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Chapter 9

On the Relaxation of
Intervention Effects

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9.1 Introduction

On the basis of insights captured in Rizzi's (1990) Relativized Minimality, Chomsky (2000, 2001, 2004) proposes the Defective Intervention Constraint in (1) (adapted from Chomsky 2000, 123).

- (1) $\ast\alpha > \beta > \gamma$, where (a) ">" indicates c-command, and (b) β and γ match the probe α , but β is inactive so that the effects of matching are blocked.

This constraint is appropriate as a first approximation, but certain anomalies remain unaccounted for (see, e.g., Rizzi 2004). In this chapter, I will focus on the *Wh*-Island Constraint imposed on *wh*-movement.

The *Wh*-Island Constraint, exemplified by (2a–b), has been widely assumed to be a defective intervention effect of type (1).

- (2) a. **Which of the new books_i* do you wonder [when_j John bought *t_i* *t_j*]?
 b. **Which pasta_i* do you wonder [how_j the famous Italian chef cooked *t_i* *t_j*]?

Let us consider (2a). During its derivation, we come to the stage where the Q-feature of the matrix C, being a probe, seeks a goal.

- (3) $[C_{[Q]} [you\ wonder\ [when_{[Q,wh]}] [C_{[Q]} [John\ bought\ which_{[Q,wh]} of\ the\ new\ books\ t_j]]]]]$

In (3), the *wh*-phrase *when* raises to the specifier position (Spec) of the embedded C for checking purposes. The Q-feature of the embedded C and the *wh*-feature of *when*, both of which are uninterpretable, are deleted (valued). Given that uninterpretable features render the goal active, *when*, whose uninterpretable *wh*-feature has been deleted (valued), is not active

as a goal. When the Q-feature of the matrix C seeks a goal, *when* blocks movement of *which of the new books* to the Spec of the matrix C as a result of the Defective Intervention Constraint (1). This is because *when*, which is not active but visible, c-commands *which* and thus functions as an intervener.¹

I will show, however, that the *wh*-island effects are relaxed when the following two conditions are met: (1) indirect questions are infinitive or subjunctive, and (2) extracted *wh*-phrases are D(iscourse)-linked. I will argue that this hitherto unexplained anomaly concerning the *Wh*-Island Constraint is given a principled minimalist account by an operation of covert restructuring and the Phase Impenetrability Condition (PIC) proposed by Chomsky (2000, 2001, 2004). I will show that contrary to the widespread view that the *Wh*-Island Constraint can be subsumed under the Defective Intervention Constraint (1), we still need a traditional Subjacency-type account like that advocated by Chomsky (1973, 1977, 1986) to fully accommodate the *wh*-island effects.

The chapter is organized as follows. In section 9.2, I argue that infinitive/subjunctive complements undergo covert restructuring. Specifically, I argue that an Aspect Phrase (AspP) within an infinitive/subjunctive complement undergoes covert phrasal movement to the Spec of the embedding v for reasons of temporal interpretation. I then show that the covert restructuring analysis accounts not only for the relaxation of the defective intervention effects with infinitive/subjunctive indirect questions but also for transparency (clause-mate) effects with infinitive/subjunctive complements. In section 9.3, I first show that the relaxation of the defective intervention effects can only be observed with D-linked *wh*-phrases. I argue that the selective extractability of a *wh*-phrase out of an infinitive/subjunctive indirect question should be given a traditional Subjacency-type account based on the notion of the phase. In section 9.4, I argue that this analysis also accounts for the “double *wh*-island” effects found with infinitive/subjunctive indirect questions. I also show that relativization can be dealt with in the same way as D-linked *wh*-phrases. In section 9.5, I offer concluding remarks.

9.2 Covert Restructuring

If the Defective Intervention Constraint (1) is operative in grammar, we must account for why the intervention effects are relaxed when extraction takes place out of an infinitive/subjunctive indirect question (see, e.g., Chomsky 1986; Cinque 1990; Boeckx 2001).

- (4) a. *Which of the new books_i* do you wonder [when_j to buy *t_i t_j*]?
 b. *Which pasta_i* do you wonder [how to cook *t_i t_j*]?
 (5) a. *Which of the new books_i* do you wonder [when_j you should buy *t_i t_j*]?
 b. *Which pasta_i* do you wonder [how you should cook *t_i t_j*]?
 In (4) and (5), even though the *wh*-phrase is extracted out of the indirect question, the result is relatively acceptable. In this section, I will propose that infinitive/subjunctive complements undergo covert restructuring, arguing that it accounts for the relaxation of the intervention effects. First, though, I will explicate temporal interpretations of infinitive/subjunctive complements, as these provide the basis for the covert restructuring account.

9.2.1 Temporal Interpretations of Infinitive/Subjunctive Complements

It is well known that infinitive/subjunctive complements always depend on higher clauses for tense interpretations (see, e.g., Piccolo 1984; Kempchinsky 1986; Manzini and Wexler 1987; Zagana 1988; Hornstein 1990; Thompson 1996). I claim with, among others, Zagana (1988), Hornstein (1990), Stowell (1995, 1996), Thompson (1996), and Giorgi and Pianesi (1997), that tenses are represented syntactically. Among these syntactic approaches to tenses, I adopt the neo-Reichenbachian approach advocated by Hornstein (1990) and Thompson (1996). I will argue that temporal interpretations of infinitive/subjunctive complements can be captured by covert restructuring under the neo-Reichenbachian theory of tense.

9.2.1.1 A Neo-Reichenbachian Theory of Tense The neo-Reichenbachian approach has extended Reichenbach's (1947) system, arguing that tenses are composed by linearly ordering three times: the Event time (E), the Reference time (R), and the Speech time (S). As an illustration, let us consider (6).

- (6) John had left the restaurant

In (6), the Event time is the time of John's leaving the restaurant, the Reference time is the time by which John leaves, and the Speech time is the time at which this sentence is uttered. The basic tense structure of the past perfect (6) is represented by (7).

- (7) E_R_S

When two points are separated by an underscore, the one to the left is interpreted as temporally preceding the one to the right. In (7), E is

located before R, which is itself located before S. This is in accord with the natural interpretation of (6).

The neo-Reichenbachian approach also enables us to account for the properties of complex tense configurations. Let us consider adverbial modification, taking (8a–c) as examples.

- (8) a. John is leaving at this very moment/right now
 b. John is leaving tomorrow
 c. *John is leaving yesterday
 (Hornstein 1990, 16)

Hornstein (1990) argues that an adverb can combine with a basic tense structure (BTS) to form a derived tense structure (DTS). The temporal structures of (8a–c) are given in (9).

- (9) a. $\begin{array}{ccc} \text{BTS} & & \text{DTS} \\ \text{S,R,E} & \xrightarrow{\text{now}} & \text{S,R,E} \\ & & | \\ & & \text{now} \end{array}$
 b. $\begin{array}{ccc} \text{BTS} & & \text{DTS} \\ \text{S,R,E} & \xrightarrow{\text{tomorrow}} & \text{S_R,E} \\ & & | \\ & & \text{tomorrow} \end{array}$
 c. $\begin{array}{ccc} \text{BTS} & & \text{DTS} \\ \text{S,R,E} & \xrightarrow{\text{yesterday}} & \text{E,R_S} \\ & & | \\ & & \text{yesterday} \end{array}$
 (Hornstein 1990, 19)

In (9), the points separated by a comma, which are called “associated” points, are interpreted as contemporaneous. Hornstein assumes the following constraint on the derivation of a derived tense structure:

- (10) *Constraint on DTS (CDTS)*
 DTS must preserve BTS.
 (Hornstein 1990, 15)

The notion of preservation is defined as follows:

- (11) BTSs are preserved iff
 a. no points are associated in DTS that are not associated in BTS;
 b. the linear order of points in DTS is the same as that in BTS.
 (Hornstein 1990, 15)

In (9a), the adverb *now* modifies E or R without altering the basic tense structure; there is no violation of the CDTS (10). In (9b), although the adverb *tomorrow*, which modifies E or R, alters the basic tense structure, dissociating R and E from S, there is no violation of the CDTS (10). In (9b), there are no SER points that are associated in the derived tense structure but not in the basic tense structure. Furthermore, the order of the SER points in the derived tense structure is the same as their order in the basic tense structure. Hence, the basic tense structure is preserved; (9b) satisfies the CDTS (10). In (9c), on the other hand, the order of the SER points in the derived tense structure is not the same as their order in the basic tense structure. Modification by *yesterday* alters the order of the SER points; this violates the second part of the notion of preservation (11) relevant to the CDTS (10). Hence, the neo-Reichenbachian approach can account for the contrast in acceptability between (8a–b) and (8c).

9.2.1.2 Sequence-of-Tense Phenomena Hornstein (1990) argues that sequence-of-tense phenomena, which are illustrated in (12), can also be accommodated under the neo-Reichenbachian approach.

- (12) John heard that Mary was pregnant
 (Hornstein 1990, 120)

(12) is ambiguous. On one reading, (12) is true if at some past time John heard that Mary was pregnant at a prior time. On the other reading, the time of being pregnant is the same as the time of hearing. The latter reading, where the temporal interpretation of the embedded Event time is dependent on the matrix Event time, is taken as an instance of the sequence-of-tense phenomenon. Hornstein claims that when a finite clause is embedded under a past time clause as in (12), the temporal dependency on the matrix Event time is signaled by a change in the surface form of the embedded verb. In (12) with the sequence-of-tense interpretation, the underlying tense of the embedded verb is actually the simple present, and the surface past tense form is just the morphological manifestation of the temporal dependency on the matrix Event time. Under Hornstein's analysis, the temporal structure of (12) with the sequence-of-tense interpretation is represented by (13), where the sequence-of-tense (SOT) rule applies to the basic tense structure, yielding the derived tense structure.

- (13) $\begin{array}{ccc} \text{BTS} & & \text{DTS} \\ \text{E}_1, \text{R}_1, \text{S}_1 & & \text{E}_1, \text{R}_1, \text{S}_1 \\ & \xrightarrow{\text{SOT}} & | \\ \text{S}_2, \text{R}_2, \text{E}_2 & & \text{S}_2, \text{R}_2, \text{E}_2 \end{array}$

In (13), the matrix S point (S_1) is interpreted as denoting the utterance time. The sequence-of-tense rule links the embedded S point (S_2) with the matrix E point (E_1); S_2 is interpreted as contemporaneous with E_1 . Since the embedded E point (E_2) is associated with S_2 , E_2 is also interpreted as contemporaneous with E_1 . This yields the correct interpretation; the time of being pregnant is the same as the time of hearing. Hornstein argues that the sequence-of-tense rule is optional with finite clauses. The non-sequence-of-tense analogue of (12) is given in (14).

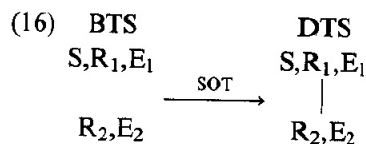
(14) John heard that Mary is pregnant

Here, the surface present tense form *is* signals that the sequence-of-tense rule is not applied. Its tense structure is represented by the left side of the arrow in (13). Since the embedded S point (S_2) is not associated with the matrix E point (E_1) or anything else, the default rule requires S_2 to be interpreted as denoting the utterance time. This yields the correct interpretation for (14), namely, Mary's pregnancy is contemporaneous with the moment of utterance.

Hornstein (1990) argues that while the sequence-of-tense rule is optional with finite clauses, it is obligatory with infinitive clauses. This captures the fact that the temporal interpretation of an embedded infinitive clause always depends on that of the embedding clause. Let us first consider (15a-c) (cf. Baker 1989, 442).

- (15) a. John seems to be in the correct room
 b. John appears to be a rich man
 c. John believes Bill to be the smartest

Under Hornstein's analysis, the temporal structure of (15a-c) is represented by (16).



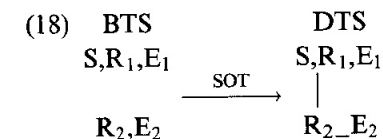
In (16), the sequence-of-tense rule applies to the basic tense structure, yielding the derived tense structure. Note that in (16), the S point is lacking in the temporal structure of the embedded infinitive clause. Hornstein assumes that the S point is tied to a tense morpheme. In an infinitive clause, where the tense morpheme is lacking, the S point is absent as well. When the S point is absent in the embedded clause, the sequence-of-tense rule associates the embedded R point (R_2) with the matrix E point (E_1). This is the case in (16), and R_2 is interpreted as contempora-

neous with E_1 . Since the embedded E point (E_2) is associated with R_2 , E_2 is also interpreted as contemporaneous with E_1 . In (15a), for example, this yields the correct interpretation that the time of being in the correct room is contemporaneous with the matrix Event time.

As pointed out by Baker (1989) and Enç (1996), among others, there are cases where a different temporal interpretation is assigned to an infinitive complement.

- (17) a. John hopes to be in the correct room
 (Baker 1989, 442)
 b. I expect John to win the race
 (Stowell 1982, 566)
 c. I promise to do it
 d. John wants to buy a new computer

I argue that the temporal structure of (17) is represented by (18).



In (18), the sequence-of-tense rule applies to the basic tense structure, yielding the derived tense structure, where the matrix E point (E_1) is associated with the embedded R point (R_2). As shown in (9), adverbial modification alters the basic tense structure in accordance with the meaning of an adverb. I argue that in the same way, the lexical meanings of verbs like *hope*, *promise*, *want*, and *expect* may alter the basic tense structure of their infinitive complement. These verbs assign a later time to their infinitive complement. They dissociate the embedded E point (E_2) from the embedded R point (R_2), shifting the former to the right of the latter. In (17a), for example, this yields the correct interpretation that the time of being in the correct room is in the future relative to the matrix Event time, that is, the time of hoping. Note that this dissociation of the embedded E and R points in the derived tense structure does not violate the CDTS (10). Baker (1989) also observes that adjectives like *certain* assign either the same or a later time to their infinitive complement.

- (19) John is certain to be at home
 (Baker 1989, 443)

The temporal structure of (19) is either (16) or (18). This analysis correctly captures the fact that the tense interpretation of an infinitive complement is determined by the lexical meaning of the matrix predicate.²

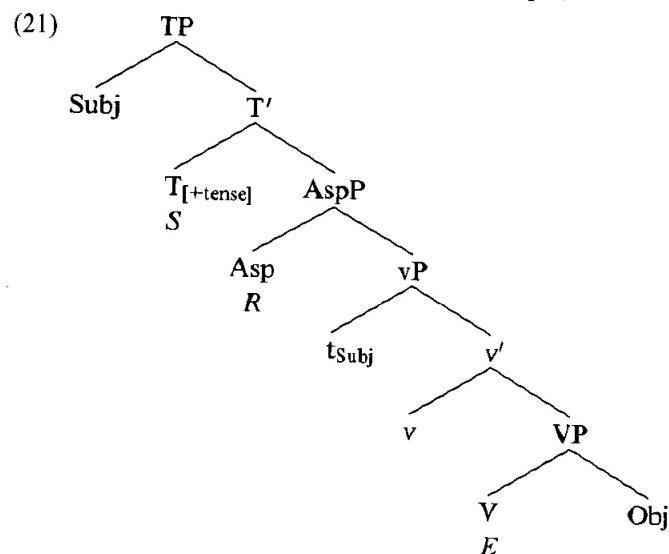
I also argue that exactly like infinitive complements, subjunctive complements also obligatorily undergo the sequence-of-tense rule. As examples, consider (20a–b).

- (20) a. I demand that he (should) go there
 b. His teacher requires that he (should) go to bed early

I argue that exactly like the matrix verbs in (17), verbs selecting subjunctive complements like *demand*, *request*, and *insist* assign a later time to their complement, dissociating the embedded E point (E_2) from the embedded R point (R_2) and shifting the former to the right of the latter. The temporal structure of (20a–b) is also represented by (18). In (20a), for example, this correctly yields the interpretation that the time of going there is in the future relative to the matrix Event time, that is, the time of demanding.

9.2.1.3 A Syntactic Representation of the Sequence-of-Tense Phenomena

Having shown how the sequence-of-tense phenomena can be accommodated under the neo-Reichenbachian approach, I now consider how they should be represented syntactically. Essentially following Hornstein (1990) and Thompson (1996), I assume that the three times (i.e., the Event, Reference, and Speech times) are syntactically represented as follows: the Event time is represented by V; the Reference time by Aspect (Asp), which is the head of the Aspect Phrase (AspP) that resides between TP and vP; and the Speech time by a [+tense] T, as shown in (21).³



Hornstein claims that tense points can interact only under government, defined as follows:

- (22) A governs B iff_{def} all maximal projections that dominate B dominate A, and if A governs B then A governs the head of B.
 (Hornstein 1990, 168)

On the assumption that T (INFL in Hornstein's analysis) is the head of CP (S' in his analysis), the embedding V governs the embedded CP and its head, namely, T. Hence, in (12) (repeated here as (23)), the embedding E point (E_1), which is provided by the embedding verb *heard*, can interact with the embedded S point (S_2), which is provided by the embedded T, as represented by (24).

- (23) John heard that Mary was pregnant

- (24) [TP John [T_[Past] [AspP Asp [vP v [VP *hear* [CP that [TP Mary [T_[Present] S₁ R₁ E₁ S₂ [be pregnant]]]]]]]]]]]

This allows the sequence-of-tense rule to link the embedded S point (S_2) with the embedding E point (E_1), which yields the derived tense structure in (13).

Hornstein's analysis, however, cannot account for the sequence-of-tense phenomena with infinitive/subjunctive clauses. Let us again consider (17a) (repeated here as (25)).

- (25) John hopes to be in the correct room

Its structure is represented in (26).

- (26) [TP John [T_[Present] [AspP Asp [vP v [VP *hope* [CP C [TP PRO to [AspP Asp [be in the correct room]]]]]]]]]
 S₁ R₁ E₁ R₂

Recall that the S point is lacking in the temporal structure of an infinitive complement clause, and thus the sequence-of-tense rule links the embedding E point (E_1), which is provided by the embedding verb *hope*, with the embedded R point (R_2), which is provided by the embedded Asp. In (26), however, the embedding V does not govern the embedded Asp, since CP, which is assumed to be the maximal projection of T under Hornstein's analysis, dominates the embedded Asp but not the embedding V. Hence, Hornstein's analysis would wrongly predict that the sequence-of-tense rule cannot apply to an infinitive/subjunctive complement clause.

Note also that Hornstein's analysis crucially relies on the notion of government, which is no longer available in the Minimalist Program (MP).

I depart from Hornstein's analysis, arguing that tense points can interact only under a local structural relation, that is, a specifier-head or head-complement relation. I assume the widespread view that the head of CP is C. I also claim that T, which hosts an S point, covertly raises to C. Let us first look at how this analysis accounts for the sequence-of-tense phenomena with finite clauses.

(27) ... [_{VP} v-V [_{VP} t_v [_{CP} C-T [_{TP} Subj [_T ...

As shown schematically in (27), the embedded [+tensed] T, which provides the embedded S point, covertly raises to the embedded C.⁴ The matrix V (more precisely, the trace/copy left by V-raising to v), which provides the matrix E point, enters into a head-complement relation with the embedded CP, to whose head the embedded T is raised. Hence, the two tense points, the matrix E and embedded S points, can interact; the sequence-of-tense rule can link these two points.

Let us now turn to the sequence-of-tense phenomena found with infinitive/subjunctive complement clauses. On the basis of insights by Burzio (1986) and Boeckx (2001), I propose covert restructuring, whereby infinitive/subjunctive complements undergo covert clause-union, becoming part of the higher clauses covertly. More specifically, I argue that the embedded AspP, whose head Asp provides the embedded R point, covertly raises to the Spec of the matrix v to which the matrix V, which provides the matrix E point, raises, as shown schematically in (28).

(28) ... [_{VP} [_{AspP} ...] [_{v'} Subj₁ [_{v'} v-V [_{VP} t_v [_{CP} C [_{TP} Subj₂ [_T [_{AspP} ...]

In (28), the matrix subject (Subj₁) originates in the Spec of v and then AspP raises to the outer Spec of v. The embedded AspP enters into a specifier-head relation with the v-V complex. The matrix E and embedded R points can interact under the specifier-head relation; the sequence-of-tense rule can link these two points. Hence, the covert restructuring analysis can account for the sequence-of-tense phenomena found with infinitive/subjunctive clauses.

9.2.2 The Relaxation of the Intervention Effects

Having shown that the covert restructuring analysis accounts for the sequence-of-tense phenomena found with infinitive/subjunctive com-

plements, I will now argue that this analysis, which is independently motivated by the temporal interpretations of infinitive/subjunctive complements, also accounts for the fact that the Defective Intervention Constraint (1) is relaxed when extraction takes place out of an infinitive/subjunctive indirect question, as shown in (4) and (5) (repeated here as (29) and (30), respectively).

- (29) a. *Which of the new books_i* do you wonder [when_j to buy *t_i t_j*]?
b. *Which pasta_i* do you wonder [how to cook *t_i t_j*]?

- (30) a. *Which of the new books_i* do you wonder [when_j you should buy *t_i t_j*]?
b. *Which pasta_i* do you wonder [how you should cook *t_i t_j*]?

Let us consider (29a) as an example. Given the covert restructuring analysis, we construct the matrix vP (31) during its derivation.⁵

(31) [_{VP} [_{AspP} *t_{PRO} buy which of the new books*] [_{v'} you
↑
[_{VP} wonder [_{CP} when [_{TP} PRO to [_{AspP} *t_{PRO} buy which*
of the new books]]]]]

In (31), the embedded AspP *t_{PRO} buy which of the new books* is required to raise covertly to the Spec of the matrix v for its temporal interpretation, since infinitive/subjunctive complements obligatorily undergo the sequence-of-tense rule. The present analysis assumes the single-output syntax advocated by, among others, Bobaljik (1995), Brody (1995), Groat and O'Neil (1996), and Pesetsky (2000), which claims that Spell-Out takes place after covert operations. In the single-output model, there is just one movement component; the phonological principles of chain pronunciation determine whether the head of a chain is the only position pronounced (overt movement) or whether a trace position is pronounced (covert movement). I argue that this AspP-movement is a covert phrasal movement in the sense that the moved phrase is pronounced in the original position of its chain and unpronounced in its moved position in the PF component. Under this analysis, the *wh*-phrase *which of the new books*, which is buried in the moved AspP, can bypass the intervening element *when* without inducing any intervention effects.⁶ The *wh*-phrase *which of the new books* raises from within the inner Spec of the matrix v to the outer Spec of the matrix v and then to the Spec of the matrix C, yielding (32).⁷

- (32) [_{CP} *Which of the new books* do [_{TP} you [_{VP} *which of the new books* [_{AspP} t_{PRO} buy *which of the new books*]]]]
 [v' t_{you} [_{VP} wonder [_{CP} when PRO to [_{AspP} t_{PRO} buy *which of the new books*]]]]]]]

Following Pesetsky (2000), let us assume that the first instance of phrasal movement of a *wh*-phrase to the Spec of an interrogative C is overt in that the *wh*-phrase is pronounced in the head position of its chain and unpronounced in the other positions in the PF component. In (32), the *wh*-phrase *which of the new books* is pronounced in the Spec of the matrix C and unpronounced in the other positions. This yields (29a).⁸ (29b) and (30a–b) can be accounted for in the same way. Hence, the covert restructuring analysis can account for the relaxation of the intervention effects with infinitive/subjunctive indirect questions.

9.2.3 Transparency Effects with Infinitive/Subjunctive Complements

It has been observed that infinitive/subjunctive clauses pattern alike regarding binding phenomena. In particular, infinitive/subjunctive complements are typically more transparent, showing clause-mate effects like anaphor binding and obviation. Here, we will look at another piece of evidence for the covert restructuring analysis: it can also account for transparency effects with infinitive/subjunctive complements.

Let us first look at anaphor-binding facts. There are languages in which an anaphor can refer to an antecedent across an infinitive or subjunctive clause, but not across an indicative clause. Icelandic is the best-studied language of this type (see, e.g., Anderson 1986; Manzini and Wexler 1987; Koster 1987; Manzini 2000).

- (33) a. **Jón_i segir að María elskar sig_i*
 John says that Mary loves.IND himself
 'John_i says that Mary loves himself_i.'
 b. *Jón_i segir að María elski sig_i*
 John says that Mary loves.SUBJ himself
 'John_i says that Mary loves him_i.'
 c. *Maria_i skipaði Harald að PRO raka sig_i*
 Mary ordered Harold to shave herself
 'Mary_i ordered Harold to shave her_i.'
 (Manzini and Wexler 1987, 417)

As shown in (33b–c), when the reflexive pronoun *sig* is embedded in an infinitive or subjunctive clause, it can be bound by the matrix subject. However, as shown in (33a), when embedded in an indicative clause, it cannot be.

Let us next look at obviation facts. In languages like Catalan, Icelandic, Italian, and Spanish, the subject of a subjunctive clause is disjoint in reference from the matrix subject (see, e.g., Picallo 1985; Kempchinsky 1986; Manzini 2000). The following examples are from Catalan:

- (34) a. *Il_i dis qu'il_i ne mostrera cette photo*
 he say that he NEG show.IND this picture
 'He_i says that he_i will not show this picture.'
 b. **Il_i veu qu'il_i vienne*
 he want that he come.SUBJ
 'He_i wants that he_i comes.'
 (Picallo 1985, 1–2)

As shown in (34a), the coreference reading between the embedded and matrix subjects is possible when the embedded clause is indicative. When the embedded clause is subjunctive, however, the coreference reading is not possible, as shown in (34b).

The anaphor-binding and obviation facts show that infinitive/subjunctive clauses are more transparent than indicative clauses, though there are parametric variations among languages with respect to binding domains and the existence of long-distance reflexives that determine whether or not the transparency effects are observed in a given language (see, e.g., Manzini and Wexler 1987 for detailed discussion).

The covert restructuring analysis accounts for these transparency effects. Let us assume that TP constitutes a binding domain for reflexives in languages like Icelandic and pronouns in languages like Catalan. Let us also assume with Chomsky (1995), among others, that binding conditions apply at LF. Then, in the Icelandic example (33a), the antecedent *Jón* 'John' is outside the minimal TP that contains the reflexive pronoun *sig* 'himself'; anaphor binding is not possible. In the Catalan example (34a), the antecedent *il* 'he', the matrix subject, is outside the minimal TP that contains the embedded subject pronoun *il* 'he'; there is no obviation effect.

Let us next consider the Icelandic examples (33b–c) and the Catalan example (34b). Under the covert restructuring analysis, since the complement clause is infinitive or subjunctive in (33b–c) and (34b), the embedded AspP undergoes covert phrasal movement to the Spec of the

matrix *v*. The relevant structures of (33b) and (34b) are represented in (35) and (36), respectively.

(35) [TP $Jón_i$ [_{VP} [_{AspP} $Maria_j$ $elski$ sig_i] [_{v'} $t_{Jón}$ [_{VP} $segir$ [_{CP} $að \dots$

(36) [TP Il_i [_{VP} [_{AspP} il_i $vienne$] [_{v'} t_{Il} [_{VP} $veut$ [_{CP} $que \dots$

In (35), the antecedent *Jón* 'John' is within the minimal TP that contains the reflexive pronoun *sig* 'himself' in the covertly moved AspP in the Spec of the matrix *v*. Anaphor binding is possible, and hence (33b) is acceptable. (33c) can be accounted for in the same way. In (36), since the antecedent *il* 'he', the matrix subject, is within the minimal TP that contains the embedded subject pronoun *il* 'he' in the covertly moved AspP, they cannot be coreferential with each other. Hence, (34b) is deviant.

The covert restructuring analysis receives further support from a subject/nonsubject asymmetry with respect to anaphor-binding and obviation facts. Let us first look at anaphor binding. As shown in (37), in Icelandic, a reflexive in the subjunctive complement clause may not be interpreted as coreferential with a matrix nonsubject.

- (37) *Ég sagði $Jón_i$ að $María$ hefði $boðið$ $sér_i$
 I told John that Mary had (SUBJ) invited himself
 'I told John_i that Mary had invited him_i.'
 (Anderson 1986, 67)

Note that the Icelandic reflexive is not subject oriented, as exemplified by (38).

- (38) Ég sendi $Jón_i$ föt a sig_i
 I sent John clothes for himself
 'I sent John_i clothes for him_i.'
 (Manzini and Wexler 1987, 437)

Hence, the unacceptability of (37) is not due to any non-subject-oriented property of the Icelandic reflexive. Similar facts are found with obviation. In Catalan, an embedded subject and a matrix nonsubject can corefer, as shown in (39).

- (39) La Mercè deia al $Pere_i$ que [pro_i busqués una feina
 the Mercè told to the Peter that (he) looked for a better
 millor]
 job
 'Mercè told Peter_i that (he_i) looked for a better job.'
 (Picallo 1985, 83)

Under the covert restructuring analysis, during the derivation of (37), the embedded AspP, which contains the reflexive *sér* 'himself', moves covertly to the Spec of the matrix *v*.

- (40) [TP Ég [_{VP} [_{AspP} $María$ $hefði$ $boðið$ $sér_i$] [_{v'} $t_{Ég}$ [_{VP} $sagði$ $Jón_i$ [_{CP} $að \dots$

Since the matrix indirect object *Jón* 'John' is within the matrix VP, it does not c-command the reflexive *sig* 'himself' within the covertly moved AspP, which resides in the Spec of the matrix *v*. Hence, anaphor binding is not possible. Similarly, in (39), the indirect object *Pere* 'Peter', which is within the matrix VP, does not c-command the empty pronoun *pro* within the covertly moved AspP, which is in the Spec of the matrix *v*. Hence, the obviation effect is not observed.

9.3 A Subjacency-Type Account of Selective Extractability

9.3.1 Selective Extractability

In the previous section, I pointed out that examples like (29) and (30), where the *wh*-phrases are extracted out of infinitive/subjunctive indirect questions, are acceptable, and I argued that such relaxation of the intervention effects can be accounted for by the covert restructuring analysis. In this section, I will first point out that the intervention effects are not always relaxed with infinitive/subjunctive indirect questions; only D-linked *wh*-phrases in the sense of Pesetsky (1987) can be extracted out of infinitive/subjunctive indirect questions. I will then argue that the selective extractability of a *wh*-phrase out of an infinitive/subjunctive indirect question should be given a Subjacency-type account based on the Phase Impenetrability Condition (PIC).

In (29) and (30), where the extracted *wh*-phrases *which of the new books* and *which pasta* are D-linked, infinitive/subjunctive indirect questions do not function as islands. Infinitive/subjunctive indirect questions, however, are not always devoid of islandhood. First, non-D-linked *wh*-phrases like *who* and *what* cannot be extracted out of infinitive/subjunctive indirect questions, as shown in (41) and (42) (cf. Cinque 1990; Rizzi 1990; Boeckx 2001).⁹

- (41) a. ??*What_i* do you wonder [*when_j* to buy *t_i* *t_j*]?
 b. ??*What_i* do you wonder [*how_j* to cook *t_i* *t_j*]?
 (42) a. ??*What_i* do you wonder [*how_j* you should buy *t_i* *t_j*]?
 b. ??*What_i* do you wonder [*how_j* you should cook *t_i* *t_j*]?

Although judgments regarding extraction out of a subjunctive indirect question vary among speakers, there are speakers who see a clear contrast between extraction of a D-linked *wh*-phrase as in (29) and (30) and that of a non-D-linked *wh*-phrase as in (41) and (42). Second, it has been observed that *wh*-adjuncts like *how*, *when*, and *why* cannot be extracted out of infinitive/subjunctive indirect questions, as shown in (43)–(45) (see, e.g., Huang 1982).

- (43) a. **How_j* did you wonder [which problem_i to solve *t_i* *t_j*]?
 b. **How_j* did you wonder [which problem_i you should solve *t_i* *t_j*]?
 (44) a. **When_j* did you wonder [where_i to go *t_i* *t_j*]?
 b. **When_j* did you wonder [where_i you should go *t_i* *t_j*]?
 (45) a. **Why_j* did you wonder [where_i to go *t_i* *t_j*]?
 b. **Why_j* did you wonder [where_i you should go *t_i* *t_j*]?

Note that this fact has traditionally been attributed to the Empty Category Principle (ECP). Although the ECP accounts for the *wh*-island effects with *wh*-adjunct extraction in (43)–(45), it cannot be invoked in a minimalist account, since ECP approaches employ notions such as head government, antecedent government, proper government, and indexing that are not allowed in the Minimalist Program. We therefore need to give an alternative account of (43)–(45) that is compatible with the minimalist spirit.

9.3.2 The Phase Impenetrability Condition and Successive Cyclicity

Before we turn to an account of the selective extractability of *wh*-phrases out of infinitive/subjunctive indirect questions, a few remarks are in order concerning the Phase Impenetrability Condition (PIC) and successive-cyclic movement. Chomsky (2000, 2001, 2004) assumes the PIC (46) (adapted from Chomsky 2001, 14), which ensures that derivations proceed phase by phase, thereby reducing computational burden.¹⁰

- (46) In [_{NP} Z ... [_{HP} α [_{H'} H YP]]], where HP is a phase and ZP is the next phase (where phases are vP and CP), the domain of H is not accessible to operations at ZP.

Chomsky claims that the PIC follows from the fact that Spell-Out is subject to the general condition on operations (47) (adapted from Chomsky 2001, 14).

- (47) A phase Ph₁ is interpreted/evaluated at the next phase Ph₂.

In order to ensure successive-cyclic movement under the PIC, Chomsky makes the following assumption (adapted from Chomsky 2001, 12):

- (48) The head of a phase, C and v, may be assigned an EPP feature.

This provides an “escape hatch” for successive-cyclic movement through the edge of a phase.

Chomsky assumes the probe-goal theory of movement, where three kinds of uninterpretable formal features are involved in overt movement. In overt *wh*-movement to the Spec of an interrogative C, the following uninterpretable formal features are involved: the Q-feature of C, the *wh*-feature of a *wh*-phrase, and the EPP feature of C, as shown in (49a).

- (49) a. [C_[Q,EPP] [... *wh*-phrase_[Q,wh] ...]]
 b. [C_[Q,EPP] [... *wh*-phrase_[Q,wh] ...]]
 c. [*wh*-phrase_[Q] [C_[EPP] [... *t_{wh}*-phrase ...]]]

The uninterpretable Q-feature of C, which counts as a probe, seeks a goal, namely, a matching feature. The Q-feature of C enters into a matching relation with that of the *wh*-phrase, which is interpretable. As shown in (49b), the Q-feature of the probe C and the *wh*-feature of the goal *wh*-phrase, being uninterpretable, are both deleted (valued). The Q-feature of the *wh*-phrase, being interpretable, remains. As shown in (49c), the EPP feature of C, being a selectional feature, merges the *wh*-phrase in Spec,C. Since the EPP feature is uninterpretable, it is deleted (valued). This is essentially the mechanism responsible for overt *wh*-movement.

Chomsky (2000) applies the probe-goal theory of movement, which assumes three kinds of uninterpretable formal features to be involved in overt movement, to successive-cyclic movement without change. He assumes that a noninterrogative C or v without undeleted (unvalued) φ-features may also be assigned a nonspecific periphery feature (P-feature), which is contingent on the assignment of the EPP feature to the head of a phase in accordance with (48).

While essentially following Chomsky's analysis of successive-cyclic movement, I depart from it in claiming that only C may be assigned an EPP feature (and a P-feature); v may not. Let us look at how successive-cyclic movement proceeds under this analysis, taking (50) as an example.

- (50) *Where* did John buy it *t*?

During its derivation, we construct the vP phase (51).

- (51) [_{vP} John [_{v_φ}] [_{vP} buy it_[φ,Case] where_[Q,wh]]]]

In (51), Agree of *v* with the object *it* establishes a Case-agreement relation, deleting (valuing) the ϕ -features of *v* and the Case feature of *it*. Although *v* is not assigned an EPP feature or a P-feature, *where* may raise to the vP-edge position, as shown in (52).

(52) [_{VP} *where*_[Q,wh] [_{v'} John [_v [_{VP} buy *it*_[ϕ] *t*_{where}]]]]

Although this movement is not triggered by any formal feature at this vP-phase level, it does not violate the economy condition that bans superfluous steps in a derivation. This is because according to (47), evaluation/interpretation for the vP phase takes place at the next phase, namely, the CP phase. That evaluation includes whether or not movement of *where* to the vP-edge position satisfies the economy condition. At the CP-phase level, C is assigned an EPP feature and a Q-feature. These features trigger movement of *where* to Spec,C, which licenses movement of *where* to the vP-edge position. This ensures successive-cyclic movement without assuming that *v* may be assigned an EPP feature (and a P-feature).¹¹

The analysis of successive-cyclic movement proposed here should be preferred over Chomsky's analysis on theoretical grounds, because it does not have to assume *v* with a P-feature. Chomsky (2000) assumes that P-features are defective, arguing that they are analogous to the [person] feature of a defective T. There is a case where C is assigned a Q-feature, a full complement of peripheral features. By analogy with the T-system, it is reasonable to claim that defective C with a P-feature also exists. In contrast to C, *v* is never assigned a Q-feature; this is clear from the fact that a *wh*-phrase can never be stranded in the vP-edge position. This casts serious doubt on Chomsky's analysis, which assumes *v* with a P-feature.

9.3.3 D-Linking/Specificity and a Subjacency-Type Account

Returning to the main subject, I now propose a minimalist account of the selective extractability of *wh*-phrases out of infinitive/subjunctive indirect questions based on the claim that specific DPs in the sense of Enç (1991) move out of VP to the vP-edge position while nonspecific DPs do not, as advocated by, among others, Mahajan (1990), Diesing (1992), Runner (1994), and Torrego (1998). Essentially following Diesing (1992), I argue that specific (what Diesing calls "presuppositional") DPs are required to move out of VP to the vP-edge position before a derivation reaches LF, in accordance with the Mapping Hypothesis. One of Diesing's arguments supporting this contention is based on the antecedent-contained deletion (ACD) construction (see, e.g., Bouton 1970; Sag 1976; May 1985; Larson and May 1990; Fiengo and May 1994; Pesetsky 2000).

(53) Mary read every book that John will

The meaning of the elided VP complement of *will* cannot be understood as the matrix VP *read every book that John will*, since this would lead to an infinite regress. If the DP *every book that John will* moves out of the VP covertly, then it leaves behind a VP of the form *read t*, which provides the appropriate antecedent for the elided VP, as shown in (54).

(54) Mary [_{VP} [_{DP} every book that John will [_{VP} *read t*]] [_{VP} *read t*]]

Hence, as argued by Pesetsky (2000), the ACD construction can be used as a diagnostic for phrasal movement: unless phrasal movement takes place, there is no way of licensing the ACD construction. Diesing observes that while specific DPs allow the ACD construction, as shown in (55), nonspecific DPs do not, as shown in (56).

- (55) a. I read every book that you did
 b. I read each book that you did
 c. Robert played many of the pianos that Clara did
 d. Dulles suspected the spy that Angleton did
 ((55a–c) from Diesing 1992, 71–72; (55d) from Fiengo and May 1994, 242)
- (56) a. *?I read many books that you did
 b. *I read books that you did
 c. *Max put some things he could in his pockets
 (Diesing 1992)

The contrast between (55) and (56) supports the Mapping Hypothesis, which requires specific DPs, but not nonspecific DPs, to move out of VP covertly.

As argued by Cinque (1990), among others, D-linked *wh*-phrases also count as specific, since they are understood as presupposing the existence of a known set of specific elements. In (29a) and (30a), for example, the D-linked *wh*-phrase *which of the new books* presupposes the existence of a known set of specific new books, and the question is interpreted as asking which of such new books a person has bought. Further evidence for this contention comes from ACD facts. As observed by Pesetsky (2000), exactly like specific DPs, D-linked *wh*-phrases in situ also license the ACD construction, which suggests that D-linked *wh*-phrases are themselves specific and thus required to move out of VP covertly in accordance with the Mapping Hypothesis.

- (57) Which girl invited [which student that John did]?
(Pesetsky 2000, 6)

Let us consider (29a) (repeated here as (58)) as an example.

- (58) *Which of the new books_i* did you wonder [when_j to buy *t_i t_j*]?

During its derivation, we construct the embedded vP phase (59).

- (59) [_{vP} PRO [_v [_{VP} buy which of the new books when]]]

According to Diesing's analysis, the D-linked *wh*-phrase *which of the new books*, being specific, is required to move out of the VP covertly in accordance with the Mapping Hypothesis. Recall that we are assuming that a phase Ph₁ is interpreted/evaluated at the next phase Ph₂ (47). Hence, this semantic/interpretive condition on specific DPs requires the D-linked/specific *wh*-phrase *which of the new books* to move out of the VP into the vP-edge position covertly until the derivation reaches the next phase level, namely, the embedded CP phase (60).

- (60) [_{CP} when PRO to buy [_{AspP} [_{vP} *which of the new books*

↑
[_{v'} *t'*_{when} [_{v'} *t*_{PRO} buy *which of the new books t*_{when}]]]]]

Note in passing that in (60), the other *wh*-phrase *when* moves first to the vP-edge position and then to the Spec of the embedded C.¹²

As the derivation proceeds, we construct the matrix vP phase; the relevant structure is represented in (61).

- (61) [_{vP}¹ [_{AspP} [_{vP}² *which of the new books* [_v² *t'*_{when} [_v² *t*_{PRO} buy *which of the new books t*_{when}]]]]] [_v¹ you [_{VP} wonder when ...

In (61), the embedded AspP undergoes covert restructuring. Recall that the D-linked/specific *wh*-phrase *which of the new books* resides in the embedded vP-edge (vP²-edge) position. From there, it raises to the matrix vP-edge (vP¹-edge) position, as shown in (62).

- (62) [_{vP}¹ *which of the new books* [_v¹ [_{AspP} [_{vP}² *which of*

↑
the new books [_v² *t'*_{when} [_v² *t*_{PRO} buy *which of the new books t*_{when}]]]]] [_v¹ you [_{VP} wonder when ...

Although this movement is not triggered by any formal feature at the matrix vP-phase level, its evaluation with respect to the economy condition takes places at the next phase, namely, the matrix CP phase, in accordance with (47). At the matrix CP-phase level, the Q-feature and

EPP feature of the matrix C trigger movement of *which of the new books* to its Spec, as shown in (63).

- (63) [_{CP} *which of the new books* [_C [you [_{vP}¹ *which of the*

↑
new books [_v¹ [_{AspP} [_{vP}² *which of the new books* [_v² *t'*_{when} [_v² *t*_{PRO} buy *which of the new books t*_{when}]]]]] [_v¹ you [_{VP} wonder when ...

Recall that the covertly moved embedded AspP is not pronounced in the head position of its chain (in the matrix clause); instead, it is pronounced in its trace position (in the embedded clause). Recall also that according to Pesetsky's (2000) principle of pronunciation regarding *wh*-movement, the first instance of phrasal movement of a *wh*-phrase to the Spec of an interrogative C is overt in that the *wh*-phrase is pronounced in the head position of its chain and unpronounced in the other positions. In this derivation, the *wh*-phrases *which of the new books* and *when* are pronounced in Spec,C and unpronounced in the other positions. This derivation converges; (58) is acceptable. (29b) and (30a–b) can be explained in the same way.

Let us next consider (41a) (repeated here as (64)).

- (64) ??*What_i* do you wonder [when_j to buy *t_i t_j*]?

During its derivation, we construct the matrix vP (vP¹) phase; the relevant structure is shown in (65).

- (65) [_{vP}¹ [_{AspP} [_{vP}² *t*_{PRO} to buy *what t*_{how}]]] [_v¹ you [_{VP} wonder how ...

In (65), the embedded AspP undergoes covert restructuring. Note that there is no way of raising the non-D-linked/nonspecific *wh*-phrase *what* to the embedded vP-edge (vP²-edge) position. Recall that under the proposed analysis of successive-cyclic movement, *v* may not be assigned an EPP feature or a P-feature; there are no formal features that trigger movement of *what* to the embedded vP-edge (vP²-edge) position. Furthermore, since *what* is non-D-linked/nonspecific, the Mapping Hypothesis does not require *what* to move out of VP to the vP-edge position. It should also be noted that *what* cannot undergo non-feature-driven movement to the embedded vP-edge (vP²-edge) position because of the economy condition. This is because *what* does not undergo feature-driven movement at the next phase (the matrix vP (vP¹) phase), where movement in the embedded vP (vP²) phase is evaluated, since under the proposed analysis of successive-cyclic movement, *v* may not be assigned an EPP feature or a P-feature. The *wh*-phrase *what* stays within the embedded vP (vP²) phase and thus is not accessible to operations at the

matrix CP because of the PIC. There is no way of satisfying the uninterpretable EPP feature and Q-feature of the matrix C. This derivation crashes; (64) is therefore unacceptable. (41b) and (42a–b) can be ruled out in the same way.¹³ As shown in (43)–(45), adjunct *wh*-phrases cannot be extracted out of infinitive/subjunctive indirect questions, either. This fact can be explained on a par with the inability of non-D-linked *wh*-phrases like *who* and *what* to be extracted out of infinitive/subjunctive indirect questions. This is because the notion of specificity is only relevant to DP denotations; thus, adjunct *wh*-phrases like *why*, *how*, and *when*, which are not DPs, do not count as specific.¹⁴

9.4 Double *Wh*-Islands and Relativization

The analysis proposed here receives further support from the fact that D-linked/specific *wh*-phrases, though extractable from infinitive/subjunctive indirect questions, exhibit “double *wh*-island” effects with infinitive/subjunctive indirect questions, as shown in (66).

- (66) ??*Which assignment_i* did you ask [to whom_j to find out [when_k to give *t_i* *t_j* *t_k*]]?

As the derivation proceeds, we construct the matrix vP (vP¹) phase (67).

- (67) [_{VP}¹ [_{AspP}² [_{VP}² [_{AspP}³ [_{VP}³ *which assignment* [_{VP}³ *t_{PRO}* give *which assignment t_k*]]] [_{VP}² *t_{PRO}* find out when_k to ...]] [_{VP}¹ you ask to whom_j ...]

In (67), covert restructuring (covert AspP-movement) applies twice. The D-linked/specific *wh*-phrase *which assignment* is required to move out of VP to the most deeply embedded vP-edge (vP³-edge) position in accordance with the Mapping Hypothesis. It cannot raise any further because of the economy condition, however, since its movement is not triggered by any formal feature at the intermediate vP-phase (vP²-phase) level or at the matrix vP-phase (vP¹-phase) level. *Which assignment* is not accessible to operations at the matrix CP because of the PIC. There is no way of satisfying the uninterpretable EPP feature and Q-feature of the matrix C. This derivation crashes; the “double *wh*-island” effects follow.

The proposed analysis can also account for the fact that relativization behaves exactly like movement of a D-linked/specific *wh*-phrase with respect to the *Wh*-Island Constraint, as shown in (68) and (69).

- (68) a. My old Dodge, which my mechanic knew [how to fix *t_i*], ...
 b. ??My old Dodge, which I know [how my mechanic fixed *t_i*], ...
 (69) ?These are the only vegetables which I don't know [how to find out [where to plant *t_i*]]
 (Frampton 1990, 62–63)

As shown in (68a) and (68b), respectively, relativization may take place out of an infinitive indirect question but not out of a finite indirect question. Relativization out of an infinitive indirect question exhibits the “double *wh*-island” effects, as shown in (69). These facts also follow from the proposed analysis if we assume with Cinque (1990) that relative operators are specific, just like D-linked *wh*-phrases.

9.5 Conclusion

In this chapter, I have investigated the relaxation of the intervention effects. I have shown that indirect questions do not always constitute islands; D-linked/specific *wh*-phrases can be extracted out of infinitive/subjunctive indirect questions. I have argued that this hitherto unexplained anomaly concerning the *Wh*-Island Constraint is given a principled minimalist account by covert restructuring and the PIC. If the present analysis is on the right track, it supports the view that we still need a traditional Subjacency-type account based on the PIC to fully accommodate *wh*-island effects, contrary to the widespread view that the *Wh*-Island Constraint can be subsumed under the Defective Intervention Constraint.

Before closing this chapter, I will briefly point out an interesting theoretical issue raised by the proposed analysis. Recall that this analysis crucially assumes that derivations are interpreted/evaluated locally. More specifically, following Chomsky (2001, 2004), I have assumed here that a phase is interpreted/evaluated at the next phase. Within the theory of computational complexity, it is generally agreed that local considerations induce less computational burden than global ones (see, e.g., Chomsky 1995; Fukui 1996; Ishii 1997). As Chomsky (2000) argues, however, it is not clear whether computational complexity matters for a cognitive system like language, which does not involve any processing but only stores information; in other words, there is no a priori reason to claim that the computation should be local to avoid the problem of computational complexity. Nevertheless, we need to seek a resolution of this local versus global issue on empirical grounds. Even if language is local in nature, we

still need to find out, empirically, how local the computation should be. The analysis proposed here gives a local account based on the notion of phase to the relaxation of the intervention effects and the selective extractability of *wh*-phrases with infinitive/subjunctive indirect questions, providing evidence that language is phasally local in nature.

Notes

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1. See section 9.3 for an explication of the more precise mechanism responsible for overt *wh*-movement in the probe-goal theory of movement.

2. Hornstein's (1990) analysis of infinitive clauses is different from Stowell's (1982). Citing (i) as an example, Stowell claims that a control infinitive clause has an independent temporal interpretation in the sense that its tense is always understood as being unrealized.

(i) John remembered to bring the wine
(Stowell 1982, 563)

According to Stowell, in (i), John has not yet brought the wine at the time when he remembers to do so. Hornstein, however, adduces arguments against Stowell's unrealized-tense analysis, two of which I outline here.

First, when the control infinitive clause is modified by an adverb, its tense is not understood as being unrealized; instead, the matrix and embedded events are interpreted as contemporaneous with each other, as shown in (ii).

(ii) At 6 o'clock, John remembered to bring the wine
(Hornstein 1990, 226)

In (ii), John's bringing the wine is temporally located at 6 o'clock and contemporaneous with John's remembering.

Second, contrary to what Stowell claims, (i) does not involve an ordered set of events. It does not imply that John has a memory event. Rather, it implies that John did what he was supposed to do. This is clearer with the verb *forget*.

(iii) Yesterday, John forgot to bring the wine
(Hornstein 1990, 226)

(iii) does not involve an ordered set of events (i.e., a forgetting that precedes a wine-bringing); rather, it implies that John did not do what he was supposed to do.

Karttunen (1971) adduces similar arguments for Hornstein's view. Karttunen classifies verbs like *remember*, *forget*, *manage*, *happen*, and *bother* as implicative verbs. He claims that an implicative verb does not represent a separate event, but

expresses a necessary and sufficient condition that alone determines whether the event of the complement clause took place. The verb *remember*, for example, states that the subject is obligated to carry out the act described in the complement clause and also willing to carry out the obligation. According to Karttunen, in (i), for example, all that took place when John remembered to bring wine is that he did it. Remembering to bring wine is inseparable in space and time from bringing wine; it is the same event. What (i) means is that John was obligated to bring wine and intended to do so, and whether or not he did depended only on whether he remembered his commitment.

3. Here, I assume Thompson's (1996) analysis, which claims that the R point is provided by the head of an Aspect Phrase. Hornstein (1990) assumes, however, that the R point is provided by the perfective morpheme, which is adjoined to VP. Note that crucial to the present analysis is the assumption that the R point is provided by a functional head that resides between T and v, whatever the functional head may be.

4. Hornstein (1990) argues against the covert T-to-C movement analysis advocated here. His argument is based on the fact that the application of the sequence-of-tense rule has phonological effects. In (12) (repeated here as (i)) with the sequence-of-tense interpretation, for example, although the underlying tense of the embedded verb is the simple present, the embedded verb has the surface form of the past tense element *was*.

(i) John heard that Mary was pregnant

Hornstein claims that since LF operations do not feed PF operations under the standard model of grammar, the covert T-to-C movement analysis is untenable. As we will see later, however, the present analysis assumes single-output syntax, which claims that Spell-Out takes place after LF operations; LF operations feed PF operations. The present analysis therefore does not face the problem raised by Hornstein.

5. More precisely, the embedded AspP first moves to the Spec of the embedded C and then to the Spec of the matrix v because of the PIC. Following Chomsky (2001, 2004), I assume here that a phase is interpreted/evaluated at the next phase (for details, see section 9.3.2). Then, although nothing requires the embedded AspP to raise to the Spec of the embedded C, evaluation/interpretation for the embedded CP takes place at the next phase, that is, the matrix vP phase. At the matrix vP-phase level, the embedded AspP is required to raise to the Spec of the matrix v for its temporal interpretation, which licenses its movement to the Spec of the embedded C at the embedded CP-phase level. I thank a reviewer for bringing this issue to my attention.

6. Boeckx (2001) also claims that an infinitive/subjunctive complement becomes part of the higher clause, which voids the intervention effects. Under Boeckx's analysis, first the embedded TP (IP in his analysis) raises into the matrix clause overtly (Boeckx 2001, 213).

(i) $V_{\text{matrix}} [IP \text{ Infinitive/subjunctive } [VP \dots]] / [CP \ C \ t_i]$

Then the embedded CP undergoes remnant movement, reordering the CP-IP sequence (Boeckx 2001, 214).

(ii) $V_{\text{matrix}} [[CP [C [t_i]]]_j [[IP I_{\text{infinitive/subjunctive}} [VP \dots]]_i t_j]]$

Boeckx's analysis is problematic in that it is unclear about the landing sites of these operations and their driving forces.

7. See section 9.3.2 for a more precise explication of how overt *wh*-movement proceeds in a successive-cyclic manner under the notion of phase.

8. In the derivation of (29a), the chain of the *wh*-phrase *which of the new books* consists of the following three copies: the copy in the Spec of the matrix C, the one in the Spec of the matrix v, and the one inside the moved AspP. Now, how can we ensure that the copy of *which of the new books* in the original position, which is not part of the chain, is unpronounced? Bobaljik (1995) points out that it is not sufficient to claim that one member of every chain is pronounced. Rather, we should assume that maximally one copy of a single element is pronounced regardless of the number of chains in which it occurs. In (i), for example, although there are two chains—an A-chain created by movement to the subject position and a subsequent \bar{A} -chain created by movement to the Spec of the matrix C—only one copy of *who* is pronounced (Bobaljik 1995, 350).

(i) Who did Sam think [*t'* had been arrested *t*]?

Recall that in the derivation of (29a), Pesetsky's (2000) principle of chain pronunciation requires the *wh*-phrase *which of the new books* to be pronounced in its head position, namely, the Spec of the matrix C. It then follows that all the other copies of the *wh*-phrase must be unpronounced regardless of whether they are part of the chain. Hence, the copy of *which of the new books* in its original position is unpronounced. I thank a reviewer for bringing this issue to my attention.

9. Cinque (1990) classifies the *wh*-island as a weak island. However, the inability of a non-D-linked *wh*-phrase to be extracted out of an infinitive/subjunctive indirect question as in (41) and (42) suggests that *wh*-islands should not be treated on a par with weak islands like inner islands, factive islands, and extraposition islands. Unlike *wh*-islands, these weak islands allow extraction of a *wh*-argument even though the *wh*-phrase is not D-linked (see, e.g., Cinque 1990; Manzini 1992).

(i) a. *Inner (negative) island*

*To whom didn't you speak *t*?*

b. *Factive island*

*To whom do you regret that you could not speak *t*?*

c. *Extraposition island*

*To whom is it time to speak *t*?*

(Cinque 1990, 1–2)

10. Unlike the discussion in Chomsky 2001, 2004, the discussion to follow does not assume a distinction between strong and weak phases.

11. See Ishii 2003 for the view that this non-feature-driven movement of a *wh*-phrase to the vP-edge position is scrambling in the sense of Fukui (1993) and Saito and Fukui (1998).

12. Under the assumption that a phase is interpreted/evaluated at the next phase, although *when* in (60) is not required to raise to the Spec of the embedded v by any formal features, evaluation/interpretation of the embedded vP takes place at

the next phase, namely, the embedded CP phase. At that level, *when* is required to raise to the Spec of the embedded C by the EPP and P-features of the embedded C, which licenses its movement to the Spec of the embedded v at the embedded vP-phase level.

13. It is crucial in the proposed analysis that contrary to what is advocated by, among others, Johnson (1991) and Koizumi (1995), there is no overt/covert phrasal movement to a VP-external position for reasons of Case; otherwise, non-D-linked *wh*-objects like *what* in (41) and (42) may also move out of the VP and reside in the vP-edge position. Evidence for this view comes from the ACD facts. If there were any overt/covert phrasal movement to the vP-edge position for Case reasons, we would lose an explanation of the contrast in acceptability between (55) and (56) regarding the ACD facts. See also Pesetsky 2000 for more arguments supporting the view that there is no overt/covert phrasal movement to a VP-external position for Case reasons.

14. A reviewer points out that (i) is deviant, apparently contrary to what the present analysis predicts.

(i) **Which date*_{*j*} do you wonder [how_{*i*} Mary should cook the pasta *t*_{*i*} *t*_{*j*}]?

Huang (1982) argues that *wh*-adjuncts like *where* and *when* are DPs (NPs in his analysis) inserted in the environment [_{PP} P [_{DP} ____]], where P may or may not be phonetically realized. This contention is supported by the fact that *where* and *when* can be complements of prepositions, as shown in (ii).

(ii) a. *From where* did he come *t*?

b. *Since when* has he been here *t*?

(Huang 1982, 536)

Huang furthermore argues that overt extraction of *where* and *when* cannot affect only a DP within a PP regardless of whether P is phonetically realized or not, because of the Condition on Extraction Domain (CED). The CED states that an element may be extracted from a domain only if the domain is properly governed. Since the domain of an adjunct is by definition not properly governed, the CED blocks extraction of a DP out of a PP. It follows that overt extraction of *where* and *when* must affect the whole PP.

Like *where* and *when*, the *wh*-phrase *which date* may also appear in the complement position of P.

(iii) *On which date* do you draw your salary *t*?

It is then reasonable to claim that *which date* is also inserted in the environment [_{PP} P [_{DP} ____]] and its overt extraction must affect the whole PP. It then follows that in (i), the extracted *wh*-phrase *which date* is a PP and thus does not count as specific, since the notion of specificity is relevant only to DP denotations. Hence, the proposed analysis can account for the fact that examples like (i) are deviant.

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PART IV

Wh-Constructions