatridou & Zeijlstra to appear)
- Unexpected results are due to more general problem with LFs in which \textit{some} is in the scope of negation

(30) John didn’t see some man. \( [*\neg \exists, \exists \rightarrow \neg] \)

(31) * \( \neg \exists_+ x [\text{person}'(x) \rightarrow \text{go}'(x)] \)

- As a PPI, \textit{some} needs to escape the scope of negation

(32) Considering our Modified Principle of Scope Economy for ‘Some people didn’t come’:
   
   \[
   \neg \exists_+ x [\text{person}'(x) \land \neg \text{go}'(x)] \neq \exists_+ x [\text{person}'(x) \land \neg \text{go}'(x)]
   \]

- Overt movement is allowed because it is scopally informative

\( \checkmark \) Overt movement is allowed because it is scopally informative

- The post-movement derivation is ruled out for the same reason \( \textbf{31} \) is ruled out: \textit{some} is trapped in the scope of negation

- QUESTION: Why can’t \textit{some} escape the scope of negation in ‘Didn’t some people come’ as it does in \( \textbf{30} \)?

\( \times \text{Some} \)

(33) some man

(34) some people

(35) Expected distribution:
   a. Didn’t some people come. \( [*\neg \exists, \exists \rightarrow \neg] \)

- OBSERVATION: There appears to be a restriction on subject undergoing further movement above the \textit{Neg}_2 projection:
  - \( *A \ B \ t_A \ t_B \ t_A \)

- This is not entirely surprising. Such a movement would give us the same scopal relations we had in the non-inverted counterpart, ‘Some people didn’t come,’ undoing the effect of two movements:
  - \( A \ B \ t_A \)

(36) some people

- Likely due to more general principles of economy
Few

(37)  a. * Didn’t few people sleep.  (WTE)
    b. Few people didn’t sleep.  (WTE)

Because it is quantificational, we expect the same distribution as with other quantifiers:

(38) Expected distribution:
    a. Didn’t few people come.  [¬ \( \rightarrow \) few, *few \( \rightarrow \) ¬]
    b. Few people didn’t come.  [¬ \( \rightarrow \) few, few \( \rightarrow \) ¬]

(39) Attested distribution:
    a. * Didn’t few people come.
    b. Few people didn’t come.  [¬ \( \rightarrow \) few, *few \( \rightarrow \) ¬]

‘It’s not the case that few people slept.’
Missing: ‘Few people are such that they didn’t sleep.’

• Few is downward entailing, negation is also downward entailing

• Few resists specific interpretations (Beghelli & Stowell, 1997) which is why it must be interpreted in the scope of negation

• Unexpected results are due to more general problem with LFs in which few outscopes negation

• The pre-movement structures is ruled out

• Puzzle: Since only inverse scope is possible, we expect ‘Didn’t few people come’ to be possible according to our Modified Principle of Scope Economy

Summary:

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Figure 3: Overview of the analyses of negative auxiliary inversion

Strengths of analysis:

• Correlation between non-inverted and inverted sentences is reflected in the analysis

• Movement is restricted in a similar way to the restrictions on QR

Weaknesses of analysis:

• Requires us to posit a second projection for negation; this projection is semantically non-negative

• Contrary to what has been attested in the literature, negation in this analysis can raise at LF on its own. It is believed that its movement requires an independently raising element to bring negation along (For references, see Iatridou & Zeijlstra, to appear.)
4 Competing analyses

4.1 Subject reconstruction

(40) Subject reconstruction analysis:
   a. Syntax:

   ![Diagram of syntax]

   - Negation is interpreted in its base-generated position
   - The subject reconstructs to its base-generated position
   - Negation moves only at PF

   b. LF:

   ![Diagram of LF]

   - Negation moves in the syntax, is interpreted in its moved position
   - The subject is interpreted in its moved position

(41) Compare to our analysis:

   - Negation moves in the syntax, is interpreted in its moved position
   - The subject is interpreted in its moved position

4.1.1 Why doesn’t the subject reconstruct?

- Strong quantifiers like every do not reconstruct as readily or possibly ever
  ([Lasnik 1999, Lechner 2007, Szabolcsi 2010])

(42) Every coin is 3% likely to land tails. ([Lasnik 1999, p. 93])

- Lechner (2007) proposes a constraint on the basis of further evidence:
  Strong quantifiers like every cannot reconstruct below T°

Strengths of proposed analysis:

- Does not require us to posit that movement of negation is semantically active
- Non-strong quantifiers have only one way in which they can be in the scope of another operator: reconstruction
  - In our analysis, there are two ways in which non-strong quantifiers can be in the scope of another operator: (i) reconstruction, and (ii) the operator raising to a higher position, as it does with strong quantifiers.
Weakness for alternate analysis:

- If strong quantifiers are unable to reconstruct, negation would need to also raise at LF

4.2 Further movement of impossible subjects

(43) Further movement of impossible subjects analysis: (Foreman, 1999, 2001)

RefP

Jack

Ref

Neg

didn’t

Jack

T

Neg

...  

- Impossible subjects raise to a higher projection, a referential projection
- Different types of subjects occupy different subject positions

(44) Compare to our analysis:

*  

Neg

didn’t

Jack

T

Neg

...  

- Referential subjects are ruled out by Modified Principle of Scope Economy
- All subjects occupy canonical subject position
- Our analysis is based on Foreman’s analysis of NAI
- The empirical coverage is similar

Strengths of Foreman’s analysis:

- Certain types of quantificational subjects are biased towards a referential interpretation, the analysis captures these biases
- Accounting for the impossibility of some does not require further explanation

Weakness of proposed analysis:

- Have to say that expletives raise to the referential projection

(45) * Didn’t it rain. (WTE)

- Some spurious ambiguity: In the case in which the subjects raise, it is difficult to tell whether a Neg is present in the derivation. Its presence does not show effects in such cases.
4.3  Neg2 is logical negation

a. Analysis (Foreman 2001):  
```
Neg\textsuperscript{2}  
- n’t everybody T\textsuperscript{o} did  
```
- Negation merges high

b. Present analysis:
```
Neg\textsuperscript{2}  
everybody T\textsuperscript{o} did  
```
- Negation merges low

**Weaknesses of proposed analysis:**
- Does not reflect the correlation between non-inverted and inverted sentences
  - This makes it harder to restrict the subject from undergoing QR above the higher position
  - We want to restrict it from doing so, as we saw with *some*.
  - Sentential negation is typically fixed in languages; it is unusual to have restrictions on when sentential negation can be merged

4.4  Non-movement

a. Alternate analysis:
```
TP  
T\textsuperscript{o} didn’t everybody vP  
```
- Subject does not raise

b. Present analysis:
```
Neg\textsuperscript{2}  
TP  
T\textsuperscript{o} didn’t everybody vP  
```
- Subject raises to canonical position

**Strengths of proposed analysis:**
- Does not require us to stipulate the existence of a second negative projection which is not semantically active
- Cross-linguistically, some languages have sentential negation in a position that is structurally higher

**Non-movement analyses have been proposed by a number of authors**
Based on parallelism to existential expletive constructions

- **Non-movement analysis:**
  - TP
  - $\emptyset$
  - $T^o$ a
  - anybody ...

- **Existential expletive:**
  - TP
  - There
  - $T^o$
  - isn’t
  - anybody ...

**Strengths of analysis:**

- Correlation between non-inverted and inverted sentences is reflected in the analysis
- Assimilation to existential expletive constructions explains the definiteness restriction on subjects

**Weaknesses of analysis:**

- NAI has to be a different kind of existential expletive construction because the assimilation is not perfect:
  - Existentials in SE are incompatible with universally quantifying noun phrases

**Figure 4: Comparing the subject distribution**

**5 Not-constructions**

- Foreman (1999, 2001) extends his analysis to account for Not-constructions in SE

**Subject** | **Exist.** | **Neg. Inv.**
--- | --- | ---
Uniform distribution | a NP | ✓ | ✓
no NP | ✓ | ✓
the NP | ✗ | ✗
Jack | ✗ | ✗
Different distribution | every NP | ✗ | ✓

- Difficult to explain why it is that inversion only occurs in sentences containing sentential negation morpheme n’t (See Parrott, 2000).
5.1 Extending the present analysis

(51) Neg$_2$P

\[ \text{not} \quad \text{Neg}_2^o \quad \text{everybody} \]
\[ \text{T}^{o} \quad \text{[PAST]} \]
\[ \text{Neg}_1^o \quad \text{vP} \]

- Phrasal movement of negation; negation can skip heads
- Movement is subject to Modified Principle of Scope Economy

6 Licensing NPI and n-word subjects

- Need another mechanism to license NPI and n-word subjects

6.1 ✓NPI subjects

(52) a. Didn’t anybody go to the party.
   ‘Nobody went to the party.’

b. * Anybody didn’t go to the party.
   ‘Nobody went to the party.’

- Unlike the non-specific subjects discussed earlier, their non-inverted counterparts are not possible
- Another case of negation licensing needed in Roberts (2010) for licensing NPI subjects in yes-no questions:

(53) a. Which one of them doesn’t anybody like? (McCloskey, 1996)
   b. * Which one of them does anybody like? (McCloskey, 1996)

- Movement argued to occur by Roberts (2010):

(54) ... doesn’t anybody doesn’t like...

(55) Didn’t anybody didn’t go...

- Movement similar to T-to-C movement
- Once again, we see that movement cannot be as high as C because NAI constructions can be embedded with an overt complementizer:

(56) I hope that won’t anybody hit us. (AppE; Feagin, 1979)

- Movement to the same projection needed in negative concord constructions

6.2 ✓N-word subjects

(57) a. Didn’t nobody go to the party.
   ‘Nobody went to the party.’

b. * Nobody didn’t go to the party.
   ‘Nobody went to the party.’

- Non-inverted counterparts are not possible under a negative concord interpretation
- Can be embedded with an overt complementizer:

(58) She loves the fact (that) don’t nobody like her. (WTE; Foreman, 1999)

- Extend Alonso Ovalle and Guerzoni’s (2004) analysis for negative concord to WTE:
- N-words are non-negative existential quantifiers, equivalent to non-negative existential quantifiers at truth-conditional level
- Licensed by a null operator, in a position above TP but below CP

• Proposal:
  - In negative auxiliary inversion constructions, the position which houses the null operator can be licensed by overt head movement of the negative auxiliary

Summary:
- Negation raises to a position which has been independently argued for in the literature to account for both types of subjects
- Both NPI and n-word subjects are licensed by overt head movement of negation

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