

Scope in negative inversion constructions: Evidence from positive polarity item modals

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This paper presents and explores a scope puzzle in English Negative Inversion (NI) constructions. NI (e.g. *Under no circumstances will I sing*) involves I^0 -to- C^0 /Foc⁰ movement of an auxiliary and preposing of a negative expression, which could be one of a variety of (Strawson) downward-entailing (DE) expressions (Haegeman 1995, 2000, Rizzi 1996, Büring 2004, Collins & Postal 2014, a.o.). It has been argued that the preposed expression must take widest scope in a NI clause (Collins & Postal 2014). This is claimed to be necessary to account for the lack of inversion in (1a), where NEG scopes only over the preposed topic, in contrast to (1b), where it scopes over the whole clause (Büring 2004, Collins & Postal 2014)

(1) a. With no job, Kim would be happy.

b. With no job would Kim be happy. (Büring 2004: 6)

I present new data showing that this claim must be revised. Certain modals, such as deontic *should* and *must*, obligatorily take scope over sentential negation in uninverted sentences (Cormack & Smith 2002, Butler 2003, von Stechow & Iatridou 2007) and have been argued to be positive polarity items (PPIs) (Homer 2010; Iatridou & Zeijlstra 2013). If the preposed negative expression takes widest scope, we should therefore predict that these modals cannot appear in NI sentences. However, as (2-3) demonstrate, this is not the case. *Should* is a strong PPI that is not licensed in the scope of DE operators (e.g. *fewer than three* in (2)), while *must* is a weaker PPI; it is licensed in the scope of (Strawson) DE operators (e.g. *only* in (4)) as long as they are not antiadditive (AA) (e.g. *no* in (3)). Sentences (2-3) are unsurprisingly ungrammatical on the (b) readings, where the PPI modal takes scope under an antilicenser; what is surprising is that the grammatical wide scope reading for the modal (a) is available for both sentences.

(2) On fewer than three days this week should you water your lawn.

a. SHOULD_{DEO} > FEWER THAN THREE b. *FEWER THAN THREE > SHOULD_{DEO}

(3) To no student must you give the answers to the exam questions.

a. MUST_{DEO} > NEG b. *NEG > MUST_{DEO}

When the preposed expression is not an antilicenser for the PPI, both readings are available.

(4) Only then must you leave.

a. MUST_{DEO} > ONLY b. ONLY > MUST_{DEO}

Two explanations for the facts in (2-4) are possible: either the preposed negative expression reconstructs to be interpreted below the PPI modal at LF, or else the modal takes exceptional wide scope above the preposed expression in SpecCP/FocP. The first option is ruled out by the data in (5-7). These sentences show that, while the preposed expression does reconstruct for Binding Condition C (5), it does not reconstruct for scope (6-7). These conflicting reconstruction facts are interesting in their own right and will be discussed in greater detail.

(5) To no fan of Adele_i did she_{*i/j} give an autograph.

(6) Never have more than four students passed this exam.

a. *MORE THAN FOUR > NEVER b. NEVER > MORE THAN FOUR

(7) To no student does John always give an A.

a. *ALWAYS > NEG b. NEG > ALWAYS

The second option has precedent in the literature. Iatridou & Zeijlstra (2013) argue that PPI modals can undergo quantifier raising (QR) to escape the scope of a negative expression. They propose that all modals are generated below sentential negation and obligatorily reconstruct to this position unless the modal is a PPI; PPI modals that appear above NEG in the surface structure are interpreted in their surface position, while PPI modals that appear below NEG QR to escape its scope. If the modals in (2-4) achieve wide scope by QR, we can capture both their grammaticality and the facts in (5-7). In uninverted sentences, PPI modals do not have to QR very far to escape an antilicenser; in NI sentences they must QR a little higher, to a position above SpecCP/FocP. This is perfectly compatible with the preposed expression taking widest scope within its clause, as Collins & Postal (2014) claimed; the modal simply QRs to a position outside the clause.

However, this approach faces two problems. Firstly, it must explain why quantificational DPs, such as *more than four students* in (4), are unable to QR above the preposed negative expression in NI sentences as modals do. I argue that this can be attributed to independent differences between *more than four students* (a non-PPI phrase) and *must* (a PPI head). This account also predicts that other PPI modals will behave like deontic PPI modals in NI contexts; epistemic *must*, which is a PPI (Iatridou & Zeijlstra 2013), should be just as grammatical on a wide-scope reading with a preposed AA operator as its deontic counterpart is in (3), and just as grammatical on both readings with a preposed DE operator as deontic *must* is in (4). This prediction is not borne out. There are two patterns of responses to epistemic PPI modals in NI sentences, and neither is identical to the deontic pattern. Group A speakers accept epistemic PPI modals in a subset of the NI contexts where they accept deontic PPI modals; they accept epistemics on a wide scope reading but not on a narrow scope reading, regardless of whether the preposed expression is an antilicenser for that PPI (8) or not (9). Group B speakers reject epistemic PPI modals in all NI sentences regardless of the intended scope.

(8) To no student *must* Laura have given an A.

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| Group A: | a. $MUST_{EPI} > NO$ | b. $*NO > MUST_{EPI}$ |
| Group B: | a. $*MUST_{EPI} > NO$ | b. $*NO > MUST_{EPI}$ |

(9) To few students *must* Laura have given an F.

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|-----------------|------------------------|------------------------|
| Group A: | a. $MUST_{EPI} > FEW$ | b. $*FEW > MUST_{EPI}$ |
| Group B: | a. $*MUST_{EPI} > FEW$ | b. $*FEW > MUST_{EPI}$ |

I argue that for Group A the (b) readings are ruled out by the Epistemic Containment Principle (ECP) (von Stechow & Iatridou 2003), which bans moved quantifier phrases from binding their traces across epistemic modals at LF; thus, the contrast in their responses for deontic and epistemic PPI modals reduces to an independently motivated property of epistemic modals.

All that is left to explain is the behaviour of the Group B speakers. I explore several initially appealing lines of investigation and show that none of them can capture all of the data. For example, the data in (8-9) cannot be due to a general ban on epistemic modals undergoing subject-auxiliary inversion, because they readily do so in questions:

- (10) a. Where might he have gone?
 b. Must she have seen the accident?

Similarly, (8-9) cannot be due to a need for epistemic modals to be interpreted higher than deontics (Cinque 1999, Hacquard 2006, a.o.). If this were the relevant asymmetry, we would expect the opposite pattern; the need for epistemics to scope high should give them all the more reason to take wide scope in NI sentences. Alternatively, one might imagine that epistemic modals are incompatible with the information structure effect of NI. It has been suggested that NI involves verum focus (Leonetti & Escandell-Vidal 2009), which has been argued to yield epistemic implicatures. However, epistemic modals coexist with verum focus in (11).

- (11) a. Mustn't there be some kind of emergency off switch?
 b. The butler **MUST** be guilty!

A fourth possibility is that Group B speakers have a different version of the ECP. Perhaps, for these speakers, the ECP constrains not only representations but also derivations (see Preminger 2014); Group B's ECP' would include a ban on movement that creates a $*QP_i \dots modal_{EPI} \dots t_i$ configuration unless failure to move would lead to ungrammaticality (as in uninverted sentences like *Everyone must_{EPI} have t_i passed the exam*, where *everyone* has to move over the modal to get to SpecIP; this creates an ECP' violation that is resolved by having the modal take scope above the QP at LF); this would rule out NI with epistemic modals for these speakers. This, I argue, captures the contrast between epistemic and deontic PPI modals for these speakers as well as the data in (5-7) and (10-11). In this way, the intricate NI scope data discussed in this paper shows that we must revise what has been said about both the scopal properties of the NI construction itself and the scope-taking behaviour of epistemic modals.