On Negative Intervention Effects

Hitoshi Akahane

1. Introduction

Cross-linguistically, we observe that sentence negation causes intervention effects. Inner islands which are exemplified by (1) are the most well-known cases:

(1) a. *This mist can't last, as$_i$ Morpho and Hoppy don't realize t_i.
(Ross (1984: 258))

b. *How$_i$ didn't you behave t_i? (Cinque (1990: 1))

In (1a), the adverbial operator *as* cannot move to the clause-initial position (= [Spec, C]) from the base position indicated by t_i if the negative operator *not/n't* is involved. The same holds for the movement of *how* in (1b). Although (1b) (and perhaps (1a)) could be grammatical if the adverbial operator is construed as scoping over negation, the reading we are concerned with is the one in which the negation outscopes the adverbial operator.

Not only in overt operator-movement as seen in (1) but also in covert operations which are supposed to be necessary for quantifier scope does negation count as an intervener which causes intervention effects. This can be observed for instance in the following French single in-situ wh-question:

(2) ?*Jean ne mange pas quoi? (Bošković (2000: 66))
Jean NEG eats NEG what
'What doesn't Jean eat?'

In (2), the in-situ wh *quoi* cannot take the whole sentence in its scope for negation

intervenes. As a result, it cannot be a grammatical (non-echo) wh-question.

The aim of this paper is to provide a syntactic account of negative intervention phenomena, especially covert ones such as (2), along the lines of the current Minimalist Program (MP) developed by Chomsky (2000) and subsequent work.[1] In order to capture scope properties of quantificational elements, I will assume with Nissenbaum (2000) and Chomsky (2004) that Move may either proceed or succeed Spell-Out. I will argue that quantifier scope should be defined in terms of phase. Adopting Chomsky's hypothesis that CP and *v*P are always phases to which syntactic operations are strictly confined,[2] I will propose that the phrase which hosts sentence negation, namely, Neg(ative)P should be also identified as a phase. This will be quite crucial when we discuss negative intervention effects.

The organization of this paper is as follows. In section 2, I will review some quantifier scope phenomena and examine how to handle negative intervention effects which are observed in them. In section 3, I will show NegP should be identified as a phase from semantic and phonological facts. Section 4 will be devoted to the discussion of a phase-theoretic account of quantifier scope. I will argue that quantifier raising (QR), whether before or after Spell-Out, should apply cyclically just like other operations but it should not apply successively. Major quantifier scope facts will be accommodated. Utilizing devices proposed, section 5 will examine two negative intervention phenomena: single in-situ wh-questions in French and wh-scope marking constructions in German. Section 6 is the conclusion.

2. Quantifier Scope and Negative Intervention

Sentences such as (3) and (4) are typical examples which involve scope interactions between two quantified phrases:

(3) Someone loves everyone. ($\exists > \forall$, $\forall > \exists$)

(4) What did John say that everyone saw? (wh > ∀, ∀ > wh)

In (3), the subject DP with the existential quantifier (∃) interacts with the object DP with the universal quantifier (∀), which results in a two-way ambiguous sentence. That is, either ∃ or ∀ has wider scope than the other. Likewise, in (4), the wh *what* and the quantified phrase *everyone* interact with each other and give rise to two possible interpretations: either wh or ∀ outscopes the other. Since the work by May (1977), QR has been broadly accepted in order to comprehend quantifier scope. QR is originally considered to adjoin quantified phrases to S (= TP). We thus obtain (5a) and (5b) from (3) as a consequence of QR:

(5) a. [TP ∃*x* [TP ∀*y* [TP *x* loves *y*]]]

b. [TP ∀*y* [TP ∃*y* [TP *x* loves *y*]]]

In the early MP framework, Hornstein (1995), Pica and Snyder (1995), Kitahara (1996) and many others attempt to reduce QR to A-movement because QR is clause-bounded. Under A-movement analyses, the quantified subject DP in the base position (the lower [Spec, *v*] in (6)) can interact with the quantified object DP in the Case-checking position (the upper [Spec, *v*] in (6) or the Spec of some functional category which contains VP):

(6) [TP *someone* T [*v*P (∀) *t*∃ *v* [VP loves *everyone*]]]

The A-movement approach to quantifier scope encounters some difficulties, however. For example, it seems implausible for a quantified DP which is the complement of a preposition to move to [Spec, *v*] for Case checking (see Hornstein (1995)). In addition, the A-movement approach cannot be compatible with the current MP framework because movement is not necessary for (accusative) Case checking once we accept Case valuation through agreement: the object DP has only to stay in the base position and enter into an agreement relation with *v* to get Case.

Generally, A-movement is not interfered with by negation. Observe the following example:

(7) John does not love everyone.

In (7), the subject DP *John* is supposed to move from [Spec, *v*] to [Spec, T] crossing Neg (*n't*):

(8) [TP John$_i$ T [NegP Neg [vP t_i v [VP love everyone]]]]

The negative counterparts of (3) and (4) on the other hand show intervention effects:

(9) Someone does not love everyone. ($\exists > \forall$, $\forall \not> \exists$)

(Aoun and Li (1993: 168))

(10) What did you say that everyone didn't buy? (wh > $\forall$, $\forall \not>$ wh)

(Hornstein (1995: 117))

According to Aoun and Li (1993), (9) is an unambiguous sentence in that $\exists$ has wider scope than $\forall$ but not the other way around. Similarly, (10) is not ambiguous and it only has the interpretation that wh takes scope over $\forall$. Intriguingly, Hornstein (1995: 243n. 44) mentions the possibility that [Spec, Neg] has both A- and A′-properties. He conjectures that in sentences such as (9), PRO is situated in [Spec, *v*] and it is controlled by the subject which is base-generated in [Spec, T]:

(11) [TP someone$_i$ does [NegP not [vP PRO$_i$ [VP love everyone]]]]

In the structure (11), even if *everyone* is raised to [Spec, *v*] for Case checking, *someone* is still higher than *everyone*. Hence, the inverse-scope reading ($\forall > \exists$) does not obtain. Although the contradiction between (7) and (9) seems to be resolved, there remains a question of why negative sentences should be distinguished from affirmative counterparts this way. There is no reason that affirmative sentences such as (3) cannot have a subject-controlled PRO as in (12):

(12) [TP someone$_i$ T [vP PRO$_i$ [VP love everyone]]]

In more recent work by Reinhart (1998), Fox (2000), Nissembaum (2000),

Cecchetto (2004) and others, QR is maintained rather than abandoned. These authors propose that QR should be motivated by the Interface Economy Condition:

(13) Interface Economy Condition (IEC)

Optional operation can apply only if they have an effect on outcome.

(Chomsky (2000: 109; 2001: 34))

On the basis of the IEC, QR must make some difference to the interpretation of quantified DPs (changing scope relations, repairing type mismatch[3], etc.), though QR itself is an optional operation.

Chomsky (2004) adopts the idea from Nissenbaum (2000) that when Move precedes Spell-Out it is overt movement, and when Move succeeds Spell-Out it is covert movement. Traditionally, QR has been considered to fall under the latter. If QR is really an instance of movement, it should obey the same restrictions as other (overt) movement. One of such restrictions is a cyclicity condition called the Phase Impenetrability Condition (PIC), which reduces operative complexity in syntactic derivation:

(14) Phase Impenetrability Condition

For [$_{ZP}$ Z ... [$_{HP}$ α [H YP]]] with ZP the smallest strong phase, the domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations. (Chomsky (2001: 14))

Chomsky identifies only CP and *v*P as (strong) phases. In principle, no operation in a phase can access the previous phase. Thus, within each phase, application of all syntactic operations must be completed.[4] Covert movement is discussed in the context of the phase theory by Nissenbaum (2000) and Cecchetto (2004) among others. In particular, Cecchetto argues that QR is subject to the PIC. While Cecchetto assumes with Chomsky that only CP and *v*P are phases, he revises the definition of the PIC:

(15) [N]o single instance of movement can cross two (or more) heads that

belong to the set {*v*, C}. (Cecchetto (2004: 361))

Following Nissenbaum (2000), Cecchetto presupposes that covert operations can apply in a countercyclic fashion, and this requires the above revision of the PIC.

With the revised PIC, Cecchetto explicates that a quantified DP in an embedded clause cannot have scope over the matrix clause in examples such as (16):

(16) A technician said that John inspected every plane.

Cecchetto hypothesizes that QR raises quantified DPs to TP, and for the purpose of fixing the infinite regress problem in antecedent contained deletion configurations, *v*P can also be an adjunction site for QR. In (16), *every plane* undergoes QR and is adjoined to the embedded TP. It has to further raise to the matrix TP so it can outscope *a technician* in the matrix [Spec, T]. But this is not feasible because the two intervening phase heads (the embedded C and the matrix *v*) are crossed:

(17) *[TP every plane$_i$ [TP a technician [$_v$P $\boxed{v}$ said [CP $\boxed{C}$ [TP t_i [TP John [$_v$P $\boxed{v}$ inspected t_i]]]]]]]

Hence, the clause-boundedness of QR is captured.

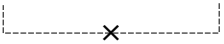
Cecchetto's account does not explain the negative intervention effect in (9), however. As illustrated below, (15) is not violated:

(18) [TP everyone$_i$ [TP someone does [NegP not [$_v$P $\boxed{v}$ love t_i]]]]

If QR can freely raise quantified DPs to TP insofar as (13) and (15) are complied with, we have no account for the impossibility of the inverse-scope interpretation of (9). One might wonder if quantifier scope and negative intervention effects are amenable to the phase theory. Within a pre-Minimalist framework, Rizzi (1990) argues that a negative operator is placed in an A′-Spec and constitutes a Relativized-Minimality (RM) barrier against antecedent-government by a distant A′-operator, as

schematized in (19):

(19) [XP *Op*i ... [NegP ***not*** ... [*v*P *t*i ...]]]



Even if QR is certainly a kind of A′-movement, antecedent-government is only required for identifying nonargument traces so that we cannot adopt Rizzi's account for QR in (18). Needless to say, the antecedent-government requirement has no independent support any more with the advent of the MP. It should rather be derived from something more primitive in the computational system.

Aoun and Li (1993) utilize biding instead of antecedent-government and they impose on QR a locality requirement which is almost parallel to Rizzi's RM. The problem is that their approach is representational in nature and therefore global (as well as Cecchetto's). This is what the current MP is trying to avoid. In what follows, retaining QR, I am going to discuss how we should deal with negative intervention effects.

3. NegP as a Phase[5)]

To tackle negative intervention effects, let us consider what structural status NegP has. As broadly received in the literature, I assume that NegP sits between TP and *v*P. Contra Rizzi (1990), Pollock (1989) and other authors suggest that *not/n't* should be the head of NegP. When *not/n't* occupies the head of NegP in a finite indicative clause, the dummy auxiliary *do* must be inserted to support T (i.e. *do*-support) without any other auxiliary in T:

(20) a. *The writers not believed the boy.

b. The writers did not believe the boy.

cf. The writers could not believe the boy.

For our discussion, I would like to assume with Pollock that the negative operator *not/n't* heads NegP. The negative operator is assigned [+Neg] in its own right.

Suppose that even when the operator *not/n't* does not appear, NegP should be always involved and it should be headed by Neg with [Neg] unvalued. This is because Neg (or Σ in Laka's (1990) term) always participates in representing the polarity of a clause.[6] In derivation, the unvalued [Neg] feature may be valuated through feature agreement (Chomsky (2000) and subsequent work). Otherwise, it will be given the default value [−Neg] (i.e. affirmative) by some sort of redundancy rule at the Conceptual-Intentional (C-I) interface.

The question which I would like to pose is what role NegP plays in the current MP framework. On the meaning side, it is no doubt that Neg is a substantial element which represents sentence negation. Under Chomsky's hypothesis, phases semantically correspond to propositional units. We can understand that *v*P is a good candidate for a phase because *v*P basically represents the core of a proposition. In the syntactic structure, *v*P is contained by NegP. If *v*P corresponds to a proposition p, it is not unlikely that the composite of [Neg([+Neg]) + *v*P] corresponds to $\sim p$. From the viewpoint of logic, if p is a proposition, then $\sim p$ is also a proposition. I therefore claim that NegP is a propositional unit and it should be naturally qualified as a phase at least when its head is occupied by a negative operator with [+Neg]. As for cases where *not/n't* does not appear but inner island effects are induced by other negative elements such as negative adverbs, the relevant effects are due to feature valuation through agreement. I will not go into this in the present paper but refer the reader to Akahane (2006).

On the phonology side, identifying NegP as a phase seems to be motivated by an analysis of ellipsis in Takahashi (2002). Takahashi argues that ellipsis can apply only if the elided site is the complement domain of a phase head. In (21), an example originally cited in Ross's (1969) work on sluicing, the complement domain of C (i.e. TP) can be elided:

(21) [CP C [TP he is writing something]], but

↓

you can't imagine [CP why C ~~[TP he is writing something]~~]

→ He is writing something, but you can't imagine why.

By the time Spell-Out applies to a phase, the complement domain of the phase head has already finished with computations. Takahashi's proposal is that such a completed complement domain should be recyclable in another phase (e.g. TP in (21)). Once recycled, the complement domain is phonologically reduced.

Similar to TP ellipsis, a *v*P complement to Neg can be elided when it is recycled in another NegP which is headed by *not*. Observe the example in (22):

(22) My car Past [NegP [*v*P pass the smog test]] but

↓

Henry's did [NegP not ~~[*v*P pass the smog test]~~]

→ My car passed the smog test but Henry's did not.

Actually, Lobeck (1995) and Potsdam (1996) analyze the head of NegP *not* as a licensor of an empty VP(*v*P) or VP(*v*P) ellipsis. Setting recycling aside, I would like to suggest that phase heads should be able to license phonological reduction of their complement domains (under certain conditions concerning morphological realization, Spec-head agreement, etc.).

Chomsky (2000, 2001) positions affix-hopping in phonology rather than in narrow syntax. Since affix-hopping and *do*-support are two sides of the same coin, *do*-support in negative sentences such as (20b), the most classical negative intervention effect described in generative terms, would also advocate the view that NegP is a phase for morpho-phonological operations. If so, we can say that a syntactic approach to negative intervention effects is favored over a semantic/pragmatic one (Szabolcsi and Zwarts (1993), etc.) with respect to phonology/morphology. For the expository reason, I hereafter display NegP in the structure

only when it counts as a phase with [+Neg] on the head.

4. A Phase-Theoretic Approach to Quantifier Scope

4.1. The Scope Principle

In this section, I want to argue that we can capture negative intervention effects once NegP is identified as a phase. To this end, one might attempt to simply modify (15): no single instance of movement can cross two (or more) heads that belong to the set {*v*, Neg, C}. However, the revised PIC is quite different from the original one in (14) in that the latter but not the former forces cyclic computations. I keep to the original PIC in order to reduce operative complexity and eliminate overt-covert asymmetry. Both overt and covert operations should therefore apply cyclically phase by phase.

Let us consider the ambiguous example (3). Suppose that the derivation of (3) proceeds as follows (the spelled-out domain is shaded):

(23) a. [$_{vP}$ (∀i) someone *v* [$_{VP}$ loves everyone$_i$]]

covert QR

b. [$_{CP}$ C [$_{TP}$ someone$_j$ T [$_{vP}$ (∀i) t_j *v* [$_{VP}$ loves everyone$_i$]]]]

overt DP-mov't

c. [$_{CP}$ C [$_{TP}$ someone$_j$ T [$_{vP}$ *(∃j) (∀i)* t_j *v* [$_{VP}$ love everyone$_i$]]]]

covert QL

First, *everyone* moves to the edge of *v*P from the object position after Spell-Out as in (23a) (the head of the covert chain is enclosed within round brackets). This could be viewed as an instance of QR and it will result in repairing type mismatch (see footnote 3). I suggest that QR should be feature-driven, which I will come back to later. Second, *someone* moves overtly to [Spec, T] from the base position as in (23b). The final step is (23c). I assume that quantifier lowering (QL), an optional operation first discussed by May (1977), is a legitimate covert operation.

QL adjoins quantifiers to lower phrases (see Fox (2000) for discussion of QL in the Minimalist context). In (23c), QL applies to *someone* and adjoins it to *v*P. It is significant that both QR and QL apply in a cyclic fashion respecting the original PIC.

For scope interaction, let me introduce (24), a revision of the Scope Principle proposed by May (1985):

(24) Scope Principle

a. Operators are free to take on any type of relative scope relation iff they are in the same phase at the output level.

Otherwise,

b. the surface configuration determines the relative scope relation.

By convention, operators in (24) are pure (universal/existential) quantifiers and whs. It is predicted that inverse-scope interpretation or scope ambiguity comes out if (24a) is met at the output level. In (23c), the two quantifiers $\exists$ and $\forall$ are in the same phase, namely *v*P, so either of them can take scope over the other (their traces should be ignored). QL is an optional operation, not feature-driven, so $\exists$ should be regarded as a member of the CP phase when it remains outside *v*P without being lowered to *v*P (recall TP is not a phase).

4.2. Negative Intervention Effects

Let us return to (9), whose derivation is given below:

(25) a. [$_{vP}$ ($\forall_i$) someone v [$_{VP}$ love everyone$_i$]]

covert QR

b. [$_{NegP}$ someone$_j$ Neg [$_{vP}$ ($\forall_i$) t_j v [$_{VP}$...]]]

overt DP-mov't

c. [$_{CP}$ C [$_{TP}$ someone$_j$ T [$_{NegP}$ t_j Neg [$_{vP}$ ($\forall_i$) t_j v [$_{VP}$...]]]]]

overt DP-mov't

d. [$_{CP}$ C [$_{TP}$ someone$_j$ T [$_{NegP}$ *($\exists_j$)* t_j Neg [$_{vP}$ *($\forall_i$)* t_j v [$_{VP}$...]]]]]

covert QL

The first step in (25a) is the same as (23a). According to Chomsky (2000: 109), (26) applies optionally:

(26) The head H of phase Ph may be assigned an EPP-feature.

Since we assume NegP is a phase, Neg can be assigned an EPP-feature. EPP must be satisfied overtly. I adopt Chomsky's (1995) view rather than the one in his subsequent work that the EPP-feature triggers overt DP-movement because it is a kind of D-feature (see Akahane (2006) where I discussed this in some detail). Hence, the subject *someone* moves overtly to [Spec, Neg] as in (25b). *Someone* continues overt movement to [Spec, T] as in (25c). If it is lowered covertly by QL, the adjunction site should not be the edge of *v*P but the edge of NegP as in (25d) according to the PIC. The consequence is that the two quantifiers are not phase-mates. $\exists$ is in the NegP phase if lowered, or otherwise it is in the CP phase; $\forall$ on the other hand remains in the *v*P phase. In such a situation, the Scope Principle does not allow them to interact. With the PIC and the Scope Principle, the question of why (9) has no inverse-scope reading is solved.

So far, we have confined the adjunction site of QR to *v*P and never taken into consideration successive-cyclic QR from *v*P to NegP and to TP. If successive-cyclic QR to NegP and to TP is possible as in (27a, b), (9) should have the inverse-scope interpretation, contrary to fact:

(27) a. [CP C [TP someone$_j$ T [NegP *(∃j)* *(∀i)* t_j Neg [vP t_i t_j v [VP...]]]]]

covert QL *covert* QR *covert* QR

b. [CP C [TP *(∀i)* *someone$_j$* T [NegP t_i t_j Neg [vP t_i t_j v [VP...]]]]]

covert QR *covert* QR *covert* QR

Williams (1977), May (1985) and others analyze vP(VP) as providing a local host for quantificational elements with some scope property. Citing Heim and Kratzer (1998), Fox (2000) argues that the semantic type mismatch between a quantificational element and its sister (V) is repaired by QR to vP (see footnote 3). It seems that these are closely related with the properties of v. I contend that QR to the edge of vP is driven by an uninterpretable feature on v which I will call [QU(antificational)] (cf. Chomsky (1995: 377; 2000: 109)). [QU] is optionally assigned to v and it is checked only against quantificational elements including whs. As [QU] is assigned only to v (not to Neg nor to T), derivation with successive-cyclic QR shown in (27) could never take place.

Next, I would like to consider wh-question examples. There must also be a trigger for wh-movement to the edge of vP. As mentioned already, I assume that EPP only triggers DP-movement. Suppose so, wh-movement to the edge of vP should not be due to EPP. In (28), for instance, what is moved to the sentence-initial position is a wh-adverb, and it is intended to modify the embedded predicate:

(28) How$_i$ do you believe John solved the problem t_i?

The wh-adverb *how* moves first to the embedded [Spec, C] from the base position, i.e. the edge of the embedded vP. This movement is triggered by an uninterpretable feature [Q] on C. Let us say that [Q] serves for wh-scope marking and it is assigned to C optionally (rather than inherently) to be checked against a wh before Spell-Out. On the way to the matrix [Spec, C], the wh-adverb needs to stop by the edge of the matrix vP to meet the PIC:

(29) [$_{vP}$ believe [$_{CP}$ *how*$_i$ [$_{TP}$ John [$_{vP}$ t_i solved the problem]]]]

An EPP-feature, if assigned to *v*, cannot trigger this movement because it should be satisfied by D. Instead, wh-movement to the edge of *v*P is triggered by [QU] on *v*.

It should be noticed that [QU] on *v* can be checked against a quantificational element either before or after Spell-Out. In (29), the wh undergoes QR overtly to the edge of *v*P. Let us refer to overt movement which is triggered by [QU] as "overt QR." Without overt QR of the wh-adverb in (29), [Q] on C could not be checked before Spell-Out (in-situ whs will be discussed in later sections). Overt QR of whs and [QU]-assignment as such should be optional, or they would be look-ahead operations. I would like to emphasize that [Q] and [QU] are distinguished from EPP. The former are related to the properties of the phase heads C and *v* while the latter can be assigned freely to any phase head (cf. Chomsky (2000: 144 n.50)).

How can we handle the contrast between the wh-question examples (4) and (10)? Let me highlight the decisive steps of the derivation (W = QRed wh):

(30) a. [what$_i$ ... [$_{CP}$ t_i [$_{TP}$ everyone$_j$ T [$_{vP}$ *(*$\forall_j$*)* *W*$_i$ t_j *v* [$_{VP}$ saw t_i]]]]] (= (4))

covert QL *overt* QR

b. [*what*$_i$ ... [$_{CP}$ t_i [$_{TP}$ *everyone*$_j$ T [$_{NegP}$ ($\forall_j$) t_i t_j Neg [$_{vP}$ W$_i$ t_j *v* [$_{VP}$ saw t_i]]...

(*covert* QL) *overt* QR

(= (10))

In the embedded clause of each example, the wh moves overtly to the edge of *v*P to satisfy [QU] on *v*. Suppose [Q] is assigned to the intermediate declarative C. Then, the uninterpretable feature must be deleted by a wh which is raised to [Spec, C] before Spell-Out. The whs in (30a, b) move overtly to the matrix [Spec, C] via the matrix [Spec, *v*] though it is omitted. The positions crucially pertaining to relative quantifier scope are adjunction sites of QR/QL and the final destination of

wh-movement. In (30a), ∀ and W can turn out to be phase-mates in the embedded *v*P. (4) is therefore allowed two readings. In (30b), on the other hand, ∀ and W will turn out not to be phase-mates anywhere, so (10) can only have the interpretation in which the wh outscopes the quantified DP, reflecting the surface configuration.

Successive-cyclic QR to TP is also problematic in wh-question examples such as (31) where a quantified DP cannot have wider scope than a wh:

(31) Who bought everything for Max? (wh > ∀, ∀ ≯ wh)

Whs should not be eligible to undergo QL which is distinguished from reconstruction, because whs freeze in the Spec of interrogative C for the purpose of clausal typing (cf. Cheng (1991)). If so, we expect to have an output like (32) for (31):

(32) [CP *who*$_j$ C [TP t_j T [$_{v}$P *(*$\forall_i$*)* t_j *v* [VP bought everything$_i$]]]]

covert QR

It is clear that the wh and the quantified DP (∀) cannot interact in (32) because they are not phase-mates. Therefore the only possible reading faithfully reflects the surface configuration (wh > ∀). Successive-cyclic QR of ∀ to TP would render the other reading (∀ > wh) possible:

(33) [CP *who*$_j$ C [TP *(*$\forall_i$*)* t_j T [$_{v}$P t_i t_j *v* [VP bought everything$_i$]]]]

covert QR *covert* QR

This is contrary to fact.[7)]

For limited space, I cannot scrutinize all the data which are dealt with by Cecchetto (2004) and other authors. I tentatively conclude that whether overt or covert, QR and QL apply cyclically in accordance with the original PIC. QR is confined to the edge of *v*P and there is no successive QR. When the NegP phase intervenes, the Scope Principle disallows scope interaction.

4.3. Overt QR and the Interface Economy Condition

In the previous subsection, I regarded overt movement of quantificational elements to the edge of *v*P as overt QR. In languages like English, overtly QRed elements cannot stay at the edge of *v*P until the end of derivation:

(34) a. John (has) read *everything*.

b. *John (has) *everything*$_i$ read t_i.

As observed by Kayne (1975), French does not accept the counterpart of (34a) but accepts the counterpart of (34b) in compound tense:

(35) a. *Jean a lu *tout*.

Jean has read everything

b. Jean a *tout* lu.

For these facts, Belletti (1990) presents an analysis that overt QR applies to *tout* updating Kayne's (1975) original account.

Strictly speaking, it is only bare quantifiers that can undergo overt QR in French. This is confirmed by the examples in (36):

(36) a. Jean a tout compris.

Jean has all understood

'Jean understood everything.'

b. *Jean a toutes les questions comprises.

Jean has every the questions understood

'Jean understood every question.'

(Christensen and Taraldsen (1989: 82 n. 23))

The ungrammaticality of (36b) may reflect the heaviness of the raised DP, which is apparently comparable with Scandinavian object shift (OS). Overt QR should not be treated as instances of OS, however. First of all, overt QR applies to bare quantifiers while OS applies to definite DPs/pronouns.[8] Second, French overt QR happens in compound tense clauses as mentioned above, but OS takes place only

when a finite verb is extracted out of *v*P and raised to C. OS never occurs in compound tense clauses (see Holmberg and Platzack (1995), etc.):

(37) a. Jón hefur (ekki) séð hana. (Icelandic)
Jón has not seen her
'Jón has(n't) seen her.'
b. *Jón hefur hana (ekki) séð.

One could stipulate a parameter which distinguishes French-type languages from English-type languages. The simplest parameter would be that the former, but not the latter, allow overtly QRed elements to stay at the edge of *v*P until the end of derivation. I have assumed that [QU] triggers QR. The parameter might be the strength value (strong/weak) added to [QU] (cf. Chomsky (1991)): French-type languages would choose strong [QU] which triggers overt QR, and English-type languages would choose weak [QU] which triggers covert QR. I argued that [QU] on *v* triggers overt movement (QR) of a wh to the edge of *v*P. By contrast, multiple wh-questions never allow a second wh to move from the base position. Were a second wh raised to the edge of *v*P, it could not stay there. This is true not only in English but also in French:

(38) a. Who has read what?
b. *Who has what read?
(39) a. Qui a lu quoi?
who has read what
b. *Qui a quoi/que lu?

We should therefore dismiss the strong/weak [QU] parameter.

Cheng (1991) among others states that clausal typing must be done before Spell-Out. For CP to be typed as a wh-question, one (and only one) wh is required to move overtly to [Spec, C].[9] It seems probable that operations for clausal typing should be essentially motivated by the IEC. If there is no wh accessible to a wh-

interrogative ([+wh]) C before Spell-Out, CP will end up failing in clausal typing. I postulate that overt QR of whs can be triggered directly by the IEC through no mediation of [QU]. In multiple questions, whs which have moved halfway to the edge of *v*P (or NegP) and remain there never conform to the IEC or clausal typing. For this reason, the b. examples of (38)-(39) are not derivable.

Overt QR of non-whs such as *every*-DP/*tout(es)*-DP is not permissible (see (34b), (36b)). It is obvious that they could not participate in clausal typing. Suppose that [QU] only drives QR of bare quantifiers without pied-piping, i.e. *every/tout(es)*. Different from French quantifiers, English quantifiers such as *every* do not move alone:

(40) *John (has) *every*$_i$ read t_i book.

Regarding morphology (or etymology), *every* is composed of two parts: *ever* and *y* ('each'). Regarding syntax, I analyze *ever* as occupying the Spec and *y* as occupying the head, just parallel with *who* and *se* (-'*s*) of *whose*. While the Spec and the head are morphologically bound to each other, the Spec-head sequence is not a syntactic constituent so that *every* cannot move alone. Even without pied-piping, the bare quantifier *ever* ($\forall$) can undergo covert QR to satisfy [QU] on *v*, since morpho-phonological restrictions are not imposed on covert operations. I also apply this analysis to other quantifiers in English, though further investigation is of course needed. By the way, this analysis may be compatible with a base-generation analysis of floating quantifiers but not with a derivational one.

On the assumption made in section 4.2, we can have a choice of assigning [QU] or EPP to *v* in order to raise quantified DPs overtly to the edge of *v*P. Movement which is triggered by [QU] is QR, while movement which is triggered by EPP is a kind of DP-movement but not QR. Because of [QU], QR basically applies to morphologically simplex bare quantifiers, whether before or after Spell-Out, but it may be overridden by clausal typing. Both simplex whs (e.g. *who(m)*, *what*) and complex ones (e.g. *whose/which book*) can therefore undergo overt QR

for clausal typing. Even simplex whs might be analyzed as morphologically complex: *wh-* is separated from the rest. If so, QR applies to whs only for clausal typing, to which [QU] will be irrelevant. I will not pursue the latter analysis here.

5. Local C-Wh Agreement and the NegP Phase

In the preceding sections, we saw that negative intervention phenomena in English can be accommodated by the phase theory. To recapitulate, NegP as well as CP and *v*P is identified as a phase, and the PIC constrains both overt and covert operations. On these assumptions, we explained that when NegP behaves as a phase, covert QR/QL cannot carry a quantifier to the phase to which another quantifier belongs. Negative intervention effects obtain from the phasehood of NegP. In this section, I will demonstrate that further support for our account comes from single in-situ wh-questions in French and wh-scope marking constructions in German.

5.1. French Single In-Situ Wh-Questions

French single wh-questions have two alternatives. We can front a wh to the sentence-initial position ([Spec, C]) as in (41a) or place it in situ as in (41b):[10)]

(41) a. Qui$_i$ as-tu vu t_i?
who have-you seen
'Who did you see?'
b. Tu as vu qui?
(= (41a))

Several authors (Chang (1997), Bošković (2000), Cheng and Rooryck (2000), Mathieu (2004), etc.) report that the distribution of in-situ whs in French is more restricted than in English (not to speak of languages such as Japanese and Chinese without (overt) wh-movement). As observed in (42a), French in-situ wh-questions

show negative intervention effects:

(42) a. ?*Il ne mange pas quoi?
he NEG eats NEG what
'What doesn't he eat?'
b. Que ne mange-t-il pas?
(= (42a))

We can construe (42a) as an echo-question but it is not acceptable as a nonecho-question. In English multiple wh-questions, the scope interpretation of in-situ whs is not interfered with by negation.[11] Compare (43) with (42a):

(43) Who doesn't eat what?

To account for the ungrammaticality of (42a), Bošković (2000) and Cheng and Rooryck (2000) adopt covert feature-movement proposed by Chomsky (1995). They argue that a wh-feature moves covertly from an in-situ wh to the matrix C. They also posit that covert wh-feature movement is interfered with by negation in single in-situ wh-questions in French.

Bošković's (2000) analysis and Cheng and Rooryck's (2000) however differ from each other with respect to the interpretability of the wh-attracting feature and the timing of its introduction into derivation. Bošković proposes that only at the root should C be inserted covertly with an uninterpretable wh-attracting feature. Inserting a phonologically null C at the root is supposed to have no major phonological effects (cf. Chomsky (1995: 292-294)). This is countered by Cheng and Rooryck. They criticize Bošković's analysis for ignoring an intonational difference between fronted wh-questions such as (41a) and in-situ wh-questions such as (41b). In-situ wh-questions are pronounced with the yes/no-question intonation but fronted wh-questions are not.

For the intonation of in-situ wh-questions, Cheng and Rooryck argue that a null yes/no-intonation Q-morpheme is adjoined overtly to the matrix C. This Q-

morpheme has an unvalued interpretable feature [Q:]. [Q:] forces covert wh-feature movement to get its value specified as [Q: wh], or otherwise [Q: y/n]. Apart from the null Q-morpheme in Cheng and Rooryck's sense, I would like to assume that an unvalued interpretable feature which triggers wh-movement is assigned to the matrix C and realized as the yes/no-question intonation. I will use the label [uY/N] (u = unvalued) instead of [Q:] so that we can differentiate it from the feature [Q] which we have assumed (see section 4.2.). In French-type languages, [uY/N] on the matrix C gets the positive value [+Y/N] (i.e. yes/no-question) through a kind of default valuation if it enters into no agreement with any whs. I will return to this later.

Bošković (2000) and Cheng and Rooryck (2000) also diverge from each other in how to capture the locality of in-situ whs. In single wh-questions, we cannot find any in-situ whs in embedded clauses:

(44) *Marie pense que Jean a acheté quoi?
Marie thinks that Jean has bought what
'What does Marie think that Jean bought?'

(Cheng and Rooryck (2000: 12))

We have also seen in (42a) that there cannot occur in-situ whs under negation. For these facts, Bošković assumes covert feature-movement is one-swoop long-distance movement and argues that a wh-feature cannot traverse any A′-heads on the way to the matrix C, a kind of RM effect, as suggested by Roberts (1993). Thus, in (44), the wh-feature cannot move to the matrix C crossing the embedded C, an A′-head. Likewise, the wh-feature cannot reach the matrix C in (42a) because an A′-head, i.e. Neg, intervenes. Cheng and Rooryck on the other hand stipulate that the null Q-morpheme has access only to whs in the matrix clause due to its scope property. (44) is thereby ruled out. They moreover argue that wh-feature movement is blocked by inaccessible domains which are induced by negative and other operators

(cf. Honcoop (1998)).[12] In (42a), it is the negative operator *pas* which induces an inaccessible domain, and it obstructs wh-feature movement.

Bošković's account and Cheng and Rooryck's have some problems. Covert feature-movement adopted by them is global in nature because it does not operate cyclically. In the current MP framework which I am assuming, covert feature-movement should be abandoned for computational complexity, as noted by Chomsky (2000: 123). Moreover, we should expect a wh-attracting feature on the matrix C (or on the Q-morpheme adjoined to the matrix C) to search for a wh but not for a negative operator. This is simply because a negative operator is not a wh and is invisible to the wh-attracting feature on the matrix C (see Manzini (1998) for a similar discussion). Thus negation is not expected to cause intervention effects. For these reasons, I reject the covert feature-movement analyses proposed by Bošković (2000) and Cheng and Rooryck (2000). I would rather offer an alternative proposal which appeals to covert QR and local agreement conforming to the PIC.

In section 4, I proposed that QR to the edge of *v*P should be able to take place either before or after Spell-Out while wh-movement to [Spec, C] should be carried out before Spell-Out for clausal typing. Assuming this, let us consider the derivation of (41a, b):

(45) [CP ___ C [TP tu$_i$ as-T [vP ___ t_i [VP vu qui]]]]

overt wh-movement *overt/covert* QR

The wh *qui* is raised to the edge of *v*P by QR. If QR is carried out before Spell-Out, *qui* can undergo subsequent wh-movement to [Spec, C]. If it is after Spell-Out, there will be no subsequent wh-movement since overt movement (pied-piping) must meet the condition below:

(46) Pied-piping requires phonological content. (Chomsky (2001: 24))

In (44), the wh stays in situ before Spell-Out and is supposed to undergo covert

QR to satisfy [QU] on the embedded *v* (recall overt QR of whs is optional). (46) prevents the wh from being pied-piped to the outside of the embedded *v*P. Subsequently, the feature on the matrix C ([Q] or [uY/N]) will never be checked against nor agree with a wh, so (44) is excluded. The same is true of English examples such as (47):

(47) *Mary thinks that John bought what?

Let us get back to the grammatical example (41b). According to Cheng and Rooryck (2000), [uY/N] on (the null Q-morpheme at) the matrix C is only associable with a wh in the matrix clause due to its limited scope property. I would like to suggest this limited scope property should be accredited to the PIC. When the phase head C is assigned [uY/N], it probes for a wh. Under the PIC, [uY/N] can be valuated only when it finds a wh in its minimal search domain. I refer to this process as "local C-wh agreement." In (41b), the wh has been raised covertly to the edge of *v*P as illustrated in (45), and it is in the minimal search domain of [uY/N]. Since there exists no intervening phase, local C-wh agreement can be carried out successfully.

Turning to the intervention example (42a), we can easily figure out the ungrammaticality in terms of the PIC. Up to the *v*P phase, (42a) shares almost the same derivation with (41b). Before Spell-Out, the wh *quoi* stays within VP. Suppose the wh is raised to the edge of *v*P by covert QR as indicated in (48):

(48) [$_{NegP}$ il$_j$ pas Neg-mange [$_{vP}$ (quoi$_i$) t_j [$_{VP}$ t$_v$ quoi$_i$]]]

covert QR

After the *v*P phase, (42a) will take the following path. Neg is a phase head, so it is freely assigned an EPP-feature. Under the condition in (46), the wh-DP which has not been raised overtly to the edge of *v*P is not allowed to be pied-piped to [Spec, Neg]. Thence the EPP on Neg would never be satisfied. If the matrix C is assigned [uY/N], the feature searches the minimal search domain in accordance with

the PIC. But it cannot find a wh at the edge of NegP. As a result, local C-wh agreement will never hold:

(49) [CP C ilj ne-mange-T [NegP t_j pas t_{Neg} [vP (quoii) t_j [VP t_v quoii]]]]
[uY/N] ----------||----------

Needless to say, if a wh-DP has been raised overtly to [Spec, Neg] for EPP, it can not only enter into an agreement relation with a feature on C but also move to [Spec, C] without violating the PIC. (42b) derives that way.

I want to compare the pair in (42) with the one in (50):

(50) a. *Combieni n'as-tu pas lu t_i de livres?
how.many NEG have-you NEG read of books
'How many books did you not read?'

b. Combien de livresi n'as-tu pas lus t_i?
(= (50a))

(50a) moves a bare wh-quantifier (*combien*) whereas (50b) moves a wh-DP (*combien de livres*). Bare quantifiers are distinct from DPs. This is corroborated by a morphological fact in (50): the past participle agrees only with the full DP which is fronted from the base position. To be specific, the plural agreement morpheme *-s* is attached to the past participle *lu* in (50b) but not in (50a). We can therefore judge *combien* in (50a) not to be a DP.[13] Both in (42a) and in (50a), the whs have not moved overtly to [Spec, Neg], so they can never be raised further.

By the way, French multiple wh-questions tolerate in-situ whs even in embedded and negative contexts, just as English counterparts:

(51) a. Qui croit que Marie a vu qui?
who believes that Marie has seen whom
'Who believes that Marie saw whom?'

b. Qui ne mange pas quoi?
who NEG eats NEG what
'Who does not eat what?'

(Bošković (2000: 67))

If in-situ whs should be uniformly ruled out in embedded and negative contexts, these examples seem quite contradictory. In fact, in-situ whs in multiple questions can only stay in the base-positions because [Q] on C has already been satisfied by another wh which overtly occupies [Spec, C]. Since movement of a second wh is not motivated by anything, it cannot move but just stay in the base position. As suggested by Bošković (2000) and Cheng and Rooryck (2000), in-situ whs in multiple questions can be associated with a wh-operator in the scope position, i.e. [Spec, C], by means of unselective binding (Pesetsky (1987)) or choice functions (Reinhart (1998, 2006)).

If this is true, why is unselective binding/choice function unavailable for single in-situ wh-questions? Pesetsky (1987) observes that in multiple questions, D(iscourse)-linked whs are able to resort to unselective binding, and they can remain in situ. Kiss (1993) also remarks that in-situ whs in multiple questions are more or less specific. Thus, nonspecific whs cannot appear in situ:

(52) *Who slept how?

Mathieu (2004) on the other hand reports that in-situ wh-nominals in French single questions have nonspecific readings, though the quite opposite is pointed out by Chang (1997), etc. Mathieu argues that such nonspecific in-situ wh-nominals should be taken as predicative indefinites.[14] As for nominal expressions which function as predicates, they are often analyzed as NPs (see Stowell (1989), Longobardi (1994), etc.). If so, predicative wh-nominals should be bare NPs rather than DPs. I would like to assume with Reinhart (1998, 2006) that only DPs are subject to choice functions, which lead to specific interpretation (I am using the term

"specific" here just conventionally). For the present, I adopt Reinhart's (1998) analysis that D is translated as a choice-function variable *f* which is bound by a wh-operator in [Spec, C], and the complement NP as a set variable $\{x|\alpha(x)\}$ (cf. Reinhart (2006)). Since there appears no operator in [Spec, C] in single in-situ questions, choice functions should not be applicable to them.

The DP/non-DP distinction pertaining to choice functions however does not seem to work straightforwardly in single in-situ questions if the two dialects(/registers) which Mathieu (2004) and Chang (1997) refer to can be really recognized. In Chang's dialect, in-situ whs are counted as specific even in single questions but negative intervention effects manifest themselves as in (42a). In multiple questions, a wh in [Spec, C] can serve as a choice-function operator in both dialects. Let me hypothesize that there is a phonologically null choice-function operator which can be externally merged at the matrix [Spec, C] only when C is assigned [uY/N]. This enables specific wh-DPs to appear in situ in single questions. Mathieu's and Chang's dialects require local C-wh agreement in single questions since [uY/N] on the matrix C must receive a negative value for wh-question interpretation.

We could advance a parameter which distinguishes the two dialects. Mathieu actually suggests one but I do not intend to replicate his argument here.[15] Under the hypothesis just given, I would rather put forward another parameter: Chang's dialect picks up the phonologically null choice-function operator whereas Mathieu's dialect does not (though both dialects assign [uY/N] to the matrix C). Thus, our phase-theoretic approach successfully accounts for the fact that single in-situ questions in the two dialects behave the same way as to negative intervention effects but diverge as to specificity of in-situ whs.

5.2. Wh-Scope Marking Constructions

Before leaving the discussion of local C-wh agreement, I would like to mention

one more phenomenon which seems to involve the same mechanism.

German, though not all dialects, have so-called partial wh-movement constructions or wh-scope marking constructions. In the generative literature, these constructions have been discussed since Riemsdijk (1982). (53a) is an example of a normal wh-question and (53b) is an example of a wh-scope marking construction in German:

(53) a. Mit wem$_i$ glaubst du [$_{CP}$ dass Hans t_i gesprochen hat]?
with whom believe you that Hans spoken has
'To whom do you believe that Hans spoke?'

b. Was glaubst du [$_{CP}$ mit wem$_i$ Hans t_i gesprochen hat]?
what believe you with whom Hans spoken has
(= (53a))

(Rizzi (1992: 369))

In (53b), a real wh *mit wem* moves halfway and stops at the intermediate [Spec, C]. There occurs a "wh-expletive" *was* in a higher position and it marks the scope which *mit wem* actually takes. McDaniel (1989) postulates that a version of the subjacency condition rules out a chain between a real wh and the lowest instance of a wh-expletive when more than one CP intervenes. (54) illustrates the subjacency condition on chain formation in wh-scope marking constructions:

(54) a. [$_{CP_n}$ *was* ... [$_{\boxed{CP_{n-1}}}$ *mit wem*$_i$ ... t_i ...]]

b. *[$_{CP_{n+1}}$ *was* ... [$_{\boxed{CP_n}}$ dass ... [$_{\boxed{CP_{n-1}}}$ *mit wem*$_i$ ... t_i ...]]]

This condition is satisfied in (53b) but not in (55):

(55) *Was glaubst du [CP2 dass Hans meint [CP1 *mit wem*i Jacob *t*i gesprochen
what believe you that Hans think with whom Jacob talked
hat]]?
has
'To whom do you believe Hans thinks Jacob talked?'

While McDaniel's subjacency condition is obviously representational and global, it seems replaceable with the PIC in essence.

McDaniel (1989) and Rizzi (1992) also notice that a real wh cannot be associated with a wh-expletive when negation intervenes between them:

(56) a. Mit wemi glaubst du nicht [CP dass Hans *t*i gesprochen hat]?
with whom believe you not that Hans spoken has
'To whom do you not believe that Hans spoke?'

b. *Was glaubst du nicht [CP mit wemi Hans *t*i gesprochen hat]?
what believe you not with whom Hans spoken has
(= (56a))

(Rizzi (1992: 369))

Irrespective of whether a real wh is an argument or an adjunct, we can observe negative intervention effects:

(57) a. Was hast du (*nicht) gesagt [CP wie sie geschlafen hat]?
what have you not said how she slept has
'How did you (not) say that she slept?'

b. Was hast du (*nicht) gesagt [CP warum sie nicht kommt]?
what have you not say why she not comes
'Why did you (not) say that she does not come?'

(Rizzi (1992: 370))

Rizzi analyzes wh-expletives as nonarguments and argues that the chain between a wh-expletive and a real wh must obey RM.

We can derive Rizzi's RM account straightforwardly from the PIC. While I agree with Rizzi that the wh-expletive *was* is a non-argumental element, I want to make a slightly different assumption. In a nutshell, *was* is essentially the same object as the null yes/no-intonation Q-morpheme in French which is suggested by Cheng and Rooryck (2000). They both are wh-scope markers which are associated with real whs. Let us suppose that *was* is a morphologically realized C with [uY/N]. Since unvalued, [uY/N] on *was* need to be valuated through local agreement with a wh; otherwise, the feature will get the positive value [+Y/N] which is not compatible with whs (apart from those in echo-questions). The wh-expletive should not be regarded as a choice function operator since it cannot overcome intervention effects.

Let us examine (56a, b). *Mit wem* has been raised overtly to [Spec, C] of the local declarative clause. After that, it can undergo QR to the edge of the matrix *v*P either before Spell-Out as in (58a) or after Spell-Out as in (58b):

(58) a. [$_{vP}$ mit wem$_i$ du glaubst-*v* [$_{VP}$ t_v [$_{CP}$ t_i [$_{TP}$ ...]]]]

overt QR

b. [$_{vP}$ (mit wem$_i$) du glaubst-*v* [$_{VP}$ t_v [$_{CP}$ mit wem$_i$ [$_{TP}$ ...]]]]

covert QR

In (58a), *mit wem* can keep on moving to [Spec, Neg] by virtue of the D-feature of *wem*. For limited space, suffice it to say some mechanism such as feature percolation may be invoked. From there, it will be raised to [Spec, C] in the final phase (I assume with Chomsky (1995: 368) that V-second is a phonological matter):

(59) [$_{CP}$ mit wem$_i$ C du glaubst [$_{NegP}$ t_i nicht [$_{vP}$ t_i *v* ...]]] (= (56a))

In (58b), on the other hand, *mit wem* can only stay at the edge of *v*P and never be raised from there for the reason which is already familiar (see (46)). Furthermore, when *was*(C) is merged with the matrix TP, the PIC does not allow [uY/N] on *was*

to agree with *mit wem* at the edge of *v*P for the NegP phase intervenes:

(60) [CP was(C) du glaubst [NegP nicht [*v*P mit wem ...]]]
[uY/N] ——————————||----------

Thus, wh-scope marking examples with the negative operator *nicht* such as (56b) are excluded. Without the intervening NegP phase, this local C-wh agreement can be carried out unproblematically (see (57)).[16)]

To summarize, local C-wh agreement involved in German wh-scope marking constructions as well as in French single in-situ wh-questions lends support to our phase-theoretic account of negative intervention effects.

6. Conclusion

We discussed various negative intervention phenomena. The main assumption was that syntactic operations are restricted by phases (i.e. the PIC) and this affects output interpretations. I proposed that NegP should be identified as one of such phases. Under this proposal, negative intervention effects naturally follow: the NegP phase blocks scope interactions between quantificational elements and also precludes local C-wh agreement which is involved in French and German wh-questions. This seems to me to indicate that the NegP phase is reasonably motivated by external (especially, C-I) systems. It goes without saying that the present paper did not undertake to reveal all aspects of negative intervention phenomena. I hope to take up remaining questions for another occasion.

NOTES

1) As for overt negative intervention or inner island effects, see Akahane (2006). The present paper, as it were, complements that work and vice versa.

2) Chomsky (2000) states that *v*P is a phase only when the head *v* is equipped with full argument structure, i.e. transitive or unergative *v*. He labels such *v* "*v**." In this paper I will use *v*/*v*P throughout rather than *v**/*v**P.

3) Semantically, quantifiers are second-order predicates, whose type is <<*e*, *t*>, *t*>, and they are not compatible with transitive verbs whose type is <*e*, <*e*, *t*>>. Therefore, when the complement position of a transitive verb is occupied by a quantified DP, it must be vacated by QR. For more detail, see Heim and Kratzer (1998) and Fox (2000).

4) There is a loophole, however. As the proviso in the definition (14) says, the head and the edge outside the (complement) domain are accessible to the head of the next phase.

5) The argument in this section is fundamentally the same as that of Akahane (2006: section 3).

6) This does not contradict the fact that (emphatic) affirmative operator *so* distributes the same way as *not*, as demonstrated by Klima (1964):

(i) The writers could so believe the boy.

(ii) The writers *(did) so believe the boy.

7) Incidentally, May (1985) excludes QR to TP(S) just as in (33), but this is for an ECP reason.

8) In Mainland Scandinavian languages (but not in Icelandic), pronouns must stay in VP when stressed, modified or conjoined. See Holmberg and Platzack (1995: 162 n.21), etc.

9) Under Cheng's (1991) Clausal Typing Hypothesis, overt wh-movement cannot be required in languages with Q-morphemes which appear at clausal peripheries. Thus, languages such as Japanese and Chinese do not have overt wh-movement, though this is still controversial.

10) Less formally, (i) without T-to-C movement and (ii) with *est-ce que* are also used:

(i) Qui tu as vu?

(ii) Qui est-ce que tu as vu?

For the present purpose, I neglect nuances that these variations might have.

11) Even if negation is not involved, nonreferential wh-adjuncts (e.g. *how*, *why*) cannot appear in situ in multiple wh-questions:

(i) *Who remembers what we bought how/why? (Huang (1982: 535))

Note that referential wh-adjuncts (e.g. *where*, *when*) can occur in situ:

(ii) Who remembers what we bought where/when? (ibid.)

Such referential adjuncts may be looked upon as semi-arguments. In addition, we might take them not to be adverbs because they can behave as the complement to P:

(iii) a. From where did he come?

b. Since when have you been here?

cf. *For why/By how did he come?

(ibid.: 536)

12) Cheng and Rooryck (2000) cite Honcoop's (1998) notion of inaccessible domain. I doubt whether Honcoop's dynamic semantics approach could be fitted into narrow syntax.

13) The relevant agreement is sometimes optional, though bare quantifiers never participate in it. See Mathieu (2004: 1093-1094).

14) Mathieu (2004) adopts Van Geenhoven's (1998) theory of semantic incorporation and argues that such nonspecific in-situ whs are predicates denoting properties which are semantically incorporated into verbs. By virtue of semantic incorporation, existential quantification is supplied to whs by the verbs. The scope of existential quantification introduced by V is delimited to the inside of VP(vP), and the intervention effect in (42a) follows.

15) As for the difference between the two dialects, Mathieu suggests a pragmatic parameter which determines whether in-situ whs are interpreted as D-linked or not, while he maintains semantic incorporation for both dialects in order to capture the intervention effects. See Mathieu (2004: section 7.4).

16) CP with a wh-expletive can be repeated:

(i) *Was* glaubst du *was* Peter meint *was* Hans sagt *was* Klaus behauptet *mit wem*$_i$
what think you what Peter believes what Hans says what Klaus claims with whom
Maria t_i gesprochen hat?
Maria spoken has
'To whom do you think Peter believes Hans says Klaus claims Maria talked?'
(Riemsdijk (1982))

(i) is simplified as follows:

(ii) [$_{CP5}$ *was* ... [$_{CP4}$ *was* ... [$_{CP3}$ *was* ... [$_{CP2}$ *was* ... [$_{CP1}$ *mit wem*$_i$ ... t_i ...]]]]]

I conjecture that *was* in an embedded C undergoes covert raising to v in the next higher clause. This could be motivated by the IEC. The raised *was* valuates [uY/N] on another *was*. The process of local C-wh agreement accompanied by covert C-to-v movement is iterated until the matrix CP (almost the same explains the disparity between (53b) and (55)). German and French diverge in this respect. Where this divergence comes from is an open question.

References

Akahane, Hitoshi (2006) "Inner Islands: A Minimalist Account," *English Linguistics* 23, 315-346.

Aoun, Joseph and Yen-hui Audrey Li (1993) *Syntax of Scope*, MIT Press, Cambridge, MA.

Belletti, Adriana (1990) *Generalized Verb Movement: Aspects of Verb Syntax*, Rosenberg and Sellier, Turin.

Bošković, Željko (2000) "Sometimes in [Spec, C], Sometimes in Situ," *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. by Roger Martin, David Michaels and Juan Uriagereka, 53-87, MIT Press, Cambridge, MA.

Cecchetto, Carlo (2004) "Explaining the Locality Conditions of QR: Consequences for the Theory of Phases," *Natural Language Semantics* 12, 345-397.

Chang, L. (1997) Wh-*in-Situ Phenomena in French*, Master's thesis, University of British

Columbia.

Cheng, Lisa (1991) *On the Typology of Wh-Questions*, Doctoral dissertation, MIT.

Cheng, Lisa and Johan Rooryck (2000) "Licensing *Wh*-in-Situ," *Syntax* 3, 1-19.

Chomsky, Noam (1991) "Some Notes on Economy of Derivation and Representation," *Principles and Parameters in Comparative Grammar*, ed. by Robert Freiden, 417-454, MIT Press, Cambridge, MA.

Chomsky, Noam (1995) "Categories and Transformations," *The Minimalist Program*, 219-394, MIT Press, Cambridge, MA.

Chomsky, Noam (2000) "Minimalist Inquiries: The Framework," *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. by Roger Martin, David Michaels and Juan Uriagereka, 89-155, MIT Press, Cambridge, MA.

Chomsky, Noam (2001) "Derivation by Phase," *Ken Hale: A Life in Language*, ed. by Michael Kenstowicz, 1-52, MIT Press, Cambridge, MA.

Chomsky, Noam (2004) "Beyond Explanatory Adequacy," *The Cartography of Syntactic Structures 3: Structures and Beyond*, ed. by Adriana Belletti, 104-131, Oxford University Press, New York.

Christensen, Kirsti and Knut Taraldsen (1989) "Expletive Chain Formation and Past Participle Agreement in Scandinavian Dialects," *Dialect Variation and the Theory of Grammar*, ed. by Paola Benincà, 53-83, Foris, Dordrecht.

Cinque, Guglielmo (1990) *Types of Ā-dependencies*, MIT Press, Cambridge, MA.

Fox, Danny (2000) *Economy and Semantic Interpretation*, MIT Press, Cambridge, MA.

Heim, Irene and Angelika Kratzer (1998) *Semantics in Generative Grammar*, Blackwell, Oxford.

Holmberg, Anders and Christer Platzack (1995) *The Role of Inflection in Scandinavian Syntax*, Oxford University Press, New York.

Honcoop, Martin (1998) *Dynamic Excursions on Weak Islands*, Holland Academic Graphics, The Hague.

Hornstein, Norbert (1995) *Logical Form: From GB to Minimalism*, Blackwell, Oxford.

Huang, James (1982) *Logical Relations in Chinese and the Theory of Grammar*, Doctoral dissertation, MIT.

Kayne, Richard (1975) *French Syntax: The Transformational Cycle*, MIT Press, Cambridge, MA.

Kiss, Katalin (1993) "Wh-movement and Specificity," *Natural Language and Linguistic Theory* 11, 85-120.

Kitahara, Hisatsugu (1996) "Raising Quantifiers without Quantifier Raising," *Minimal Ideas: Syntactic Studies in the Minimalist Framework*, ed. by Werner Abraham, Samuel Epstein, Höskuldur Thráinsson, and C. Jan-Wouter Zwart, 189-198, John Benjamins, Amsterdam.

Klima, Edward (1964) "Negation in English," *The Structure of Language: Readings in the*

Philosophy of Language, ed. by Jerry Fodor and Jerrold Katz, 246-323, Prentice-Hall, Englewood Cliffs.

Laka, Itziar (1990) *Negation in Syntax: On the Nature of Functional Categories and Projections*, Doctoral dissertation, MIT.

Lobeck, Anne (1995) *Ellipsis: Functional Heads, Licensing, and Identification*, Oxford University Press, New York.

Longobardi, Giuseppe (1994) "Reference and Proper Names: A Theory of N-movement in Syntax and Logical Form," *Linguistic Inquiry* 25, 609-665.

Manzini, Maria (1998) "A Minimalist Theory of Weak Islands," *Syntax and Semantics 29: The Limits of Syntax*, ed. by Peter Culicover and Louise McNally, 185-209, Academic Press, San Diego.

Mathieu, Eric (2004) "The Mapping of Form and Interpretation: The Case of Optional WH-movement in French," *Lingua* 114, 1090-1132.

May, Robert (1977) *The Grammar of Quantification*, Doctoral dissertation, MIT.

May, Robert (1985) *Logical Form: Its Structure and Derivation*, MIT Press, Cambridge, MA.

McDaniel, Dana (1989) "Partial and Multiple Wh-movement," *Natural Language and Linguistic Theory* 7, 565-604.

Nissenbaum, Jonathan (2000) *Investigations of Covert Phrase Movement*, Doctoral dissertation, MIT.

Pesetsky, David (1987) "*Wh*-in-situ: Movement and Unselective Binding," *The Representation of (In)definiteness*, ed. by Eric Reuland and Alice ter Meulen, 98-129, MIT Press, Cambridge, MA.

Pica, Pierre and William Snyder (1995) "Weak Crossover, Scope, and Agreement in a Minimalist Framework," *The Proceedings of the 13th West Coast Conference on Formal Linguistics*, 334-349, CSLI, Stanford University, Stanford.

Pollock, Jean-Yves (1989) "Verb Movement, Universal Grammar, and the Structure of IP," *Linguistic Inquiry* 20, 365-424.

Potsdam, Eric (1996) *Syntactic Issues in the English Imperative*, Doctoral dissertation, University of California, Santa Cruz.

Reinhart, Tanya (1998) "*Wh*-in-situ in the Framework of the Minimalist Program," *Natural Language Semantics* 6, 29-56.

Reinhart, Tanya (2006) *Interface Strategies: Optimal and Costly Computations*, MIT Press, Cambridge, MA.

Riemsdijk, Henk van (1982) "Correspondence Effects and the Empty Category Principle," *Tilburg Papers in Language and Literature* 12, 1-19, Tilburg University, Tilburg.

Rizzi, Luigi (1990) *Relativized Minimality*, MIT Press, Cambridge, MA.

Rizzi, Luigi (1992) "Argument/Adjunct (A)symmetries," *Proceedings of the North Eastern Linguistic Society* 22, 365-381, GLSA, University of Massachusetts, Amherst.

Roberts, Ian (1993) *Verbs and Diachronic Syntax*, Kluwer, Dordrecht.

Ross, John (1969) "Guess who?," *Papers from the 5th Regional Meeting of the Chicago Linguistics Society*, 252-286, Chicago Linguistic Society, University of Chicago.

Ross, John (1984) "Inner Islands," *Proceedings of the 10th Annual Meeting of the Berkeley Linguistics Society*, 258-265, Berkeley Linguistic Society, University of California, Berkeley.

Stowell, Tim (1989) "Subjects, Specifiers, and X-bar Theory," *Alternative Conceptions of Phrase Structure*, ed. by Mark Baltin and Anthony Kroch, 232-262, The University of Chicago Press, Chicago.

Szabolcsi, Anna and Frans Zwarts (1993) "Weak Islands and an Algebraic Semantics for Scope Taking," *Natural Language Semantics* 1, 235-284.

Takahashi, Daiko (2002) "Feizu no Risaikuru (Recycling phases)," *Eigo Seinen* 148, 270-273.

Van Geenhoven, Veerle (1998) *Semantic Incorporation and Indefinite Descriptions: Semantic and Syntactic Aspects of Noun Incorporation in West Greenlandic*, CSLI, Stanford.

Williams, Edwin (1977) "Discourse and Logical Form," *Linguistic Inquiry* 8, 101-139.