Some Consequences of MERGE and Determinacy

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1. Introduction

The Minimalist Program, which seeks a "principled account" of all phenomena of human language, has the Strong Minimalist Thesis (SMT) (1) as its core hypothesis (see, among others Chomsky 1995, 2000, 2005, 2007):

(1) The Strong Minimalist Thesis (SMT)

"Language is an optimal solution to legibility conditions."

(Chomsky 2000: 97)

The SMT claims that the computational system for human language should be a "perfect system," meeting the interface conditions in a way that satisfies the third factor principles, which are language-independent principles. Among the third factor principles are principles of efficient computation (2), which require that the computational system should be restricted to a minimum:

(2) Principles of Efficient Computation

The computational system should be restricted to a minimum.

(Chomsky 1995, 2000, 2005, 2007, 2019b, c)

According to the SMT, the structure-building operation of the computational system should be simple. The simplest possible formulation is a set-formation that takes syntactic objects (SOs) X and Y, and forms {X, Y}, which is called *Merge* (see, among others Chomsky 1995, 2000, 2005, 2007).

Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019) argue, however, that when we form exocentric constructions like the subject-predicate construction,

Merge must be allowed to construct SOs in parallel and bring them together somewhere. This tacitly assumes that there is a *workspace* (WS) in which operations are carried out (see Bobaljik 1995). They propose that the right and simplest version of Merge should be on WS, not on particular SOs. They reformulate Merge as *MERGE* as an operation on WS, where WS is taken to be the stage of a derivation at any given point as shown in (3):

(3) MERGE (Chomsky 2019a, b, c; Chomsky, Gallego, and Ott 2019)
MERGE maps WS = [X, Y] to WS' = [{X, Y}]

Chomsky (2019b, c) also argues that not only should the computational system be restricted to a minimum, but the resources available to the computational system, *i.e.*, the set of elements accessible to operations, should also be reduced to a minimum, which is called *Resource Restriction* (RR) (or "limit accessibility") as shown in (4):

(4) Resource Restriction (RR) ("limit accessibility") (Chomsky 2019b, c)
The resources available to the computational system, *i.e.* the set of elements accessible to operations, should be restricted to a minimum.

Chomsky (2019b, c) claims that RR includes both *minimal search* and the Phase Impenetrability Condition (PIC). He further argues that RR forces operations including MERGE to be subject to the principle of *Determinacy* (5) (see Chomsky 2019a: 270 for Determinacy as a principle), but its exact formulations and consequences are left untouched:

(5) The Principle of Determinacy
"If the structural conditions for a rule holds for some workspace, then the structural change must be unique." (Chomsky 2019a: 275)

> "if you have this property [=RR], you infer determinacy, (which) turns out that if you think it through, when you limit the resources available, you're also going to force determinacy, meaning the operation will be uniquely determined by what's looking at." (Chomsky 2019b)

As in (6), this presentation proposes that RR should only include the PIC (but not minimal search) and that Determinacy should be formulated as a condition on the *input* of MERGE:

(6) Our Proposal
   a. RR only includes the PIC.
   b. The principle of Determinacy applies at the *input* of MERGE.

We argue that our notion of Determinacy together with the PIC gives us a *unified* account of various movement phenomena, which have been explained by different constraints or principles.

The organization of this presentation is as follows. Section 2 explicates RR and the principle of Determinacy, and proposes that RR should only include the PIC and that Determinacy should apply at the *input* of MERGE. We will then investigate an ambiguous rule application problem with MERGE. More specifically, it is shown that if *Internal Merge* (IM) applies to the same element more than once, it always causes an ambiguous rule application problem, which results in a Determinacy violation. We will argue that such an ambiguous rule application problem can be resolved by the PIC. Section 3 explores consequences of Determinacy together with the PIC. It is shown that Determinacy together with the PIC provides us with a *unified* account of various phenomena such as the Subject Condition, verb particle constructions, the Specificity Effect, no vacuous topicalization, non-existence of complementizer-less subject relatives, the *that*-trace effects, skipping strategy, adverb effects, freezing effects with topics, further

raising, Merge-over-Move, island violation repairs by ellipsis and pronouns, no superfluous steps in a derivation, and so on. Section 4 discusses how Determinacy handles with successive cyclicity, especially the intermediate copies of so called A-movement, presenting alternative views regarding the intermediate copies. Section 5 reviews three representative approaches to anti-locality, and then clarify differences between the previous approaches and our determinacy-based approach. Section 6 makes a concluding remark.

2. RR and the Principle of Determinacy

2.1 General Recursion

Before turning to RR and the principle of Determinacy, we briefly look at the notion of recursion, which is crucial in the discussion to follow. We adopt general recursion (7), which is assumed in Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019):

(7) General Recursion

Any SO once generated in WS remains accessible to further operations.

> "MERGE, applying recursively so that any generated object is accessible to further operations, thus suffices to account for the basic properties of discrete infinity and displacement." (Chomsky et al. 2019: 233)

> "All syntactic objects in the lexicon and in the workspace WS are *accessible* to MERGE; there is no need for a SELECT operation (as in, e.g., Chomsky 1995). WS represents the stage of the derivation at any given point. The basic property of recursive generation requires that any object already generated be accessible to further operations." (Chomsky et al. 2019: 245)

Let us consider WS (8) as an example:

(8) WS = [{a, {b, {c, d}}}]

According to general recursion (7), *a*, *b*, *c*, *d*, *{c, d}*, *{b, {c, d}}* and *{a, {b, {c, d}}}* in WS (8) are all accessible to further operations including MERGE.

2.2 Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019)

This section investigates RR and the principle of Determinacy proposed by Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019).

2.2.1 RR by Minimal Search and the PIC

Chomsky (2019b, c) argues that general recursion (7) allows any SO that is generated in WS to be accessible MERGE, but recursion for language is different from general recursion in that the former is subject to RR, which limits resources, *i.e.* elements accessible to operations, to be restricted to a minimum. He claims that RR includes both minimal search and the PIC, as we can see from the following quotations from Chomsky (2019a, b):

(9) Chomsky's (2019b, c) Notion of RR
RR includes minimal search and the PIC.

> "Notice that limit accessibility already includes things like PIC (phase impenetrability condition). PIC is one general condition that limits accessibility. Minimal search is another, means, for example, in successive cyclic movement, when you move at the next stage, you don't look down. You only find the up thing, the first thing you find." (Chomsky 2019a)

> "Now what are the resources? The resources are elements that are accessible to the operations. So, the really condition says, "Limit accessibility." Keep accessibility as small as you can. We already have

examples like that we are familiar with. One of them is the Phase Impenetrability Condition (PIC) [...]. Another example and this maybe only other example is a minimal search." (Chomsky 2019b)

2.2.2 Determinacy at the *Output* of MERGE

Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019) claim that Determinacy requires *subsequent* rules to apply in a deterministic way, which ensures that WS should be kept minimal throughout a derivation, as we can see from the following quotation from Chomsky, Gallego, and Ott (2019: 245-246):

"For instance, does MERGE(X,Y) add {X,Y} to WS = [X,Y] (where X, Y are LIs or complex elements), yielding WS′ = [X,Y,{X,Y}]? Or does it rather replace X and Y in WS with {X,Y}, yielding WS′ = [{X,Y}] (as assumed in Chomsky 1995: 243)? […] a workspace WS′ = [X,Y,{X,Y}] derived by MERGE(X,Y) would not ensure that **subsequent** operations can apply in a determinate fashion: any rule referencing X or Y would ambiguously refer to the individual objects X, Y or to the terms of K = {X,Y}. Indeterminacy of rules in this sense is formally unproblematic and in fact a familiar property of phrase-structure grammars; but a sensible question to ask is whether it should be permitted in an optimal I-language at all, given that it raises various technical complications (for instance with regard to the distinction between copies and repetitions, to which we return below). If the answer is negative, we are led to a view of simplest MERGE as mapping WS = [X,Y] onto WS′ = [{X,Y}], reducing its complexity and **avoiding indeterminate rule application**." (Chomsky, Gallego, and Ott 2019:245-246)

[the bold underline is our emphasis – NG and TI]

In other words, they claim that Determinacy applies at the *output* of MERGE as shown in (10) (see also Epstein, Kitahara and Seely 2018 for a similar view on Determinacy):

(10) Chomsky's (2019a, b, c) and Chomsky, Gallego, and Ott's (2019) Notion of Determinacy
Determinacy applies at the *output* of MERGE.

Under their notion of Determinacy, if MERGE creates WS that could potentially pose an ambiguous rule application problem for *subsequent* derivation, a Determinacy violation occurs. Suppose, for example, that MERGE takes WS1 as its input and then maps it to WS2, which is the case of IM of *c*, *i.e.*, movement of *c* in the traditional sense, as shown in (11):

(11) a. WS1 = [{a, {b, c}}, d]
b. WS2 = [{**c**, {a, {b, c}}}, d]

It should be noted that according to general recursion (7), any SO generated in (11) is accessible to MERGE. Under their system, Determinacy applies at the *output* of MERGE, *i.e.*, at WS2 (11b). In WS2, there are two copies of *c*. This poses an ambiguous rule application problem for *subsequent* derivation, because if we apply IM to *c* in subsequent derivation, for example, there would not be a unique way to apply IM to *c* due to its two copies. So, under their notion of Determinacy (10), no IM is ever allowed, which is clearly an undesirable result.

Chomsky (2019b, c) presents a way out of this problem, *i.e.*, such an ambiguous rule application problem can be resolved by minimal search, part of RR. In (11b), for example, there are two copies of *c*, but minimal search selects the higher copy of *c*. In other words, the higher copy of *c* is accessible, but the lower copy of *c* is not accessible. Hence, there would be no Determinacy violation

in (11b) (see Epstein, Kitahara, and Seely 2018 and Komachi, Kitahara, Uchibori, and Takita 2019 for relevant discussion).

2.3 A Proposal

2.3.1 Restricting Resources only by the Phase Impenetrability Condition (PIC)

We depart from Chomsky (2019b, c), and propose that RR should only include the PIC but not minimal search as shown in (12) (cf. (9)):

(12) Our Notion of RR

RR only includes the PIC.

Under Chomsky's view of RR, there is a redundancy between minimal search and the PIC regarding accessibility. If there are two copies of an element in WS, then minimal search always makes its higher copy accessible and its lower copy inaccessible. The PIC makes accessible the elements in the edge of a phase head and makes inaccessible those within a Transfer domain, *i.e.*, those in the complement of a phase head. Because a copy in the edge of a phase head always appears in a higher position than a copy in the Transfer domain, minimal search would make the effects of the PIC vacuous when we decide whether or not a copy is accessible. As an illustration, let us consider (13):

(13) Redundancy between Minimal Search and the PIC

[X [PH [... X ...]]]

In (13), PH is a phase head, and X undergoes movement (IM) from within the complement of the phase head, *i.e.*, the Transfer domain, to its edge. The PIC makes the lower copy of X, which is within the Transfer domain, inaccessible. If we also assume minimal search as part of RR, however, this effect of the PIC is vacuous, since minimal search selects the higher copy of X, which is in the phase

edge, making the lower copy of X inaccessible. Since the need to eliminate redundancies has been a working hypothesis in the linguistic inquiry, such a redundancy should be eliminated (Chomsky 1995: 152). We propose that RR only include the PIC, which is an independently motivated condition for Transfer. Under our analysis, there does not exist any such redundancy.

In personal communication with EKS (2018: 268), Chomsky suggests: "Labeling is a search procedure, like Agree (and in fact Merge, which searches for things to merge). So why isn't it enough to say that all search procedures are governed by the third factor principle of economy (shortest search)." Given this, one might argue that our proposal bears a burden of proof as to why minimal search is inoperative in RR even though it is given "for free" by the third factor principles. That said, however, it is still unclear how a search procedure is governed by the third factor principles and involved in operations like MERGE, Agree, and labeling. In a search procedure for labeling, which is a head search procedure, we already know what we are going to search for, *i.e.* a head, when we start the procedure. The search procedure for labeling straightforwardly follows from minimal search. In a search procedure for deciding the accessibility of copies to MERGE, however, we don't know what we are going to search for when we start the procedure. For instance, in order to figure out whether an element is accessible to MERGE in terms of minimal search, we need to keep track of the history of the search procedure. In the search procedure of *{a, {b, {c, a}}}*, for instance, we come across the higher copy of *a*, and then *b* and *c* in terms of minimal search. However, we need to keep track of this history of the search procedure, which enables us to conclude that the lower copy of *a* is inaccessible due to the higher copy of *a* which we have come across before. In other words, this would mean that in order to determine accessibility, MERGE need to constantly memorize derivational information (history) in each mapping process of WS, with an unambiguous sense of what is a copy and what is a new element. How can we make sense of such a distinction? It might be possible to formalize the process,

but given that "meaningful cyclic computational" (Chomsky 2004: 5) tries to reduce memory load and simplify the derivation by "forgetting" derivational information, such an attempt would increase computational burden, contrary to the SMT. It is not entirely clear, therefore, how the search procedure for accessibility follows only from minimal search, and how it conforms to the SMT. In this paper, adhering to the minimalist hypothesis that a redundancy should be eliminated and the SMT, we then conclude that minimal search is unnecessary (at least) for RR in determining accessibility to MERGE. (We will not commit ourselves to Agree as its status in narrow syntax is unclear; see Chomsky, Gallego, and Ott 2019: 252 for relevant discussion.) For various attempts on minimal search related to the elementary syntactic operations; see, in particular, Hiraiwa (2005), Chomsky (2015b), EKS (2018), Goto (2016; 2020), Kato, Kuno, Narita, Zushi, and Fukui (2014), Narita, Kasai, Kato, Zushi, and Fukui (2017); Ke (2019).

2.3.2 Determinacy at the Input of MERGE

As mentioned above, Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019) claim that Determinacy applies at the *output* of MERGE. Their view, however, has a look-ahead property in that we have to look at the *subsequent* stage of a derivation to decide whether Determinacy gets violated or not. Such a look-ahead property, which necessarily increases computational burden, should be eliminated (see, among others, Chomsky 2000, 2004).

Contrary to what Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019) claim, we propose that Determinacy apply at the *input* of MERGE in that if there is an ambiguous rule application at the *present* stage of a derivation (not at a *subsequent* stage of a derivation), a Determinacy violation occurs as shown in (14):

(14) Our Notion of Determinacy (cf. (10))

Determinacy applies at the *input* of MERGE.

Under our notion of Determinacy, we can decide whether Determinacy gets violated only based on the information available at the *present* stage of a derivation; our proposal does not have a look-ahead property.

Let us consider (11) (repeated here as (15)) again:

(15) a. WS1 = [{a, {b, c}}, d]

b. WS2 = [{**c**, {a, {b, c}}}, d]

According to our notion of Determinacy (14), Determinacy applies at the *input* of MERGE, *i.e.*, at WS1 (15a). Because there is only one copy of *c* in WS1, we have only one option to create WS2, *i.e.*, to move *c* in the base position; there is no ambiguous rule application. Hence, under our notion of Determinacy, there is no Determinacy violation in (15).

Suppose further that MERGE takes WS2 as its input and then maps it to WS3, *i.e.*, we apply IM to *c* again, as shown in (16):

(16) a. WS2 = [{**c**, {a, {b, c}}}, d]

b. WS3 = [{**c**, {c, {a, {b, c}}}}, d]

In (16), we have two copies of *c* at the input of MERGE, *i.e.*, at WS2 (16a). We have two options to create WS3 (16b), *i.e.*, either to move the higher copy of *c* or the lower copy of *c*. This ambiguous rule application violates our notion of Determinacy (14). It should be noted that under our notion of Determinacy, unless we are to apply MERGE to WS2, a Determinacy violation does not occur.

This shows that under our notion of Determinacy (14), if we apply IM to the same element more than once, it always results in a Determinacy violation. This incorrectly predicts that no successive-cyclic movement is allowed. We argue in the next subsection that such an ambiguous rule application problem induced by multiple applications of MERGE can be resolved by our notion of RR, *i.e.*, the PIC.

2.3.3 An Ambiguous Rule Application Problem with MERGE and its Resolution by the PIC

Let us consider (17) as an example of successive-cyclic movement:

(17) **What** did you say that John bought *t*?

a. [RP **what** [R(BUY) what]]

b. [CP **what** [C [TP John [T [*v*P John [*v*-R(BUY) [RP what [R(BUY) what]]]]]]]]

c. [*v*P you [*v*-R(SAY) [RP **what** [R(SAY) [CP what [C-that [TP John [...

d. [CP **what** [C-that [TP you [T [*v*P you [*v*-R(SAY) [RP what [R(SAY) [CP what ...

In (17), the *wh*-phrase *what* undergoes successive-cyclic movement. In (17a), we apply IM to *what*; *what* moves from its base position to the Spec of Root (R) (for phi-phi labeling; see Chomsky 2013, 2015a). In (17b), we apply IM to *what* again to move it to the embedded Spec of C. We assume with Chomsky (2013, 2015a) that *v* becomes invisible because of pair-Merge with R so that R inherits phasehood from *v*; the phase-head R-complement undergoes Transfer. Although there are two copies of *what*, *i.e.* the copy in the Spec of R and the copy in the base position, the copy in the base position, which is within R-complement, is not accessible because of the PIC after the phase-R-complement Transfer.[1] There is only one

[1] Following Chomsky (2000; 2001; 2004; 2013; 2015a) and Chomsky et al. (2019), we assume that upon the completion of a phase, the phase-head-complement becomes inaccessible to further operation:

> "In phase α with head H, the domain of H is not accessible to operations outside α; only H and its edge are accessible to such operations."
> (from Chomsky 2000: 108)

> "[Given structure [ZP Z … [HP α [H YP]]], with H and Z the heads of phases]: The domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations." (from Chomsky 2001: 14)

accessible copy of *what*, *i.e.* the one in the Spec of R; there is no Determinacy violation. In (10c), we apply IM to *what* again. Only the copy of *what* in the embedded Spec of C is accessible and all the other copies of *what* are not accessible because of the PIC after the phase-head C-complement (TP) Transfer. There is no Determinacy violation in (17c). Similarly, the PIC avoids Determinacy violations in (10d). Hence, the PIC resolves the problem of an ambiguous rule application induced by multiple applications of MERGE.

In the next section, we will look at various empirical consequences of our notion of Determinacy (14) coupled with the PIC. It is shown that our notion of Determinacy (14) is more desirable in that it gives us a unified account of various phenomena, which have been analyzed by different constraints or principles.

3. Consequences of MERGE and Determinacy

3.1 The Subject Condition

3.1.1 The Subject Condition and its Cancellation

First, the Subject Condition such as (18) (cf. Chomsky 1973; Huang 1982) follows from our notion of Determinacy (14). The derivation of (18) is represented in (19):

(18) * **Who** did [pictures of *t*] please you?

(19) [CP **who** [C-did [TP [pictures of <u>who</u>] [T [*v*P [pictures of <u>who</u>] [*v* [...

In (19), if we are to move *who* to the Spec of C, there are two accessible copies of *who*, *i.e.* the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (19) violates Determinacy. Hence, Determinacy accounts for the Subject Condition effect.

As pointed out by Lasnik and Park (2003) and Stepanov (2007), when an expletive appears in the Spec of T, the Subject Condition effect is canceled as shown in (20). The derivation of (20) is represented in (21):

(20) **Who** is there [a picture of ***t***] on the wall? (Stepanov 2007: 92)

(21) [CP **who** [C-is [TP there [T [*v*P [a picture of <u>who</u>] [*v* [...

In (21), since the Spec of T is occupied by the expletive *there*, there is only one accessible copy of *who*, which is within the Spec of *v*. Hence, there is no Determinacy violation; cancellation of the Subject Condition effect with expletives follows. The Subject Condition effect and its cancellation with expletives are also observed in Dutch as shown in (22), which follows from Determinacy in the same way:

(22) *Dutch*

a. **Wat** hebben er [***t*** voor mensen] je moeder bezocht?
what have-3PL there for people your mother visited
'What sort of people have visited your mother?'

b. * **Wat** hebben [***t*** voor mensen] je moeder bezocht?
what have-3PL for people your mother visited
'What sort of people have visited your mother?'

(Broekhuis 2006: 65)

Unlike extraction out of a subject, extraction out of an object such as (23) is allowed (but see Section 3.1.4):

(23) **Who** did you see [a picture of ***t***]?

Our notion of Determinacy (14) correctly predicts this subject-object asymmetry with respect to extraction. The derivation of (23) is represented in (24):

(24) [CP **who** [C-did [TP you [T [*v*P you [*v*-R(SEE) [RP [a picture of who] [R(SEE) [a picture of who]]]]]]]]]

In (24), when we are to move *who* to the Spec of C, there are two accessible copies of *who*, *i.e.* the one within the Spec of R and the other within the complement of R. The copy within the complement of R, however, is not accessible because of the PIC after the phase-head R-complement Transfer; there is no Determinacy violation in (24).

We can also account for the fact that extraction out of an ECM subject is allowed as exemplified by (25):

(25) Of which car did they believe [the picture ***t***] to have caused a scandal?

(Chomsky 2008: 153)

In (25), the *wh*-phrase *of which car* is extracted out of the ECM subject. The derivation of (25) is represented in (26):

(26) [CP **of which car** [C-did [TP they [T [*v*P they [*v*-R(BELIEVE) [RP [the picture of which car] [R(BELIEVE) [[the picture of which car]]]]]]]]]

In (26), although there are two accessible copies of *of which car*, *i.e.* the one within the matrix Spec of R and the other within the complement of R, the copy in the complement of R is not accessible because of the PIC after the phase-head R-complement Transfer. Hence, there is no Determinacy violation.

3.1.2 Absence of the Subject Condition Effects in Japanese, Spanish, and Icelandic

Our notion of Determinacy (14) also accounts for the absence of the Subject Condition effects in Japanese, Spanish, and Icelandic. It has been pointed out by Kayne (1983), Lasnik and Saito (1992), Ishii (1997; 2011), Saito and Fukui (1998) *inter alia* that Japanese lacks the Subject Condition effects as shown in (27), where *dare-ni* 'who-Dat' is scrambled out of the subject phrase. The result is slightly degraded, but this is due to the fact that it involves extraction out of the complex NP:

(27) *Japanese*

?**Dare-ni** [John-ga [[Mary-ga ***t*** atta] koto]-ga mondai-da to]
who-DAT John-NOM Mary-NOM met fact-NOM problem-is that
omotteru] no
think Q
Lit. 'Who, John thinks that [the fact that Mary met *t*] is a problem.'

We assume with Fukui (1986) and Kuroda (1988) *inter alia* that subjects in Japanese stay in the Spec of *v* throughout a derivation. The derivation of (27) is represented in (28):

(28) [CP **dare-ni** [C [TP T [*v*P [Mary-ga <u>dare-ni</u> atta koto]-ga [*v* [...
who-DAT Mary-NOM who-DAT met fact-NOM

In (28), there is only one accessible copy of *dare-ni* 'who-Dat' within the Spec of *v*; there is no Determinacy violation. The absence of the Subject Condition effect in Japanese follows.

In Spanish, as pointed out by Uriagereka (1988) and Gallego (2007), when the subject appears after verb, there is no subject condition effect as shown in (29a).

This is in contrast with (29b), which shows that when the subject appears before verb, the subject condition effect emerges:

(29) *Spanish*

[CP **De qué conferenciantes**$_i$ [C te parece que . . .
of what speakers CL-to-you seem-3.SG that

a. ... (?) [TP T_s me$_Z$ van a impresionar$_V$ [*v**P [las propuestas t_i]
CL-to-me go-3.PL to impress-INF the proposals
*v** t_Z t_V]]]?

b. ... * [TP [las propuestas t_i]$_j$ T_s me$_Z$ van a impresionar$_V$
the proposals CL-to-me go-3.PL to impress-INF
[*v**P t_j *v** t_Z t_V]]]?
'Which speakers does it seem to you that the proposals by will impress me?' (Uriagereka 1988: 118; Gallego 2007: 294)

This contrast between post-verbal and pre-verbal subjects also follow form Determinacy if we assume with Uriagereka and Gallego that post-verbal subjects appear in the Spec of *v* whereas pre-verbal subjects appear in the Spec of T. The derivations of (29a) and (29b) are represented in (30a) and (30b) respectively:

(30) a. [CP **de qué conferenciantes** [C [TP [T me van a
of which speakers CL-to-me go-3.PL to
impresionar [*v*P [las propuestas <u>de qué conferenciantes</u>] [*v* [...
impress-INF the proposals of which speakers

b. [CP **de qué conferenciantes** [C [TP [las propuestas <u>de qué</u>
of which speakers the proposals of which
<u>conferenciantes</u>] [T me van a impresionar
speakers CL-to-me go-3.PL to impress-INF
[*v*P [las propuestas <u>de qué conferenciantes</u>] [*v* [...

the proposals of which speakers

In (30a), when we are to move the *wh*-phrase *de qué conferenciantes* 'of which speakers' to the embedded Spec of C, there is only one accessible copy of *de qué conferenciantes* 'of which speakers' within the Spec of *v*; there is no Determinacy violation. In (30b), on the other hand, when we are to move *de qué conferenciantes* 'of which speakers' to the embedded Spec of C, there are two accessible copies of *de qué conferenciantes* 'of which speakers,' the one within the Spec of T and the other within the Spec of *v*; this violates Determinacy.

As noted by Kitahara (1994), Icelandic also lacks the Subject Condition effects as shown in (31), where *hverjum* 'who-Dat' is moved out of the subject phrase:

(31) *Icelandic*

?**hverjum** heldur þú að [myndir af ***t***] séu til sölu?
who think you that pictures of are on sale
'Who do you think that pictures of *t* are on sale?' (Kitahara 1994: 243)

This fact also follows form Determinacy if we assume with Holmberg and Hróarsdóttir (2003) that *wh*-phrases in Icelandic move directly from the Spec of *v* to the Spec of C.[2] The derivations of (31) is represented in (32):

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[2] With this assumption, Holmberg and Hróarsdóttir (2003) explain the following difference in agreement:

(i) Manninum virðast *t* hestarnir vera seinir
the manDAT seemPL the horsesNOM be slowNOM
'The man finds the horses slow' (Holmberg and Hróarsdóttir 2003: 654)

(ii) *Hvaða stúdent veist þú að finnast *t* tölvurnar ljótar?
which studentDAT know you that findPL the computersNOM uglyNOM
'Which student do you know considers the computers ugly?'
(Holmberg and Hróarsdóttir 2003: 654)

(32) [CP **hverjum** [C-að [TP [T [*v*P [myndir af <u>hverjum</u>] [*v* [...

who that pictures of who

In (32), there is only one accessible copy of *hverjum* 'who' within the Spec of *v*; there is no Determinacy violation. Hence, the absence of the Subject Condition effects in Japanese, Spanish, and Icelandic follows from Determinacy.

3.1.3 Verb Particle Constructions

Our analysis of the Subject Condition can be extended to verb particle constructions. Recall that our analysis of the Subject Condition claims that when a subject undergoes movement within CP phase, that movement creates two copies of a *wh*-phrase within the subject, which results in a Determinacy violation when we are to move the *wh*-phrase to the Spec of C. A similar pattern is observed in particle movement within RP phase. Lasnik (2001) and Boeckx (2012) observe that, when the object appears after particle, extraction out of the object is allowed as shown in (33a, 34a). When the object appears between verb and particle, on the other hand, extraction out of the object is not possible as shown in (33b, 34b):

(33) a. **Who$_1$** did Mary call up [friends of ***t$_1$***]?

b. * **Who$_1$** did Mary call [friends of ***t$_1$***]$_2$ up t_2? (Lasnik 2001: 111)

(34) a. **Who$_1$** did you pick up [friends of ***t$_1$***]?

b. * **Who$_1$** did you pick [friends of ***t$_1$***]$_2$ up t_2? (Boeckx 2012: 22)

In (i), the dative NP is moved to subject position and the matrix verb agrees with the nominative subject of the infinitival clause. In (ii), on the other hand, the dative NP is *wh*-moved and the matrix verb does not agree with the nominative subject of the infinitival clause. To account for the difference, Holmberg and Hróarsdóttir claim that "the whP must move directly from specVP to specCP, without passing through specTP. If it did pass through specTP, Agree would not be able to tell the difference between (28b)[=(i)], where the experiencer is a plain NP, and (29b)[=(ii)], where it is a whP." (p. 661)

We assume with Lasnik and Boeckx that when an object appears between verb and particle, the object moves from post-particle position to the pre-particle position. The derivation of (33b), for example, is represented in (35):

(35) [*v*-R(CALL) [RP **who** [R(CALL) [friends of who] up [friends of who]]]]

In (35), if we are to move *who* to the Spec of R (for phi-phi labeling under successive-cyclic movement), there are two accessible copies of *who* within the RP phase, *i.e.* the one after the particle *up* and the other before the particle *up*. When we are to move *who* to the Spec of R, a Determinacy violation occurs. (34b) can be accounted for in the same way. Hence, we can account for this contrast regarding extraction between pre-particle and post-particle positions under Determinacy.

3.1.4 The Specificity Effect

It is well known since Chomsky (1973) that extraction from specific DPs, namely DPs that have a definite interpretation, is not allowed (see also Chomsky 1981; Fiengo and Higginbotham 1981; Enç 1991; Diesing 1992; Stepanov 2007; Haegeman et al. 2014; Goto 2016):

(36) a. **Who** did you see [pictures of *t*]?
b. * **Who** did you see [the picture of *t*]?

This fact, which is often called the Specificity Effect, follows from Determinacy if we assume with Diesing (1992), Mahajan (1992), and Stepanov (2007) that at least in a language like English, specific DPs move out of VP (RP, in our terms) prior to

wh-extraction out of them.[3] The derivation of (29a) and (29b) are represented in (37) and (38), respectively:

(37) [CP **who** [C-did [TP you [T [*v*P you [*v*-R(SEE) [RP [pictures of who] [R(SEE) [picture of who]]]]]]]]

(38) [CP **who** [C-did [TP you [T [*v*P you [*v*-R(SEE) [RP [the picture of who] [R' [the picture of who] [R(SEE) [the picture of who]]]]]]]]]

A crucial difference between (37) and (38) is whether the movement in question for specific interpretation takes place. In (37), it does not take place because *[pictures of who]* is not specific. In (38), on the other hand, it takes place because *[the picture of who]* is specific. In (37), when we are to move *who* to the Spec of C, there are two accessible copies of *who*, *i.e.* the one within the Spec of R and the other within the complement of R, but as we have already argued in (24) above, the copy within the complement of R is not accessible because of the PIC after the phase-head R-complement Transfer; there is no Determinacy violation in (37) (note that the movement of *[pictures of who]* to the Spec of R is required for phi-phi labeling). In (38), on the other hand, even after the phase-head R-complement Transfer is applied, there are still two accessible copies of *who* when we are to move *who* to the Spec of C, *i.e.* the one within the inner Spec of R and the other within the outer Spec of R; there is a Determinacy violation in (37). It should be noted here that in addition to the movement to the inner Spec of R for phi-phi labeling, *[the picture of who]* is required to move to the outer Spec of T for the specific interpretation. Hence, Determinacy accounts for the Specificity Effect.[4]

[3] We put aside the issue of whether the movement in question is semantically motivated (Diesing 1992; Borer 1994) or syntactically motivated (Stepanov 2007; Mahajan 1992).

[4] In Spanish, as pointed out by and Gallego and Uriagereka (2007), extraction out of *a*-marked objects is not possible:

Uriagerela (1988; 1996) observes that in Galician, the Specificity Effect is cancelled by determiner incorporation into a selecting verb:

(39) *Galician*

a. *De quén liches **os** mellores poemas de amigo?
of whom read.2SG the best poems of friend

b. (?)De quén liches-**los** mellores poemas de amigo?
of whom read.2SG-the best poems of friend
'Who did you read the best poems of friendship by?"

(Uriagereka 1996: 270)

In (39a), *de quén* 'of which' is extracted from the specific DP *[los mellores poemas de amigo*] 'the best poems of friendship by' and the Specificity Effect occurs. However, in (39b), the Specificity Effect is cancelled by the determiner incorporation of *los* 'the' into the selecting verb *liches* 'read' from the specific DP. The presence of the Specificity Effect in (39a) can be accounted for in the same

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(i) (Gallego and Uriagereka 2007: 65)
?*¿[De quién]$_j$ has visitado [$_{DP}$ a muchos amigos t_j]$_i$ [$_{VP}$ . . . t_i]?
of whom have.2SG visited A many friends
'Who have you visited many friends of?'

This fact also follows form Determinacy if we assume that *a*-marked objects in Spanish have specific interpretation (cf. Torrego 1998; Leonetti 2003) The derivation of (ii) is represented in (ii):

(ii) [$_{CP}$ **de quién** [C [T-has [$_{vP}$ [*v*-R(VISITADO) [$_{RP}$ [a muchos amigos de quién] [$_{R'}$ [a muchos amigos de quién] [R(VISITADO) [a muchos amigos de quién]]]]]]]]]

In (ii), if we are to move *de quién* 'of whom' to the Spec of C, there are two accessible copies of *de quién* 'of whom' within the RP phase, *i.e.* the one within the inner Spec of R (that is required for phi-phi labeling) and the other within the outer Spec of R (that is required for specific interpretation). This is an ambiguous rule application; (ii) violates Determinacy. Hence, we can account for the fact that extraction out of *a*-marked objects is not possible under Determinacy.

way as under the assumption that specific DPs move out of RP prior to *wh*-extraction as in (38).

What is important to us is that the cancellation of the Specificity Effect in (39b) also follows from Determinacy if we assume with Stepanov (2012) and Goto (2017b) that {H, XP} structures, H a head, XP a phrase, originally have a syntactic status of H and is labeled as H as in {H, XP} = H (see Chomsky 2008; 2013; 2015a for relevant discussion), but once H undergoes head-movement from the constituent as in H_i … {t_i, XP}, then the status of the resulting syntactic structure is modified so that it gets the label of the remaining head of XP as in {t_i, XP} = X.[5] If this is the case, it follows that the syntactic status of DP in (32b) as (originally) specific is modified to non-specific after the determiner incorporation of *los* 'the' into the verb *liches* 'read': the status of the syntactic structure with no determiner incorporation (*[$_{DP}$ los [$_{NP}$ mellores poemas [de amigo de de quén]]]*) is a specific DP, but the status of the syntactic structure with determiner incorporation (*liches-los$_i$…[$_{DP}$ t_i [$_{NP}$ mellores poemas [de amigo de de quén]]]*) is modified to a non-specific NP. As we have shown in (37), non-specific NPs do not have to undergo movement for specific interpretation, there is no Determinacy violation in (39b). Hence, the cancellation of the Specific Effect with determiner incorporation follows.

Note that some languages do not exhibit the Specificity Effect. Mahajan (1992) observes that for Hindi, and Stepanov (2007) observes that for German (Mahajan argues that in (40) the specific interpretation of the noun phrase is ensured by overt object shift with Case agreement):

(40) *Hindi*

Kiskii tum socte ho ki Mohan-ne kitaab curaaii thii?

Whose you think that Mohan-ERG book-FEM stolen-FEM be-PAST-FEM

[5] For a similar view on {XP, YP} structures, see Moro (2000) and Chomsky (2013; 2015a). They argue that in {XP, YP}, if XP undergoes movement from the constituent as in XP_i … {t_i, YP}, then the status of the resulting syntactic structure is modified so that it gets the label of Y as in {t_i, YP} = Y.

'Of whom do you think that Mohan stole the book.' (Mahajan 1992: 514)

(41) *German*

Über Chomsky$_i$ habe ich [den letzten Film *t*] leier nicht gesehen

about Chomsky have I the last film unfor nicht seen

'Unfortunately, I have not seen the last film about Chomsky.'

(Stepanov 2007: 107)

These facts also follow from Determinacy if we assume Stepanov's (2007) view of the necessity of movement for specific interpretation in these languages. On the basis of binding tests and reconstruction effects in scrambling, he reaches the conclusion that "specific DPs in Hindi [and in German] do not undergo movement, […], they remain in situ, by the time extraction takes place" (pp. 105-108) (see also Neeleman 1994 for German). Since we have assumed with Chomsky (2013; 2015a) that objects universally move from its base position to the Spec of R for phi-phi labeling, we take it as given that specific DPs in Hindi and German undergo movement for phi-phi labeling (like in English and Galician), but do not for specific interpretation (unlike in English and Galician). The derivation of (40) and (41) are represented in (42) and (43), respectively:

(42) [CP kiskii [C-ho [T [*v*P Mohan-ne [*v*-R [RP [kitaab <u>kiskii</u>] [R [kitaab kiskii]]]]]]]

(43) [CP Über Chomsky [C-habe [T [*v*P ich [*v*-R [RP [den letzten Film <u>über Chomsky</u>] [R [den letzten Film über Chomsky]]]]]]]

Notice in (42) and (43) that the speicifc DPs (*kiskii kitaab* 'the book of whom' and *den letzten Film über Chomsky* "the last film about Chomsky") move from their base positions to the Spec of R for phi-phi labeling, but do not undergo movement

for specific interpretation. In (42), when we are to move *kiskii* 'whose' to the Spec of C, there are two accessible copies of *kiskii*, *i.e.* the one within the Spec of R and the other within the complement of R, but the copy within the complement of R is not accessible because of the PIC after the phase-R-complement Transfer; there is no Determinacy violation. Similarly, in (43), when we are to move *über Chomsky* 'about Chomsy' to the Spec of C, there are two accessible copies of *über Chomsky*, *i.e.* the one within the Spec of R and the other within the complement of R, but the copy within the complement of R is not accessible because of the PIC after the phase-head R-complement Transfer; there is no Determinacy violation. Hence, the absence of the Specificity Effect in Hindi and German follows.[6]

3.2 No Vacuous Topicalization

Determinacy also accounts for the contrast between (44a) and (44b). As has been well-known, particularly since Lasnik and Saito (1992), vacuous topicalization of subjects is not allowed in English as shown in (44a):

(44) a. * **John**, ***t*** came yesterday.
b. **Mary**, John likes ***t***.

We assume with Chomsky (1977), Rizzi (1997), Hiraiwa (2010), and Grohmann (2011), among many others, that a topicalized phrase targets a Spec of C, and gets topic interpretation at the CP periphery (*pace* Lasnik and Saito 1992 or Bošković

[6] As is obvious from the analyses presented above, the presence or absence of the Specificity Effect and the resulting violation of Determinacy crucially rely on the presence or absence of movement for specific interpretation prior to *wh*-extraction. Respecting the previous theories of the behavior of specific DPs, especially the theory of Stepanov (2007), we assume here that it is required for languages like English and Galician, but not for languages like Hindi and German. Needless to say, more investigation is necessary to understand what makes the fundamental difference.

1997; they assume that a topicalized phrase targets a Spec of T).[7] The derivation of (44a), for example, is represented in (45):

(45) [CP **John** [C [TP John [T [*v*P John [*v* [...

In (45), if we are to move *John* to the Spec of C for topic interpretation, there are two accessible copies of *John*, *i.e.* the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (45) violates Determinacy.

Unlike topicalization of subjects, topicalization of objects is allowed as shown in (44b). Determinacy correctly predicts this subject-object asymmetry with respect to topicalization. The derivation of (44b) is represented in (46):

(46) [CP **Mary** [C [TP John [T [*v*P John [*v*-R(LIKE) [RP Mary [R(LIKE) Mary]]]]]]]

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[7] Independent evidence for this comes from the fact that topicalization is impossible when there is no CP structure, as shown in (i):

(i) a. I want [TP him to clean the car].
b. * I want [**the car** [TP him to clean ***t***]. (Grohmann 2011: 32, fn. 3)

(i) is an ECM-structure that lacks C, where topicalization is impossible, as in (ib). As Bošković (1997) argues, if *that*-less embedded clauses in English are generally TPs, then the following contrast can also be evidence for this assumption:

(ii) a. John didn't believe that **Mary**, Bill kissed ***t***.
b. * John didn't believe **Mary**, Bill kissed ***t***. (Bošković 2016: 32, fn.15)

In (iia), since the complementizer *that* appears and the embedded clause projects up to CP, C can provide a position for the topicalized phrase *Mary*. However, in (iib), since the complementizer *that* does not appear and the embedded clause does not project up to CP, there is no position for the topicalized phrase *Mary* to appear. In passing, we assume that the embedded clause of a sentence like (iia) is layered, as shown in (iii):

(iii) [CP [C-*that* [CP *Mary* [C […

In (iii), the complementizer *that* occupies the higher C head and a topicalized phrase occupies the lower Spec of C (see Section 3.3.4 for relevant discussion).

In (46), when we are to move *Mary* to the Spec of C for topic interpretation, there are two accessible copies of *Mary*, *i.e.* the one within the Spec of R and the other within the complement of R. The copy within the complement of R, however, is not accessible because of the PIC after the phase-head R-complement Transfer; there is no Determinacy violation in (46). The contrast between (44a) and (44b), and more generally, "anti-locality" effects (cf. Abels 2003; Grohmann 2003) follow from Determinacy (see Section 5 for more discussion on anti-locality).

Similarly, Determinacy can also account for the non-existence of complementizer-less subject relatives in English such as (40):

(47) *the man [*t* likes Mary] (Bošković 1997: 26)

Before looking at how to rule out (47), let us consider the structure of a complementizer-less relative. Complementizer-less relatives are potentially ambiguous in that they can be either TPs or CPs. (48), for example, can be assigned either (49a) or (49b):

(48) the man [John likes *t*]

(49) a. the man [$_{TP}$ OP [$_{TP}$ John likes *t*]]
b. the man [$_{CP}$ OP [$_{C'}$ C [$_{TP}$ John likes *t*]]]

The empty operator *OP* adjoins to TP in (49a), whereas it moves to the Spec of C in (49b). Bošković (1997) proposes the Minimal Structure Principle (MSP) (50), which is a modified version of the principle of economy of representation proposed by Law (1991):

(50) *The Minimal Structure Principle* (Bošković 1997: 25)

Provided that lexical requirements of relevant elements are satisfied, if two representations have the same lexical structure and serve the same function, then the representation that has fewer projection is to be chosen as the syntactic representation serving that function.

In (50), "lexical structure" refers to structure involving projections of heads bearing categorial features, and satisfaction of lexical requirements refers to the satisfaction of l-/s-selection requirements and checking of features specified in lexical entries. The MSP requires that structures should contain only as many functional projections as needed to satisfy lexical requirements. It then follows from the MSP that complementizer-less relative (48) should be assigned TP structure (49a), a more economical option.

It should be noted that in contrast to complementizer-less relatives, *wh*-relatives have a *wh*-relative pronoun that has to be licensed by a functional head; *wh*-relatives like *the man who(m) John likes* are CPs in spite of the MSP.

If we follow this view that complementizer-less relatives are TPs, complementizer-less subject relatives like (47) can be excluded by Determinacy as shown below:

(51) the man [TP **OP** [TP OP [*v*P OP likes Mary]]]

If we are to adjoin *OP* to TP, there are two accessible copies of *OP*, i.e. the one in the Spec of T and the other in the Spec of *v*. This is an ambiguous rule application; (51) violates Determinacy.

Unlike in English, complementizer-less subject relatives are allowed in null subject languages like 15th century Italian and Shakespearean English:

(52) Ch'è faccedenda tocca a noi
for is matter concern to us

'For this is a matter that concerns us.' (Rizzi 1990: 71)

(53) a. There is a lord will hear you play tonight. (*Taming of the Shrew)*

b. Youth's a stuff will not endure. (*Twelfth Night*) (Bošković 1997: 185)

Complementizer-less subject relatives in null subject languages can be accounted for by Determinacy. The derivations of (52) and (53) proceed as follows:

(54) Ch'è faccedenda [$_{TP}$ **OP** [$_{TP}$ ex [$_{vP}$ tocca a noi OP]]].
for is matter concern to us

(55) a. There is a lord [$_{TP}$ **OP** [$_{TP}$ ex will [$_{vP}$ OP hear you play tonight]]].

b. Youth's a stuff [$_{TP}$ **OP** [$_{TP}$ ex will [$_{vP}$ OP not endure]]].

In (54) and (55), the Spec of T is occupied by a null expletive (*ex*). When *OP* is to adjoin to TP, there is only one accessible copy of *OP*, which is in the Spec of *v*; there is no Determinacy violation.

The present analysis is compatible with the Vacuous Movement Hypothesis (VMH), first proposed by George (1980) and adopted, e.g. by Chomsky (1986b; 2013), Ishii (2004), and Agbayani (2006), which states that a *wh*-subject does not move locally to the Spec of C, as shown in (56a):

(56) **Who** left?

a. [$_{TP}$ **who** [T [$_{vP}$ who [*v*-R(LEAVE) […

b. * [$_{CP}$ **who** [C [$_{TP}$ who [T [$_{vP}$ who [*v*-R(LEAVE) […

In (56a), there is only one accessible copy of *who*, which is within the Spec of *v*; there is no Determinacy violation. In (56b), on the other hand, there are two accessible copies of *who*, *i.e.* the one within the Spec of T and the other within the

Spec of *v*; there is a Determinacy violation. Hence, the VMH follows from Determinacy.

3.3 The *That*-trace Effects

3.3.1 The *That*-trace Effects in English

The *that*-trace effects that have received much attention in the literature (Kayne 1984; Lasnik and Saito 1992; Chomsky 1986a; Rizzi 1990; Ishii 2004; Mizuguchi 2008; Abe 2015; Bošković 2016, among many others) also follow from Determinacy. Pairs of examples that call for an explanation are like those in (57):

(57) a. * **Who** do you think that ***t*** saw Bill?
b. **Who** do you think ***t*** saw Bill?

The derivation of (57a) is represented in (58):

(58) [CP **who** [C-that [TP who [T [*v*P who [*v*-R(SEE) [RP Bill [R(SEE) [...

In (58), if we are to move *who* to the embedded Spec of C, there are two accessible copies of *who*, *i.e.* the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (58) violates Determinacy. Hence, Determinacy accounts for the *that*-trace effect.[8]

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[8] The same account extends to so-called complementizer-*trace* effects:

(i) a. ***Who** do you wonder whether/if ***t*** saw Bill?
b. ***Who** do you prefer for ***t*** to see Bill?

The derivations of (ia, b) are represented in (iia, b), respectively:

(ii) a. [CP **who** [C-whether/if [TP who [T [*v*P who [*v* […
b. [CP **who** [C-for [TP who [T-to [*v*P who [*v* […

If the complementizer *that* does not appear, the *that*-trace effect is canceled as shown in (57b). We assume with Chomsky (2015a) that when the complementizer *that* does not appear, C is deleted, T inherits phasehood from C, and the phase-T-complement (*v*P) undergoes Transfer. The derivation of (57b) is represented in (59), where Ø stands for C-deletion of the complementizer *that*:

(59) [RP **who** [R [C(that) → Ø [TP who [T [*v*P who [*v*-R(SEE) [...

In (59), when we are to move *who* from the embedded Spec of T to the matrix Spec of R, there are two accessible copies of *who, i.e.* the one within the Spec of T and the other within the Spec of *v*. The copy within the Spec of *v*, however, is not accessible because of the PIC after the phase-head T-complement (*v*P) Transfer. Hence, there is no Determinacy violation in (59); cancellation of the *that*-trace effect with C-deletion follows.[9]

In (iia, b), if we are to move *who* to the embedded Spec of C, there are two accessible copies of *who, i.e.* the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; both (iia, b) violate Determinacy.

[9] One might wonder if the account of the Subject Island effect given in (19), repeated below in (i), is consistent with the account of the cancellation of the *that*-trace effect given in (59), repeated below in (ii):

(i) *Who did [pictures of _] please you?
[CP **who** [C(did) [TP [pictures of who] [T [*v*P pictures of who] [v [... (= (19))

(ii) Who do you think _ saw Bill?
[RP **who** [R [C(that)→Ø [TP who [T [*v*P who [*v*-R(SEE) [... (= (59))

As argued in (ii), if the extraction of the subject *wh*-phrase from the embedded clause is allowed when the embedded C is null, it should be predicted that the Subject Island effect in (i) disappears if it is embedded within the sentence with no overt C. However, this prediction is not borne out; consider (iii):

(iii) *Who do you think [pictures of _] will please you?

The question we need to answer here is why (i) and (iii) yield a Determinacy violation, while (ii) does not.

We suggest that the PIC implies (iv) and (iii) has the derivation as in (v):

3.3.2 Skipping Strategy

The present account of the *that*-trace effect also accommodates Rizzi and Shlonsky's (2007) "skipping strategy," which express a generalization that captures apparent violations of the *that*-trace effect. In English, as pointed out by Rizzi and Shlonsky (2007), when the expletive *there* appears in the Spec of T, the *that*-trace effect is canceled as shown in (60b):

(60) a. * **What** do you think that ***t*** is in the box?

b. **What** do you think that there is ***t*** in the box?

(Rizzi and Shlonsky 2007: 126)

Also in French, if the complementizer is the relative pronoun *qui*, the effect is canceled as shown in (54b) (Kayne 1976, 1983; Rizzi 1990):

(61) *French*

a. * **Quelle étudiante** crois-tu que ***t*** va partir?
which student believe-you that go leave

b. **Quelle étudiante** crois-tu qui ***t*** va partir?

(iv) When an element X undergoes successive-cyclic movement, X must stop by the edge of a phase.

(v) [RP **who** [R [C(that)→Ø [TP who [T' [pictures of who] [T [*v*P pictures of who] [*v* [...

In (v), there are two accessible copies of *who*, *i.e.* the one within the inner Spec of T and the other within the outer Spec of T. The inner copy of *who* is necessary to ensure phi-phi labeling, and the outer copy of *who* is necessary to satisfy the requirement of (iv). In this situation, if we are to move *who* to the matrix Spec of R, a Determinacy violation occurs.

Note that in (i) and (ii), unlike in (iii), there is no need to have a copy of *who* in the outer Spec of T. In (i), since T is not a phase head, (i) does not have to satisfy the requirement of (iv). In (ii), since *who* in the Spec of T can satisfy the requirement of (v) by itself, it does not have to stop by the outer Spec of T anymore. In this way, given (iv), the accounts of (i) and (ii) can be maintained while accommodating the fact in (iii).

which student believe-you that go leave

Lit. 'Which student do you believe that is going to leave?'

(Rizzi and Shlonsky 2007: 131)

The contrasts above follow from Determinacy if we assume with Taraldsen (2001) and Rizzi and Shlonsky (2007) that the suffix *-i* of the complementizer *qui* in French (61b) is an expletive-like element. The derivation of (60b) and (60b) are represented in (62) and (63), respectively:

(62) [CP **what** [C-that [TP there [T-is [*v*P <u>what</u> [*v* [...

(63) [CP **quelle étudiante** [C-que [TP i [T [*v*P <u>quelle étudiante</u> [*v* [...

which student that which student

In (62), since the Spec of T is occupied by the expletive *there*, there is only one accessible copy of *what*, which is within the Spec of *v*. Hence, there is no Determinacy violation. Likewise, in (63), since the Spec of T is occupied by the expletive-like element *-i*, there is only one copy of *quelle étudiante* 'which student,' which is within the Spec of *v*. Hence, there is no Determinacy violation.

A similar pattern is also found in a variety of languages such as Swedish, Danish, and Yiddish as shown in (64)-(66):

(64) *Swedish*

a. * Vilken elev trodde ingen att skulle fuska?
which pupil thought nobody that would cheat

b. Vilken elev trodde ingen att han skulle fuska?
which pupil thought nobody that he would cheat
'which pupil didn't anyone think would cheat?' (Engdahl 1982: 166)

(65) *Danish*

a. * Vennen (som) han påstod at havde
firend-Def (that) he claimed that had borrowed
lånt bogen var forsvundet.
book-Def was disappeared

b. Vennen (som) han påstod at der havde
firend-Def (that) he claimed that there had borrowed
lånt bogen var forsvundet.
book-Def was disappeared
'The friend that he claimed had borrowed the book had disappeared.'

(Engdahl 1985: 21)

(66) *Yiddish*

a. * **Ver** hot er moyre az vet ***t*** kumen?
who has he fear that will come

b. **Ver** hot er moyre az es vet ***t*** kumen?
who has he fear that Expl will come
'Who does he fear will come?' (Diesing 1988: 137)

These contrasts can also be accounted for in the same way as those of English (60) and French (61) if we assume with Mizuguchi (2008) and Abe (2015) that the resumptive pronoun *han* 'he' in Swedish (64b), the expletive *der* 'there' in Danish (65b), and the expletive *es* in Yiddish (66) are merged to the Spec of T. The derivation of (64b), for example, is represented in (67):

(67) [CP **vilken elev** [C-att [TP han [T [*v*P <u>vilken elev</u> [*v* […
which pupil that he which puipl

In (67), since the embedded Spec of T is occupied by *han* 'he,' there is only one accessible copy of *vilken elev* 'which pupil,' which is within the Spec of *v*. Hence, there is no Determinacy violation. (65b) and (66b) can be accounted for in the same way; the absence of the *that*-trace effect in theses languages follows.

3.3.3 Absence of the *That*-trace Effects in Pro-Drop Languages, Japanese, and Icelandic

Determinacy also accounts for the absence of the *that*-trace effects in pro-drop languages such as Italian, Spanish, and Greek. As originally observed by Perlmutter (1971), these languages do not exhibit *that*-trace effects, as illustrated in (68)-(70) (cf. Rizzi 1982, 1990; Uriagereka 1988):

(68) *Italian*

Chi credi [che ***t*** vincerà]?
who think that win
'Who do you think that *t* will win?' (Rizzi and Shlonsky 2007: 127)

(69) *Spanish*

Quién dijiste [que ***t*** salió temprano]?
who said-you that left early
'Who did you say left early?' (Perlmutter 1979: 103)

(70) *Greek*

Pjo nomizis [oti ***t*** tilefonise]?
who think-2s that telephoned
'Who do you think called?' (Roussou 2002: 40)

We assume with Rizzi (1982, 1990) that in these languages the small pro appears in the Spec of T (to satisfy the Extended Projection Principle, EPP), or with Goto (2017b) that a verb with rich agreement is merged to the Spec of T (for phi-phi labeling). The derivation of (68), for example, is represented in (71):

(71) [CP **chi** [C-che [TP pro/vincerà [T [*v*P <u>chi</u> [*v*-R(VINCERÁ) [...

In (71), since the embedded Spec of T is occupied by pro/*vincerà* 'win,' there is only one accessible copy of *chi* 'who,' which is within the Spec of *v*. Hence, there is no Determinacy violation. (68)-(70) can be accounted for in the same way; the absence of the *that*-trace effect in pro-drop languages follows.[10]

As originally pointed out by Ishii (2004), Japanese does not exhibit *that*-trace effects, as shown in (72), where the subject null operator OP is scrambled out of a *that*-clause:

(72) *Japanese*

[**OP** [John-ga [***t*** Mary-ni hanasikaketa to] omotteiru] yorimo]
John-NOM Mary-DAT talked to that think than
harukani ookuno hito-ga Susy-ni hanasi tagatte ita
far more people-NOM Susy-DAT wanted to talk
'Far more people wanted to talk with Susy than John thinks that talked to Mary.' (Ishii 2004: 212)

[10] Examples like the following may lend credence to the theory of Goto (2017b) that agreement plays a key role in cancelling the *that*-trace effect:

(i) *Barvarian*
a. **Es Kinda** hot da Hauns gfrogt [***t*** ob-s ***t*** hamkummts]
your children has the John asked if-2pl home-come
b. * **Es Kinda** hot da Hauns gfrogt [***t*** ob-Ø ***t*** hamkummts]
your children has the John asked if home-come
'lit. Your children, John asked if t will come home.' (Mayr 2010: 121)

According to Mayr (2010), the suffix *-s* attached to the embedded complementizer *ob* in (ia) is a manifestation of agreement, and subject extraction (or rather, the *if*-trace effect; see footnote 9) is allowed only if there is such an agreement. Given that *-s* is a manifestation of agreement rather than a manifestation of pro, the Barvarian fact could easily be accounted for in the same manner as those in pro-drop languages under Goto's approach.

Again we assume with Fukui (1986) and Kuroda (1988) that subjects in Japanese stay in the Spec of *v* throughout a derivation. The derivation of (72) is represented in (73):

(73) [CP **OP** [TP [*v*P OP [RP Mary-ni R(HANASIKAKE)] *v*-R(HANASIKAKE)]
Mary- DAT talk to talk to
T-*ta*] C-*to*]
PAST that

In (73), there is only one accessible copy of OP within the Spec of *v*; there is no Determinacy violation. The absence of the *that*-trace effect in Japanese follows.

As originally noted by Maling and Zaenen (1978), Icelandic does not exhibit *that*-trace effects either, as shown in (74), where the subject *wh*-phrase is *hver* 'who' is moved out of a *that*-clause:

(74) *Icelandic*
Hver sagðir þú að ***t*** hefði borðað þetta epli?
who said you that had eaten this apple
'Who did you say had eaten this apple?' (Maling and Zaenen 1978: 480)

Again we assume with Holmberg and Hróarsdóttir (2003) that *wh*-phrases in Icelandic move directly from the Spec of *v* to the Spec of C. The derivation of (74) is represented in (75):

(75) [CP **hver** [C-að [TP [T [*v*P hver [*v* [...
who that who

In (75), since *hver* 'who' does not appear in the Spec of T, there is only one accessible copy of *hver* 'who', which is within the Spec of *v*. Hence, there is no

Determinacy violation; the absence of the *that*-trace effect in Japanese and Icelandic also follows.

3.3.4 Adverb Effects

We can also account for the so-called adverb effects (see, e.g., Bresnan 1977; Culicover 1991; Browning 1996). It has been observed that when adverbs such as *quickly* or *hardly* appear after *that*, the *that*-trace effect is not cancelled, as shown in (76a, 77a), but when adverbs such as *fortunately* or *tomorrow* appear after the complementizer *that*, the *that*-trace effect is canceled, as shown in (76b, 77b, 78):

(76) a. * **Who** did John say [that [***t*** quickly ran to the store]]?

b. **Who** did John say [that [fortunately ***t*** ran to the store]]?

(Brillman and Hirch 2015: 5)

(77) a. * **Who** did she say [that [***t*** hardly speaks to her]]? (Rizzi 1997: 311)

b. **Who** did she say [that [tomorrow ***t*** would regret his words]]?

(Bresnan 1977: 194)

(78) *Yiddish*

Ver hot er moyre [az [haynt vet ***t*** kumen]]?

who has he fear that today will come (Diesing 1988, p. 138)

We assume with Douglas (2017) that when the adverbs which cancel the *that*-trace effect appear after the complementizer *that*, CP structure is layered, with the complementizer *that* being in the higher C head (C_1) and the adverbs being in the lower Spec of C (C_2). On the other hand, when the adverbs which do not cancel the *that*-trace effect appear after the complementizer *that*, CP structure is not

layered, with *that* being in the C head and the adverbs being in the Spec of T.[11]

The derivation (76a), for example, is represented in (79), where CP is not layered, and *who* is moved from its base position to the higher Spec of T via C-to-T feature-inheritance:

(79) [CP **who** [C-that [TP <u>who</u> [quickly [T [*v*P <u>who</u> [*v* [...

In (79), when we are to move *who* to the embedded Spec of C, there are two accessible copies of *who*, *i.e.* the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (79) violates Determinacy. (77a) can be accounted for in the same way.

On the other hand, the derivation of (77b), for example, is represented in (80), where CP is layered by *fortunately*, and *who* is moved from its base position to the lower Spec of C_2 via C_1-to-C_2 feature-inheritance:

(80) [CP1 C_1-that [CP2 **who** [fortunately [C_2 [TP [T [*v*P <u>who</u> [*v* [...

In (80), we assume with Goto (2011) that "in the layered CP structure, either C_1-to-C_2 feature-inheritance or C-to-T feature-inheritance may take place" (p. 36), and that when C_1-to-C_2 feature-inheritance takes place, phi-feature valuation (phi-phi labeling) occurs in the lower Spec of C_2, accompanying phasehood-inheritance from the higher C_1 head to the lower C_2 head. Suppose that in (80) C_1-to-C_2 feature-inheritance takes place, the lower C_2 head inherits phasehood from the higher C_1 head, and the lower phase-head C_2-complement (TP) becomes

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[11] Independent evidence for this comes from the fact that the adverbs like *fortunately* can appear above TP, i.e. a CP field, but the adverbs like *quickly* cannot:

(i) a. John said that **fortunately** Mary ran to the store.
b. * John said that **quickly** Mary ran to the store.
(Brillman and Hirch 2015: 5)

a Transfer domain. Then, in (80), when we are to move *who* to the embedded Spec of C_2, there is only one accessible copy of *who* within the Spec of *v*; there is no Determinacy violation. (77b, 78) can be accounted for in the same way.[12]

The same account extends to cases like those in (81)-(83) where the *that*-trace effect is cancelled by having a topicalized phrase in the CP area:

(81) *Yiddish*

Ver$_i$ hot er nit gevolt az [ot di bikher]$_j$ zol t_i leyenen t_j?
who has he not wanted that the books should read

(Diesing 1990: 75)

(82) a. Robin met the man who Leslie said that [to KIM] ***t*** had given the money.
b. I asked who you had claimed that [on the TABLE] ***t*** had put the book.

(Culicover 1993: 98)

(83) a. * a man who I think that ***t*** knows this book very well
b. a man who I think that, this book, ***t*** knows t very well (Ishii 2004: 203)

These facts can be accounted for in the same way as the adverb effect on the assumption that the topicalized phrases in the embedded clauses in (81)-(83) are located in the lower Spec of C_2, yielding a layered CP structure, as shown in (79).

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[12] Suppose that in (80) C_1-to-T feature-inheritance takes place, C_1 retains the phasehood, and the phase-C_1-complement (CP_2) becomes a Transfer domain. Then the derivation proceeds as represented in (i):

(i) [CP1 **who** [C_1-that [CP2 [fortunately [C_2 [TP who [T [*v*P who [*v* [...

In (i), when we are to move *who* to the embedded Spec of C_1, there are two accessible copies of *who*, *i.e.* the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (i) violates Determinacy. Hence, in (80), to avoid a violation of Determinacy, C_1-to-C_2 feature-inheritance is forced.

The derivation of (81), for example, is represented in (84), where *[ot di bikher]* 'the books' is located in the lower Spec of C_2 for topic interpretation and *ver* 'who' is moved from its base position to a higher position of the lower Spec of C_2 via C_1-to-C_2 feature-inheritance:

(84) [CP1 C_1-az [CP2 **ver** [[ot di bikher] [C_2 [TP [T [*v*P <u>ver</u> [*v* [...
that who the books who

In (84), when we are to move *ver* 'who' to the embedded Spec of C_2, there is only one accessible copy of *ver* 'who' within the Spec of *v*. Hence, there is no Determinacy violation. (82a, b, 83b) can be accounted for in the same way.

3.4 Freezing Effects with Topics

We can also account for freezing effects with topics. It has been noted that extraction is impossible from topicalized phrases, as shown in (85a, b). In (85a), the *wh*-phrase *who* is extracted out of the topicalized phrase *[pictures of who]* and the result is degraded. Similarly, in (85b), the noun phrase *vowel harmony* is extracted out of the topicalized phrase *[articles about vowel harmony]* and the result is degraded. The grammaticality of (85a, b) is based on Lasnik and Saito (1992), but authors vary considerably in their judgments on such examples. In any case, there is a general tendency for topicalized phrases to trigger freezing effects for extraction.

(85) a. ??**Who1** do you think that [[pictures of ***t1***]2 John would like *t2*]?
b. ??**Vowel harmony1**, I think that [[articles about ***t1***]2 you read *t2*]?
(based on Lasnik and Saito 1992: 101)

The derivation of (85a), for example, is represented in (86), where *[pictures of who]* moves from its base position to the lower embedded Spec of C_2 for topic

interpretation via the Spec of R and the phase-head R-complement undergoes Transfer:

(86) [CP1 **who** [C_1-that [CP2 [pictures of who] [C_2 [TP John [T-would [v*P John [v*-R(LIKE) [RP [pictures of who] [R(LIKE) [pictures of who]]]]]]]]]]

In (86), CP is layered by the topicalized phrase . Under the assumption made in the previous section, there are two possibilities for feature-inheritance, *i.e.,* either to apply C_1-to-C_2 feature-inheritance or C-to-T feature-inheritance. Suppose that in (79) C_1-to-T feature-inheritance takes place, C_1 retains the phasehood, and the phase-head C_1-complement (CP_2) becomes a Transfer domain. Then, in (86), when we are to move *who* to the higher embedded Spec of C_1, there are two accessible copies of *who*, *i.e.* the one within the lower Spec of C_2 and the other within the Spec of R. This is an ambiguous rule application; (86) violates

Determinacy. (85b) can be accounted for in the same way.[13] Hence, Determinacy accounts for the freezing effect with topics.[14]

Chomsky (1986b) and Lasnik and Saito (1992) note that unlike extraction out of topicalized phrases, extraction out of moved *wh*-phrases is allowed as shown in (87):

(87) ?**Who** are you wondering [how many pictures of ***t***] John bought ***t***?

(Richards 2001: 188)

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[13] Under the assumption made in the previous section, there are two possibilities for feature-inheritance, *i.e.*, either to apply C_1-to-C_2 feature-inheritance or C-to-T feature-inheritance. Suppose that in (86) C_1-to-C_2 feature-inheritance takes place, the lower C_2 head inherits phasehood from the higher C_1 head, and the lower phase-C_2-complement (TP) becomes a Transfer domain. Then the derivation proceeds as represented in (i), where *[pictures of who]* is located in the lower embedded Spec of C_2 for topic interpretation and *John* is also located in the lower embedded Spec of C_2 due to C_1-to-C_2 feature-inheritance:

(i) [CP1 C_1-that [CP2 **who** [[pictures of who] [John [C_2 [TP John [T-would [v*P John [v*-R(LIKE) [RP [pictures of who] [R(LIKE) [pictures of who]]]]]]]]]]]]

In (i), when we are to move *who* to the embedded Spec of C_2, there is only one accessible copy of *who* within the Spec of C_2; there is no Determinacy violation. This is contrary to our expectation. Then question is why C_1-to-T feature-inheritance is forced in (86). Note here that the derivation in (i) violates the interface condition in (ii) (from Richards 2007: 566):

(ii) Value and Transfer of uFs must happen together.

The derivation (i) violates the condition (ii) because the lower phase-C_2-complement (TP) undergoes Transfer; Value of uFs of C_2 and *John* and Transfer of them do not happen together. Therefore, if (ii) is a rationale for feature-inheritance, as Richards (2007) argues, then C_1-to-T feature-inheritance should be forced in (86).

[14] The same effect is observed in extraction out of moved *wh*-phrases as shown in (i) (cf. Chomsky 1986a, Lasnik and Saito 1992, Richards 2001), which also follows from Determinacy in the same way as in (77):

(i) ?**Who** are you wondering [how many pictures of ***t***] John bought ***t***?

For some speakers, extraction out of moved *wh*-phrases may be allowed. We leave this issue for future research.

The present analysis correctly predicts this asymmetry with respect to extraction. The derivation of (87) is represented in (88):

(88) [CP [how many pictures of **who**] [C [TP John [T [*v**P John [*v**-R(BUT) [RP [how many pictures of who] [R(BUY) [how many pictures of who]]]]]]]]

In (88), when we are to move *[how many pictures of who]* to the embedded Spec of C, there is only one accessible copy of *who*, *i.e.* the one within the Spec of R. Hence, there is no Determinacy violation. The difference between extraction out of topicalized phrases and extraction out of moved *wh*-phrases also follows from Determinacy.

3.5 Further-Raising

Determinacy also accounts for why further-raising from the finite clause is not allowed as shown in (89), where *John* and *who* are moved out of a finite clause:

(89) a. * John seems that reads a book.
b. * Who seems that will leave.

The derivation of (89a), for example, is represented in (90):

(90) [CP **John** [C-that [TP John [T [*v*P John [*v*-R(READ) [...

In (90), if we are to move *John* to the embedded Spec of C, there are two accessible copies of *John*, *i.e.* the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (90) violates Determinacy. (89b) can be accounted for in the same way.

As pointed out by Fernández-Salguerio (2004), further-raising is allowed in pro-drop languages such as Italian and Spanish, as shown in (91), where *Juan y Pedro* 'John and Peter' is moved out of a finite clause:

(91) *Spanish*

Juan y Pedro parece que ***t*** son muy listos

John and Peter seems that are very smart

'John and Peter seem to be very smart.' (Fernández-Salguerio 2004: 100)

Again we assume that in pro-drop languages, the small pro (Rizzi 1982, 1990) or a verb with rich agreement (Goto 2017b) occupies the Spec of T. The derivation of (91) is represented in (92):

(92) [CP **Juan y Pedro** [que [TP pro/son [T [*v*P Juan y Pedro [*v*-R(SON) [...

In (92), since the Spec of T is occupied by pro/*son* 'seems,' there is only one accessible copy of *Juan y Pedro* 'John and Peter,' which is within the Spec of *v*. Hence, there is no Determinacy violation. The difference between English-type languages and pro-drop languages with respect to the possibility of further-raising also follows from Determinacy.

Note that further-raising is not allowed even if the complementizer *that* does not appear:

(93) a. *John seems reads a book.

b. *Who seems will leave.

In our analysis of the cancellation of the *that*-trace effect presented in (59) above, we argued that when the complementizer *that* does not appear, C is deleted, T inherits phasehood from C, and the phase-T-complement (*v*P) undergoes Transfer. If this analysis is applied to (93a, b) as it is, then the derivations of (93a, b) should be as in (94a, b), and it follows that no Determinacy violation occurs, contrary to fact:

(94) a. [TP **John** [… [C(that) → Ø [TP John [T [*v*P John [v-R(READ) […

b. [$_{TP}$ **Who** [… [C(that) → Ø [$_{TP}$ <u>who</u> [T [$_{vP}$ <u>who</u> [v-R(LEAVE) […

Thus we assume that in raising predicates such as *seem* and *be likely*, C-deletion, phasehood-inheritance, and *v*P-Transfer do not apply even if the complementizer *that* does not appear, and rather that CP exists for successive-cyclic movement (see Bošković and Lasnik 2003 for relevant discussion). Given this assumption, the derivations of (93a, b) should be as in (95a, b):

(95) a. [$_{CP}$ **John** [C [$_{TP}$ <u>John</u> [T [$_{vP}$ <u>John</u> [*v*-R(READ) […

b. [$_{CP}$ **Who** [C [$_{TP}$ <u>who</u> [T [$_{vP}$ <u>who</u> [*v*-R(LEAVE) […

In (95a, b), if we are to move *John* and *who* to the embedded Spec of C, there are two accessible copies of *John* and *who*, i.e. the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (95a, b) violate Determinacy.

Significantly, the assumption that CP exists for successive-cyclic movement in a raising predicate is motivated by the fact that the *that*-trace effect is not canceled even if the complementizer *that* does not appear in the raising predicate, as shown in (96) (taken from Kayne 1984: 3):

(96) a. *Who$_i$ is it likely t_i will read the book?

b. ?*Who$_i$ does it appear t_i likes Mary?

Given that CP exists for successive-cyclic movement in the raising predicate, the derivations of (96a) and (96b) proceed as represented in (97a, b), respectively:

(97) a. [$_{CP}$ **who** C [$_{TP}$ <u>who</u> [T [$_{vP}$ <u>who</u> [*v*-R(READ) [$_{RP}$ the book [R(READ […

b. [$_{CP}$ **who** C [$_{TP}$ <u>who</u> [T [$_{vP}$ who [*v*-R(LIKE) [$_{RP}$ Mary [R(LIKE) […

In (97a, b), if we are to move *who* to the embedded Spec of C, there are two accessible copies of *who*, i.e. the one within the Spec of T and the other within the Spec of *v*. This is an ambiguous rule application; (96a, b) violate Determinacy. Hence, the *that*-trace effect in the raising predicate follows from Determinacy if we assume that CP exists for successive-cyclic movement in the raising predicate. We leave it open why C-deletion, phasehood-inheritance, and *v*P-Transfer do not apply in raising predicates.

3.6 **Merge-over-Move** (Chomsky 1995)

The contrast in (98) which has received much attention in the minimalist literature (see, e.g., Chomsky 1995; 2000; Shima 2000, Toyoshima 2009; Goto 2013; 2017a; Epstein, Kitahara, and Seely 2014 for previous proposals) also follow from Determinacy if we assume with Abe (2018) and Goto (2017a) that the associate of *there* is located in the Spec of R to receive partitive Case (Belletii 1988; Lasnik 1995):

(98) a. * There seems a man to be in the room.
b. There seems to be a man in the room.

The derivations of (98a, b) are represented in (99a, b), respectively:

(99) a. [**a man** [to [*v*+R(be) [a man[Partitive] [R(be) [a man[uCase] in the room]]]]]]
b. [**there** [to [*v*+R(be) [a man[Partitive] [R(be) [a man[uCase] in the room]]]]]]

In (99a), when we are to move *a man* to the Spec of *to* to derive the surface order, there are two accessible copies of *a man*, *i.e.* the one in the base position and the other in the Spec of R. This is an ambiguous rule application; (99a) violates Determinacy. In (99b), on the other hand, there are two accessible copies of *a man*, *i.e.* the one in the base position and the other in the Spec of R, but *a man*

does not undergo any further movement; there is no Determinacy violation in (99b).[15]

3.7 Determinacy Violation Repair by Ellipsis

Merchant (2001) observes that the Subject Island effect is cancelled if the extraction site is elided, as shown in (100b):

(100) a. * **Which Marx brother** is [a biography of ***t***] going to appear this year?

b. A biography of one of the Marx brothers is going to appear this year, but I don't know **which (Marx brother)**. (Merchant 2001: 185)

This fact follows from Determinacy if we assume with Merchant (2001) that the

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[15] If the associate of *there* is always located in the Spec of R to receive partitive Case, we need to reconsider the derivations of (21) and (62) that we previously proposed to explain the fact that when an expletive appears, the Subject Condition effect and the *that*-trace effect are cancelled, repeated here as (i) and (ii):

(i) **Who** is there [a picture of ***t***] on the wall?
[CP **who** [C-is [TP there [T [*v*P [a picture of <u>who</u>] [*v* [... (= (21))

(ii) **What** do you think that there is ***t*** in the box
[CP **what** [C-that [TP there [T-is [*v*P <u>what</u> [*v* [... (= (62))

We argued that in (i) and (ii), since the Spec of T is occupied by the expletive *there*, there is only one accessible copy of *who/what*, which is within the Spec of *v*. Hence, there is no Determinacy violation. However, if the associate of *there*, *i.e. [a picture of who]* in (i) and *what* in (ii) behave in the same way as those in (99) in the course of derivation, then it is expected that a Determinacy violation should arise when we are to move *who*/*what* from the Spec of R to the matrix Spec of C. Then we stipulate that when the associate of *there* is a *wh*-phrase (or a phrase that contains a *wh*-phrase), the associate is base generated in the Spec of *v* and receives partitive Case in situ after R raises to *v*, as represented below:

(iii) [CP **who** [C-is [TP there [T [*v*P [a picture of <u>who</u>][Partitive] [*v*+R(be) [...

(iv) [CP **what** [C-that [TP there [T-is [*v*P <u>what</u>[Partitive] [*v*+R(be) [...

Needless to say, all these remarks are speculative; there are many other possibilities that require further investigation.

subject in (100b) stays in the Spec of *v* throughout a derivation. The derivation of (100b) is represented in (101):

(101) [CP **which (Marx brother)** [TP [T [*v*P [a biography of <u>which (Marx brother)</u>] [*v* [is going to appear]]]]]

In (101), there is only one accessible copy of *which (Marx brother)* within the Spec of *v*. Hence, there is no Determinacy violation; cancellation of the Subject Condition effect with ellipsis follows.

The same account extends to the fact that the *that*-trace effect is also cancelled if the extraction site is elided, as shown in (102b) (Merchant 2001; Kandybowicz 2006):

(102) a. * John said that someone would write a new textbook, but I can't remember **who** John said that ***t*** would write a new textbook.

b. John said that someone would write a new textbook, but I can't remember **who**. (Merchant 2001: 185)

The derivation of (102b) is represented in (103):

(103) [CP **who** [C-that [TP [T-would [*v*P <u>who</u> [*v* [write a new book]]]]]]]

In (103), there is only one accessible copy of *who* within the Spec of *v*. Hence, there is no Determinacy violation; cancellation of the *that*-trace effect with ellipsis also follows.[16]

[16] In relation to movement out of an ellipsis site, Lasnik (2001) observes that extraction out of a pseudogapping object is not allowed as shown by the contrast in (i):

(i) (Lasnik 2001: 110)

3.8 Determinacy Violation Repair by Resumptive Pronouns

Assuming our notion of Determinacy (14), Nakashima (2018) proposes that the Adjunct Condition such as (104) follows from Determinacy, claiming that MERGE maps WS = [X, Y] onto WS' = [{X, Y}, X] *only if X is an adjunct* (in other words, adjuncts may be left in the WS without removed from WS, unlike the derivation (3) where X is removed from WS). The derivation for (104) he proposes is represented in (105):

(104) * **Who** did they leave [CP ***t*** before speaking to ***t***]?

(105) * WS = [{**who**, {C, {TP, {CP who, C'}}}}, {CP who, C'}]

In (105), if we are to move *who* to the matrix Spec of C, there are two accessible copies of *who*, *i.e.* the one within *{C, {TP, {CP who, C'}}}* (main clause) and the other within *{CP who, C'}* (adjunct clause). This is an ambiguous rule application; (105)

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a. Bill selected a painting of John, and Susan should [a photograph of Mary]$_i$ [~~VP select t_i~~].
b. ?* **Who** will Bill select a painting of, and who$_j$ will Susan [a photograph of t_j]$_i$ [~~VP select t_i~~]?
(Cf. Who$_i$ did you select a picture of t_i?)

This fact also follows from Determinacy if we assume that the remnant in pseudogapping undergoes movement for not only agreement (Lasnik 2001) but also for focus (Gengel 2013). Given that the movement for agreement targets a phrase above VP (Lasnik 2001) and the movement for focus targets a phrase above *v*P (Gengel 2013), the derivation of (ib) is represented in (ii):

(ii) [CP **who** [C-will [TP Susan [T [*v*P [a photograph of who] [*v'* Susan [*v* [RP [a photograph of who] [R(SELECT) [a photograph of who]]]]]]]]]]

In (ii), if we are to move *who* to the Spec of C, there are two accessible copies of *who*, *i.e.* the one within the Spec of R (that is required for phi-phi labeling) and the other within the Spec of *v* (that is required for focus interpretation). This is an ambiguous rule application; (ii) violates Determinacy. Hence, we can account for the fact that extraction out of a pseudogapping object is impossible under Determinacy.

violates Determinacy. In this way, the Adjunct Condition effect follows from Determinacy, Nakashima argues.

As pointed out by Ross (1967), when a resumptive pronoun instead of a copy appears in the adjunct clause, the Adjunct Condition effect is cancelled as shown in (106):

(106) a. * **Which woman** did John started laughing [after ***t*** kissed Bill]?

b. (Tell me again:) **which woman** was it that John started laughing [after **she** kissed Bill]? (Boeckx 2012: 81)

We suggest that the fact also follows from Determinacy if we assume with Nakashima that adjuncts may be left in the WS without removed from WS. The derivation of (106b) is represented in (107):

(107) WS = [{**which woman**, {C, {TP, {CP <u>which woman</u>, C'}}}}, {CP she, C'}]

In (107), there is only one accessible copy of *which woman* within *{C, {TP, {CP <u>which woman</u>, C'}}}* (main clause). Hence, there is no Determinacy violation; cancellation of the Adjunct Condition effect with resumptive pronouns follows.

The circumvention of island effects with resumptive pronouns is also observed in a complex NP environment as shown in (108), which follows from Determinacy in the same way, given that the *that*-clause selected by N is an adjunct (cf. Stowell 1981):

(108) a. * **Who** did Sue read [the claim that ***t*** was drunk] in the Times?

b. **That man**, Sue read [the claim that <u>**he**</u> was drunk] in the Times? (Boeckx 2012: 6)

The derivation of (108b) is represented in (109):

(109) WS = [{**that man**, {C, {TP, {CP <u>that man</u>, C'}}}}, {CP he, C'}]

In (109), there is only one accessible copy of *that man* within *{C, {TP, {CP <u>that man</u>, C'}}}* (main clause). Hence, there is no Determinacy violation; cancellation of the complex NP island constraint t with resumptive pronouns also follows.

3.9 No Superfluous Steps

Determinacy provides us with an important insight to understand the last resort nature of successive-cyclic movement that avoids superfluous steps. Let us compare two possible derivations of (110), which are represented in (110a, b) (where the derivations of the embedded clause are omitted for simplicity):

(110) **What** did you say that John bought ***t***?

a. [CP **what** [that [TP John [*v*P John [*v*-R (BUY) [RP <u>what</u> [R(BUY) [...

b. * [CP **what** [that [TP <u>what</u> [TP John [*v*-R (BUY) [RP <u>what</u> [R(BUY) [...

In (110a), *what* moves from the Spec of R to the Spec of C successive-cyclically, without stopping over the other intermediate positions. In (110b), on the other hand, *what* moves from the Spec of R to the Spec of T before moving to the Spec of C, stopping over (or adjoining to) the intermediate position "superfluously." In the minimalist literature, it has been assumed (particularly since Chomsky 2013; 2015a) that the derivation (110a) is favored over the derivation (110b). But the question is why.

In Chomsky (1991; 1993; 1994, and Chomsky and Lasnik 1993), for example, the derivation (110b) with superfluous steps was excluded by the principle of Economy of Derivation, which can be formulated as in (103) (from Müller and Sternefeld 1996: 480-481):

(111) *Economy of Derivation*

If two derivations D_1 and D_2 are in the same reference set and D_1 involves fewer operations than D_2, then D_1 is to be preferred over D_2.

Two derivations D_1 and D_2 are in the same reference set iff they yield the same LF output.

According to this principle (111), the derivation (110a) (D_1) is preferred over the derivation (110b) (D_2) because D_1 involves fewer operations than D_2 in that D_2 requires two applications of movement to the matrix *wh*-phrase *who*, while D_1 requires only one.

The principle of Economy of Derivation follows from Determinacy. In (110a), when we are to move the *what* to the Spec of C, there is only one accessible copy of *what* within the Spec of *v*; there is no Determinacy violation. In (110b), on the other hand, when we are to move *what* to the Spec of C, there are two accessible copies of *what*, *i.e.* the one within the Spec of T and the other within the Spec of *v*; this violates Determinacy. Hence, the last resort nature of successive-cyclic movement, and more generally, the principle of Economy of Derivation follows from Determinacy, which restricts the intermediate landing site of successive-cyclic movement to a phase edge position and forces an element to move out of a phase interior domain to a phase edge.

4. Successive Cyclicity

4.1 A-movement

Taking (112) for example, let us consider how our Determinacy-based approach to successive-cyclic movement leads us to analyze A-movement:

(112) John is likely to be arrested.

On A-movement, two kinds of approaches have been developed in the literature. The first approach assumes that *v*Ps involved in A-movement are not phases and

A-movement takes place in one fell swoop (i.e. non-successive-cyclically), skipping the intermediate positions entirely. This approach is advocated by Chomsky (2000; 2007; 2008), according to which (112) is analyzed as in (113):

(113) [TP **John** is [*v*P likely [to [*v*P [be arrested John]]]]]

In (113), *John* moves in one fell swoop from its base position to the matrix Spec of T, without leaving its copies in the intermediate positions. This derivation is supported by Lasnik (1999), Chomsky (1995), Epstein and Seely (2006).

The second approach assumes that *v*Ps involved in A-movement are phases and A-movement takes place successive-cyclically, without skipping over the intermediate positions. This approach is advocated by Legate (2003), according to which (112) is analyzed as in (113):

(114) a. [*v*P **John** [*v* [arrest John]]]

b. [*v*P **John** [*v* [likely [T-to [*v*P John [*v* [arrest John]]]]]]]

c. [TP **John** [T [*v*P John [*v* [likely [...

In (114), *John* moves from its base position to the Spec of the matrix T successive-cyclically phase by phase, leaving its copies in the intermediate positions.

Notice that neither approach violates Determinacy. In (113), even if we are to move *John* to the matrix Spec of T, there is only one accessible copy of *John* in its base position; there is no Determinacy violation. Also in (114), even if we are to move *John* to the matrix Spec of T, the intermediate copies of *John* become inaccessible because of the PIC after each-phase-*v*-complement (RP) Transfer; there is no Determinacy violation. Hence, our Determinacy-based approach to successive-cyclic movement is compatible with both approaches.

4.2 An Alternative View

If A-movement leaves copies in the intermediate positions, as in (114), that becomes an important open question for any theories that assume the principle of Determinacy. As one of the possible ways out of this problem, Kitahara (2018) suggests a way summarized as follows:

(115) *A copy-deletion approach* (Kitahara 2018)

IM optionally leaves copies.

a. The copy in the base position and the one in the criterial position must be left for θ-interpretation and labeling through feature-sharing, respectively.

b. The copy in the intermediate position may be deleted.

Under this approach, (114) is analyzed as in (116):

(116) [TP John1 is [*v*P ~~John2~~ [likely [~~John3~~ to [*v*P ~~John4~~ [be [~~John5~~ arrested John6]]]]]]]

In (116), the copies of *John* in the intermediate positions, *i.e. John2*, *John3*, *John4*, and *John5*, can be deleted; there is no Determinacy violation.

Sugimoto (2018) also suggests a way, which is summarized as follows:

(117) *Determinacy as an interface condition approach* (Sugimoto 2018; cf. Grohmann 2000, 2003, 2011)

Determinacy applies at the interfaces. A Determinacy violation occurs if two identical copies of an element occupy two different criterial positions.

Under this approach, even if (112) has the derivation as in (118) (whether before or after Transfer), a Determinacy violation does not occur:

(118) [TP **John1** is [*v*P John2 [likely [John3 to [*v*P John4 [be [John5 arrested John6]]]]]]]

In (118), only one of the copies of *John* occupies only one criterial position at the interfaces, *i.e. John1* in the matrix Spec of T; there is no Determinacy violation.

Both approaches are interesting and seem to merit further consideration. Among other things, Kitahara's approach opens up a new possibility of weakening the No-Tampering Condition (NTC) (cf. Chomsky 2008: 138) (aside from the issue of whether it is on the right track), and Sugimoto's approach promotes a free-Merge system further (cf. Chomsky 2013: 40; 2015a: 14).[17] We leave for future research an investigation of how these approaches are compatible with our notion of Determinacy (7).

5. Anti-Locality

Our notion of Determinacy is reminiscent of anti-locality. Standard locality constraints state an upper-bound restriction on the maximum distance an element may move. It has been claimed by, among others, Bošković (1997), Ishii (1999, 2004), Saito and Murasugi (1999), Grohmann (2000, 2003, 2011), and Abels (2003) that apart from standard locality constraints, there is an anti-locality constraint which imposes a lower bound of distance on legitimate movement dependency. Grohmann (2003) states anti-locality as follows:

(119) *Anti-Locality*

Movement must not be too local. (Grohmann 2003: 26)

[17] Sugimoto's approach may provide an answer to the question of why (typically) only one copy is pronounced at the PF interface: if there are two identical copies of an element at PF, a Determinacy violation occurs, so one-copy-pronunciation is forced by Determinacy.

These previous approaches to anti-locality are varied with respect to the evaluation metric for an anti-locality constraint, *i.e.* what counts as 'too local', thereby having different empirical consequences. This section first reviews three representative approaches to anti-locality, *i.e.* Saito and Murasugi (1999), Abels (2003), and Grohmann (2000, 2003), and then clarifies differences between these previous approaches and our determinacy-based approach.

5.1 Previous Approaches to Anti-Locality

5.1.1 Saito and Murasugi (1999)

Saito and Murasugi (1999) propose the constraint on chain links (CCL) (120), which is intended to ban adjunction of a specifier within the same maximal projection XP:

(120) Constraint on Chain Links (CCL)

a. A chain link must be at least of length 1.

b. A chain link from A to B is of length n iff there are n "nodes" (X, X' or XP, but not segments of these) that dominate A and exclude B.

(Saito and Murasugi 1999: 182)

This constraint rules out vacuous topicalization (121) and complementizer-less subject relatives (122):[18]

(121) ***John**, ***t*** came yesterday.

(122) *the man [$_{IP}$ OP [$_{IP}$ *t* likes Mary]]

[18] Since our notion of Determinacy can account for vacuous topicalization and complementizer-less subject relatives as argued in section 3.2, CCL can be subsumed under Determinacy.

Given that topicalization is derived by adjunction to IP, (121) is ruled out by the CCL, since (121) involves movement of *John* from the Spec of I to the IP-adjoined position. Similarly, (122) violates the CCL due to adjunction of the specifier *OP* within IP if we assume that complementizer-less subject relatives are IPs (not CPs).

5.1.2 Abels (2003)

Abels (2003) extends Murasugi and Saito's anti-locality constraint, proposing the *Stranding Generalization* (123):

(123) Given a phase head α^0 and a constituent X in α^0's c-command domain

a. $\Diamond\surd$[X...[α^0 [... t_X ...]] ...] and

b. $\neg\Diamond\surd$[X... [α^0 t_X] ...] (Abels 2003: 9)

(123a) states that any material within the complement domain of a phase head α may move out of the c-command domain of α. (123b), on the other hand, states that the complement of α may not move out of the c-command domain of α. The Stranding Generalization (123) is intended to accommodate examples like (124) and (125):

(124) What do you think that Mary has read?

(125) a. Nobody thought that anything would happen.

b. That anything would happen, nobody thought.

c. * Anything would happen, nobody thought that.

(124) and (125) are illustrations of (123a) and (123b) respectively. (124) shows that *what*, which is within the complement domain of the phase head C *that*, may be extracted across the phase head C. (123), on the other hand, shows that TP as

the complement of the phase head C is immobile. Although topicalization of the whole CP is allowed as shown in (125b), topicalization of TP out of CP with the phase head C being stranded is not, as shown in (125c).

Abels claims that the Stranding Generalization (123) is a corollary of Last Resort (126) and feature-driven Merge. It should be noted that Abels assumes that movement is a composite operation of Copy and Re-Merge:

(126) Last Resort

A constituent may only be merged, *i.e.* base-merged or re-merged, if that leads to the immediate satisfaction of a previously unsatisfiable feature.

(adapted from Abels 2003: 92)

There are two possible derivations for the illicit structure (123b). In one derivation, X directly moves out of αP without stopping over in the Spec of α, *i.e.* the edge of α. This derivation is ruled out by the PIC, which Abels claims should be subsumed under the intervention effect on the assumption that a phase head is a universal intervenor. In the other derivation, X first moves to the Spec of α, *i.e.* the edge of α, and then move out of αP. The first step of this derivation, however, would violate Last Resort (126) on the assumption that Merge is feature-driven. This is because when X is merged into the complement of α, X is already in the relevant structural configuration with α to license any formal feature that needs checking. Movement from the complement of α to the Spec of α is ruled out by Last Resort. In the licit structure (123a), on the other hand, X may move out of αP through the edge of α, since its base position is not in the checking domain of α. Hence, the Stranding Generalization (123) follows from Last Resort coupled with feature-driven Merge.[19]

[19] As pointed out by Grohmann (2011), Abels' analysis crucially relies on the legitimacy of assumed checking configuration and the assumption that Merge, whether Base-merge or Re-merge, is feature-driven. Hence, his analysis is incompatible with Chomsky's (2013, 2015a) Free Merge system, which is adopted

Abels further claims that if (123b) is a corollary of Last Resort and feature-driven Merge, (123b) should be more general in that it applies to all heads and their complements, not being limited to a phase head. Then, the following movement operations are banned within a phrase: (i) movement of a specifier to another specifier; (ii) movement of a specifier to an adjoined position; (iii) movement of a complement to an adjoined position. It should be noted that (ii) is the case which Murasugi and Saito's (1999) CCL rules out. Hence, the CCL can be subsumed under Abels' analysis.

5.1.3 Grohmann (2000; 2003)

Grohmann (2000; 2003) claims that a clause can be split into three Prolific Domains, subparts of a derivation relevant for Transfer:

(127) Clausal Tripartition (Grohmann 2003: 74)

i. θ-Domain: part of derivation where thematic relations are created
ii. Φ-Domain: part of derivation where agreement properties are licensed
iii. Ω-Domain: part of derivation where discourse information is established

Grohmann then proposes the Condition on Domain Exclusivity (128) (Grohmann 2011: 275; cf. Grohmann 2003: 78):

(128) Condition on Domain Exclusivity (CDE)

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in this paper. Furthermore, contrary what Abels claims, his anti-locality constraint does not completely follow from Last Resort. This is because if the feature to be licensed by complement-to-specifier movement, *i.e.* re-merge in the specifier position, is a feature like the EPP-feature that could not have been licensed in the complement position, a complement should in principle be able to move into the specifier position.

An object O in a phrase marker must have an exclusive Address Identification AI per Prolific Domain ΠΔ unless duplicity yields a drastic effect on the output.

i. An AI of O in a given ΠΔ is an occurrence of O in that ΠΔ at LF.

ii. A drastic effect on the output is a different realization of O at PF.

What Grohmann's anti-locality claims is that each Prolific Domain sends information in it to the interfaces through Transfer, and any given XP may only have one occurrence within a single Prolific Domain. Grohmann's anti-locality thus bans phrasal movement within a single Prolific Domain unless a multiple occurrence of O involves two phonetically distinct copies of O by spelling out of a copy with a different PF-matrix.

Grohmann's anti-locality rules out in a unified way the hypothetical expressions (129-119a) examples with their intended interpretations in the corresponding (129-131b) examples. The derivations of (129-131a) are represented in (129-131c) respectively (Grohmann 2003: 241):

(129) a. * John likes

b. John likes himself.

c. [$_{vP}$ John v^0 [$_{VP}$ likes ~~John~~]

(130) a. * Him softly kissed her.

b. He softly kissed her.

c. [$_{IP}$ him I^0 [$_{AgrOP}$ ~~him~~ AgrO^0 [$_{vP}$ softly [$_{vP}$ ~~him~~ v^0 [$_{VP}$ kissed her]

(131) a. * Who, Mary detests?

b. It is who, and who does Mary detest?

c. [$_{TopP}$ who Top^0 [$_{FocP}$ ~~who~~ Foc^0 [$_{IP}$ Mary I^0 detests ... ~~(who)~~]

(129) shows that an argument is not allowed to move from one thematic position to another, illustrating the anti-locality effect within the θ-Domain. According to the CDE (128), since there are two occurrences of *John* within the θ-Domain at LF in (129), *John* does not have an exclusive AI within the θ-Domain. Hence, (129a) violates the CDE, though the lower copy of *John* undergoes deletion at PF. It should be noted that (129b) does not violate the CDE because of a drastic effect on the output, since the lower copy of *John* undergoes Copy Spell-Out. The lower copy of *John* is realized as the reflexive pronoun *himself* as represented in its derivation (132) (where ➲ indicates Copy Spell-Out). Here, Spell-Out is defined as a process of phonetically interpreting a final PF output:

(132) [$_{v\text{P}}$ John v^0 [$_{\text{VP}}$ likes ~~John~~➲himself]]

(130) illustrates the anti-locality effect within the Φ-Domain, showing that an element cannot move from one Case agreement position to another Case position. In (130), the external argument *him* is inserted into the derivation with an accusative case feature, moves to the accusative-licensing position such as the Spec of AgrO, and then moves to the Spec of T in order to satisfy the EPP. The in-situ object *her* receives accusative case as a default option. Since there are two occurrences of *him* within the Φ-Domain at LF, *him* does not have an exclusive AI within the Φ-Domain; this violates the CDE. (131) indicates that the fronted *wh*-phrase *who* cannot serve simultaneously as a topic and a focus, illustrating the anti-locality within the Ω-domain. Assuming the split CP-hypothesis, where the Spec of Foc licenses an interrogative *wh*-element and the Spec of Top licenses a topic phrase, *who* moves from the Spec of Foc to the Spec of Top, yielding the two occurrences of *who* within the Ω-domain; this violates the CDE.[20]

[20] Boeckx (2008) suggests that the difference between symmetric and asymmetric applicatives provides an argument against Grohmann's anti-locality. In a symmetric applicative construction, either the applied (indirect) object or direct object can be passivized. In an asymmetric applicative construction, on the other

Grohmann (2003) then unifies the two locality notions, *i.e.* standard locality and anti-locality, based on Prolific Domains. He proposes the following two generalizations over movement (Grohmann 2003: 227-8):

(133) a. The Intra-Clausal Movement Generalization
Clause-internal movement always targets the next higher Prolific Domain.

b. The Inter-Clausal Movement Generalization
Movement across clauses targets a position within the same type of Prolific Domain in the next higher clause.

These two generalizations (133a) and (133b) are schematically represented in (134) and (135) respectively (Grohmann 2003: 285):

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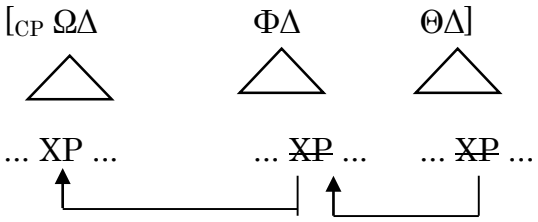
hand, only the applied (indirect) object can be passivized. Boeckx adopts McGinnis' (2001) analysis, which claims that symmetric and asymmetric applicatives correspond to Plykkänen's (2008) high-applicatives (i) and low-applicatives (ii), respectively:

(i) [*v*P *v* [VP V [LApplP IO LAppl DO]]
(ii) [*v*P *v* [HApplP IO HAppl [VP V DO]]]

In both (i) and (ii), the higher object IO counts as the closest element to move to the subject position; the applied (indirect) object can be passivized in both symmetric/high and asymmetric/low applicatives. In symmetric/high applicatives, the lower object DO is allowed to move to the outer Spec of HAppl and then to the subject position; DO can also be passivized. Grohmann's anti-locality, however, would rule out movement of DO to the outer Spec of HAppl, since it is a movement within the θ-Domain; there is no way of capuring the contrast between symmetric/high and asymmetric/low applicatives regarding passivization.

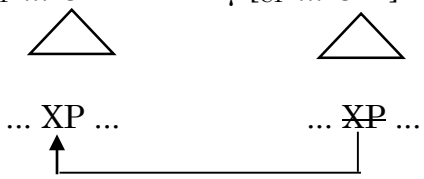
Under our determinacy-based approach to anti-locality, the contrast between symmetric/high and asymmetric/low applicatives can be accommodated if we assume that HAppl is a phase head while LAppl is not. In symmetric/high applicatives, DO first moves to the outer Spec of HAppl. When DO further moves to the subject position, the lower copy of DO is inaccessible due to the PIC; there is no Determinacy violation. In asymmetric/low applicatives, DO first moves to the outer Spec of LAppl. When DO further moves to the subject position, there are two accessible copies of DO; this violates Determinacy.

(134) Intra-Clausal Movement: αΔ-to-βΔ (α, β = {Θ, Φ, Ω}; α >> β)



(135) Inter-Clausal Movement: αΔ-to-αΔ (α= {Θ, Φ, Ω}; ‡ = clause boundary)

a. [CP ... ΘΔ ‡ [CP ... ΘΔ]



b. [CP ... ΦΔ ... ‡ [CP ... ΦΔ ...]

c. [CP ΩΔ ... ‡ [CP ΩΔ ...]

(135a) shows that successive-cyclic A'-movement takes place from a position within one Ω-Domain to a position in the next higher Ω-Domain. (135b) shows that successive-cyclic A-movement takes place from a position within one Φ-Domain to a position in the next higher Φ-Domain. (135c) shows that successive-cyclic Θ-movement takes place from a position within one Θ-Domain to a position in the next higher Θ-Domain. Grohmann argues that intra-clausal movement (134) is forced by anti-locality while inter-clausal movement (135) is forced by standard locality. Hence, anti-locality is integrated with standard locality based on Prolific Domains.

5.2. A Determinacy-Based Approach to Anti-locality

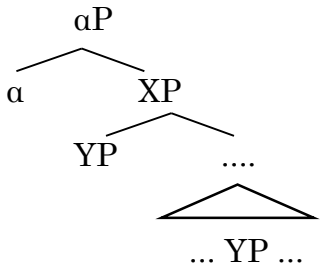
As we can see from the previous section, the evaluation metrics for anti-locality vary among these previous approaches. Grohmann (2011) points out that there are two types of evaluation metric; one concerning the domain in which movement is ruled out and the other concerning the length to be measured. The first metric is concerned with what is the relevant domain in which movement is ruled out as an anti-locality constraint violation. According to Saito and Murasugi (1999) and Abels (2003), the relevant domain for anti-locality is XP, with all kinds of phrase-internal movement being banned. Grohmann (2000; 2003) claims, on the other hand, that a chunk of phrases larger than a single XP, *i.e.* what he calls a Prolific Domain, counts as a relevant domain for anti-locality, banning prolific-domain-internal movement. The second metric is concerned with how we measure the length of movement. Saito and Murasugi measure the length of movement representationally in terms of chain links. Abels adopts a derivational measurement of length where movement steps within a single XP are inadmissible due to Last Resort. Grohmann measures the length of movement based on occurrences of an element at the interfaces.

According to our notion of Determinacy, the evaluation metric concerning the relevant domain for anti-locality is based not on XP or a prolific domain but on a phase, which is an independently motivated condition on Transfer. More precisely, the relevant domain is a transferred domain, *i.e.* the complement of a phase head. As for the evaluation metric concerning the length to be measured, our approach measures the length of movement derivationally just like Abels' approach.

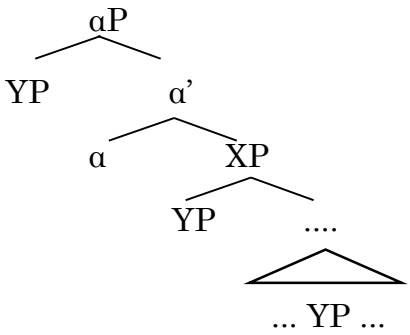
There is, however, an important difference between these previous approaches and our determinacy-based approach. Although the previous approaches are varied with respect to the two types of evaluation metric, they all agree that movement within a specific domain, whether it is XP or Prolific Domain, is banned however the length of movement is measured. In our determinacy-

based approach to anti-locality, on the other hand, movement within the complement of a phase head (a transferred domain) itself is allowed as represented in (136). In (136), where α is a phase head, YP undergoes movement within the complement of the phase head α, which is the transferred domain; there is no Determinacy violation. Further movement out of the transferred domain, however, is banned due to a Determinacy violation as represented in (137). In other words, unless there is further movement operation out of the transferred domain, "too short movement" within the relevant domain is permissible:

(136)



(137) *



As correctly pointed out by Grohmann (2011), there are two questions to which any theory of anti-locality has to provide answers:

(138) a. Why is that specific domain relevant for anti-locality?

b. How can locality and anti-locality constraints be unified?

Under the approaches advocated by Saito and Murasugi (1999) and Abels (2003), where XP is the relevant domain for anti-locality, there is no explanation as to

why XP is the relevant domain for anti-locality and there is no relation between locality and anti-locality constraints. As mentioned in the previous section, Grohmann (2000; 2003) provides answers to these two questions in terms of the two generalizations in (133), *i.e.* the intra-clausal movement generalization and the inter-clausal movement generalization, both of which are based on the notion of Prolific Domain. Among the two generalizations, the intra-clausal movement generalization, which prohibits movement from applying within one and the same Prolific Domain, captures anti-locality. The intra-clausal movement generalization is theoretically plausible in that it can be derived from the CDE, the reasonable requirement on the interfaces that an element in a phrase marker should have a unique/exclusive interpretation per Prolific Domain. It is not entirely clear, however, whether the inter-clausal movement generalization captures standard locality and how it is derived from deeper principles. Although the inter-clausal generalization describes successive cyclicity by requiring movement to proceed through a position within the same type of Prolific Domain, a question still remains why movement must proceed in such a uniform way. Furthermore, it remains unclear how the inter-clausal generalization captures syntactic island constraints, the essential part of standard locality. Since Grohmann's analysis does not assume any opaque domain or "escape hatch" for movement, it would wrongly predict that any element may be moved out of a certain domain as far as it goes through positions within the same type of Prolific Domain.

Our determinacy-based approach to anti-locality can answer to these questions in a principled way. Under our approach, locality and anti-locality are unified based on the notion of phase, which is an independently motivated condition on Transfer. This also provides an answer to the first question; a phase is the relevant domain for anti-locality, since it is operative in all kinds of locality, whether it is a standard locality which imposes an upper-bound distance on

movement or an anti-locality constraint which restricts a lower-bound distance on movement.

5. Concluding Remarks

This paper has indicated potential conceptual flaws in Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019), *i.e.*, the redundancy between minimal search and the PIC in RR and the look-ahead problem with Determinacy, and thus proposed that RR only include the PIC and Determinacy apply at the input of MERGE. We have argued that our proposal is not only theoretically superior, but also empirically superior in that it does not have such flaws and provides a principled account of various movement restrictions on different languages in a uniform way that is impossible in Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019), *i.e.*, the unified account of the Subject Condition, verb particle constructions, the Specificity Effects, no vacuous Topicalization, the non-existence of complementizer-less subject relatives, the *that*-trace effects, the freezing effects with topics, further raising, Merge-over-Move, island violation repairs by ellipsis and pronouns, no superfluous steps in a derivation, and the anti-locality effects.

Before we conclude the paper, we would like to sketch out some prospects of our proposal (6), repeated here as (139):

(139) Our Proposal

a. RR only includes the PIC.

b. Determinacy applies at the *input* of MERGE.

Following Chomsky (1995), the ideas of (139a) assumes that "there is no reason to suppose that the mechanisms of language include superfluous devices and rules to achieve, redundantly, the same result in special cases." Clearly, it is redundant to include minimal search and the PIC in RR to have a derivation in which only the higher copy of an element is accessible: the PIC always makes the

lower copy of an element, which is within the Transfer domain, inaccessible. As we have demonstrated above, one of the interesting consequences of the idea of (139a) is that it makes it possible to deduce some special movement properties of A'-related subjects in a uniform way from the general architecture of derivation: they enter the derivation by EM at the edge of the phase-head *v* for argument structure, *i.e.*, for theta-roles, and move to the edge of C-T by IM for other factors, *i.e.*, for phi-phi labeling or scope/discourse properties (cf. "duality of semantics"), but the PIC always makes accessible the higher copy at the edge of the phase; hence the derivation with A'-related subjects results in a situation that causes a Determinacy violation. In this way, (139a) is important in that it opens up a new possibility of explaining the difference between subjects and objects with respect to movement, *i.e.*, the so-called subject-object asymmetry.

What is noteworthy is that (139a) makes a further prediction for another well-known syntactic asymmetry, *i.e.*, the so-called matrix-embedded asymmetry: given that the PIC is inoperative in the matrix clause, where there is no further input to MERGE, while it is operative in the embedded clause, where there is further input to MERGE (see Chomsky 2004; Goto 2011; Obata 2010 for the asymmetry of the PIC), it follows that a Determinacy violation may be circumvented in the matrix clause as RR is sensitive to the applicability of the PIC. If this story is on the right track, then it might also be possible to derive a certain matrix-embedded asymmetry from Determinacy (argument fronting, VP-fronting, locative inversion, etc.). We leave the consequences of this and a detailed analysis of the relevant phenomena for future research.

The crucial idea of (139b) is that if *one* (lexically) same element creates *two* identical *copies* in WS, and if the two identical copies in WS are still accessible to MERGE (that is, if either one of them has not become inaccessible by the PIC), then a Determinacy violation occurs when MERGE picks up one of the two

identical copies from WS for further operations.[21] The advantage with this idea is that traditional asymmetries and cross-linguistic variation, which have been explained by different constraints or principles, can receive a unified explanation, coupled with independently motivated principles of UG, in the recent minimalist framework that attempts to reduce complexity and avoid ambiguity in syntax (Chomsky 2013; 2015a; Chomsky et al. 2019). In other words, if our approach is on the right track, then certain locality effects, especially on domains, which Villata, Rizzi, and Frank (2016) call "impenetrability locality," could be derived from Determinacy.

Significantly, given (139b), we could think of another story for locality effects: if *two* (lexically) different elements have *one* (or perhaps more) identical *feature(s)* in WS, and if the identical feature(s) is (or are) still accessible to MERGE, then a Determinacy violation occurs when MERGE picks up one of the two (lexically) different elements from WS for further computations. Specifically, if a lexical item is a bundle of features provided by the lexicon (Chomsky 1995) and they play an important role in syntactic computation (Rizzi 1990), then it is natural to extend our Determinacy approach to the problem of feature ambiguity. If this story is on the right track, then certain locality effects, especially on features, which Villata, Rizzi, and Frank (2016) call "intervention locality," could also be derived from the principle of Determinacy (the Superiority Effects, the Relativized Minimality Effect, etc.). We leave the consequences of this and a detailed analysis of the Superiority Effects and the Relativized Minimality Effect for future research.

Though many questions still remain, the principle of Determinacy, which "follows from RR – "a specially, crucial property of organic computation" (Chomsky

[21] Note that the principle of Determinacy crucially relies on the notion of "copy." Thus an important remaining question is how to distinguish copies (created by IM) from repetitions of identical elements (created by EM), as noticed by Collins and Groat (2018), Chomsky (2019a, b, c) and Chomsky, Gallego, and Ott (2019). See Goto and Ishii (in progress) for relevant discussion.

2019b) – can, it seems, be regarded as a superordinate concept that unifies various movement phenomena.

References:

Abe, Jun. 2015. The EPP and subject extraction. *Lingua* 159, 1-17.

Abe, Jun. 2018. How to probe expletives. *Studia Linguistica* 72(1), 76-112.

Abels, Klaus. 2003. *Successive cyclicity, anti-locality, and adposition stranding*. Doctoral dissertation, University of Connecticut.

Agbayani, Brian. 2006. Pied-piping, feature movement, and *wh*-subjects. In Lisa L.-S. Cheng & Norbert Corver, eds., *Wh-movement: moving On*, 71-93. Cambridge, MA: MIT Press.

Belletti, Adriana. 1988. Unaccusatives as Case assigners. *Linguistic Inquiry* 19: 1-34.

Babaljik, Janathan Davd. 1995. In terms of merge: Copy and head movement. *Papers on minimalist syntax*. MITWPL 27.41-64.

Boeckx, Cedric. 2008. *Understanding minimalist syntax*, Malden, MA: Blackwell Publishing.

Boeckx, Cedric. 2012. *Syntactic islands*, Cambridge: Cambridge University Press.

Borer, Hagit. 1994. The projection of arguments. In E. E. Benedicto & J. T. Runner eds., *University of Massachusetts occasional papers 17: Functional projections*, 19-47. Amherst, Mass.: GLSA Publications.

Bošković, Željko. 1997. *The syntax of nonfinite complementation: An economy approach*. Cambridge, MA: MIT Press.

Bošković, Želko. 2016. On the timing of labeling: Deducing Comp-trace effects, the subject condition, the adjunct condition, and tucking in from labeling. *The Linguistic Review* 33.1, 17-66.

Bošković, Željko, and Howard Lasnik. 2003. On the distribution of null complementizers. *Linguistic Inquiry* 34. 527-546.

Bresnan, Joan. 1977. Variables in the theory of transformations. In Peter Culicover, Thomas Wasow, and Adrian Akmajian eds., *Formal syntax*, 157-196, New York: Academic Press.

Brillman, Ruth and Aron Hirch. 2015. An anti-locality account of English subject/non-subject asymmetries, a handout at LSA annual meeting.

Broekhuis, Hans. 2006. Extraction from subjects: Some remarks on Chomsky's *On phases*. In Hans Broekhuis, Norbert Corver, Riny Huybregts, Urusula Kleinhenz, and Jan Koster, eds., *Organizing grammar*, 59-67, Berlin: Mouton de Gruyter.

Browning, Maggie. 1996. CP recursion and *that*-t effects. *Linguistic Inquiry* 27, 237-255.

Chomsky, Noam. 1973. Conditions on transformations. In Stephan R. Anderson and Paul Kiparsky eds., *A Festschrift for Morris Halle*, 232–286, New York: Holt, Rinehart and Winston.

Chomsky, Noam. 1977. On wh-movement. In Peter W. Culicover, Thomas Wasow & Adrian Akmajian, eds., *Formal syntax*, 71-132. New York: Academic Press.

Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.

Chomsky, Noam. 1986a. *Knowledge of language: Its nature, origin, and use*, New York: Praeger.

Chomsky, Noam. 1986b. *Barriers*, Cambridge, MA: MIT Press.

Chomsky, Noam. 1991. Some notes on economy of derivation and representation. In Robert Freidin, ed., *Principles and parameters in comparative grammar*, 417-454. Cambridge, Mass.: MIT Press.

Chomsky, Noam. 1993. A minimalist program for linguistic theory. In Kenneth Hale and Samuel Jay Keyser, eds., *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, 1-52. Cambridge, Mass.: MIT Press.

Chomsky, Noam. 1994. Bare phrase structure. *MIT Occasional Papers in Linguistics* 5: Department of Linguistics and Philosophy, MIT. Reprinted in

G. Webelhuth, ed. (1995), Malden: Blackwell, *Government and Binding Theory and the Minimalist Program*, 383-439.

Chomsky, Noam. 1995. *The minimalist program*. Cambridge, MA: MIT Press.

Chomsky, Noam. 2000. Minimalist inquires: the framework. In Roger Martin, David Michaels and Juan Uriagereka, eds., *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89-115. Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz, ed., *Ken Hale: A life in language*, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 2004. Beyond explanatory adequacy. In Adriana Belletti, ed., *Structures and beyond: The cartography of syntactic structures,* vol. 3, 104-131. Oxford: Oxford University Press.

Chomsky, Noam. 2005. Three factors in language design, *Linguistic Inquiry* 36.1, 1-22.

Chomsky, Noam. 2007. Approaching UG from below. In Uli Sauerland and Hans-Martin Gärtner, eds., *Interfaces + recursion = language?*, 1-29, Berlin: Mouton de Gruyter.

Chomsky, Noam. 2008. On phases. In Robert Freidin, Carlos Otero and Maria Luisa Zubizarreta, eds., *Foundational issues in linguistic theory: Essays in honor of Jean-Roger Vergnaud*, 291-321, Cambridge, MA: MIT Press.

Chomsky, Noam. 2013. Problems of projection. *Lingua* 130, 33-49.

Chomsky, Noam. 2015a. Problems of projection: Extensions. In Elisa Di Domenico, Cornelia Hamann, and Simona Matteini, eds., *Structures, strategies and beyond: Studies in honour of Adriana Belletti*, 3-16. Amsterdam: John Benjamins.

Chomsky, Noam. 2015b. A discussion with Naoki Fukui and Mihoko Zushi (March 4, 2014). In The Sophia lectures (Sophia Linguistica 64), Chomsky (2015b), 67-97. Tokyo: Sophia Linguistic Institute for International Communication, Sophia University.

Chomsky, Noam. 2019a. Some puzzling foundational issues: The Reading program. *Catalan Journal of Linguistics Special Issue*: 263-285.

Chomsky, Noam. 2019b. Fundamental issues in linguistics, MIT lectures, April 10th and 12th.

Chomsky, Noam. 2019c. UCLA lectures, April 29th, 30th, May 1st, 2nd.

Chomsky, Noam, and Howard Lasnik. 1993. The theory of principles and parameters. In Joachim Jacobs, Wolfgang Sternefeld, Arnim von Stechow, and Theo Vennemann, eds., *Syntax: An international handbook of contemporary research*, 506-569. Berlin: Walter de Gruyter.

Chomsky, Noam, Ángel J. Gallego, and Dennis Ott. 2019. Generative grammar and the faculty of language: Insights, questions, and challenges. *Catalan Journal of Linguistics*: 229-261.

Collins, Chris and Erich Groat. 2018. Distinguishing Copies and Repetitions. Ms. Available at LingBuzz (https://ling.auf.net/lingbuzz/003809).

Culicover, Peter. 1991. Polarity, inversion, and focus in English. *ESCOL '91*, 46-68, Columbus, Department of Linguistics, Ohio State University.

Culicover, Peter. 1993. Evidence against ECP: Accounts of the *that*-t effects. *Linguistic Inquiry* 24, 557-561.

Diesing, Molly. 1988. Word order and the subject position in Yiddish. In James Blevins and Julie Carter, eds., *Proceedings of the 18th Annual Meeting of the Northeastern Linguistics Society*, 124-140.

Diesing, Molly. 1990. Verb movement and the subject position in Yiddish. *Natural Language and Linguistic Theory* 8, 41-79.

Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.

Douglas, Jamie. 2017. Unifying the *that*-trace and anti-*that*-trace effects. *Glossa* 2 60, 1-28.

Enç, Murvet. 1991. The semantics of specificity. *Linguistic Inquiry* 22, 1-25.

Engdahl, Elisabet. 1982. Restrictions on unbounded dependencies in Swedish. In Elisabet Engdahl and Eva Ejerhed, eds., *Readings on unbounded*

dependencies in Scandinavian languages, 151-174. Stockholm; Almquist and Wiksell International.

Engdahl, Elisabet. 1985. Parasitic gaps, resumptive pronouns, and subject extractions. *Linguistics* 23, 3-44.

Epstein, Samuel and Daniel Seely. 2006. *Derivations in minimalism*, Cambridge: Cambridge University Press.

Epstein, Samuel D., Hisatsugu Kitahara, and T. Daniel Seely. 2014. Labeling by minimal search: Implications for successive cyclic A-movement and the elimination of the postulate "phase". *Linguistic Inquiry* 45, 463-481.

Epstein, Samuel, Hisatsugu Kitahara, and Daniel Seely. 2018. Can "determinacy + PIC" explain descriptions of remnant movement asymmetries? In *Proceedings of the Linguistic Society of Japan 157*, 264-269.

Fernández-Salguerio, Gerardo. 2004. Agree, the EPP-F and further-raising. In Randall S. Gess and Edward J. Rubin eds., *Theoretical and experimental approaches to Romance Linguistics,* 97-108, Amsterdam/Philadelphia: John Benjamins Publishing Company.

Fiengo, Robert and James Higginbotham. 1981. Opacity in NP. *Linguistic Analysis* 7, 347-373.

Fukui, Naoki. 1986. *A theory of category projection and its application*. Doctoral dissertation, MIT.

Gallego, Ángel. 2007. *Phase theory and parametric variation*. Doctoral dissertation, Universitat Autònoma de Barcelona.

Gallego, Ángel, and Juan Uriagereka. 2007. Conditions on sub-extraction. In *Coreference, modality, and focus: Studies on the syntax-semantics interface*, ed. by Luis Eguren and Olga Ferna´ndez-Soriano, 45–70. Amsterdam: John Benjamins.

Gengel, Kirsten. 2013. *Pseudogapping and Ellipsis*, Oxford University Press, Oxford.

George, Leland. 1980. *Analogical generalization in natural language syntax*. Doctoral dissertation, MIT.

Goto, Nobu. 2011. *Feature-inheritance: Its effects on Agree, Move, and Delete*, Doctoral dissertation, Tohoku Gakuin University.

Goto, Nobu. 2013. Labeling and scrambling in Japanese. *Tohoku: Essays and studies in English Language and Literature* 46, 39-73.

Goto, Nobu. 2016. Labelability = extractability: Its theoretical implications for the free-Merge hypothesis. In *Proceedings of the North Eastern Linguistic Society* 46, 335-348. Amherst, Mass.: GLSA Publications.

Goto, Nobu. 2017a. How to label there-constructions. *English literature, regional branches combined issue* vol.9, 33-43.

Goto, Nobu. 2017b. Eliminating the strong/weak parameter on T. In Michael Yoshitaka Erlewine ed., *Proceedings of GLOW in Asia XI – Vol.2*, 56-71, MIT Working Papers in Linguistics #85.

Goto, Nobu. 2020. When and how does search take place. Ms. Available at LingBuzz (https://ling.auf.net/lingbuzz/005000).

Goto, Nobu and Toru Ishii. In progress. The role of case in copy/repetition distinction. Ms., Toyo University and Meiji University.

Grohmann, K. Kleanthes. 2000. *Prolific peripheries: A radical view from the left*, doctoral dissertation, University of Maryland.

Grohmann, K. Kleanthes. 2003. *Prolific domains: On the antilocality of movement dependencies*. Amsterdam: John Benjamins.

Grohmann, K. Kleanthes K. 2011. Anti-locality: too-close relations in grammar. In Cedriic Boeckx ed., *The oxford handbook of linguistic minimalism*, 260-290, Oxford: Oxford University Press.

Haegeman, Liliane, Ángel L. Jiménez-Fernández and Andrew Radford. 2014. Deconstructing the subject condition in terms of cumulative constraint violation. *The Linguistic Review* 31(1), 73-150.

Holmberg, Anders & Thorbjörg Hróarsdóttir. 2003. Agreement and movement in Icelandic raising constructions. *Lingua* 113, 997-1019.

Hiraiwa, Ken. 2005. Dimensions of symmetry in syntax: Agreement and clausal architecture, doctoral dissertation, MIT.

Hiraiwa, Ken. 2010. Scrambling to the edge. *Syntax* 13(2), 133-164.

Huang, C.-T. James. 1982. *Logical relations in Chinese and the theory of grammar*. Doctoral dissertation, MIT.

Ishii, Toru. 1997. *An asymmetry in the composition of phrase structure and its consequences*. Doctoral dissertation, University of California, Irvine.

Ishii, Toru. 1999. Cyclic spell-out and the *that-t* effects. In Sonya Bird, Andrew Carnie, Jason D. Hargen, and Peter Norquest eds., *Proceedings of the 18th west coast conference on formal linguistics*, Somerville, MA: Cascadilla Press, 220-31.

Ishii, Toru. 2004. The phase impenetrability condition, the vacuous movement hypothesis and *that*-t effects. *Lingua* 114.2, 183-215.

Ishii, Toru. 2011. The subject condition and its crosslinguistic variations. In Christina Galeano, Emrah Gorgugu, and Irina Presnyakova eds., *Proceedings of western conference in linguistics (WECOL) 2011*, 407-418, Simon Fraser University, Canada.

Kandybowicz, Jason. 2006. Comp-trace effects explained away. In Donald Baumer, David Montero and Michael Scanlon, eds., *Proceedings of the 25th West Coast Conference on Formal Linguistics*, 220-228, Somerville, MA: Cascadilla.

Kato, Takaomi, Masakazu Kuno, Hiroki Narita, Mihoko Zushi, and Naoki Fukui 2014. Generalized search and cyclic derivation by phase: A preliminary study. *Sophia Linguistica* 61, 203-222.

Kayne, Richard. 1976. *French syntax*. Cambridge, Mass: MIT Press.

Kayne, Richard. 1984. *Connectedness and binary branching*. Dordrecht: Foris.

Ke, H. Alan. 2019. *The syntax, semantics and processing of agreement and binding grammatical illusions*, doctoral dissertation, University of Michigan, Ann Arbor.

Kitahara, Hisatsugu. 1994. A minimalist analysis of cross-linguistically variant CED phenomena. In *Proceedings of the North Eastern Linguistic Society* 24, 241-253. Amherst, Mass.: GLSA Publications.

Kitahara, Hisatsugu. 2018. On Chomsky's READING lecture, a paper presented at Keio University.

Komachi, Masayuki, Hisatsugu Kitahara, Asako Uchibori, and Kensuke Takita. 2019. Generative procedure revisited. *Reports of the Keio Institute of Cultural and Linguistic Studies* 50, 269-283.

Kuroda, Shige-Yuki. 1988. Whether we agree or not: A comparative syntax of English and Japanese. In William J. Poser ed., *Papers from the Second International Workshop on Japanese Syntax*, 103-143, Stanford: CSLI.

Lasnik, Howard. 1995. Case and expletives revisited: On greed and other human failings. *Linguistic Inquiry* 26, 615-633.

Lasnik. Howard. 1999. Chains of argument. In Samuel Epstein and Nobert Hornstein eds., *Working minimalism*, 189-216, Cambridge, MA: MIT Press.

Lasnik, Howard. 2001. Subjects, objects, and the EPP. In William D. Davies and Stanley Dubinsky eds., *Objects and other subjects: Grammatical functions, functional categories, and configurationality*, 103-121, Dordrecht: Kluwer.

Lasnik, Howard and Myung-Kwan Park. 2003. The EPP and the subject condition under sluicing, *Linguistic Inquiry* 34.4, 649-660.

Lasnik, Howard and Mamoru Saito. 1992. *Move α: Conditions on its application and output*, Cambridge, MA: MIT Press.

Law, Paul. 1991. *Effects of head movement and the theory of subjacency and proper government*, doctoral dissertation, MIT.

Legate, Julie. 2003. Some interface properties of the phase. *Linguistic Inquiry* 34: 506-516.

Leonetti, Manuel. 2003. Specificity and object marking: the case of Spanish a. In Klaus von Heusinger and Georg A. Kaiser (eds.). *Proceedings of the Workshop Semantic and Syntactic Aspects of Specificity in Romance Languages*. Arbeitspapier 113. 67-101. Konstanz: Universität Konstanz.

Mahajan, Anoop. 1992. The specificity condition and the CED. *Linguistic Inquiry* 23, 510-516.

Maling, Joan and Annie Zaenen. 1978. The nonuniversality of a surface filter, *Linguistic Inquiry* 9.3, 475-497.

Mayr, Clemens. 2010. On the necessity of φ-features: the case of Barvarian subject extraction. In E. Phoevos Panagiotidis, ed. *The complementizer phase*, 117-142. Oxford: Oxford University Press.

McGinnis. Martha. 2001. Variation in the phrase structure of applicatives. *Language variation yearbook* 1, 105-46.

Merchant, Jason. 2001. *Syntax of silence: Sluicing, islands, and the theory of ellipsis*. Oxford: Oxford University Press.

Mizuguchi, Manabu. 2008. Derivation, minimalism, and *that*-trace effects. *English Linguistics*, 56-92.

Moro, Andrea. 2000. *Dynamic antisymmetry*. Cambridge, MA: MIT Press.

Müller, Gereon and Wolfgang Sternefeld. 1996. A'-chain formation and economy of derivation. *Linguistic Inquiry* 27, 480-511.

Narita, Hiroki, Kasai, Hironobu, Kato, Takaomi, Zushi, Mihoko, & Fukui, Naoki. 2017. 0-Search and 0-Merge. In Fukui, Naoki eds. *Merge in the Mind-Brain: Essays on theoretical linguistics and the neuroscience of language*, 127-154. New York: Routledge.

Nakashima, Takanori. 2018. Adjuncts and determinacy of rules. Paper presented at ELSJ 11th international spring forum at Hokkaido University (May 12).

Neeleman, Ad. 1994. Scrambling as a D-structure phenomenon. In N. Corver & H. van Riemsdijk eds., *Studies on scrambling: Movement and non-movement*

approaches to free word-order phenomena, 387-429. Berlin: Mouton de Gruyter.

Obata, Miki. 2010. *Root, Successive-Cyclic and Feature-Splitting Internal Merge: Implications for Feature-Inheritance and Transfer*, doctoral dissertation, University of Michigan, Ann Arbor.

Perlmutter, David. 1971. *Deep and surface structure constraints in syntax*. New York: Holt, Rinehart and Winston.

Plykkänen, Liina. 2008. *Introducing arguments*. Cambridge, MA: MIT Press.

Richards, Marc D. 2007. On feature-inheritance: An argument from the Phase Impenetrability Condition. *Linguistic Inquiry* 38, 563-572.

Richards, Norvin. 2001. *Movement in language: Interactions and architectures*. Oxford: Oxford University Press.

Rizzi, Luigi. 1982. *Issue in Italian syntax*, Dordrecht: Foris.

Rizzi, Luigi. 1990. *Relativized minimality*, Cambridge, Mass: MIT Press.

Rizzi, Luigi. 1997. The fine structure of the left periphery. In Liliane Haegeman ed., *Elements of grammar: Handbook in generative syntax*, 281-337, Dordrecht: Kluwer.

Rizzi, Luigi and Ur Shlonsky. 2007. Strategies of subject extraction. In Uli Sauerland and Hans Martin Gärtner eds., *Interfaces + recursion = language? Chomsky's minimalism and the view from syntax-semantics*, 115-160, Berlin: Mouton de Gruyter.

Ross, John Robert. 1967. *Constraints on Variables in Syntax.* Doctoral dissertation, MIT.

Roussou, Anna. 2002. C, T, and the subject: *that*-t phenomena revisited. *Lingua* 112, 13-52.

Saito, Mamoru and Naoki Fukui. 1998. Order in phrase structure and movement. *Linguistic Inquiry* 29. 439-474.

Saito, Mamoru and Keiko Murasugi. 1999. Subject predication within IP and DP. In K. Jonson and I. Roberts (eds.), *Beyond principles and parameters: Essays in memory of Osvaldo Jaeggli*, Dordrecht: Kluwer, 167-88.

Shima, Etsuro. 2000. A preference for Move over Merge. *Linguistic Inquiry* 31, 375-385.

Stepanov, Arthur. 2007. The end of CED? Minimalism and extraction domains. *Syntax* 10, 80-126.

Stepanov, Arthur. 2012. Voiding island effects via head movement. *Linguistic Inquiry* 43:4, 680-693.

Uriagereka, Juan. 1988. *On government*. Doctoral dissertation, University of Connecticut, Storrs.

Uriagereka, Juan. 1996. Determiner clitic placement. In Robert Freidin, ed., *Current issues in comparative grammar*, 257-294. Dordrecht, Kluwer.

Stowell, Tim. 1981. *Origins of Phrase Structure*. Doctoral dissertation, MIT.

Sugimoto, Yushi. 2018. A note on MERGE, unpublished manuscript, Sophia University and University of Michigan.

Taraldsen, Knut Tarald. 2001. Subject extraction, the distribution of expletives and stylistic inversion. In Aafke C. Hulk and Jean-Yves Pollock, eds., *Subject inversion in Romance and the theory of universal grammar*, 163-182, New York: Oxford University Press.

Torrego, Esther. 1998. *The dependencies of objects.* Cambridge, MA: MIT Press.

Toyoshima, Takashi. 2009. Dynamic economy of derivation. In Kleanthes K. Grohmann, ed., *Explorations of phase theory: interpretation at the interfaces*, 211-252, Berlin/New York: Mouton de Gruyter.

Uriagereka, Juan 1988. *On Government*, doctoral dissertation, University of Connecticut.

Uriagereka, Juan. 1996. Determiner clitic placement. In *Current issues in comparative grammar*, ed. by Robert Freidin, 257-294. Dordrecht, Kluwer.

Villata Sandra, Luigi Rizzi, and Julie Franck. 2016. Intervention effects and relativized minimality: New experimental evidence from graded judgments. *Lingua* 179, 76-96.

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