A Phase-based Account of Sentence Negation in English: With Special Reference to the Negative Inversion Construction

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1. Introduction

It is a well-known fact of English that a preposed sentence-negative element triggers subject-auxiliary inversion, as illustrated in (1).

(1) a. Never have I seen so much rain. (Klima (1964: 300))
b. With no job would John be happy. (Liberman (1975: 77))
c. On no account will I go there. (Haegeman (1995: 180))

This phenomenon is called negative inversion, and there have been a number of studies on it in the generative literature (Klima (1964), Liberman (1975), and Haegeman (1995, 2000a, b) among others). One of the most promising approaches is proposed by Haegeman (1995, 2000a, b), who advocates the NEG-criterion as described in (2).

(2) NEG-criterion
a. A NEG-operator must be in a Spec-head configuration with an X°[NEG].
b. An X°[NEG] must be in a Spec-head configuration with a NEG-operator.
(Haegeman (1995: 106))

The criterion in (2) states that a sentence-negative element and a syntactic head with a NEG-feature must be in a Spec-head configuration with each other. Under this assumption, the negative inversion construction will be derived as shown in (3).

This is a revised version of the paper presented at the 66th Chubu-branch Meeting of the English Literary Society of Japan, held at Chukyo University on October 18, 2014. I would like to express my deep gratitude to my professors, Takeshi Omuro and Tomoyuki Tanaka. I am also grateful to my seniors and colleagues. This research was funded by JSPS Research Fellowships for Young Scientists (15J10175). Of course, all remaining errors are my own.

(3) [CP on no account C [TP I [T will[NEG]][VP go there $t_{\text{on no account}}$]]]

In (3), once the sentence-negative element moves to [Spec, CP], the T-head carrying a NEG-feature must move to C in order to enter into a Spec-head relation with it, in accordance with the NEG-criterion. Thus, the surface form is yielded where the order of the subject and the auxiliary is inverted.

However, the criterion in (2) seems to go no further than putting the fact in another way in terms of a formal/semantic feature, and therefore there remains a fundamental question why a sentence-negative element and a T-head must be in a Spec-head configuration to begin with. One might try to attribute this requirement to Agree with respect to a NEG-feature, along the lines of Kato (1997) (in his work, feature checking). However, within the recent framework of the Minimalist Program (Chomsky (2000, 2001, 2004, 2008, 2013)), a probe and its goal can Agree with each other even if they are not in a Spec-head configuration: in (3), the T-head could enter into an Agree relation with the sentence-negative element in their base positions, without inducing T-to-C movement. Thus, it is unclear what on earth the requirement imposed by the NEG-criterion comes from. Therefore, this paper attempts to deduce the effects of the NEG-criterion on negative inversion from the general architecture of the phase-based derivational model (Chomsky (2004, 2008, 2013)), within the recent Minimalist framework.

The organization of this paper is as follows. Section 2 lays out the phase-based derivational model, and presents the idea that a modification relation must be formed within a single transferred domain, along the lines of Tanaka (2011). Section 3 proposes that a sentence-negative element and the T-head of TP as its scope must be included in the same transferred domain, and demonstrates how major properties of negative inversion are derived under this proposal. Section 4 shows that the proposed analysis can be extended to non-inverted negative sentences. Section 5 offers concluding remarks.

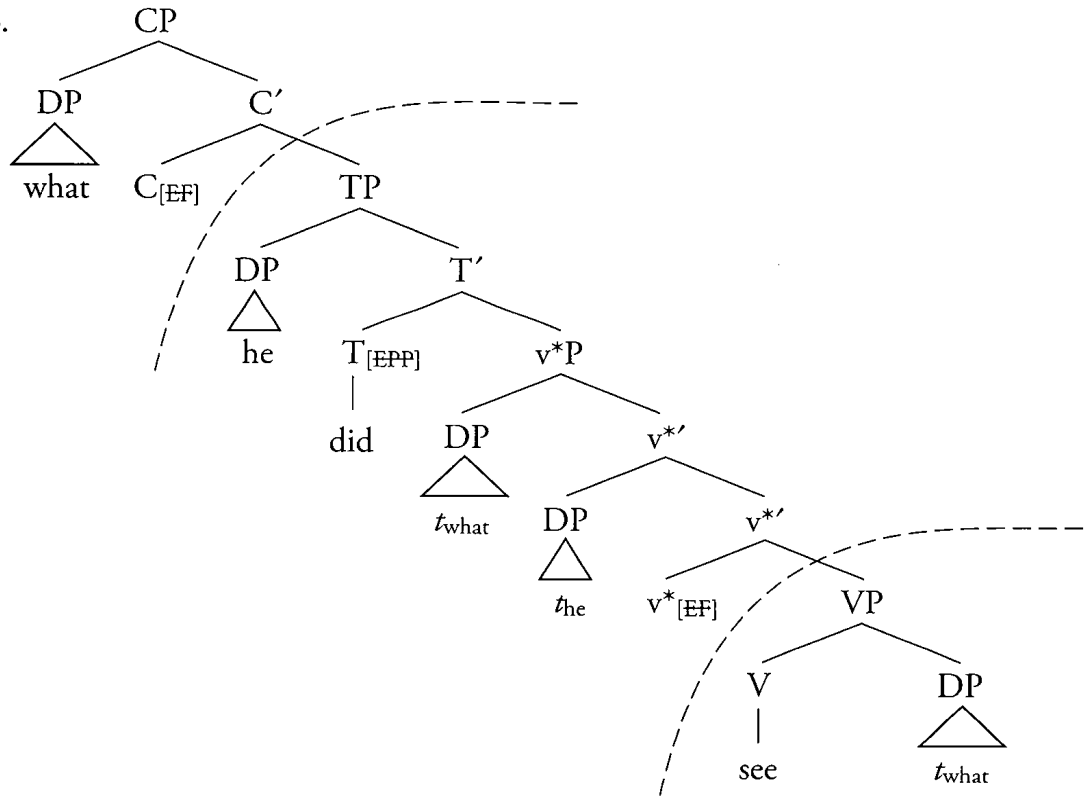
2. Theoretical Background

It has been traditionally assumed that the derivation of a sentence proceeds in a lump-sum way, where after all the syntactic operations have been applied, the whole sentence is sent off to the phonological and semantic components. On the other hand, Chomsky (2004, 2008, 2013) abandons this idea, and instead proposes the phase-based derivational model, in which syntactic structures are built up in units

of phase and their relevant parts are cyclically transferred to the phonological and semantic components. For example, the w*h*-question in (4a) will be derived as shown in (4b). (Note that V-to-v*/T-to-C movements are omitted in (4b) for expository purposes.)

(4) a. What did he see?

b.



In (4b), the subject DP is merged in [Spec, v*P], while the object DP is merged in the complement position of V. At the v*P phase, the edge feature on v* probes and attracts the object DP from the complement positon of V to the outer [Spec, v*P]. Once all the operations within the v*P phase have been completed, the domain of v*, i.e. VP is transferred to the phonological and semantic components. Then, at the CP phase, the EPP-feature on T probes and attracts the subject DP from [Spec, v*P] to [Spec, TP]. On the other hand, the edge feature on C probes and attracts the object DP from the outer [Spec, v*P] to [Spec, CP]. After these operations, the domain of C, i.e. TP is sent off to the phonological and semantic components. Thus, the syntactic structure of a sentence is cut into chunks, so that the amount of information to deal with in each step of the derivation can be vastly reduced, leading to computational efficiency.

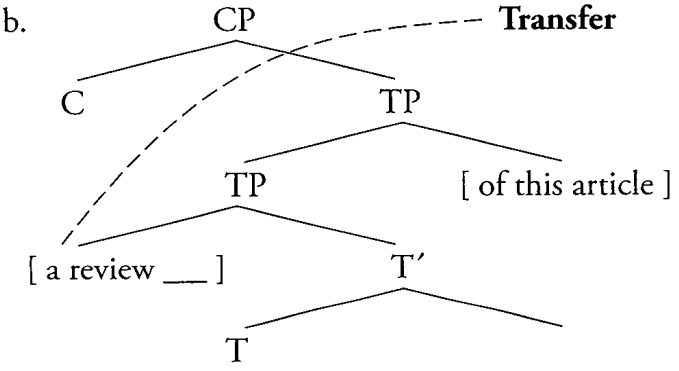
Now, if the discussion so far is on the right track, it follows that the semantic component receives the relevant information from the syntactic component in

units of the domain of a phase head that is transferred cyclically. Therefore, the computation in the semantic component is taken to proceed by a transferred domain. In this vein, Tanaka (2011) argues that a modifying element and a modified one must be within the same transferred domain, as stated in (5).

(5) The modification interpretation is formed within a single transferred domain.
(Tanaka (2011: 183))

This is illustrated by the example of extraposition from a subject DP in (6).

(6) a. A review came out yesterday of this article.

b. 

(cf. Tanaka (2011: 185))

In (6b), both of the extraposed PP and the subject DP fall within the domain of C, yielding the modification relation between the two elements, in accordance with (5). Hence, this derivation converges at the conceptual-intentional interface.[1]

To sum up this section, it has been argued within the phase-based derivational model that the computation in the semantic component proceeds by the transferred domain of a phase head that is transferred cyclically, with the consequence that a modifying element and a modified one must be within a single transferred domain.

3. A Phase-based Account of the Negative Inversion Construction

3.1. Preliminary Description

The important semantic relation for the discussion here is the scope of negation. Based on the above conclusion that the computation in the semantic component proceeds in units of a transferred domain, this paper proposes the following condition

[1] See Tanaka (2011) for further evidence for the assumption in (5) from adverbial modification and secondary predication.

on the computation of the scope of negation.

(7) The highest copy of a sentence-negative element and the T-head of TP as its scope must be within a single transferred domain.

The condition of (7) states that the highest copy of a sentence-negative element, which is a negative operator, and the T-head of TP, which is the scope of negation, must be transferred simultaneously to the semantic component. If both of them are within a single transferred domain, a scopal relation between them can be properly established, leading to a convergent derivation at the conceptual-intentional interface.[2] Two comments are in order with regard to the condition of (7). First, it can be seen as just a special case of (5); a sentence-negative element and its scope TP forms a sort of modification relation, in that the former is taken as a negator with the latter a kernel sentence modified by it. Second, the scope of negation is determined by the highest copy of a sentence-negative element.[3] This is supported by the fact in (8) that a negative subject DP resists reconstruction with respect to its scopal relation with a raising predicate. As observed by Lasnik (1999), this sentence has a reading where negation takes wide scope over *certain*, but it does not have a reading where negation is reconstructed under the scope of *certain*. (The lack of the latter reading is notated by the symbol #.)

(8) a. No one is certain to solve the problem. (neg > certain, #certain > neg) (Lasnik (1999: 205))
(not paraphrasable as 'It is certain that no one will solve the problem.')
b. [TP no one is certain [TP $t_{\text{no one}}$ to [v*P $t_{\text{no one}}$ solve the problem]]]

[2] An anonymous reviewer asks about the exact mechanism under which the scopal relation between a sentence-negative element and the T-head of TP as its scope is calculated in the semantic component. One of the possibilities would be that the two elements form a chain within the same transferred domain, so that the scope of negation can be determined (see Holmberg (2012), who argues that a negative element form a chain with a polarity head in the TP domain, whereby they share a polarity feature). Accordingly, if a sentence-negative element cannot form a chain with the T-head of TP as its scope within a single transferred domain, the scope of the former cannot be determined and therefore the derivation will be ruled out by Full Interpretation (cf. Chomsky (1986)), which requires that every element which appears in the conceptual-intentional interface must have an appropriate interpretation.

[3] One might wonder why the lower copies of a sentence-negative element are not involved in the computation of the scope of negation. This can be reliably attributed to the idea that interpretative effects including a scopal property, which is an A′-property, are determined by the final landing site (Rizzi (2006) and Chomsky (2008)). See Haegeman and Zanuttini (1991) and Haegeman (1995) for arguments that the lower copies of a sentence-negative element (in their work, its traces) do not qualify as an operator.

This suggests that only the highest copy of a sentence-negative element participates in the computation of the scope of negation, while its lower copies do not.[4]

Before going into the details of negative inversion, this paper introduces the assumption that FocP with a sentence-negative element in its specifier constitutes a phase under the Split-CP hypothesis (Rizzi (1997)), based on the fact that it is a negative operator occupying a scope position. The relevant definitions are given in (9).

(9) a. NEG-operator: a negative phrase in a quantificational scope position
b. Quantificational scope position: edge of CP/$v^{(*)}$P phase

According to (9), a NEG-operator is defined as a negative phrase in the edge of CP or $v^{(*)}$P phase.[5, 6] This will lead to a conceptual motivation for the above assumption, in the light of Chomsky's (2000) conception of phases as propositional constituents: as schematized in (10), a set of the sentence-negative element in [Spec, FocP] and TP as the complement of Foc encodes a complete negative proposition, in that the former qualifies as a NEG-operator which has scope over the propositional content denoted by the latter. (Apart from this conceptual argument, there is also empirical evidence for the phasehood of a negative FocP, as we will see below.)

(10) [$_{FocP}$ negative XP [$_{TP}$ .....]]
NEG-operator scope

The next section demonstrates how the proposed condition of (7) can account for the basic mechanism of negative inversion.

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[4] Unlike the case of negation, the computation of other modification relations may involve the lower copies of the moved element; in sentences like (i), the PP *of which car* has no choice but to establish a modification relation with the host DP in its base position, since its highest copy in [Spec, CP] and the host DP belong to different transferred domains (see Tanaka (2011: 197n26) for relevant discussion). This paper only concerns the scopal/modification relation between a sentence-negative element and its scope TP, leaving related issues like that discussed in this footnote for further research.

(i) Of which car was [the (driver, picture) __] awarded a prize? (Chomsky (2008: 147))

[5] This is based on the idea of May (1985), according to whom the edge of a verb phrase as well as a clause can provide a landing site for Quantifier Raising. See Butler (2005), who argues, independently of the context of negation, that phases are defined in terms of quantification; each phase corresponds to one domain of quantificational closure.

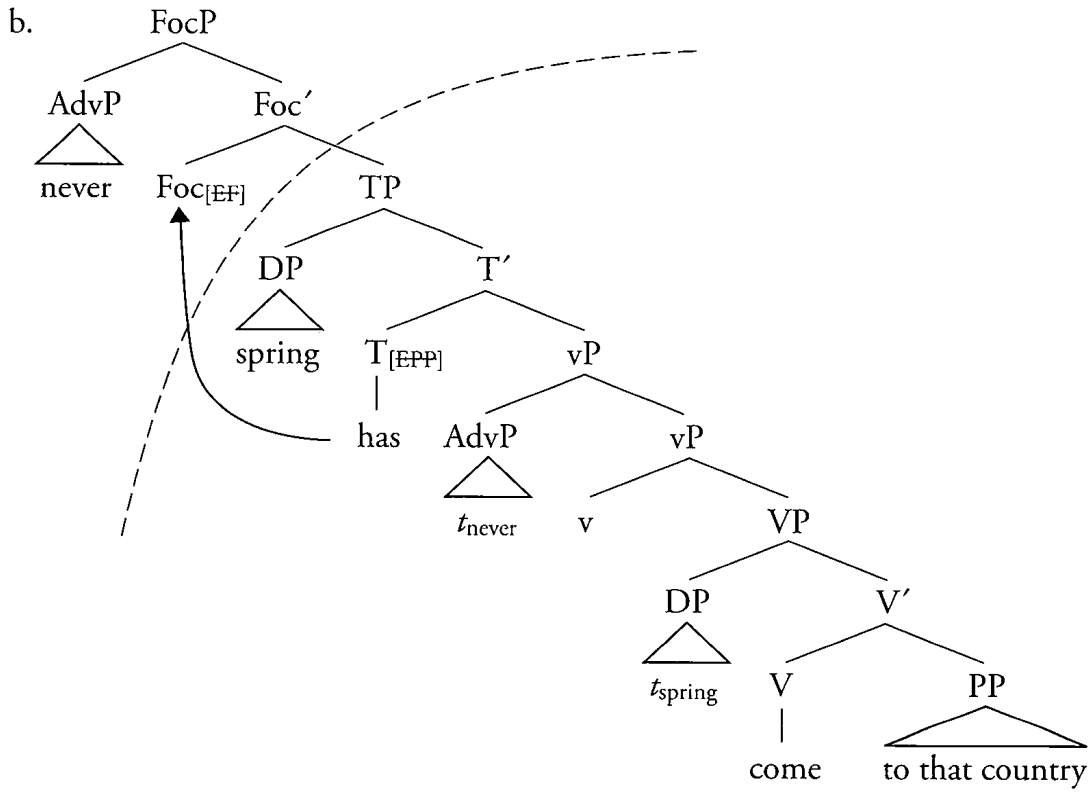
[6] Unaccusative and passive verb phrases are weak phases represented as vP (Chomsky (2001, 2004)), although the complement of v is not transferred at the vP level.

3.2. The Derivation of the Negative Inversion Construction

This paper proposes that the negative inversion construction is derived as in (11), along the lines of Haegeman and Guéron (1999), but adapted to the phase-based derivational model.[7] (In what follows, V-to-v$^{(*)}$ movement and FinP/ForceP are omitted if they are irrelevant for the present discussion.)

(11) a. Never has spring come to that country.

b.



In (11b), the negative adverb phrase is base-generated in the left-adjoined position of vP. At the FocP phase, the subject DP moves from [Spec, VP] to [Spec, TP] under probing by the EPP-feature on T. On the other hand, the negative adverb phrase moves from the left-adjoined position of vP to [Spec, FocP] under probing by the edge feature on Foc. Once all the syntactic operations within the FocP phase have been completed, the domain of Foc, i.e. TP will be transferred to the phonological and semantic components. Crucially, if the T-head remained in situ, the highest copy of the negative adverb phrase in [Spec, FocP] and the T-head would be transferred in

[7] This paper assumes that head movement applies in the syntactic component and feeds the computation in the semantic component. See Roberts (2010) for independent evidence that T-to-C movement carries a certain interpretative effect, which implies that it should apply before branching into the phonological component.

two different transferred domains. This would cause the derivation to crash, due to the failure to determine the scope of negation under the proposed condition of (7), as shown by the ungrammaticality of (12).

(12) *Never spring has come to that country.

Thus, the condition of (7) will provide us with the basic mechanism of negative inversion, where the T-head moves obligatorily to Foc if the sentence-negative element is preposed to [Spec, FocP], thereby deriving the effects of the NEG-criterion on negative inversion.[8, 9]

It is important to note that T-to-Foc movement is the only legitimate way to ensure the relationship between the highest copy of a sentence-negative element and its scope TP within a single transferred domain. It is impossible for the whole TP to move to [Spec, FocP], which has been already filled with the sentence-negative element. Furthermore, TP cannot move to Foc, because such movement violates the Uniformity Condition on Chains in (13).

(13) The Uniformity Condition on Chains
Only a head can be adjoined to a head; only a maximal projection can be merged as a specifier. (Matushansky (2006: 72))

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[8] An anonymous reviewer suggests under the strictly bottom-up derivational model that the negative adverb phrase should move to [Spec, FocP] after T-to-Foc movement in the derivation of (11a). Instead, this paper adopts the phase-based derivational model where operations within a single phase apply simultaneously, so that the well-formedness of the derivation is evaluated at the end of the phase (cf. Chomsky (2008)). Thus, there is no clear order between T-to-Foc movement and preposing of the negative adverb phrase to [Spec, FocP].

[9] Given that the condition of (7) is imposed after transferring to the semantic component, it cannot be a trigger for T-to-Foc movement which applies in the syntactic component, so a trigger for it needs to be postulated independently of (7), as suggested by an anonymous reviewer. A possible candidate would be an uninterpretable T feature (henceforth, *u*T) with the EPP property of the kind proposed by Pesetsky and Torrego (2001), which is assumed to be optionally assigned to Foc in this paper. Specifically, if an *u*T is assigned to Foc in (11), T will move to Foc in the syntactic component, with the consequence that (7) is satisfied, leading to a convergent derivation at the conceptual-intentional interface. On the other hand, if an *u*T were not assigned to Foc, T would stay in situ in the syntactic component, causing the derivation to crash at the conceptual-intentional interface because of the failure to satisfy (7). It should be stressed here that the condition of (7) is still necessary to capture the fact that negative inversion depends on the preposed sentence-negative element:

(i) a. *Has spring never come to that country.
b. *[$_{FocP}$ [$_{Foc}$ has] [$_{TP}$ spring t_{has} [$_{vP}$ never [$_{vP}$ come to that country]]]]

Although the *u*T on Foc is satisfied by the moved T-head in (i), this derivation will be ruled out by the condition of (7); the highest copy of *never* in the left-adjoined position of vP and the T-head in Foc belong to two different transferred domains. I thank an anonymous reviewer for bringing this point to my attention.

Thus, the T-head as a landmark of TP undergoes head movement to Foc, which serves to create the configuration required by the condition of (7).[10] This is consistent with the idea that head movement and phrasal movement are two sides of the same coin, and therefore they are in complementary distribution, i.e., head movement can apply where phrasal movement cannot, and vice versa (cf. Pesetsky and Torrego (2001) and Matushansky (2006)).

In sum, the obligatoriness of T-to-Foc movement can be attributed to the condition of (7), which follows as a consequence of the phase-based derivational model. In other words, we have started from the phase-based derivational model and reached the Spec-head configuration of a sentence-negative element and a T-head in the CP domain, i.e. the effects of the NEG-criterion on negative inversion.[11]

The next section shows that the analysis based on the proposed syntactic structure can provide a straightforward explanation for some major properties of the negative inversion construction, including the interaction of negative inversion with other kinds of A′-movement.

3.3. Explaining the Properties of the Negative Inversion Construction

3.3.1. Basic Properties

First, the negative inversion construction involves a sentence-negative element which functions as a focus. This is supported by the fact in (14) that it can serve as an answer to an interrogative sentence, which is the general property that distinguishes a focus denoting new information from a topic denoting old information (Rochemont (1986) and Culicover (1991)).

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[10] Independently of these considerations, Webelhuth (1992), Doherty (2000), and Chomsky (2001) provide arguments that TP cannot undergo any kinds of phrasal movement in general.

[11] As is well-known, a preposed constituent-negative element does not trigger subject-auxiliary inversion, as illustrated in (i).

(i) With no job, Mary would be happy. (Haegeman (2000b: 21))
(paraphrasable as 'Mary would be happy without a job.')

This is because the negative quantifier in (i) takes scope over PP, not TP, which renders T-to-C movement unnecessary under the present analysis (hence impossible by Last Resort). See Haegeman (2000b) for the analysis that a constituent-negative element moves to [Spec, TopP], not [Spec, FocP].

An anonymous reviewer points out that weakly negative adverbs such as *scarcely* do not obligatorily trigger subject-auxiliary inversion, as illustrated in (ii).

(ii) Scarcely anybody rejects suggestions. (Klima (1964: 273))

It is somewhat unclear whether the present analysis can extend to account for this fact, so this paper leaves this problem for further research, assuming for the present that this is an idiosyncratic property of weakly negative adverbs.

(14) A: Did you see anyone?
B: No, not a single person did I see. (Culicover (1991: 30))

This is straightforward under the present analysis, according to which the sentence-negative element moves to [Spec, FocP].

Second, it is observed from (15) that the preposed sentence-negative element gives rise to weak crossover effects.

(15) a. *No book$_i$ would I expect its$_i$ author to praise publicly.
(Koizumi (1995: 143))

b. *[$_{FocP}$ DP [$_{Foc}$ would][$_{TP}$ I [$_{v^*P}$ t_{DP} [$_{v^{*\prime}}$ v* [$_{VP}$ its author [$_{V\prime}$ expect [$_{TP}$ …]]]]]]]

(DP: no book)

Given the assumption that a bound variable pronoun must be A-bound by its antecedent (cf. Reinhart (1983)), the ungrammaticality of (15a) immediately follows because the subject DP of the infinitive containing the bound variable (which has moved to the matrix [Spec, VP]; see Chomsky (2008)) cannot be A-bound at any points of the derivation by its antecedent negative DP, which undergoes A′-movement through the outer [Spec, v*P] to [Spec, FocP], as shown in (15b).

Third, it has been pointed out since the 1970s (Hooper and Thomson (1973) and Emonds (1976)) that negative inversion is generally a root phenomenon, and therefore it cannot occur within an adverbial clause, as shown in (16).

(16) *If under no conditions may they leave the area, how can they pay their debt?
(Emonds (1976: 29))

Assuming with Haegeman (2006) that an adverbial clause typically involves a reduced CP domain lacking FocP (as well as ForceP and TopP), it cannot provide [Spec, FocP] as a landing site for the sentence-negative element, yielding the ungrammaticality of (16).[12]

[12] Note that the negative inversion construction can be embedded under an assertive predicate, as exemplified in (i).

(i) I exclaimed that never in my life had I seen such a crowd. (Hooper and Thompson (1973: 474))

Given the assumption that the complement clause of an assertive predicate has the same syntactic structure as a root clause (Hooper and Thompson (1973)), it follows that negative inversion can be embedded in (i), where the preposed sentence-negative element can occupy [Spec, FocP] as its appropriate landing site.

Fourth, negative inversion is clause-bound in that the sentence-negative element cannot move out of the clause which it negates, and its long-distance extraction results in semantic oddity (Sobin (2003)), as shown in (17a), with its structure in (17b) under the present analysis.

(17) a. ??Not a penny did Bill say that Mary remembered to bring. (Sobin (2003: 185))

b. ??[$_{FocP}$ DP [$_{Foc}$ did] [$_{TP}$ Bill [$_{v*P}$ t_{DP} [$_{v*'}$ v* [$_{VP}$ say [$_{ForceP}$ t_{DP} [$_{TP}$ …]]]]]]]

(DP: not a penny)

This fact is exactly what the present analysis predicts: in (17b), the highest copy of the negative DP in the matrix [Spec, FocP] and the T-head of the embedded TP as its scope are within two different transferred domains, with the result that the condition of (7) is violated, causing the derivation to crash.

3.3.2. Interaction of Negative Inversion with Other Kinds of A′-movement

First, let us consider how negative inversion interacts with *wh*-movement. As illustrated in (18) and (19), negative inversion is incompatible with *wh*-movement in a matrix clause, regardless of whether the *wh*-phrase is an argument as in (18) or an adjunct as in (19). Assuming with Rizzi (1997) that the landing site of a matrix *wh*-question is [Spec, FocP] and Foc is not recursive, the *wh*-phrase and the sentence-negative element compete for the same position, yielding the ungrammaticality of these sentences.

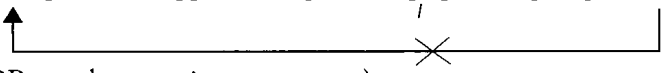
(18) a. *Which book under no circumstances would you read?
b. *Under no circumstances which book would you read?
(Haegeman and Guéron (1999: 226))

(19) a. *Why under no circumstances would you go there?
b. *Under no circumstances why would you go there?
(Haegeman and Guéron (1999: 226))

Turning to the cases where negative inversion occurs in embedded clauses, the clause led by the sentence-negative element constitutes an island, from which arguments cannot be extracted via *wh*-movement, either in direct questions as in (20) or indirect questions as in (21). (Notice that each of (20b) and (21b) represents the structure of the embedded clause.)

(20) a. ?*What did he say that under no circumstances would he do?
(Nakamura (1994: 165))

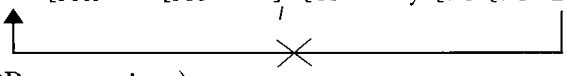
b. ?*... [ForceP DP [Force that][FocP PP [Foc did][TP he [v*P [v*P t_{DP} [v*′ ...]] t_{PP}]]]]



(DP: what, PP: under no circumstances)

(21) a. *John asked me who at no time had Mary taken money from.
(cf. Nakamura (1994: 163))

b. *... [ForceP DP [FocP PP [Foc had][TP Mary [v*P [v*P t_{DP} [v*′ ...]] t_{PP}]]]]



(DP: who, PP: at no time)

At the FocP phase, the edge feature on Foc probes and attracts the negative PP to [Spec, FocP], while the T-head undergoes head movement to Foc. Once all the operations by Foc have been applied, the domain of Foc, i.e. TP is transferred to the phonological and semantic components and hence becomes inaccessible to operations outside FocP, according to the Phase Impenetrability Condition (henceforth, PIC) in (22). Therefore, the edge feature on Force cannot probe and attract the *wh*-phrase in the outer [Spec, v*P] without violating the PIC, as shown in (20b) and (21b).[13]

(22) The Phase Impenetrability Condition
The domain of H is not accessible to operations outside HP; only H and its edge are accessible to such operations. (Chomsky (2001: 13))

On the other hand, it is interesting to note that negative inversion is compatible with *wh*-movement of adjuncts in embedded clauses, as exemplified in (23) and (24).

[13] This paper assumes the version of the PIC as cited in (22) (which is called a Strong PIC by Citko (2014)), according to which the domain of a phase head H becomes inaccessible as soon as HP is completed. On the other hand, Chomsky (2001) suggests another version of the PIC as formulated in (i) (which is called a Weak PIC by Citko), which dictates that the domain of H becomes inaccessible at the point the next phase ZP is constructed.

(i) The domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations. (Chomsky (2001: 14))

Note that the analysis proposed in the text will remain essentially unchanged, even if the Weak PIC is adopted. In the case of *wh*-movement (e.g. (20) and (21) in the text and (ib) in footnote 14), the domain of Foc is not accessible at the next phase ForceP. Given that TopP also constitutes a phase in the CP domain (Koike (2013)), the same holds for the case of topicalization as in (25). I thank an anonymous reviewer for clarifying this point.

(23) a. ?Lee wonders whether at no time at all would Robin volunteer.
(Culicover (1991: 12))

b. ?... [ForceP whether [FocP PP [Foc would]/[TP Robin [v*P volunteer t_{PP}]]]]
(PP: at no time at all)

(24) a. Lee wonders why in no way would Robin volunteer. (Culicover (1991: 12))

b. ... [ForceP why [FocP PP [Foc would]/[TP Robin [v*P volunteer t_{PP}]]]]
(PP: in no way)

This paper argues that the relevant *wh*-phrases can be directly merged in [Spec, ForceP], given that they are adjuncts and hence need not be merged within $v^{(*)}P$ as the thematic domain (see Rizzi (1990) for a similar analysis of *why*). Then, it is no surprise that these sentences are grammatical because there is no *wh*-movement across the sentence-negative element, as shown in (23b) and (24b). It is important to note in (24) that what Lee wants to know is the reason for Robin not to volunteer, i.e., *why* takes wide scope over the sentence-negative element. This lends support to the assumption that *why* is base-generated outside TP, which is the scope of the sentence-negative element according to the present analysis.[14]

Next, let us consider the interaction of negative inversion with topicalization. It is shown in (25) that negative inversion is incompatible with topicalization of an argument. Once the derivation reaches the FocP phase, the domain of Foc, i.e. TP is sent off to the phonological and semantic components. Therefore, the edge feature on

[14] In contrast, negative inversion constitutes an island for *wh*-movement of an adjunct when the *wh*-phrase moves out of the embedded clause in which it originates, as demonstrated by the fact in (i) that the sentence-initial *wh*-phrase can be only construed as an adjunct of the matrix clause.

(i) a. How did you say that on no account would they travel to France?
(Haegeman (2000b: 37))

b. *... [ForceP how [Force that][FocP on no account [Foc would]/[TP ... t_{how}]]]

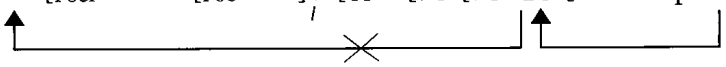
c. [Force [FocP how [Foc did][TP you [v*P say t_{how} [ForceP ...]]]]]

This fact also follows from the present analysis. As shown in (ib), the edge feature on the embedded Force cannot probe and attract the *wh*-phrase within the embedded TP, which has been already transferred at the FocP phase, without violating the PIC. (Note that in this case, *how* asks about the way to travel to France (e.g. *by plane, by ship, by train* and so on), and the whole embedded clause containing it is negated by the negative PP. Therefore, *how* is forced to be base-generated within TP as the scope of the negative PP.) On the other hand, the edge feature on the matrix Foc can have access to the *wh*-phrase base-generated within the matrix TP, which will not be transferred until all the syntactic operations within the FocP phase have been completed, as shown in (ic). Thus, the derivation in (ic) is the only grammatical way to yield the surface form of (ia), and therefore the *wh*-phrase can only modify the matrix clause.

Top, which is merged above FocP, cannot probe and attract the topic DP within TP without violating the PIC, as shown in (25b).

(25) a. *These steps never did I sweep with a broom. (Emonds (1976: 41))

b. *[$_{TopP}$ DP [$_{FocP}$ never [$_{Foc}$ did] [$_{TP}$ I [$_{v*P}$ [$_{v*P}$ t_{DP} [$_{v*'}$ sweep t_{DP}]] adjunct]]]]



(DP: these steps, adjunct: with a broom)

On the other hand, it is noteworthy that negative inversion can occur with a topicalized sentential adjunct, as illustrated in (26) (see Haegeman and Guéron (1999) for detailed discussion of the contrast between (25) and (26)).

(26) a. During the holidays, on no account will I write another paper.
(Haegeman and Guéron (1999: 226))

b. [$_{TopP}$ during the holidays [$_{FocP}$ PP [$_{Foc}$ will] [$_{TP}$ I [$_{v*P}$ write another paper t_{PP}]]]]
(PP: on no account)

Assuming that such a sentential adjunct can be base-generated in sentence-initial position, i.e. [Spec, TopP] as a scene-setting phrase (cf. Haegeman (2000a)), the grammaticality of (26) is accounted for because it does not involve extraction across the sentence-negative element, as shown in (26b).

To sum up, this section has proposed the basic mechanism of negative inversion built upon the condition of (7), and shown that the proposed analysis can account for a number of properties of the negative inversion construction, including its interaction with other kinds of A′-movement.

4. Non-inverted Negative Sentences

This section attempts to extend the proposed analysis based on the condition of (7) to non-inverted negative sentences, with the aim of providing a unified explanation for sentence negation.

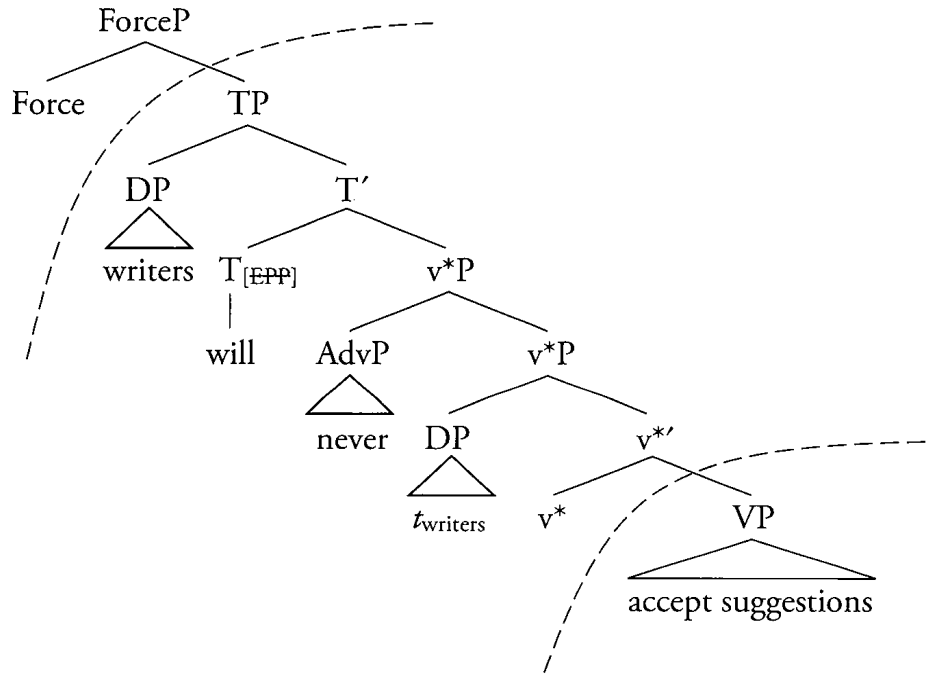
4.1. Negative Phrases as Adjuncts

It should be noticed that negative inversion is triggered only when a sentence-negative element is fronted to sentence-initial position. To put it another way, if a sentence-negative element stays in its base position, subject-auxiliary

inversion does not apply, as shown in the following examples with adjunct negative phrases.

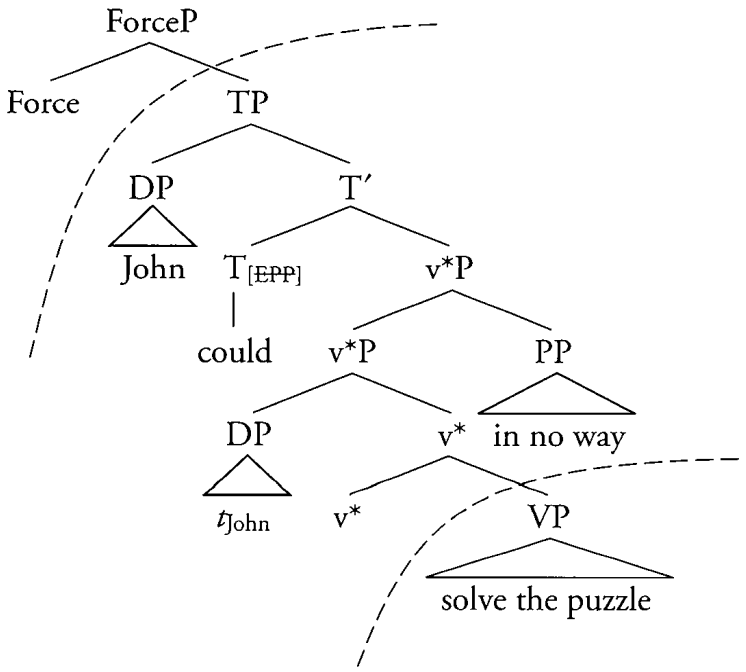
(27) a. Writers will never accept suggestions.

b.



(28) a. John could solve the puzzle in no way.

b.



As is clear from (27b) and (28b), both of the highest copy of the sentence-negative

element and the T-head of TP as its scope fall within a single transferred domain, as it stands. Therefore, it is unnecessary for the T-head to undergo head movement to the CP domain and hence such movement is blocked under Last Resort, yielding the non-inverted word order of (27a) and (28a).[15, 16]

This suggests that a sentence-negative element and a T-head do not always need to be in a Spec-head configuration with each other. It is just in this point that the present analysis differs from the analysis based on the NEG-criterion, which requires that a NEG-operator and a syntactic head with a NEG-feature be in a Spec-head configuration with each other, as mentioned in section 1 (see Haegeman (1995: 287) for her analysis of examples like (28) in terms of a null expletive operator).

4.2. Negative Phrases as Arguments

Next, let us consider the cases in which a sentence-negative element occurs as a subject DP as in (29a) or an object DP as in (29b).

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[15] Note that subject-auxiliary inversion is induced by a factor independent of negation in an interrogative with a negative adverb phrase like (ia).

(i) a. Will writers never accept suggestions?

b. [$_{FocP}$ Op never [$_{Foc}$ will] [$_{TP}$ writers [$_{v*P}$ never [$_{v*P}$ v* [$_{VP}$ accept suggestions]]]]]

Assuming with Grimshaw (1997) that *yes-no* questions involve a null interrogative operator, it might be suggested that *never* covertly moves to the CP domain, as shown in (ib), in a parallel way the lower *wh*-phrase does in a multiple *wh*-question (see section 4.2.2 below; see also Higginbotham and May (1981) for their idea of absorption whereby two operators are amalgamated into a single coordinate operator under structural adjacency). This results in the highest copy of *never* and the T-head raised to Foc being contained in a single transferred domain, satisfying the condition of (7). However, this is a rough idea, so there remain many problems, in particular what exact mechanism is behind T-to-Foc movement in direct questions, which is beyond the scope of this paper.

[16] An anonymous reviewer points out the fact that *never* can also occur before a finite auxiliary, as shown in (ia), with its structure in (ib) under the present analysis.

(i) a. Spring never has come to that country.

b. [$_{ForceP}$ Force [$_{TP}$ spring [$_{T'}$ never [$_{T'}$ [$_{T}$ has][$_{vP}$ come to that country]]]]]

On the assumption that there is an extra position for adverbs between a subject DP and T (cf. Pollock (1989: 370n8)), the negative adverb phrase, which is presumably adjoined to T′ , can precede the auxiliary occupying T in the structure of (ib), where its highest copy and the T-head of TP as its scope are transferred simultaneously, leading to the grammaticality of (ia).

Incidentally, examples of sentence negation with *not* like (ii) are explained in roughly the same way as (27): *not* is base-generated in the head or specifier of NegP located between TP and v$^{(*)}$P (cf. Bobaljik (2002)), and hence falls within the same transferred domain as the T-head of TP as its scope, regardless of whether NegP constitutes a phase.

(ii) a. John did not bake cakes.

b. [$_{ForceP}$ Force [$_{TP}$ John [$_{T}$ did][$_{NegP}$ not [$_{v*P}$ v* [$_{VP}$ bake cakes]]]]]

(29) a. No one could solve the puzzle.
b. John answered nothing.

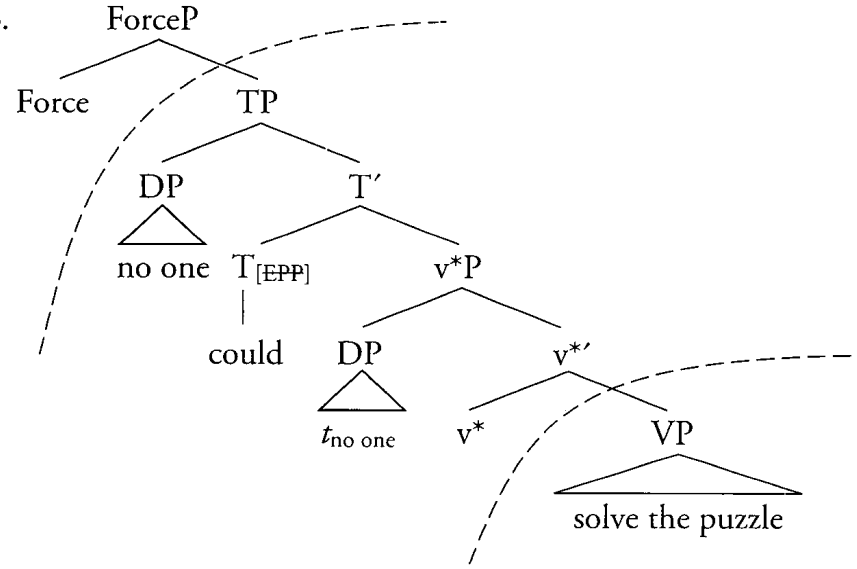
Such negative DPs behave very much like adjunct negative phrases with respect to the tag-question diagnosis of sentence negation, as shown below (see Klima (1964) and Huddleston (1984) for further evidence that examples like (29) express sentence negation). Therefore, there is no doubt that they are also involved in the computation of the scope of negation.

(30) Writers will never accept suggestions, will they? (Klima (1964: 263))
(31) a. No one could solve the puzzle, could he?
b. John answered nothing, did he?

4.2.1. Negative Subject DPs

The present analysis can easily account for a sentence with a negative subject DP.

(32) a. No one could solve the puzzle.
b.



In (32b), the highest copy of the negative subject DP and the T-head are contained within the same transferred domain.[17] Therefore, sentences like (32a) satisfy the

[17] Following up Haegeman (1995), [Spec, TP] can be defined as having both A- and A′-properties including a scopal property. See also Chomsky (2013: 47) for the analysis that subject *wh*-questions have the Q-feature of C inherited to T, so that [Spec, TP] serves as a criterial position. If this is correct, the left edge of TP would be included in the list of quantificational scope positions in the definition of (9b).

condition of (7) and are properly read off as sentence negation, yielding a convergent derivation.

4.2.2. Negative Object DPs

Given the discussion so far, one might wonder how the present analysis can deal with a sentence with a negative object DP.

(33) a. John answered nothing.
b. [ForceP Force [TP John T [v*P v* [VP answered nothing]]]]

As shown in (33b), once all the operations by v* have been completed at the v*P phase, the complement of v*, i.e. VP is transferred to the phonological and semantic components. Importantly, the sentence-negative element and the T-head belong to two different transferred domains, and hence this derivation would be ruled out as a violation of the condition of (7), contrary to the fact that (33a) is undoubtedly grammatical. However, it turns out that this does not constitute a counterexample to the present analysis, if we assume covert movement of the kind proposed by Chomsky (2004).

Chomsky (2004) argues that internal Merge can apply even after Spell-out; an element undergoes so-called covert movement without pied-piping its phonological features.[18] Under this idea, let us consider the following example of a multiple *wh*-question. (In what follows, the relevant copy lacking phonological features is notated in an outlined font.)

(34) a. Who bought what?
b. [CP who what [TP t_{who} bought what]] (cf. Nissenbaum (2000: 203))

In (34b), the *wh*-phrase *what* is overtly spelled out in postverbal positon, while its copy without phonological features is adjoined to the *wh*-phrase in [Spec, CP] (or moves to the lower [Spec, CP]), in a parallel way languages like Bulgarian overtly

[18] The idea of covert movement can be implemented in at least two ways within the Minimalist framework. One is that after Spell-out, an element moves without pied-piping its phonological features (Nissenbaum (2000), Chomsky (2004), and Akahane (2008) among others). The other is that before Spell-out, an element moves with its phonological features, but its lower copy is pronounced in the phonological component (Pesetsky (2000), Bobaljik (2002), and Arano (2014) among others). In this paper, the former analysis is adopted for expository purposes.

create the configuration of multiple *wh*-fronting (cf. Chomsky (1995), Nissenbaum (2000), and Richards (2001) among others). Subsequently, this derivation is handed over to the conceptual-intentional interface, where the *wh*-phrase *what* can be properly interpreted as an interrogative operator taking scope over the whole sentence. Behind this argument is the intuition that a *wh*-phrase in situ is also an intrinsic operator, and hence it must move to the CP domain to satisfy its scopal property (Chomsky (1995: 199)). The above discussion can be summarized in (35).

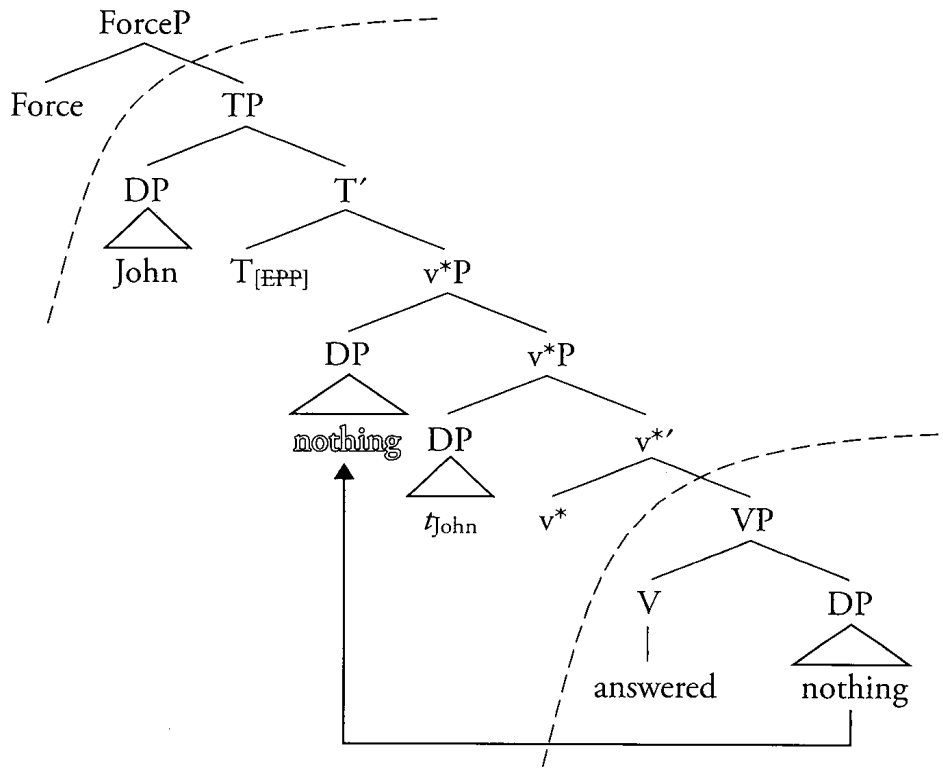
(35) An operator must be in a scope positon by the time it reaches the conceptual-intentional interface.

If an operator does not occupy its appropriate scope position, it could not be identified as an operator, so that the sentence containing it would be deviant at the conceptual-intentional interface (Chomsky (2008: 151)).

Given that a sentence-negative element is an intrinsic operator (cf. Partee (1993)), it follows that it must be in a scope position in order to fulfill its function as a negative operator, in accordance with (35). With this in mind, let us return to the negative sentence in (33), repeated here with its revised structure under the present analysis.

(36) a. John answered nothing.

b.



At the v*P phase, the negative object DP covertly moves to the left edge of v*P, which is a closer sentence-negative scope position than that of the CP domain.[19, 20] As a consequence of covert movement, both of the highest copy of the negative object DP, which is in the left edge of v*P, and the T-head fall within the same transferred domain, i.e. TP. Thus, the scopal relation of the two elements can be properly established under the condition of (7), leading to a convergent derivation.

There is a piece of independent evidence for the assumption that a negative object DP covertly moves to the left edge of v*P.

(37) a. The DA cross-examined none of the witnesses during any of the trials.
(Lasnik (2001: 104))

b. ... [$_{v*P}$ 𝔻ℙ [$_{v*P}$ $t_{\text{the DA}}$ v* [$_{VP}$ [$_{VP}$ cross-examined DP] adjunct]]]

(DP: none of the witnesses, adjunct: during any of the trials)

[19] According to Fox (2000), Shortest Move dictates that Quantifier Raising move a quantified expression to the closest position in which it can be interpreted: in the case of a quantified object DP, it is the edge of a verb phrase (Fox (2000: 24)). See also Akahane (2008) for the analysis that Quantifier Raising of an object is driven by a quantificational feature on v*.

An anonymous reviewer asks in what case an element undergoes covert movement instead of overt movement (equivalently, its lower copy is pronounced rather than its highest copy). It has been claimed in the literature that the pronunciation of the lower copy is sanctioned when the pronunciation of the highest copy is prohibited by some phonological requirement (Bobaljik (2002), Bošković and Nunes (2007), and Arano (2014)). In the case at hand, if the moved object DP were to be pronounced in the left edge of v*P, it would intervene between the affix on T and the verbal stem raised to v*, violating the phonological adjacency requirement between them. On the other hand, the latter requirement will be satisfied if its highest copy is phonologically deleted and instead its lower copy is pronounced, as shown in (36). See Bošković and Nunes (2007) for a similar analysis of covert object shift across a main verb in Scandinavian languages in terms of the pronunciation of the lower copy.

[20] Apart from the theoretical consideration of closeness, there is convincing empirical evidence that a sentence-negative element does not necessarily move to the CP domain: a negative object DP cannot license a negative polarity item in subject position, as shown in (i).

(i) *Anyone ate nothing. (Cormack and Smith (2000: 403))

If the negative object DP were to move to the CP domain covertly, the negative polarity item in [Spec, TP] could be c-commanded by it, and hence this sentence should be grammatical, given the standard assumption that negative polarity items must be licensed by c-commanding affective constituents including negatives (cf. Klima (1964)). On the other hand, the present analysis can easily account for the ungrammaticality of (i): the negative polarity item in [Spec, TP] is not c-commanded by the negative object DP as its licenser, which stays within the v*P domain. Therefore, we can safely conclude that a negative object DP remains within the v*P domain unless it is overtly fronted to sentence-initial position, as illustrated in (ii).

(ii) Nothing did anyone eat. (Cormack and Smith (2000: 403))

Note that the licensing of negative polarity items by their c-commanding affective constituents is independent of the condition of (7). See Kato (2002) for the analysis that negative polarity items are licensed via their c-command relation and feature sharing with affective constituents.

As shown in (37), a negative object DP can license a negative polarity item within a VP adjunct. The grammaticality of (37a) immediately follows under the present analysis: in (37b), the negative object DP covertly moves to the left edge of v*P as a scope position, from which it can properly c-command the negative polarity item (see footnote 20 for the licensing condition on negative polarity items).

To the extent that the present analysis based on the condition of (7) successfully accounts for non-inverted negative sentences, it will provide a unified explanation for sentence negation which covers both negative inversion constructions and non-inverted negative sentences.

5. Concluding Remarks

This paper has provided a phase-based explanation for sentence negation in English, especially shedding light on the basic mechanism of negative inversion. It has been argued that the highest copy of a sentence-negative element and the T-head of TP as its scope must be included in the same transferred domain, because a modification relation only holds within a single transferred domain. Under this idea, if a sentence-negative element is preposed to [Spec, FocP], the T-head must undergo movement to Foc, thereby deriving the effects of the NEG-criterion on negative inversion. The proposed syntactic structure allows us to account for a number of properties of the negative inversion construction in a principled way. Then, it has been demonstrated that the present analysis can also accommodate non-inverted negative sentences, which leads to a unified explanation for sentence negation covering both negative inversion constructions and non-inverted negative sentences.

Nagoya University (Doctoral Student) Received August 23, 2015

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