

The Principle of Determinacy and its Implications for MERGE

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1. Introduction: Chomsky et al. (2019) clarify the concept workspace WS and reformulate Merge as MERGE, an operation on WS (not on a particular syntactic object, SO), where WS is taken to be a stage of the derivation: MERGE maps $WS=[X, Y]$ to $WS'=[\{X, Y\}]$. They claim that MERGE should apply in a deterministic fashion based on the principle of Determinacy, but its explications and consequences are left untouched. This paper proposes that Determinacy be formulated as a condition on the *input* of MERGE, arguing that our notion of Determinacy coupled with the Phase Impenetrability Condition (PIC) gives us a *unified* account of various movement phenomena.

2. Proposal: We propose that Determinacy apply at the *input* of MERGE in that if there is an ambiguous application of MERGE at the present stage of a derivation, a Determinacy violation occurs. Let us look at how our Determinacy captures movement. Suppose that MERGE takes WS1 (1a) as its input and then maps it to WS2 (1b), which is the case of Internal Merge (IM) of \underline{c} :

(1) a. $WS1 = [\{a, \{b, \underline{c}\}\}, d]$ b. $WS2 = [\{\underline{c}, \{a, \{b, \underline{c}\}\}\}, d]$ c. $WS3 = [\{c, \{\underline{c}, \{a, \{b, \underline{c}\}\}\}\}, d]$

At the input of this MERGE (1a), there is only one accessible copy of \underline{c} ; hence there is no Determinacy violation. Suppose that we apply further MERGE to WS2 (1b), mapping to WS3 (1c), *i.e.*, we apply IM to \underline{c} again (successive-cyclic movement of \underline{c}). Given the notion of recursion that any SO once generated in WS remains accessible to further operations (Chomsky et al. 2019), we have two accessible copies of \underline{c} at the input of MERGE (1b), rendering two options available; to move either the higher copy of \underline{c} or the lower copy of \underline{c} . This ambiguous application of MERGE would violate Determinacy, and incorrectly predict that no successive-cyclic movement is allowed. We argue that such an ambiguous rule application problem is resolved by the PIC as in (2):

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

a. $[_{CP} \text{ what } [_{C\text{-that}} [_{TP} \text{ John } [_{T} [_{vP} \text{ John } [_{v\text{-R(BUY)}}] [_{RP} \text{ what } [_{R(BUY)} \text{ what}]]]]]]]]]$

b. $[_{CP} \text{ what } [_{C\text{-did}} [_{TP} \text{ you } [_{T} [_{vP} \text{ you } [_{v\text{-R(SAY)}}] [_{RP} \text{ what } [_{R(SAY)}] [_{CP} \text{ what } [_{C\text{-that}} [_{TP} \dots]]]]]]]]]]]$

In (2a), *what* moves from its base position to the Spec of Root (R) that inherits phasehood from *v*, and R-complement undergoes Transfer, rendering *what* in the base position inaccessible to further operations by the PIC (Chomsky 2013, 2015). There is only one accessible copy of *what* in Spec-R; there is no Determinacy violation. Similarly, the PIC avoids Determinacy violations in (2b).

3. Consequences: First, our Determinacy explains the Subject Condition effect (3a) and its cancellation (3b) as in (4a, b). In (4a), to move *who* to Spec-C, there are two accessible copies of *who* in Spec-T and Spec-*v*, thereby violating Determinacy. But in (4b), Spec-T is occupied by *there*. There is only one accessible copy of *who* in Spec-*v*; no Determinacy violation occurs:

(3) a. ***Who** did [pictures of *t*] please you? b. **Who** is there [a picture of *t*] on the wall?

(4) a. $[_{CP} \text{ who } [_{C\text{-did}} [_{TP} \dots \text{ who } [_{T} [_{vP} \dots \text{ who } [_{v\text{-}}] \dots]]]]]]]$ b. $[_{CP} \text{ who } [_{C\text{-is}} [_{TP} \text{ there } [_{T} [_{vP} \dots \text{ who } [_{v\text{-}}] \dots]]]]]]]$

Determinacy also explains the absence of the Subject Condition effects in Japanese (5a) as in (5b):

(5) a. ?**Dare-ni** [John-ga [[Mary-ga *t* atta] koto]-ga mondai-da to] omotteru] no
who-Dat John-Nom Mary-Nom met fact-Nom problem-is that think Q

Lit. 'Who, John thinks that [the fact that Mary met *t*] is a problem.' (Saito and Fukui 1998)

b. $[_{CP} \text{ dare-ni } [_{C} [_{TP} [_{T} [_{vP} [_{Mary-ga} \text{ dare-ni } \text{atta koto}]]]]]]]]]$

In (5b), to move *dare-ni* to Spec-C, there is only one accessible copy of *dare-ni* in Spec-*v*; there is no Determinacy violation (Fukui 1986, a.o. for evidence that subjects in Japanese stay in situ).

Second, our Determinacy explains the ban against vacuous Topicalization (6a) as in (6b):

(6) a. ***John**, *t* came yesterday. b. $[_{TP} \text{ John } [_{TP} \text{ John } [_{T} [_{vP} \text{ John } [_{v\text{-}}] \dots]]]]]$

In (6b), to move *John* to the higher Spec-T for topic interpretation, there are two accessible copies of *John* in the lower Spec-T and Spec-*v*, thereby violating Determinacy.

Third, our Determinacy explains the *That-t* effect (7a, b) and its cancellation (7c, d) as in (8):

- (7) a. ***Who** do you think that *t* saw Bill? b. **Who** do you think *t* saw Bill?
 c. **What** do you think that there is *t* in the box? d. **Who** did he say that *tomorrow t* would go?

- (8) a. [CP **who** [that [TP who [T [vP who [v... b. [RP **who** [R [CP that → Ø [TP who [T [vP who [v...
 c. [CP **what** [that [TP there [T [vP what [v... d. [CP that [CP **who** [tomorrow [C [TP [T [vP who [v...

In (8a), to move *who* to Spec-C, there are two accessible copies of *who* in Spec-T and Spec-v, thereby violating Determinacy. In (8b), C is deleted and vP undergoes Transfer via inheritance of phasehood from C to T (Chomsky 2015). To move *who* from Spec-T to the matrix Spec-R (see (2b)), there is only one accessible copy of *who* in Spec-T; no Determinacy violation occurs. In (8c), since Spec-T is occupied by *there*, to move *what* to Spec-C, there is only one accessible copy of *what* in Spec-v; no Determinacy violation occurs. In (8d), *that* occupies the higher C, and *tomorrow* the lower Spec-C under a layered CP approach to the adverb effects (Douglas 2017). Under a C-to-C inheritance approach to the layered CP (Goto 2011), phi-valuation of *who* takes place at the lower Spec-C. To move *who* to the lower Spec-C, there is only one accessible copy of *who* in Spec-v; no Determinacy violation occurs. The absence of the *that*-trace effect in Spanish (9a) and Japanese (9b) also follows from our Determinacy. If *pro* appears in Spec-T in *pro*-drop languages like Italian and Spanish (Rizzi 1982) (see (11b)), and Japanese subjects stay in Spec-v (see (5b)), there is only one accessible copy of *quién/OP* in Spec-v; no Determinacy violation occurs:

- (9) a. **Quién** dijiste [que *t* salió temprano]? ‘Who did you say that *t* left early?’ (Spanish)
 b. [OP [A-ga [*t* B-ni hanasikaketa to] omotteiru] yorimo] ookuno hito-ga C-ni hanasitagatta
 A-Nom B-Dat talked to that think than more people-Nom C-Dat wanted to talk
 ‘More people wanted to talk with C than A thinks that talked to B.’ (Japanese)

Fourth, our Determinacy explains the cross-linguistic contrast of further-raising as in (11a, b):

- (10) a. *John and Peter seem that are very smart. (English)
 b. Juan y Pedro parece que son muy listos. (Spanish) ((10b) is the counterpart of (10a))
 (11) a. [CP **John and Peter** [C-that [TP John and Peter [T [vP John and Peter [v ...
 b. [CP **Juan y Pedro** [C-que [TP *pro* [T [vP Juan y Pedro [v ...

In (11a), to move *John and Peter* to Spec-C, there are two accessible copies of *John and Peter* in Spec-T and Spec-v, thereby violating Determinacy. In (11b), to move *Juan y Pedro* ‘John and Peter’ to Spec-C, Spec-T is occupied by *pro*, since Spanish is a *pro*-drop language (see (9a) above). There is only one accessible copy of *Juan y Pedro* in Spec-v; there is no Determinacy violation.

Fifth, Determinacy explains the principle of Economy of Derivation, which bans superfluous steps of a derivation. Suppose that in the matrix clause of (2), *what* stops over the higher Spec of T before moving to Spec-C as in (12). Here, there are two accessible copies of *what* in Spec-T and Spec-R, thereby violating Determinacy. But if *what* moves from Spec-R to Spec-C phase-by-phase as in (2b), there is only one accessible copy of *what* in Spec-R; there is no Determinacy violation:

- (12) *[CP **what** [C-did [TP what [TP you [T [vP you [v-R(SAY) [RP what [R(SAY) [...

Our analysis of successive-cyclic IM is compatible with the two existing approaches to A-movement: (i) vP is not a phase (Chomsky 2000, 2007, 2008), and A-movement does not leave copies in intermediate positions (Lasnik 1999; Epstein and Seely 2006); (ii) vP is a phase and A-movement leaves copies in the intermediate positions (Legate 2003). In the former, one-fell-swoop movements avoid Determinacy violations, and in the latter, the PIC avoids Determinacy violations.

4. Conclusion: Determinacy as an *input* condition on MERGE coupled with the PIC presents us with a *unified* explanation of various movement phenomena. We will show that it makes many further correct predictions regarding not only other movement phenomena but also deletion phenomena, and does have far-reaching consequences for the theory of MERGE.

References: Chomsky, N., Á. Gallego, and D. Ott. 2019. Generative grammar and the faculty of language: Insights, questions, and challenges, unpublished manuscript. Lingbuzz/003507.