

Intervention Effects in Covert Movement Constructions

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Abstract: Intervention effects induced by sentence negation can be found in many languages. In this paper, we discuss the scope interpretation of quantifiers in English, and in-situ wh-phrases in French single questions, as well as those in German scope-marking constructions. Our claim is that intervention effects should be explained syntactically. In order to capture the relevant phenomena, the framework of Chomsky (2000) and subsequent work is adopted. This paper proposes that NegP, headed by sentence negation, should be identified as a phase. It is further assumed that quantifier raising (QR) and quantifier lowering (QL), whether applied covertly or overtly, are subject to the Phase Impenetrability Condition just like other operations. Under these assumptions, intervention effects in quantifier scope phenomena can be obtained. We also argue that local agreement must hold between a wh-phrase and a scope marker in C in French single in-situ questions, as well as German scope-marking constructions. The locally limited scope of wh-phrases in these constructions follows from phase theory.*

Key words: PIC, NegP, QR/QL, interface economy, local C-wh agreement

1. Introduction

Cross-linguistically, sentence negation appears to cause intervention effects. The inner islands exemplified by (1) are among 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 (i.e. [Spec, C]) from the base position indicated by t_i if the negative operator *not/n't* intervenes. The same holds for the movement of *how* in (1b). (1b) (and perhaps (1a)) could be grammatical if the adverbial operator is construed as scoping over negation. However, the reading we are concerned with is one in which negation has wide scope over the adverbial.

Not only in constructions involving overt operator-movement as seen in (1), but also in those with covert operations which are supposed to be necessary for quantifier scope, does negation count as an instigator of intervention effects. This

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can be observed 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 wh-in-situ *quoi* cannot take the whole sentence in its scope since negation intervenes. As a result, it cannot function as 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 the scopal properties of quantificational elements, I will assume with Nissenbaum (2000) and Chomsky (2004) that Move may precede as well as follow Spell-Out. I will argue that quantifier scope should be defined in terms of phases. 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 also be identified as a phase. This becomes crucial when we discuss negative intervention effects.

The organization of the paper is as follows. In section 2, I will review some quantifier scope phenomena, and examine how to handle negative intervention effects observed in them. In section 3, I will demonstrate how NegP should be identified as a phase, based on semantic and phonological facts. Section 4 will be devoted to discussion of a phase-theoretic account of quantifier scope. I will argue that QR, occurring before or after Spell-Out, should apply cyclically just like other operations, but not successively. In addition, I will also introduce another scope-related operation which plays an important role in inverse-scope phenomena. The major quantifier scope facts will thus be accommodated. To support the proposals in the preceding sections, I examine two negative intervention phenomena in section 5: 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 quantifiers.

- (3) Someone loves everyone. ($\exists > \forall, \forall > \exists$)
 (4) What did John say that everyone saw? (wh > $\forall, \forall > \text{wh}$)

In (3), the existential quantifier \exists in the subject DP interacts with the universal

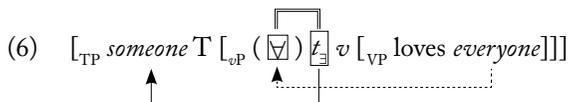
¹ For overt negative intervention effects, see Akahane (2006). The present paper, as it were, complements that work and vice versa.

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

quantifier \forall in the object DP causing ambiguity. That is, either quantifier can have wide scope over the other. Likewise in (4), the *wh*-phrase *what* and the quantifier \forall (*everyone*) give rise to two possible interpretations. Since May (1977), QR has been broadly accepted in order to explain quantifier scope. Originally, QR was considered an adjunction operation of quantifiers to S (= TP). We thus obtain (5a, b) from (3) as a consequence.

- (5) a. $[_{TP} \exists x [_{TP} \forall y [_{TP} x \text{ loves } y]]]$
- b. $[_{TP} \forall y [_{TP} \exists x [_{TP} x \text{ loves } y]]]$

In the early MP framework, Hornstein (1995), Pica and Snyder (1995), Kitahara (1996) and others attempted to reduce QR to A-movement, since it appears to be clause-bounded like A-movement. Under A-movement analyses, the subject quantifier in its base position (the lower [Spec, *v*] in (6)) can interact with the object quantifier in its Case-checking position (the upper [Spec, *v*] in (6)).



The A-movement approach to quantifier scope encounters some difficulties, however, as pointed out by Fox (2000) and others. For example, it is implausible that a quantified DP serving as the complement of a preposition moves to [Spec, *v*] for Case checking (see Hornstein (1995)). In addition, the A-movement approach is not compatible with the current MP framework because movement is not necessary for (accusative) Case checking, given the concept of Case valuation through agreement: the object DP simply stays in its base position in order to enter into agreement with *v* and get Case.

Generally, negation does not interfere with A-movement, as shown by (7).

- (7) John does not love everyone.

Here the subject *John* will move from [Spec, *v*] to [Spec, T], crossing Neg (*n't*).



The negative counterparts of (3) and (4), on the other hand, do 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 unambiguous in that \exists can have wide scope over \forall but not the other way around. Similarly, (10) is not ambiguous, and only has an interpretation whereby the *wh*-phrase takes scope over \forall . Hornstein (1995) gives an analysis of (9), which is not convincing, however. He conjectures

that PRO is situated in [Spec, *v*] in (9), and controlled by the subject in [Spec, T].

(11) [_{TP} someone_i does [_{NegP} not [_{vP} PRO_i [_{VP} love everyone]]]]

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

(12) [_{TP} someone_i T [_{vP} PRO_i [_{VP} loves everyone]]]

Intriguingly, Hornstein (1995: 243n.44) mentions the possibility that [Spec, Neg] has both A- and A'-properties. Although this sounds odd from the traditional viewpoint, it is true that the A/A'-distinction in GB theory is difficult to maintain rigidly in the MP framework (see Chomsky (1995)). We acknowledge the mixed status of [Spec, Neg]; this issue will be taken up later.

In more recent work by Reinhart (1998), Fox (2000), Nissenbaum (2000), Cecchetto (2004) and others, QR is maintained rather than abandoned. These authors argue 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 therefore affect the interpretation of quantifiers (changing scope relations, repairing type mismatch³ and so on).

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

(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 one. Within each phase, then, the application of

³ Semantically, quantifiers are second-order predicates whose type is $\langle\langle e, t \rangle, t \rangle$, and are not compatible with transitive verbs with the type $\langle e, \langle e, t \rangle \rangle$. 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).

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 like 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)

In particular, Cecchetto presupposes that covert operations can apply in a counter-cyclical fashion, hence the above revision of the PIC.

With the revised PIC, Cecchetto demonstrates that a quantifier in an embedded clause cannot have scope over the matrix clause as exemplified in (16).

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

Cecchetto hypothesizes that quantifiers raise to TP. Moreover, for the purpose of fixing the infinite regress problem in antecedent contained deletion configurations, *v*P can also serve as an adjunction site for quantifiers. In (16), *every plane* undergoes QR and is adjoined to the embedded TP. It has to raise further to the matrix TP in order to take scope over *a technician* in the matrix [Spec, T]. This is not feasible, however, as two intervening phaseal heads are crossed (the embedded C and the matrix *v*).

- (17) * $[_{TP} \text{every plane}_i [_{TP} \text{a technician} [_{vP} \text{said} [_{CP} \text{said} [_{TP} \text{John} [_{vP} \text{inspected } t_i]]]]]]]$
-

The clause-boundedness of QR is thus captured.

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

- (18) $[_{TP} \text{everyone}_i [_{TP} \text{someone does} [_{NegP} \text{not} [_{vP} \text{love } t_i]]]]]$
-

If QR can freely raise quantifiers to TP in compliance with (13) and (15), we have no account for the impossibility of the inverse-scope interpretation in (9). This raises the question of whether quantifier scope and negative intervention effects are amenable to phase theory. Within a pre-MP framework, Rizzi (1990) argues that a negative operator can occupy an A'-Spec and hence qualifies as a Relativized- Minimality (RM) barrier against antecedent-government by a distant A'-operator. This is schematized in (19).

- (19) $[_{XP} Op_i \dots [_{NegP} \text{not} \dots [_{YP} t_i \dots]]]$
-

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

Even if QR represents a kind of A'-movement, antecedent-government is only required for identifying non-argument traces. As a result, we cannot adopt RM for QR. Moreover, the antecedent-government requirement has no independent status in the MP and must be derived from something more primitive in the computational system.

Aoun and Li (1993) use binding instead of antecedent-government to achieve the desired results and impose a locality requirement on QR somewhat similar to RM. The problem is that their approach (as well as Cecchetto's) is representational in nature, and also global; computations are not evaluated in a strictly limited local domain, exactly what the current MP attempts to avoid. In the next section, we discuss how to deal with negative intervention effects while retaining QR.

3. NegP as a Phase⁵

To tackle negative intervention effects, let us consider what the structural status of NegP is. As broadly received in the literature, NegP sits between TP and *v*P. I follow Pollock (1989) in assuming that the negative operator *not/n't* heads NegP. When *not/n't* occupies the head of NegP in a finite indicative clause, the dummy auxiliary *do* must be inserted in the absence of any other auxiliary to support T (i.e. *do*-support).

- (20) a. *The writers not believed the boy.
 b. The writers did not believe the boy.
 cf. The writers could not believe the boy.

The negative operator is assigned [+Neg] inherently. Suppose that even when the operator *not/n't* does not appear, NegP is always present and is headed by Neg unvalued for features. This is because Neg (or Σ in Laka's (1990) terms) always participates in the representation of the polarity of a clause.⁶ In derivation, the unvalued [Neg]-feature may be valued through agreement (Chomsky (2000) and subsequent work). Otherwise, it will be given the default value [-Neg] (i.e. affirmative) by a redundancy rule at the Conceptual-Intentional (C-I) interface.

The question that now concerns us is what role NegP plays in the current MP framework. With respect to meaning, there 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 therefore understand how *v*P is a candidate for a phase because *v*P basically represents the core of a proposition. In syntactic structure, *v*P is dominated by NegP. If *v*P represents a proposition *p*, it is not unlikely that the composite of [Neg([+Neg]) + *v*P] corresponds to

⁵ The arguments in this section are fundamentally the same as the ones of Akahane (2006: sec. 3).

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

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

$\sim p$. From the viewpoint of logic, if p is a proposition, then $\sim p$ is also a proposition. The claim then is that NegP is a propositional unit, and should naturally qualify as a phase at least when headed by a negative operator with the feature [+Neg]. In some cases, *not/n't* does not appear, but inner island effects are induced by negative elements such as negative adverbs. Here the relevant effects are due to feature valuation through agreement. We do not pursue this issue in the present paper, but refer readers to Akahane (2006).

With respect to phonology, identifying NegP as a phase can be motivated by an analysis of ellipsis as in Takahashi (2002). Takahashi argues that ellipsis applies only if the elided site is in the complement domain of a phaseal 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) $[_{CP} \quad C \quad [_{TP} \text{he is writing something}]]$, but
 \downarrow
 you can't imagine $[_{CP} \text{why } C \quad [_{TP} \text{he is writing something}]]$
 \rightarrow He is writing something, but you can't imagine why.

By the time Spell-Out applies to a phase, the computation of the complement domain is already finished. 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 vP complement to Neg can be elided when it is recycled in another NegP headed by *not*. Observe the example in (22).

- (22) My car Past $[_{NegP} \quad [_{vP} \text{pass the smog test}]]$ but
 \downarrow
 Henry's did $[_{NegP} \text{not } [_{vP} \text{pass the smog test}]]$
 \rightarrow My car passed the smog test but Henry's did not.

In fact, Lobeck (1995) and Potsdam (1996) analyze *not* as a licenser of an empty VP(vP), i.e. VP(vP) ellipsis. Recycling aside, I would like to suggest that phaseal heads are capable of licensing the phonological reduction of their complement domains—under certain conditions concerning morphological realization, Spec-head agreement and so on.

Chomsky (2000, 2001) places 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 paradigm negative intervention effect described in generative terms—would also provide evidence for the view that NegP constitutes a phase for morpho-phonological operations. If so, we can maintain that a syntactic approach to negative intervention effects is favored over a semantic/pragmatic one (Szabolcsi and Zwarts (1993) among others). For expository reasons, we henceforth display NegP in the structure only when it counts as a phase with a [+Neg] feature specification.⁷

⁷Two anonymous reviewers point out that in *there*-constructions, agreement between T and

quantified subject \exists in the first conjunct is also prohibited by Parallelism. This explains why (24) has only the interpretation where \exists has scope over the attitude verb *seem*. In (25), lowering can apply to both conjuncts, hence the sentence is ambiguous:

- (25) An American runner seems to Bill to have won a gold medal, and
 a Russian athlete does ~~seem to Bill to have won a gold medal~~, too.

Following Chomsky (1995: ch.4, 327), QL does not restore quantifiers to traces—that is, it is not the same as reconstruction. Rather, QL adjoins quantified expressions to lower phrases. In (23c), lowering applies to *someone* and adjoins it to vP . Significantly, both QR and QL apply cyclically in accordance with the PIC in (14).

To better understand scope interaction, we introduce (26), a revised version of the Scope Principle proposed by May (1985):

- (26) Scope Principle
- a. Operators are free to realize any type of scope relation iff they are in the same phase at the output level. Otherwise,
 - b. the surface configuration determines the scope relation.

By convention, the operators in (26) are pure (universal/existential) quantifiers and *wh*. We thus predict that inverse-scope interpretation or scope ambiguity emerges if (26a) is met at the output level. In (23c), the two quantifiers \exists and \forall are in the same phase, namely vP , so either can take wide scope. It should also be noted that their traces are ignored. Fox (2000) presumes that QL is a totally optional operation, i.e. not feature-driven. If so, \exists in (23c) must be regarded as a member of the CP phase when it remains outside vP and does not lower (recall TP is not a phase). Notice that \exists is allowed to have scope over \forall with QL due to (26a) or without it (26b). This redundancy can be avoided if QL is not totally optional. Suppose quantifiers must undergo some scope-related operation in order to satisfy their scope properties. Movement is normally feature-driven. Feature-driven QR can then be viewed as a “default” scope-related operation, and non-feature-driven QL as a supplementary one. In other words, quantifiers which have not undergone QR must undergo QL as a last resort. QL applies unless it is prevented from doing so by some other constraint such as Parallelism. Returning now to (23c), we have only one option: apply QL to \exists . In the next subsection, we will examine the details of how (26b) works.

4.2. Negative intervention effects

Let us now turn to (9), whose derivation is given below.

- (27) a. $[_{vP} (\forall_i) \text{ someone } v [_{VP} \text{ love everyone}_i]]$
↑
covert QR
- b. $[_{NegP} \text{ someone}_j \text{ Neg } [_{vP} (\forall_i) t_j v [_{VP} \dots]]]$
↑
overt DP-mov't
- c. $[_{CP} C [_{TP} \text{ someone}_j \text{ T } [_{NegP} t_j \text{ Neg } [_{vP} (\forall_i) t_j v [_{VP} \dots]]]]]$
↑
overt DP-mov't
- d. $[_{CP} C [_{TP} \text{ someone}_j \text{ T } [_{NegP} (\exists) t_j \text{ Neg } [_{vP} (\forall_i) t_j v [_{VP} \dots]]]]]$
↑
covert QL

The first step in (27a) is the same as (23a). According to Chomsky (2000: 109), (28) applies optionally:

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

Under the assumption that Neg heads a phase, it can be assigned an EPP-feature. The EPP must be satisfied overtly. Here we adopt Chomsky's (1995: ch. 4) view rather than the one in subsequent work whereby the EPP triggers overt DP-movement because it is a kind of D-feature (see Akahane (2006) where this is discussed in some detail). The subject DP *someone* therefore moves to [Spec, Neg] overtly as in (27b). Still, it is not required to remain there. Furthermore, English only tolerates a negative non-argument at the edge of NegP for special reasons (presumably due to morphology or discourse).⁸ Since DP-movement in (27b) is triggered by the EPP, not by QR, it should not be related to the scope of *someone*. This EPP-driven movement is important as it opens up new possibilities for interpretations which can be evaluated in the next phase on the basis of the PIC (14).

In (27c), *someone* continues overt movement to [Spec, T]. Since *someone* has not undergone QR per se, QL should apply to it. According to the PIC, the adjunction site of QL should be the edge of NegP as in (27d). The complement domain of Neg (i.e. *vP*) cannot be accessed by QL in any case since this has already been spelled out. As a consequence, the two quantifiers are not phase-mates: \exists belongs to the NegP phase, while \forall belongs to the *vP* phase. In such a situation, the Scope Principle will not allow them to interact and (26b) is invoked. Given the PIC and Scope Principle, the question of why (9) has no inverse-scope reading is resolved.

If QL is a totally optional operation, and if the IEC has priority over all other principles, we might expect that \exists in (27d) will be able to lower to the edge of *vP*,

⁸ In languages such as French, the edge of NegP can host a negative argument (see Christensen and Taraldsen (1989) for Scandinavian):

(i) Elle n'a rien lu. (Kayne 1975: 13)
 she NEG has nothing read
 'She didn't read anything.'

Chomsky (2001) suggests a parameter to distinguish object-shift (OS) languages from non-OS languages referring to "surface interpretation." A similar parameter may be required to distinguish negative-argument-shift (NAS) languages from non-NAS ones.

giving rise to another scope relation $\forall > \exists$. It has already been suggested that QL is not totally optional. We also saw in (16) that QR is clause-bounded. Let us assume then that such locality effects are real. Again, the covert scope-related operations QR and QL are legitimate operations, so they must obey the PIC and confine themselves within a single phase plus the adjacent edge (the complement domain of the previous phase having already been spelled out and rendered inaccessible). This result is guaranteed by assuming that the IEC will work only if it does not override the PIC. This way the IEC may be considered to apply locally, and in accordance with the PIC without looking over the whole sentence.

So far, we have restricted the adjunction site of QR to vP and not taken into consideration successive-cyclic QR. If successive application of QR to NegP and TP is also possible as shown in (29a, b), (9) should have an inverse-scope interpretation contrary to fact:

- (29) a. $[_{CP} C [_{TP} \text{someone}_j T [_{NegP} (\exists)_j (\forall)_j t_j \text{Neg} [_{vP} t_i t_j v [_{VP} \dots]]]]]$
 covert QL covert QR covert QR
- b. $[_{CP} C [_{TP} (\forall)_j \text{someone}_j T [_{NegP} t_i t_j \text{Neg} [_{vP} t_i t_j v [_{VP} \dots]]]]]$
 covert QR covert QR covert QR

Williams (1977), May (1985) and others have analyzed vP (VP) as providing a local host for quantifiers with some scopal properties. Citing Heim and Kratzer (1998), Fox (2000) argues that a semantic type mismatch between a quantifier and its sister (V) is repaired by QR to vP (see footnote 3). It seems that this is closely related to the properties of v . We contend that QR to the edge of vP is driven by a feature on v which we will call [QU(antifunctional)] (cf. Chomsky (1995: ch. 4, 377; 2000: 109)). [QU] is checked against different types of quantifiers including wh-phrases. As [QU] is assigned only to v (i.e. not to Neg or T), successive-cyclic QR as in (29) can never take place.

Let us now consider wh-question examples. In (30), the wh-phrase *how* moves from the embedded clause to the matrix [Spec, C].

- (30) How_i do you believe John solved the problem t_i ?

How is base-generated at the edge of the embedded vP and first moves to the embedded [Spec, C]. This movement is triggered by a feature on C, viz. [Q], after the Q-morpheme. [Q] (as well as [QU]) must be distinguished from the EPP-feature since the former is related to inherent properties of the phasal head (cf. Chomsky (2000: 144, n.50)). Whether interrogative or declarative, C is always assigned [Q]. [Q] serves to set (not fix) a wh-phrase in an operator position, and can trigger overt wh-movement. Let us suppose there are no untoward effects if it is unchecked. On the way to the matrix [Spec, C], the wh-adverb stops at the edge of the matrix vP to satisfy the PIC:

- (31) $[_{vP} \text{believe} [_{CP} \text{how}_i [_{TP} \text{John} [_{vP} t_i \text{solved the problem}]]]]]$

There should also be a trigger for this movement. As already mentioned, we assume that the EPP-feature is checked only against DP. In (31) the EPP-feature, if assigned to v , cannot drive movement of *how* because it is an adverb, not a DP. Movement of the *wh*-phrase to the edge of vP must therefore be generally triggered by [QU] on v . [QU]-triggered movement is QR, and we just saw that QR takes place both before and after Spell-Out. In (31), the *wh*-phrase undergoes QR before Spell-Out. Let us refer to such QR as “overt QR.” Without overt QR, [Q] on the matrix C cannot induce overt *wh*-movement, nor can (30) be derived (*wh*-in-situ will be discussed in later sections). Regardless of whether QR is overt or covert, it should be optional—otherwise, it would be a look-ahead operation.

How can the contrast between the *wh*-question examples (4) and (10) be reconciled? Let us highlight the decisive steps of the derivation ($W = \text{QRed wh}$).

- (32) a. $[\text{what}_i \dots [{}_{\text{CP}} t_i [{}_{\text{TP}} \text{everyone}_j \text{T} [{}_{vP} (\forall_j) W_i t_j v [{}_{VP} \text{saw } t_i]]]]]$ (= (4))
- $\underbrace{\hspace{10em}}_{\text{covert QL}} \quad \underbrace{\hspace{10em}}_{\text{overt QR}}$
- b. $[\text{what}_i \dots [{}_{\text{CP}} t_i [{}_{\text{TP}} \text{everyone}_j \text{T} [{}_{\text{NegP}} (\forall_j) t_i t_j \text{Neg} [{}_{vP} W_i t_j v [{}_{VP} \text{saw } t_i]]]]]$...
- $\underbrace{\hspace{10em}}_{\text{covert QL}} \quad \underbrace{\hspace{10em}}_{\text{overt QR}}$
- (= (10))

In the embedded clause of each example, the *wh*-phrase moves overtly to the edge of vP to satisfy the [QU] feature. The intermediate declarative C is assigned [Q]. Next, the *wh*-phrase is moved to the embedded [Spec, C] before Spell-Out. It moves overtly to the matrix [Spec, C] via the matrix [Spec, v] though the latter is omitted in (32). For semantic purposes such as clausal typing (Cheng (1991)) and operator-variable construction, *wh*-phrases must be frozen in the Spec of interrogative C; namely, they cannot undergo QL from their final checking point (unlike reconstruction for A-binding). All intermediate traces are ignored for the semantic purposes just mentioned, except those at the point of QR, i.e. the edge of vP . The positions crucially pertaining to relative quantifier scope are thus adjunction sites of QR/QL and the final destination of *wh*-movement. In (32a), \forall and W turn out to be phase-mates in the embedded vP ; (4) therefore has two readings. In (32b), on the other hand, \forall and W are not phase-mates at any point, so (10) can only have an interpretation in which the *wh*-phrase has wide scope over \forall , reflecting the surface configuration. Still, one might wonder if the final destination of *wh*-movement (i.e. the matrix [Spec, C]) is really crucial in (32b). In (32b) the *wh*-phrase should undergo QR to the matrix vP , which would accord with the expected scope interpretation. Although this turns out to be the case in (32b), in what follows we confirm that the final destination of *wh*-movement is crucial.

Consider (33), where the quantifier \forall in object DP cannot take scope over the subject *wh*-phrase:

- (33) Who bought everything for Max? ($\text{wh} > \forall, \forall \not> \text{wh}$)

(34) is the output of (33), provided that the *wh*-phrase is frozen at the final destination and never undergoes QL for clausal typing or other reasons.

$$(34) \left[{}_{\text{CP}} \text{ } wh_o_j \text{ } C \left[{}_{\text{TP}} t_j \text{ } T \left[{}_{\text{vP}} (\forall_i) t_j \text{ } v \left[{}_{\text{VP}} \text{bought everything}_i \right] \right] \right] \right]$$

$\underbrace{\hspace{15em}}_{\text{covert QR}}$

In (34), the *wh*-phrase and \forall cannot interact because they are not phase-mates: the former belongs to the CP phase and the latter to the *vP* phase. Therefore, the only possible reading (*wh*> \forall) faithfully reflects the surface configuration. If the final destination of *wh*-movement is not crucial, how does this outcome obtain? The subject *wh*-phrase does not undergo QR, so it might resort to QL from [Spec, T] to *vP*. This would put \forall and the *wh*-phrase in the same phase, and lead to the impossible reading \forall >*wh*. We should never think of successive-cyclic QR of \forall to TP.

$$(35) \left[{}_{\text{CP}} \text{ } wh_o_j \text{ } C \left[{}_{\text{TP}} (\forall_i) t_j \text{ } T \left[{}_{\text{vP}} t_j \text{ } t_j \text{ } v \left[{}_{\text{VP}} \text{bought everything}_i \right] \right] \right] \right]$$

$\underbrace{\hspace{10em}}_{\text{covert QR}} \quad \underbrace{\hspace{10em}}_{\text{covert QR}}$

The derivation with successive-cyclic QR in (35) would render the reading \forall >*wh* possible.⁹

We 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 *vP* and does not apply successive-cyclically.¹⁰ Because of limited space, we do not scrutinize all the relevant data that appear in the literature (in Appendix we discuss some problematic phenomena). When a NegP phase intervenes, the Scope Principle disallows scope interaction.

4.3. Overt QR and the Interface Economy Condition

In the previous section, it was proposed that QR applied overtly. In languages like English, quantifiers raised overtly cannot stay at the edge of *vP* until the end of a derivation.

- (36) 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 (36a) with neutral intonation, but accepts that of (36b) in compound tenses.

⁹ May (1985) excludes the possibility of QR to TP(S) just as in (35), but this is for reasons pertaining to the Empty Category Principle.

¹⁰ The view that QR cannot apply successive-cyclically seems contradictory with regard to the following example:

- (i) One girl knows what every boy bought for Mary.

Moltmann and Szabolcsi (1994) observe that the embedded subject *every boy* can take scope over the matrix subject *one girl* in (i). However they note this phenomenon is restricted to verbs such as *know* and *find out* in the matrix clause, and a similar interpretation is unavailable with verbs such as *wonder*. I suspect that the complement of *know* in (i) is actually a free relative clause labeled D which undergoes raising to the edge of *vP*. This might enable the two quantifiers to interact.

- (41) a. Qui a lu quoi?
 who has read what
 b. *Qui a quoi/que lu?

The strong/weak [QU] parameter should therefore be dismissed.

Cheng (1991) states that clausal typing must be carried out before Spell-Out. For CP to be typed as a wh-question, one (and only one) wh-element is required to move overtly to [Spec, C].¹² It seems that operations for clausal typing are essentially motivated by the IEC. If there is no wh-phrase accessible to a wh-interrogative([+wh]) C before Spell-Out, CP will fail in clausal typing. We submit that overt raising of a wh-element can be triggered directly by the IEC as well as by [QU]. In multiple questions, wh-expressions which move 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 (40)–(41) cannot be derived. Such halfway movement may have some semantic effects in scrambling languages like Japanese. English and French are not scrambling languages, however, so there are no such effects. (40b) and (41b) are simply gibberish.

Overt raising of non-wh-phrases such as *every*-DP/*tout(es)*-DP is not permitted (see (36b) and (38b)). Here it is obvious that they cannot participate in clausal typing. Suppose that the [QU]-feature only drives the raising of bare quantifiers without pied-piping, i.e. *every/tout(es)*. Unlike the French quantifier *tout(es)*, the English quantifier *every* does not move alone.

- (42) *John (has) *every*_i read *t*_i book.

With respect to morphology (or etymology), *every* is composed of two parts: *ever* and *y* ‘each.’ Here we analyze *ever* as occupying the [Spec, D] and *y* as occupying D, parallel to the elements *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, hence *every* cannot move alone.

The contrast in (43) would seem to strengthen the bimorphemic analysis of *every*.

- (43) a. *The men have every picked up a glass.
 b. The men have every one picked up a glass.

As shown in (43a), *every* cannot float separately from its host. The ungrammaticality of (43a) can be associated with that of *every the men/the every men*. Note that even if the plural noun *men* were replaced with the singular noun *man*, (43a) could not be saved: **every the man/the every man*. *Every* cannot cooccur with *the*. This is because both (*ever*-)*y* and *the* compete for the same head position of DP. Under a derivational account of quantifier float, *the men* cannot move out of *[*every the men*]/*[*the every men*] leaving *every* behind. On the other hand, we can derive

¹² Under Cheng’s (1991) Clausal Typing Hypothesis, overt wh-movement cannot be required in languages with Q-morphemes which appear at the periphery of clauses. Languages such as Japanese and Chinese thus do not have overt wh-movement.

(43b) by moving *the men* out of [*every one (of) the men*]. English floating quantifiers are basically universal, such as *all*, *both* and *each*. Unlike *every*, they can cooccur with *the* (*each* is an obvious exception). As with *every*, existential quantifiers such as *many* and *some* do not participate in quantifier float. This follows if the bimorphemic analysis extends to them as well, although further investigation is needed regarding overt raising of a monomorphemic quantifier from the object position. Without pied-piping, the bare quantifier *ever* (\forall) can undergo covert QR, since morpho-phonological restrictions are not imposed on such operations.

Due to the [QU]-feature, QR basically applies to morphologically simplex bare quantifiers, before or after Spell-Out. Such morpho-phonological restrictions may be overridden by the IEC or clausal typing, however. Both simplex wh-phrases (e.g. *who(m)*, *what*) and complex ones (e.g. *whose/which book*) can therefore undergo overt QR. Even simplex wh-phrases might also be analyzed as morphologically complex: *wh-* is separated from the rest. If so, QR applies to wh-expressions only for clausal typing, to which [QU] is completely irrelevant. Still, we do not pursue the latter analysis here.

5. Local C-Wh Agreement and the NegP Phase

In preceding sections, we saw that negative intervention phenomena in English can be accommodated by phase theory. To recapitulate, NegP as well as CP and v P will be identified as a phase, while the PIC will constrain both overt and covert operations. On these assumptions, we can explain how, when NegP behaves as a phase, covert QR/QL will not carry a quantifier to the phase to which another quantifier belongs. Negative intervention effects obtain from the phasehood of NegP. 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 alternative forms. In one, a wh-phrase can be fronted to the sentence-initial position ([Spec, C]) as in (44a), or placed in situ as in (44b).¹³

- (44) a. Qui_i as-tu vu t_i?
 who have-you seen
 ‘Who did you see?’
 b. Tu as vu qui? (= (44a))

Several authors (Chang (1997), Bošković (2000), Cheng and Rooryck (2000), Mathieu (2004), and others) report that the distribution of in-situ wh-phrases in French is more restricted than in English. In languages such as Japanese and

¹³ Less formally, (i) without T-to-C movement and (ii) with *est-ce que* are also licit:

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

For the present discussion, we ignore any nuances that these variations might give rise to.

Chinese, which do not have (overt) *wh*-movement, the distribution of *wh*-in-situ is much less restricted. As observed in (45a), in-situ *wh*-questions in French show negative intervention effects.

- (45) a. ?*Il ne mange pas quoi?
 he NEG eats NEG what
 ‘What doesn’t he eat?’
 b. Que ne mange-t-il pas? (= (45a))

(45a) can be construed as an echo-question, but is not acceptable as a nonecho-question. In English multiple *wh*-questions, negation does not interfere with the scope interpretation of in-situ *wh*-phrases. Compare (46) with (45a).¹⁴

- (46) Who doesn’t eat what?

To account for the ungrammaticality of (45a), both Bošković (2000) and Cheng and Rooryck (2000) adopt the covert feature-movement proposed by Chomsky (1995 ch. 4). They argue that a *wh*-feature moves covertly from an in-situ *wh*-phrase to the matrix C; moreover, negation interferes with such covert *wh*-feature movement in single in-situ *wh*-questions.

Bošković’s (2000) and Cheng and Rooryck’s (2000) analysis, however, differ from each other with respect to the interpretability of the *wh*-attracting feature as well as the timing of its introduction into a 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 presumably has no major phonological effects (cf. Chomsky (1995: ch. 4, 292–294)). Bošković’s analysis is countered by Cheng and Rooryck (2000), who criticize it for ignoring the intonational difference between fronted *wh*-questions (44a) and in-situ *wh*-questions (44b). In-situ *wh*-questions are pronounced with the yes/no-question intonation but fronted *wh*-questions are not.

Regarding the intonation of *wh*-in-situ 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*:], which forces covert *wh*-feature movement for the purpose of specification: [*Q*: *wh*] or otherwise [*Q*: *y/n*]. Apart from the null *Q*-morpheme in Cheng and Rooryck’s sense, we assume that an unvalued interpretable feature triggering *wh*-movement will be assigned

¹⁴ 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, they may never be adverbials because they can function as a 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)

to the matrix C and realized as yes/no-question intonation. The label [uY/N] (u = unvalued) is used instead of [Q:] so that it is differentiated from the feature [Q] (see section 4.2.). In French-type languages, [uY/N] on a matrix C receives the positive value [+Y/N] (i.e. a yes/no-question) by default if it enters into no agreement with any wh-phrase. We return to this point later.

The analyses of Bošković (2000) and Cheng and Rooryck (2000) also diverge in how to capture the locality of wh-in-situ. In single wh-questions (apart from echo-questions), there are no in-situ wh-phrases in embedded clauses.

- (47) *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 (45a) that wh-in-situ cannot occur under negation. For this, Bošković assumes that covert feature-movement is one-step long-distance movement. He argues that a wh-feature cannot cross any A'-heads on the way to the matrix C—a kind of RM effect—as suggested by Roberts (1993). Thus in (47), the wh-feature cannot move to the matrix C and cross the embedded C, an A'-head. Likewise, it cannot reach the matrix C in (45a) because Neg, an A'-head, intervenes. Cheng and Rooryck, on the other hand, stipulate that a null Q-morpheme has access only to wh-phrases in the matrix clause due to its scopal property, thus ruling out (47). Moreover, they argue that wh-feature movement is blocked by inaccessible domains induced by negative- and other operators (cf. Honcoop (1998)). In (45a), it is the negative operator *pas* that induces an inaccessible domain and obstructs wh-feature movement.¹⁵

Neither Bošković's nor Cheng and Rooryck's account is without problems, however. The covert feature-movement adopted in both is global, i.e. does not operate cyclically. In the MP framework assumed here, covert feature-movement is abandoned because of computational complexity, as noted by Chomsky (2000: 123). Moreover, we expect a wh-attracting feature on a matrix C (or a Q-morpheme adjoined to the matrix C) to search for a wh-element, but not a negative operator. The latter lacks a wh-feature and is invisible to an attracting feature on the matrix C (see Manzini (1998) for a similar discussion). In short, negation should not cause intervention effects. For this and other reasons, we reject covert feature-movement analyses in favor of one which appeals to covert QR and local agreement in compliance with the PIC.

In section 4, it was proposed that QR to the edge of vP could take place both before and after Spell-Out, whereas wh-movement to [Spec, C] must occur before Spell-Out for the purpose of clausal typing. Assuming this, let us consider the derivation of (44a, b).

¹⁵ Cheng and Rooryck (2000) cite Honcoop's (1998) notion of inaccessible domain. It is doubtful that Honcoop's dynamic semantics approach could be applied to narrow syntax.

$$(48) \left[{}_{\text{CP}} \text{---} \text{C} \left[{}_{\text{TP}} \text{tu}_i \text{as-T} \left[{}_{v\text{P}} \text{---} \text{t}_i \left[{}_{\text{VP}} \text{vu qui} \right] \right] \right] \right]$$

\uparrow \uparrow
overt wh-movement *overt/covert QR*

In (48), the wh-phrase *qui* is raised to the edge of *vP* by QR. If this takes place before Spell-Out, *qui* can undergo subsequent wh-movement to [Spec, C]. If it occurs after Spell-Out, there will be no subsequent wh-movement, since overt movement (pied-piping) must meet the following condition:

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

In (47), the wh-phrase stays in situ before Spell-Out (recall that overt/covert QR is optional); it may thus undergo covert QR triggered by [QU] on the embedded *v*. Principle (49) prevents it from being pied-piped to the outside of the embedded *vP*. Moreover, [uY/N] on the matrix C can never agree with a wh-element. The default valuation is [+Y/N] (yes/no-question), which is incompatible with a wh-element; (47) is therefore excluded. The same situation holds in English nonecho-questions such as (50).

(50) *Mary thinks that John bought what?

Let us return to the grammatical example (44b). According to Cheng and Rooryck (2000), a [uY/N]-feature on the null Q-morpheme in the matrix C is only accessible to a wh-feature in the matrix clause due to its limited scopal properties. We suggest that these should be ascribed to the PIC. When the phaseal head C is assigned the feature [uY/N], it probes for a wh-phrase. Under the PIC, [uY/N] can be valued only when it finds one in its minimal search domain. We refer to this process as “local C-wh agreement.” In (44b), the wh-element has been raised covertly to the edge of *vP*, as illustrated in (48). It is in the minimal search domain of [uY/N]. Since there is no intervening phase, local C-wh agreement can apply successfully.

Turning now to the intervention example (45a), the ungrammaticality can be construed in terms of the PIC. To the level of the *vP* phase, the derivation of (45a) largely parallels that of (44b). Before Spell-Out, the wh-element *quoi* stays within VP. Suppose that it is raised to the edge of *vP* by covert QR. After *vP*, (45a) takes the following path. Neg is a phaseal head, so it is freely assigned an EPP-feature. Under Principle (49), a wh-DP which has not been raised overtly to the edge of *vP* is not eligible to pied-pipe to [Spec, Neg].

$$(51) \left[{}_{\text{NegP}} \text{---} \text{il}_i \text{pas Neg-mange} \left[{}_{v\text{P}} \text{(quoi}_i \text{)} \text{t}_j \left[{}_{\text{VP}} \text{t}_v \text{quoi}_i \right] \right] \right]$$

\uparrow \uparrow
~~*overt DP-mov't*~~ *covert QR*

The EPP-feature on Neg would never be satisfied. Even if an EPP-feature is not assigned to Neg, [uY/N] on the matrix C cannot find a wh-phrase in the minimal search domain as required by the PIC. As a result, local C-wh agreement will never hold.

$$(52) \left[{}_{CP} \underset{i_j}{C} \underset{j}{il} \text{ne-mange-T} \left[{}_{NegP} \underset{j}{t_j} \text{pas } \underset{Neg}{t_{Neg}} \left[{}_{vP} \text{(quoi)} \underset{i_j}{t_j} \left[{}_{VP} \underset{V}{t_V} \text{quoi}_{i_j} \right] \right] \right] \right]$$

[uY/N] ————— × ············

Needless to say, if the wh-DP raises overtly to the edge of NegP, it can move to [Spec, C] without violating the PIC, deriving (45b).

Compare (45a, b) with (53a, b).

- (53) a. *Combien_i n'as-tu pas lu _i de livres?
 how.many NEG have-you NEG read of books
 'How many books did you not read?'
 b. Combien de livres_i n'as-tu pas lus _i? (= (53a))

The wh-elements in (53a, b) differ in category. While *combien de livres* in (53b) is a DP, *combien* in (53a) is not. This difference is reflected in verbal morphology: the past participle *lu* does not agree with the bare wh-quantifier in (53a), but number (plural) agreement holds with the wh-DP in (53b).¹⁶ (53a) is ungrammatical because the wh-phrase fails to raise to the edge of NegP. In this regard, (53a) is on par with (45a).

As it happens, French multiple wh-questions tolerate wh-in-situ even in embedded and negative contexts, just as their English counterparts do.

- (54) 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 wh-in-situ were uniformly ruled out in embedded and negative contexts, these examples would seem quite contradictory. In multiple questions, wh-in-situ can only remain in base-position when the Spec of [+wh]C is occupied overtly by another wh-element. In such situations, movement of a second wh-phrase is unmotivated. Both Bošković (2000) and Cheng and Rooryck (2000) suggest that in multiple questions, wh-items are able to link with operator positions by means of unselective binding (Pesetsky (1987)) or choice functions (Reinhart (1998, 2006)).

Why then would unselective binding/choice function be unavailable for single wh-in-situ questions? Pesetsky (1987) observes that in multiple questions, D(iscourse)-linked wh-phrases can resort to unselective binding. Kiss (1993) also remarks that wh-elements in situ in multiple questions are specific. It then follows that nonspecific wh-phrases cannot appear in situ:

¹⁶ Although plural agreement is optional, bare wh-quantifiers never participate in it. See Mathieu (2004: 1093–1094).

(55) *Who slept how?

Mathieu (2004) reports that in-situ wh-nominals in French single questions have nonspecific readings, contra Chang (1997). Moreover, he argues that such entities should be taken as predicative indefinites.¹⁷ Nominal expressions which function as predicates are often analyzed as NPs (see Stowell (1989) and Longobardi (1994)). If so, predicative wh-nominals can also be looked upon as NPs rather than DPs. Following Reinhart (1998, 2006), we suggest that only DPs are subject to choice functions leading to specific interpretations (the term “specific” here is used conventionally). For the present, let us adopt Reinhart’s (1998) proposal that D translates as a choice-function variable f bound by a wh-operator in [Spec, C], and the complement NP is a set variable $\{x|\alpha(x)\}$. In single in-situ questions, there is no operator in [Spec, C], so choice functions do not apply to them.

The DP/non-DP distinction pertaining to choice functions, however, does not operate straightforwardly in single in-situ questions if the two dialects/registers to which Mathieu (2004) and Chang (1997) refer actually exist. In Chang’s dialect/register, whs-in-situ are considered as specific even in single questions, but negative intervention effects still manifest themselves as in (45a). In multiple questions, a wh-element in [Spec, C] can serve as a choice-function operator in both dialects/registers. Let us then suppose that a phonologically null choice-function operator can be inserted in the Spec of the matrix [uY/N]C. This would enable specific wh-DPs to appear in situ even in single questions. Mathieu’s and Chang’s dialects/registers require local C-wh agreement in single questions, since [uY/N] on the matrix C must receive a negative value for wh-question interpretation.

One could propose a parameter which distinguishes between the two dialects/registers. Mathieu actually suggests one, but we do not replicate his argument here.¹⁸ Under the hypothesis just given, we propose a different parameter whereby Chang’s dialect/register picks up the phonologically null choice-function operator but Mathieu’s dialect/register does not. Both dialects assign [uY/N] to the matrix C. Our phase-theoretic approach thus successfully accounts for the fact that single in-situ questions in the two dialects/registers behave in the same way with regard to negative intervention effects, but diverge as to the specificity of whs-in-situ.

¹⁷ Mathieu (2004) adopts Van Geenhoven’s (1998) theory of semantic incorporation, and argues that nonspecific in-situ wh-elements are in fact predicates denoting properties that are semantically incorporated into verbs. By virtue of semantic incorporation, existential quantification is supplied to wh-phrases by V. The scope of existential quantification introduced by V is delimited to the inside of VP(v P), hence the intervention effect in (45a) follows.

¹⁸ Mathieu suggests a pragmatic parameter to account for the difference between the two dialects/registers, which determines whether in-situ wh-phrases receive a D-linked interpretation or not. He assumes semantic incorporation for both dialects/registers in order to capture the intervention effects. See Mathieu (2004: sec. 7.4).

5.2. Wh-scope marking constructions

Before leaving the discussion of local C-wh agreement, we draw attention to another phenomenon which seems to involve the same mechanism.

German has so-called wh-scope marking constructions which have been discussed in the generative literature since Riemsdijk (1982). Example (56a) is a “normal” wh-question and (56b) is an example of a wh-scope marking construction.

- (56) 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
 (= (56a))

(Rizzi 1992: 369)

In (56b), a wh-phrase *mit wem* moves halfway to the matrix C and stops at the intermediate [Spec, C]. A “wh-expletive” *was* appears in the higher position and marks the scope which *mit wem* actually takes. McDaniel (1989) postulates that a version of the Subjacency Condition rules out the chain between a wh-phrase and the lowest instance of a wh-expletive when more than one CP intervenes. (57) illustrates the Subjacency Condition on chain formation in wh-scope marking constructions.

- (57) a. [_{CP_n} was ... [_{CP_{n+1}} mit wem_i ... t_i ...]]
 b. * [_{CP_n} was ... [_{CP_{n+1}} dass ... [_{CP_{n+2}} mit wem_i ... t_i ...]]]

This condition is satisfied in (56b), but not in (58).

- (58) *Was glaubst du [_{CP₂} dass Hans meint [_{CP₁} mit wem_i Jacob t_i gesprochen hat] has]?
 ‘To whom do you believe Hans thinks Jacob talked?’

While McDaniel’s Subjacency Condition is obviously representational and global, it can easily be replaced by the PIC.

McDaniel (1989) and Rizzi (1992) also note that a wh-phrase cannot be associated with a wh-expletive when negation intervenes.

- (59) a. Mit wem_i 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 wem_i Hans t_i gesprochen hat]?
 what believe you not with whom Hans spoken has
 (= (59a))

(Rizzi 1992: 369)

Negative intervention effects obtain irrespective of whether the *wh*-phrase is an argument or an adjunct.

- (60) 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 non-arguments, and argues that the chain between a *wh*-expletive and a *wh*-phrase must obey RM.

We can straightforwardly derive Rizzi’s RM account from the PIC. While the *wh*-expletive *was* may be non-argumental, we make a slightly different assumption, i.e. that *was* is essentially the same as the null *yes/no*-intonation *Q*-morpheme in French proposed by Cheng and Rooryck (2000). Both are *wh*-scope markers associated with *wh*-elements. Let us suppose that *was* is a morphologically realized *C* with the feature [uY/N]. Since it is unvalued, [uY/N] on *was* needs to be valued through local agreement with a *wh*-element; otherwise, the feature will receive the positive value [+Y/N] which is not compatible with *wh*-elements. The *wh*-expletive should not be regarded as a choice function operator, however, because it cannot overcome intervention effects.

Let us further examine (59a, b). Here *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 before Spell-Out as in (61a), or after Spell-Out as in (61b).

- (61) 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 (61a), *mit wem* can continue to [Spec, Neg] by virtue of the D-feature on *wem*. Suffice it to say that a mechanism such as feature percolation is involved. From this intermediate position, it will be raised to [Spec, C] of the final phase (we concur with Chomsky (1995: ch. 4, 368) that V-second is a phonological matter).

- (62) [_{CP} mit wem_i C du glaubst [_{NegP} *t*_i nicht [_{vP} *t*_i *v* ...]]] (= (59a))

In (61b), on the other hand, *mit wem* can only stay at the edge of *v*P and never raise from there for by-now familiar reasons (see (49)). Crucially, when *was* (*C*) merges with the matrix TP, the PIC does not allow its [uY/N]-feature to agree with *mit wem* at the edge of *v*P due to the intervention of the NegP phase.

- (63) [_{CP} was(C) du glaubst [_{NegP} nicht [_{vP} (mit wem) ...]]]
 |
 [uY/N] ————— || —————

It then follows that *wh*-scope marking examples with the negative operator *nicht* such as (59b) will be excluded. Without an intervening NegP phase, local C-*wh* agreement is straightforward (see (60)).

To summarize, local C-*wh* agreement in German *wh*-scope marking constructions—as well as French single in-situ *wh*-questions—lends support to our phase-theoretic account of negative intervention effects.¹⁹

6. Conclusion

This paper has discussed various negative intervention phenomena. The main assumption was that syntactic operations are restricted by phases (i.e. the PIC), which then affects output interpretations. It was proposed that NegP should be identified as one such phase. Under this proposal, negative intervention effects naturally follow: a NegP phase blocks scope interactions between quantifiers, and precludes the local C-*wh* agreement that is involved in French single in-situ *wh*-questions and German *wh*-scope marking constructions. This would indicate that NegP phase is motivated by external (especially, C-I) systems. It goes without saying that some aspects concerning negative intervention phenomena remain to be elucidated; these must wait for another occasion.

Appendix

Here we briefly discuss a couple of examples which appear cumbersome to the analysis of quantifier scope proposed in section 4. First, let us examine the contrast below:

- (64) a. The teacher gave a book to every student. ($\exists > \forall, \forall > \exists$)
 b. The teacher gave a student every book. ($\exists > \forall, \forall \not> \exists$)

Dative constructions such as (64a) show scope ambiguity. Either of the two quantified object DPs can take wider scope than the other. This is almost parallel to the facts observed in (3). Double object constructions such as (64b), on the other hand,

¹⁹ A CP with a *wh*-expletive can be repeated:

- (i) *Was* glaubst du *was* Peter meint *was* Hans sagt *was* Klaus behauptet
 what think you what Peter believes what Hans says what Klaus claims
mit wem_i Maria *t_i* gesprochen hat?
 with whom 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* values the [uY/N]-feature on another *was*. This process of local C-*wh* agreement accompanied by covert C-to-*v* movement is repeated until it reaches the matrix CP (this essentially explains the disparity between (56b) and (58)). German and French diverge in this respect, but the source of the divergence is an open question.

are not ambiguous. The only possible reading is one in which the indirect object IO has scope over the direct object DO (see Larson (1988) citing an observation by David Lebeaux). If the two quantifiers are in the same phase, the Scope Principle predicts that both (64b) and (64a) are ambiguous with respect to quantifier scope.

McGinnis (2001) provides a phase-theoretic account of the impossible $\forall > \exists$ reading in double object constructions. According to her analysis, these have the structure (65) with a low applicative phrase ApplLP.

(65) $[_{vP} \text{SU } [_{v'} v [_{VP} \text{V } [_{\text{ApplLP}} \text{IO } [_{\text{ApplL}'} \text{ApplL DO}]]]]]]]$

McGinnis assumes that QR is driven by an EPP-feature on a phaseal head, subject to the Minimal Link Condition (MLC) (cf. Bruening (2001)). She puts forward a hypothesis that the sister of VP heads a phase if an argument is generated in its specifier. On this hypothesis, even though ApplL does not head a phase, in (65) v does, hence it can drive QR. With two quantified DPs in (64b), only the IO can undergo QR since it is closer to v than the DO. This is what the MLC requires, hence (64b) has only the $\exists > \forall$ reading. McGinnis gives no explanation for the ambiguity of (64a).

The pseudogapping facts in (66) may also follow from the same analysis:

- (66) a. ?John gave Bill a lot of money, and
 Mary will give Susan a lot of money.
 b. *John gave Bill a lot of money, and
 Mary will give Bill a lot of advice.

(Lasnik 1999)

Some readers might assume that the verb *give* is base-generated in ApplL, and that ApplL' is deleted in the second conjunct of (66a). Deletion of a non-maximal projection does not seem plausible, however. Lasnik (1999) takes the pseudogapping shown in (66a) to be VP ellipsis. For double object constructions, he proposes that VP consists of three AgrP-VP layers. In (67) below, we replace AgrP with vP and revise the structure adding PRO:

(67) $[_{vP1} \text{SU } [_{v1} v1 [_{vP2} \text{IO } [_{v2} v2 [_{vP3} \text{PRO } v3 [_{VP} \text{V DO}]]]]]]]]]$

Here the IO is base-generated at [Spec, $v2$], where it receives the role of Beneficiary and controls PRO with the Goal in [Spec, $v3$]. Ellipsis applies to VP and produces (66a). As seen in section 3, phonological reduction applies to the complement domain of a phaseal head. On the same grounds, $v3$ can be identified as a phaseal head. The outermost $v1$ and intermediate $v2$ complete the full argument structure, so they also head phases. While the [QU]-feature on $v1$ triggers QR, only the IO quantifier is raised, by definition of the PIC. The DO quantifier can undergo QR only to the edge of $vP3$. At the end of the derivation, the two object quantifiers will not be phase-mates. The Scope Principle then allows the IO to take scope over the DO but not the reverse (64b).

As for dative constructions, the structure of VP could be as follows:

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【要 旨】

不可視移動構文における干渉効果

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多くの言語において、文否定要素が引き起こす干渉効果が観察される。本稿は、英語における数量詞の相対的作用域解釈、フランス語の単一 wh 疑問文における元位置の wh の作用域解釈、更にはドイツ語の作用域標示構文における wh の作用域解釈等について考察し、Chomsky (2000) 以降の枠組みを採用することにより、これらの現象が統語的に説明されることを論ずる。干渉効果を捉えるため、本論考は、文否定辞を主要部とする否定辞句がフェイズの一つと認定されることを提案する。不可視移動をスペル・アウト後の演算と認めた上で、数量詞繰り上げ及び数量詞繰り下げも他の演算と同様、フェイズ不可侵性条件に従うものとする。これにより、数量詞の相対的作用域解釈における干渉効果が導き出される。また、wh は C を占める作用域標識と局所的に一致が必要とすることにより、フランス語の単一 wh 疑問文やドイツ語の作用域標示構文における wh の作用域が説明される。