Linguistic Research 40(1): 27-65
DOI: 10.17250/khisli.40.1.202303.002

MERGE, Minimal Yield, and Workspace accessibility*

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Mizuguchi, Manabu. 2023. MERGE, Minimal Yield, and Workspace accessibility. *Linguistic Research* 40(1): 27-65. This paper considers Minimal Yield, which is a condition on MERGE, and removes the redundancy between Minimal Search and the Phase Impenetrability Condition in warranting the condition when internal MERGE applies. By proposing that Transfer applies freely, the paper claims that Minimal Yield is guaranteed without reference to Minimal Search, providing empirical evidence for the proposed approach and demonstrating its superiority over Minimal Search. As a consequence of the proposal, A-movement is reconsidered. I claim that A-movement is not due to internal MERGE but to external MERGE, arguing for uniform association of phase-internal/cross-phasal relations with external/internal MERGE. This paper concludes that genuine explanation is possible for language. **(Kokugakuin University)**

Keywords Workspace, resources, Minimal Search, Transfer, Stability, A/A′-movement

1. Introduction

Linguistics, biolinguistics or the Minimalist Program in particular, is normal science and seeks for explanation, not description, of the object of inquiry, in this case, language or I-language, which is taken to be a computational system that is a property of an individual. This naturally suggests that we should construct the theory of language (i.e., generative grammar of a particular I-language and Universal Grammar (UG), which is the theory of the genetic component of the Faculty of Language). In theory construction, we should look for the simplest theory: simpler theory implies deeper explanation and leads

* This paper is a substantially revised and extended version of the paper I presented at the SMOG Syntax Circle (October 1, 2022). I would like to thank the audience and three anonymous reviewers for helpful comments, questions, and discussions on earlier versions of this paper, without which the paper would not have been possible. Needless to add, all remaining errors and inadequacies are solely my own. The research reported in this paper has been supported by Japan Society for the Promotion of Science (JSPS) under Grant-in-Aid for Scientific Research (C) (#20K00616).

to better understanding of the object that we seek to understand; in any scientific inquiry, less is better than more. As Einstein once said, “If you can’t explain it simply, you don’t understand well enough.” Science tries to maximize explanation by minimizing the number of assumptions for empirical phenomena, striving for unification and simplification through devising theory after theory. A quest for maximal simplicity of theory is also taken for granted given the idea, tracing back to Galileo, that nature is simple and is perfectly designed, and the task of science is to demonstrate it. If the capacity for language, which is a species-specific, shared property of the human being and the innate endowment for language acquisition, is part of nature, then it should be simple, which can also be considered the reason for the learnability, universality, and evolvability of language. Science is all about looking for the simplest theory (genuine explanation) for simple nature and showing how nature is perfect. The Minimalist Program, which is a science of human language, is no exception.

Against this general background, I discuss the simplest theory for language under a more restrictive formulation of Merge, called MERGE. Chomsky (2021) argues that MERGE satisfies the condition of Minimal Yield (MY) and generates the fewest possible new items accessible to further operations. In this paper, I point out the redundancy between Minimal Search (MS) and the Phase Impenetrability Condition (PIC) in warranting MY when movement or internal MERGE applies. I then propose to remove the redundancy by arguing that Transfer, which restricts accessibility for the subsequent derivation, applies freely. I provide three empirical cases as evidence for the proposed approach over MS. I also argue as one consequence of the proposal that A-movement is not generated by internal MERGE but by external MERGE, claiming that phase-internal/cross-phasal relations are uniformly associated with external/internal MERGE.

The organization of this paper is as follows. In section 2, I first discuss MERGE and MY. Then in section 3, I show that both MS and PIC can play a role in MERGE satisfying MY and point out the redundancy between them. In section 4, I argue that free Transfer removes the redundancy and then discuss empirical evidence for the claim in section 5. In section 6, I consider A-movement under the approach to MY proposed in this paper. Finally, I summarize and conclude the paper in section 7.

2. From Merge to MERGE

In the Government and Binding (GB) Theory, phrase structure was taken care of by X′-theory, which was the amalgam of (i) composition, (ii) order, and (iii) projection. In the Minimalist Program, X′-theory has been decomposed and the three components are taken care of independently. The composition or building part of X′-theory is due to Merge, which is considered the simplest structure-building operation forming the core of UG and satisfying the Basic Property of Language.[1] The simplest assumption following from the Strong Minimalist Thesis (SMT), which says that the computational system for human language is governed by third-factor principles such as computational efficiency or natural law, is that Merge is unconstrained and applies freely, with any two elements merged to form a set (syntactic object), as defined by Collins and Stabler (2016: 47):[2]

(1) Given any two distinct syntactic objects X, Y, Merge (X, Y) = {X, Y}.

This formulation of Merge, however, is not restrictive enough. For an operation *O* to apply to items, it must locate them first and for this purpose, must incorporate an operation Σ that searches and selects items to which *O* will apply. Following Chomsky (2021: 17), assume that Σ is Search, which is a third-factor element, on the shelf and available for any operation. Given (1), Merge, based on Search, will search the entire lexicon, which requires huge search and is not computationally efficient, on the assumption that language seeks to reduce the burden of computation. Lexical items or "resources" for Merge should be restricted for the operation to apply.

In a series of his recent papers, Chomsky (2019b, 2020, 2021) (also Chomsky, Gallego, and Ott 2019) proposes a more restrictive version of Merge. He argues that Merge is not an operation on syntactic objects but on the Workspace (WS), which represents the current stage of the derivation and contains resources for the computation, and maps one WS into another WS (WS′).[3] Merge in this sense is called, for distinction,

1 Order is syntactically undetermined and it is fixed through externalization at SM. On the other hand, projection (a label), as I will discuss below, is determined by Minimal Search.

2 Set-formation does not necessarily restrict elements to be merged to two (cf. footnote 3) but set-formation via Merge or linguistic recursion applies to two elements, which is considered the minimum number required to form a syntactic object or carry the derivation forward, conforming to SMT. See Kayne (1981, 1984), Chomsky (2004) among others for arguments for binary Merge. For relevant discussion, see Citko and Gračanin-Yuksek (2021).

3 The Workspace is constructed by FormSet (FS), which can be assumed to be a freely available operation

capital Merge or MERGE. For instance, when the two syntactic objects X and Y are merged, MERGE applies to the WS which contains X and Y as its terms and maps it to WS′, where X and Y form a set. Consider (2):

(2) MERGE: WS = [X, Y] → WS′ = [{X, Y}]

Under MERGE, square brackets represent the Workspace and curly brackets represent syntactic objects generated in the Workspace ([...] ≠ { ... }). In (2), unlike in (1), the search space is limited to the Workspace.

MERGE is more restrictive than the previous formulations of Merge not only because the Workspace restricts resources for Merge but also because MERGE has to satisfy Minimal Yield (MY), which is a condition on MERGE requiring the operation to construct the fewest possible new items accessible to further operations; to put it in other words, mapping the WS to the WS′ by MERGE can increase the number of accessible items in the Workspace only by one. Consider this with (2). In the WS of (2), X and Y are accessible while in the WS′, X, Y and the newly created object {X, Y}, which is distinct from X and Y, are accessible. In the mapping, MERGE has yielded and added to the WS′ only one new item (i.e., {X, Y}) accessible to further operations, which satisfies MY.

Now suppose that MERGE maps the WS as illustrated in (3):

(3) MERGE: WS = [X, Y] → WS′ = [{X, Y}, X, Y]

Chomsky (2020, 2021) argues that MERGE produces copies when it applies, with external as well as internal MERGE creating copies. Given that external MERGE and internal MERGE are one and the same operation (that is, MERGE) and that recursion yields copies in the WS′ (which is to be mentioned below), it naturally follows that external MERGE creates copies of the items to which it applies. In (2), when the WS is mapped onto the WS′, X and Y are duplicated and then merged as {X, Y}. The other X and the other Y are removed as a consequence of MY from the Workspace. In (3),

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(see, e.g., Chomsky 2023).

The idea of Workspace is not new. See also Chomsky (1995) for Numeration and Chomsky (2000) for Lexical Array. As regards the question why one WS is formed rather than another, see Chomsky (1995: 227) for relevant discussion.

on the other hand, X and Y remain even after MERGE has mapped the WS onto the WS′. In this case, MY is violated since MERGE has constructed three new items accessible to further operations (i.e., X, Y and the object {X, Y}) and the mapping has increased the number of accessible items by more than one.

MERGE abiding by MY, accessible items can appear only once in the WS′: MY restricts computational resources in the Workspace, making determinate rule application possible for subsequent operations. This way, MERGE is not only more restrictive and simpler than previous versions of Merge; recursion in language is also more restrictive than normal recursion (say, in proof theory), where the WS′ will be [{X, Y}, X, Y], not [{X, Y}]: items that were generated earlier are preserved and are accessible afterward. MY makes derivations strictly Markovian in that history of derivations is not preserved in the Workspace, with the next step having no access to the history.[4]

Chomsky argues that recursion qua MERGE is empirically evidenced by island constraints (Ross 1967). Consider (4):

(4) a. *What is Bill spreading the news that Mary will buy _ ?
b. *What do you wonder who believes that the student bought _ ?
c. *What have you just bought two hamburgers and _ ?

Take the Complex NP Constraint in (4a). Suppose that MY is ignored and that the history is preserved and is not rendered inaccessible. The WS (5) is generated in the derivation of (4a) (subscripts are added here and elsewhere only for convenience):

(5) WS = [{the {news {that {Mary {will {buy $what_1$}}}}}}, ..., $what_2$, ...]

When the *wh*-phrase is externally merged with *buy*, its copy is created and remains in the WS. In (5), more than one *wh*-phrase has been yielded and is accessible to the computation in the later derivation. When MERGE applies to the WS, $what_2$ can be manipulated in addition to $what_1$. If $what_2$ is manipulated, *what* will not be extracted out of a complex NP, with the result that the island violation would not be observed. The

4 An anonymous reviewer asked if the recursion described here is unique to human language or is observed elsewhere. As regards this, Chomsky (2021) suggests that linguistic recursion conforms to MY since SMT holds for organic systems. As far as this observation is correct, the recursion described here will be unique to human language.

same thing can be said about other islands. Without MY, derivations would be allowed to circumvent syntactic islands.

3. Internal MERGE

We have seen that MERGE satisfies MY and maps the Workspace to another Workspace in such a way that it generates the fewest possible new items accessible to further operations, introducing at most one accessible new item in the derived Workspace. However, restrictive MERGE may face a problem when a ubiquitous property of language is taken into consideration: movement, which is nothing other than internal MERGE. Suppose that we have the WS (6a) and internal MERGE maps the WS to the WS′ as shown in (6b):

(6) a. WS = [{Z, {X, Y}}]
b. WS′ = [{Y_2, {Z, {X, Y_1}}}]

Recall that MERGE (both external and internal) produces copies. When internal MERGE applies to construct (6b) from (6a), the object {Z, {X, Y}} and Y are duplicated and then merged as {Y_2, {Z, {X, Y_1}}}; the other {Z, {X, Y}} is removed as a consequence of MY. Notice, however, that in the WS′, Y_2 and the object {Y_2, {Z, {X, Y_1}}} have been generated and the number of accessible items has increased by more than one, which violates MY. Given that syntactic objects that have been created are left unchanged (the condition of no-tampering, which can be considered a natural requirement for efficient computation following from SMT – Chomsky 2008), Y_1 will not be removed from the object when (6a) is mapped to (6b).

Chomsky (2020, 2021) argues that no violation of MY occurs in (6b), claiming that Y_1 is inaccessible due to Minimal Search (MS). Recall that MERGE (or for that matter, any operation) must be accompanied by the operation Search in order to select items to which it will apply. Provided that operations conform to third-factor or efficiency principles, it follows that Search is minimal, abiding by the condition of least effort. Searching [{Y_2, {Z, {X, Y_1}}}], the Search operation will stop if it selects Y_2 since the selection of Y_1 instead of Y_2 requires deeper, hence non-minimal, search. In other words,

Y_1 is *protected* by Y_2 from Search when it is c-commanded by Y_2.[5] Following Chomsky (2023), call the structure $\{Y_2, \{Z, \{X, Y_1\}\}\}$, where Y_2 c-commands Y_1, a c-command (cc-)configuration. Selection of Y_1 is blocked by Y_2 and as a result, only one Y (that is, Y_2) is accessible to MERGE (or any further operation), with no violation of MY.

We have seen that MS allows MERGE to satisfy MY. Notice that MS is not the only factor that warrants MY. As Chomsky (2020, 2021) argues, there is another independent principle that reduces the set of objects accessible to MERGE and guarantees MY: that is, Phase Theory or more concretely, the Phase Impenetrability Condition (PIC), which prevents access to items in a previous phase and reduces Search, making efficient computation possible. To see this, consider (7):

(7) What do you think the professor will recommend?

In (7), the *wh*-element moves successive cyclically to the matrix Spec,CP by way of phase edges (Spec,CP and Spec,vP) and $\{Y_2, \{Z, \{X, Y_1\}\}\}$ is generated at each phase level. At the phase level, the phase complement becomes inaccessible due to PIC, which says that 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 (Chomsky 2000). It then follows that only the *wh*-element at the edge is accessible, with all the other *wh*-copies in earlier phases being inaccessible to Search, hence to MERGE. MY is satisfied thanks to PIC.[6]

At the same time, notice that in (7), MS can also warrant MY: at each phase level, the *wh*-element at the edge c-commands, hence protects from MS, the lower *wh*-element or copy, which is thus no longer accessible to further operations:

(8) $\{what_5 \{C \{ ... \{what_4 \{v \{ ... \{what_3 \{C \{ ... \{what_2 \{v \{V what_1\}\}\}\}\}\}\}\}\}\}\}$

We can see that there is redundancy between MS and PIC in warranting MY when internal MERGE takes place.

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5 Komachi et al. (2019), through personal communication with Chomsky, note that he suggests this as Shortest Move Corollary, which is a subpart of MS.

6 PIC suggests that more than one item in the Workspace can become inaccessible, which is unproblematic given that the derived Workspace does not increase the relevant number by more than one, with MERGE not violating MY.

Now the question is: How do we deal with this redundancy? As discussed above, both MS and PIC (Phase Theory) can be considered corollaries of SMT or genuine explanation. One way to proceed is thus to maintain both MS and PIC in warranting MY: we could argue that what we see here is necessary redundancy. Still, another approach is to adopt well-known Occam's razor if something is to be explained at all and hypothesize that MY is warranted by one of the two: something is wrong, which is why we face the redundancy. In the following sections, I explore the latter approach, arguing that PIC is the answer to MY, and present three empirical arguments as evidence for this claim.[7]

4. Restricting accessibility

PIC is the condition for strict cyclicity imposed by Phase Theory. As noted, due to PIC, phase complements become inaccessible at the phase level, with only the phase head and the phase edge accessible to operations in the subsequent derivation, which allows MY to be satisfied. It can be considered that PIC is not an independent condition but follows as a consequence of Transfer, the operation which applies cyclically at the phase level and sends derivations or structured syntactic objects to the Conceptual-Intentional (CI) and Sensory-Motor (SM) interfaces, at which they receive interpretations essentially as instructions for constructing thoughts and as those for external manifestation, rewritten in a form that can be used by the CI and SM systems: when a phase is completed, the phase complement is shipped off to semantic interpretation at CI and externalization at SM.[8] Once syntactic objects are dispatched, handed over to the CI and SM interfaces, they will leave the hands of the computation (narrow syntax), with the result that they become inaccessible. The phase complement is rendered inaccessible through Transfer. Cyclic Transfer at the phase level brings about or deduces PIC; in other words, PIC simply describes Transfer (i.e., what is accessible and what is not after the application

7 For relevant discussion, see Goto and Ishii (2020), who also argue that resources in the Workspace are restricted only by PIC and propose to eliminate the redundancy between MS and PIC.

8 Chomsky (2021: 7) suggests that access to the derivation by extra-linguistic systems such as CI and SM can in principle take place at any stage of the computation and that there is no need to postulate interface levels. In this paper, I adopt the conventional assumption for the proposal here. See also Shim (2022) for the proposal that outside systems directly access the derivation at the phase level, with no need to assume Transfer as an independent operation.

of Transfer) (see Chomsky 2004, Gallego 2020, and Shim 2022 for relevant discussion; see also Chomsky 2021 for the suggestion that PIC and Transfer can be unified).

Given that PIC follows from Transfer, I argue that MY can be warranted without reference to MS: that is, MS is simply irrelevant to MY or is not employed for the purpose of satisfying it.[9] To develop the proposal, let us consider Transfer. It has been argued that the structures of I-language are generated in accord with SMT and that operations apply only within the bounds of third-factor or efficiency principles. If so, Transfer will also be constrained only by efficiency principles. Chomsky (1998: 121-122) argues as follows: "One plausible element of optimal design is that there are no constraints on application of operations." Given that language is optimally designed, we come to the conclusion that linguistic or syntactic operations fall out as "unconstrained transformational rules" (Epstein 2007). Considering that Transfer is one of the operations, it will be no exception. Then it will be a stipulation that Transfer applies only at the phase level. Transfer, like MERGE, should be unconstrained and should apply freely, not only at the phase level but also anywhere in the course of the derivation; transfer to the interfaces should take place at any stage of the computation (cf. footnote 8). In fact, Chomsky (1998) writes immediately after the quote cited above that "Accordingly, Spell Out can apply anywhere." Spell Out is now called Transfer; more precisely, it is Transfer to the SM interface for externalization.[10]

Bearing in mind that Transfer applies freely, when the operation applies to a syntactic object, it will not dispatch the object in full but only part of it; otherwise, the derivation cannot continue in that a single application of Transfer would always terminate the derivation (see also Chomsky 2004 for relevant discussion). Given that operations maximize their effects, which naturally follows from the condition of computational efficiency or SMT, I argue that (9) will result as an outcome when Transfer applies to the object {X, {Y, {Z, K}}} (for convenience, the object in the Workspace that has been transferred is shaded in the paper):

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9 Chomsky (2021: 18) notes that MS is a freely available least effort condition. In this sense, MS cannot be gotten rid of and is available for other purposes (e.g., labeling). I thank an anonymous reviewer for clarification of this point.

10 An anonymous reviewer suggests that application of operations such as Transfer is optimal as far as they apply only at the phase level. As I have discussed, however, given optimal design, no constraints (including "at the phase level") should be imposed on (application of) operations themselves, except for those imposed by SMT. Given SMT, it follows that syntactic operations should be available anywhere, which makes efficient computation possible.

(9) {X, {Y, {Z, K}}}

In (9), {Y, {Z, K}} is dispatched, with X left for the subsequent derivation, which maximizes the effects of Transfer and at the same time allows the derivation to continue thanks to accessible X.[11] This way, multiple applications of Transfer are possible in the course of the derivation. Given the discussion so far, impenetrability or inaccessibility follows not only at the phase level (the conventional PIC effect) but also anywhere in the course of the derivation since Transfer applies freely; in other words, inaccessibility is not a consequence of Phase Theory (PIC) but of free Transfer.

With this proposal in place, let us now go back to (6), a case of internal MERGE, and consider how MY is satisfied without reference to MS. Under free Transfer, as shown in (9), Transfer can apply to {Z, {X, Y_1}} when the Workspace is derived. Consider (10):

(10) WS′ = [{Y_2, {Z, {X, Y_1}}}]

In (10), there is only one term of Y that is accessible in the Workspace (i.e., Y_2) after the application of internal MERGE, with no violation of MY.

Provided that inaccessibility follows from free Transfer, the discussion here will raise the question of what roles phases, which are identified by (or are the loci of) unvalued features (Chomsky 2019a), play in the derivation if Transfer can apply even at the non-phase level. I argue that phases have two roles. One of the roles is to force Transfer to apply: when the derivation reaches a phase level, Transfer will automatically apply, putting syntactic objects to interpretation at CI and externalization at SM. This way, strict cyclicity is warranted under free Transfer, which also has the choice of *not* applying.

The second assumption on phases is that phase heads allow themselves to be exempt from being transferred; that is, as shown in (11), Transfer at the phase level makes two outcomes possible (PH = phase head):

(11) a. {XP, {PH, YP}}
b. {XP, {PH, YP}}

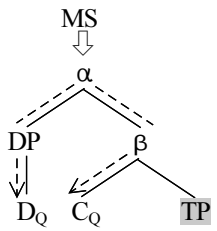
11 Note that in (9), not only X but also the object as a whole is accessible in the derived Workspace. In the rest of the paper, this is assumed.

Empirical arguments for this assumption come from labeling. First consider (12):

(12) I know {$_{\alpha}$ what {$_{\beta}$ C {$_{TP}$ John bought}}}.

The example is ambiguously interpreted: the object α *what John bought* allows a *wh*-question interpretation as well as a free relative interpretation. The first interpretation follows when only TP is transferred, excluding the phase head C, as in (11a). Recall from section 2 that under the Minimalist view of structure building, where the information encoded in X′-theory has been decomposed, syntactic objects that have been constructed by MERGE are without (projection) labels. However, they must be labeled and identified independently: labels are required for CI interpretation and externalization at SM. As Chomsky (1995: 243) writes, "verbal and nominal elements are interpreted differently at LF and behave differently in the phonological component." Without labels, such distinction would be impossible and syntactic objects cannot be interpreted or externalized, violating Full Interpretation (FI), which requires appropriate interpretation of every syntactic object (Chomsky 2013, 2015). It has been argued that labeling for identification is executed by MS, which, when applied to the object, locates and designates as the label the closest head (typically in the case of the object {X, {YP}}) or the closest agreeing features (in the case of the object {{XP}, {YP}}, where the heads X and Y agree in the feature F). When TP is transferred in (12), *what* and C are accessible to MS for labeling, which, when applied to α, simultaneously finds the two heads as they are equally close to MS. Consider (13):

(13)

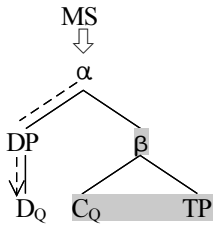


Since *what* and C agree in Q, MS will locate the agreeing feature as the label of α. The object α is identified as the Q-feature, shared by the two agreeing heads C_Q and D_Q, and is labeled <Q, Q> (or QP) through the detection of this specific feature. Having <Q, Q> designated as the label, α will be interpreted as an interrogative clause, and an

interrogative or *wh*-question interpretation will obtain for (12) at CI.

The second interpretation follows when β is transferred (=(11b)) and becomes inaccessible. In this case, as illustrated in (14), MS, when applied to α, will locate D (i.e., the head of *what*):

(14)



Though *what* is a *wh*-element with the Q-feature, notice that it is not the only feature borne by the *wh*-phrase, hence located by MS: not just the Q-feature but all the features associated with it, including its categorial feature, are located through the detection of the head, with α turning out to be DP. As a result, α will not be interpreted as a *wh*-interrogative clause but as nominal, and a free relative interpretation will obtain for α (Izvorski 2000; Caponigro 2002, 2003; Donati 2006; Ott 2011).[12]

Next consider successive cyclic movement in such examples as (7), repeated below for convenience:

(7) What do you think the professor will recommend?

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12 This analysis is also endorsed by the fact, which is noted in Caponigro (2002), that free relatives, unlike *wh*-interrogatives, never allow extraction out of them. Consider the following examples from Italian, where the region enclosed by square brackets is a free relative clause in (i) while it is a *wh*-interrogative clause in (ii):

(i) *Queste sono le ragazze che odio [chi ha invitato t]
these are the girls that I-hate who has invited
'These are the girls that I hate who invited.'

(ii) Queste sono le ragazze che so [chi ha invitato t]
these are the girls that I-know who has invited
'These are the girls that I know who invited.' (Caponigro 2002: 142)

The ungrammaticality of (i) straightforwardly follows from the analysis I have proposed. A free relative clause is a complex NP, where CP is inside DP, and a relative operator is extracted out of it, which violates the Complex NP Constraint. The ill-formedness of (i) is on a par with that of (4a).

Provided that head movement is the job of externalization, there is no need to assume that phase heads should be exempt from the domain of Transfer for the purpose of head movement. However, without the assumption, incorrect labeling can result, and the derivation will be ruled out at CI. In (7), the *wh*-phrase at the root Spec,CP moves through phase edges for Transfer, which, as I have argued, is triggered at the phase level. Suppose that Transfer applies, with phase heads, along with their complements (i.e., β), dispatched in the derivational process as shown in (15):

(15) a. $\{_{\alpha}$ what $\{_{\beta}$ v, VP$\}\}$
b. $\{_{\alpha}$ what $\{_{\beta}$ C, TP$\}\}$

As discussed, in this case, MS will locate the head of *what*, designating it as the label, with the result that α is labeled D, hence it is DP. Given that T selects vP and *think* selects CP, the labeling will violate selection. Assuming that selectional restrictions are reducible to the properties of CI (Pesetsky 1982; Fortuny 2008 among others for relevant discussion), hence FI, (15) will be ruled out in violation of FI.[13]

Based on ambiguous interpretations observed in (12) and successive cyclic movement, I have shown that the second assumption on phases follows from labeling or FI at CI.[14]

In this section, I have argued that inaccessibility due to free Transfer is the answer to MY, claiming that the redundancy between PIC and MS is removed. In the discussion, I have also reconsidered the role of phases in the derivation. As discussed, free Transfer subsumes PIC and can take care of traditional PIC examples such as (7), where successive cyclic movement is observed. In the next section, I discuss three pieces of empirical evidence for the free Transfer approach over the MS approach in warranting MY.

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13 I assume that labeling for MS applies freely, at every Workspace, with label information retained thanks to phase-level memory. Given that unlabeled objects are allowed during the derivation (Chomsky 2013), I also assume that the object XP-YP, when left unlabeled at the point when labeling applies, can be subject to labeling in the subsequent derivation.

14 Under free Transfer, both (11a) and (11b) are allowed at the phase level but the choice between the two is ruled in or out by FI at CI: as for (12), both choices satisfy selectional restrictions while as for (15), only (11a) does.

5. Empirical arguments for the free Transfer approach to MY

5.1 Spec-to-Spec anti-locality effect

The first empirical argument comes from subject *wh*-question. Consider (16):

(16) (I wonder) who broke the window?

In (16), *who* is internally merged. It has traditionally been assumed that the subject *wh*-phrase moves to Spec,CP from within vP (most typically, Spec,vP) via Spec,TP, and under the MS approach to MY, this movement process is allowed: *who* at Spec,CP protects *who* at Spec,TP, which in turn protects *who* at Spec,vP, since the higher one c-commands the lower one; (17) is a cc-configuration (see also (8)):

(17) {who$_3$ {C {who$_2$ {T {who$_1$ {v {break {the window}}}}}}}}

On the other hand, under the free Transfer approach to MY I have proposed, it is predicted that *who* will not move to Spec,TP on its way but will move in one fell swoop to Spec,CP from Spec,vP: movement from Spec,TP to Spec,CP will be banned, with Spec-to-Spec anti-locality observed (see Erlewine 2016 for the discussion of Spec-to-Spec anti-locality). Suppose that the *wh*-phrase moves to Spec,TP. MERGE abiding by MY, (18) will be derived, where in the absence of a phase head, TP (T′ in X′-theory) is shipped off by free Transfer and *who$_1$* is protected from accessibility, with *who$_2$* left so that the derivation can be carried forward:

(18) {who$_2$ {T {who$_1$ {v {break {the window}}}}}}

In (18), MY is satisfied for the inaccessibility of *who$_1$* in the derived Workspace.

This, however, will raise an interpretive problem at the interfaces. In (18), only *who$_2$* and the whole object are accessible to operations and when labeling applies to (18), MS will locate the head of *who$_2$*, not T, as the label. Consequently, the object *{who$_2$ {T {who$_1$ {v {break {the window}}}}}}* is labeled D; in other words, it is DP, not TP, being interpreted as nominal, not clausal (recall the discussions around (12) and (15)). In the next Workspace, C is merged with (18). Notice that C selects T, but not D, and that

selection will be violated for (18) being labeled incorrectly. The derivation (17) will violate FI, ruled out at the interfaces for incorrect labeling. Recall that in (18), *{who$_1$ {v {break {the window}}}}* cannot be transferred as T is not a phase head; in the absence of a phase head, the transfer is banned for computational efficiency.

Under the free Transfer approach to MY, it follows that the derivation for subject *wh*-movement is not (17) but (19), where the subject skips Spec,TP and moves directly to the phase edge:

(19) {who$_2$ {C {T {who$_1$ {v {break {the window}}}}}}}

In (19), thanks to the phase head C, Transfer can dispatch *{T {who$_1$ {v {break {the window}}}}}*, leaving C, after *who* is internally merged, and *who$_1$* becomes inaccessible, which satisfies MY; recall that I have argued that phase heads allow themselves to be exempt from being transferred. Labeling or MS, when applied to (19), can see both *who$_2$* and C, simultaneously locating the two heads, which agree in Q. Consequently, (19) can be labeled <Q, Q> (i.e., it is QP) thanks to the shared feature or agreement between C and the *wh*-phrase, being interpreted as interrogative. It is labeled correctly for CI interpretation. Besides, C selects TP since the object *{T {who$_1$ {v {break {the window}}}}}* is labeled TP via MS locating T, which satisfies selection by C, hence FI.[15]

The derivation (19), hence the proposed approach to MY, is empirically endorsed by languages with agreement alternations. It has been observed that in some languages, distinct agreement forms are observed with the verb depending on the position of the subject: canonical or full agreement appears on the verb when the subject is in Spec,TP while partial or non-canonical agreement emerges when it is in the position other than Spec,TP. Fiorentino, which is a northern Italian dialect, is one such language.[16] Consider the following examples:

15 Chomsky (2015) argues that T is weak as a label, with an overt/visible Spec,TP required for labeling of the {T {v ... }} set. In other words, the EPP follows from T's need to function as a label. Unless the syntactic object is labeled with the help of Spec,TP, it cannot be interpreted and FI will be violated. For a different approach to the EPP based on the properties of the interfaces, hence FI, see Mizuguchi (2022a). Below I discuss why *{T {who$_1$ {v {break {the window}}}}}* is unproblematic without Spec,TP.

16 As discussed in Brandi and Cordin (1989), Trentino, which is another Italian dialect, behaves the same way as Fiorentino.

(20) a. Le ragazze l'hanno telefonato.
the girls LE have$_{(3.PL.FEM)}$ phoned
'The girls have phoned.'
b. Gl'ha telefonato le ragazze.
GLI has$_{(3.SG.MASC)}$ phoned the girls (Campos 1997: 93)

As shown in (20), in this language, agreement on the verb differs depending on whether the subject occurs before or after the verb: canonical or full agreement appears only when the subject is pre-verbal, that is, it is in Spec,TP while non-canonical or partial agreement is observed when the subject is post-verbal or not in Spec,TP.[17] Guasti and Rizzi (2002) argue that such alternations are rather stable in languages with agreement alternations, which suggests that the position of the subject is crucial in determining the forms of morphological agreement.

We have seen that morphological forms of agreement allow us to see if the Spec,TP position is created in the course of the derivation. Now consider the case where the subject is *wh*-moved in Fiorentino. In this case, as shown below, the neutral clitic form will appear on the verb as in (20b):

(21) a. Quante ragazze gl'ha telefonato?
how-many girls GLI has phoned
'How many girls have phoned?'
b. *Quante ragazze l'hanno telefonato?
how-many girls LE have phoned (Campos 1997: 94)

This argues that the subject, as illustrated in (19), skips Spec,TP and moves directly from Spec,vP to Spec,CP, with no Spec,TP generated in the derivation.[18]

Other languages that show agreement alternations include Kinande (=(22)), Kaqchikel

17 LE in (20a) is a subject clitic, with the verb agreeing with the subject; GLI in (20b) is a neutral clitic, with the verb appearing in third person, singular, masculine form.

18 An anonymous reviewer points out that skipping over Spec,TP by a *wh*-phrase in (21) depends on the way the neutral clitic on the verb is analyzed and those features borne by the *wh*-phrase, which are different from those of regular DPs. Notice that the very same clitic is observed on the verb in (20b), which has a regular DP as the subject. This argues that there is no difference between *wh*-phrases and regular DPs as regards the neutral clitic and we can conclude that the clitic appears on the verb when no Spec,TP is created.

(=(23)) and Tamazight Berber (=(24)). Consider the following examples:

(22) a. iyondi yo u-alangira / *a-alangira Marya
who that ANTI.AGR-saw / AGR-saw Mary
'Who saw Mary?'
b. Kambale a-alangira Marya
Kambale AGR-saw Mary
'Kimbale saw Mary.' (Schneider-Zioga 2007: 404)

(23) a. Achike *x-ø-u-tëj / x-ø-tj-ö ri wäy?
who COM-B3.SG-A3.SG-eat / COM-B3.SG-eat-AF the tortilla
'Who ate the tortilla?'
b. Iwïr x-ø-u-tëj ri wäy ri a Juan.
yesterday COM-B3.SG-A3.SG-eat the tortilla Juan
'Yesterday Juan ate the tortilla.' (Erlewine 2016: 430)

(24) a. mani thamttut ag ʕlan / *thʕla araw
which woman C see.PERF.PART / 3SG.FEM.see.PERF boys
'Which woman saw the boys?'
b. thamttut thʕla araw
woman 3SG.FEM.see.PERF boys
'The woman saw the boys.' (Ouali 2008: 164)

In these languages, as in Fiorentino, subject movement to Spec,CP and subject movement to Spec,TP show distinct agreement patterns. In Kinande, when the subject *wh*-phrase is extracted, the morpheme *u-* emerges on the verb; in Kaqchikel, Agent Focus (AF) appears; in Tamazight Berber, person, number and gender agreement between the verb and the subject (regular subject-verb agreement), otherwise obligatory, is suppressed. Following Schneider-Zioga (2007), I assume that the morpheme *a-* indicates canonical subject-verb agreement, with the subject in Spec,TP, while the morpheme *u-* is an anti-agreement marker, which suggests that the subject is not in Spec,TP. As for Kaqchikel, AF can be considered non-canonical agreement for lack of a Set A agreement marker, which cross-references the subject in transitive clauses and is observed in a basic transitive clause in (23b). In (22a)-(24a), unlike in (22b)-(24b), non-canonical agreement appears on the verb.

The examples from the languages above also argue for (19). If the subject *wh*-phrase

moved to Spec,TP, it would be predicted that the canonical agreement (the morpheme *a*-, the absence of AF and the appearance of a Set A agreement marker, regular subject-verb agreement) is observed thanks to Spec,TP, just as in (22b)-(24b). Distinct agreement morphology suggests that derivations involved are not the same. Subject *wh*-movement provides one empirical argument for the proposed approach to MY.[19] On the other hand, under the MS approach to MY, movement via Spec,TP will be predicted and some additional assumption is required (say, the one proposed in Erlewine 2016) to avoid movement to Spec,TP in subject *wh*-movement.

The proposed approach to MY can also take care of (25), which is an example of an ECP violation. Chomsky (2021: 18) argues that the example shows MS is observed by MERGE (and other operations):

(25) *Who$_3$ do you wonder if ~~who$_2$~~ was appointed ~~who$_1$~~?

PIC cannot be resorted to in order to warrant MY in that T is not a phase head and *{appointed who$_1$}* does not become inaccessible. Chomsky (2021) says that if MS is ignored and *who$_2$* does not protect *who$_1$* from Search, *who$_1$* can move to *who$_3$* (via the edge of the embedded CP), which is a legitimate application of MERGE, and (25) will be grammatical, with no ECP violation.

Given the proposed approach, the ECP violation can be explained without MS. As I have discussed, movement of *who* to Spec,TP will generate (18), which is to lead to incorrect labeling, therefore ruled out at CI: the object *{who$_2$ {was {appointed who$_1$}}}* will be labeled DP, not TP, for the transfer of *{was {appointed who$_1$}}*. The derivation satisfies MY but at the same time has the effect that the head of *who$_2$* is located as the label of *{who$_2$ {was {appointed who$_1$}}}*, which will be interpreted as nominal, not clausal. Also, the labeling will incur a violation of a selectional relation at CI on the assumption that C does not select DP. Under the proposal in this paper, the ECP violation in question is reducible to the properties of CI or FI.

Recall that subject *wh*-phrase skips Spec,TP and moves directly to Spec,CP. In (25),

19 See Ouhalla (1993) for more examples of non-canonical agreement in subject A′-movement in other languages.

See also Ouali (2008), Legate (2011, 2014), Erlewine (2016), Messick (2020), Bošković (2021, 2022, to appear) among others for the argument that the subject leaps Spec,TP when it undergoes *wh*- or A′-movement. The literature also endorses the approach to MY proposed in this paper.

the problem of labeling, hence a violation of FI, can be circumvented if *who* moves directly to Spec,CP from within vP. Notice that (25) under this derivation will be ruled out for the "EPP" on T: no Spec,TP is generated. As noted in footnote 15, the EPP or the Spec requirement on T is nothing other than the labeling requirement on T: T can function as a label only with the help of Spec,TP. Under the derivation in question, an ECP violation will be ruled out in violation of FI: a T-headed set {T {v ... }} will be left unlabeled in the absence of Spec,TP. As discussed, every syntactic object must be labeled and identified for CI interpretation and externalization at SM so that FI can be satisfied.

We have argued that an ECP violation such as (25) can be properly excluded even if the subject *wh*-phrase leaps Spec,TP. This now raises the question why no EPP violation or unlabeled object occurs with subject *wh*-movement such as (16). As discussed, (16) generates (19), where Spec,TP is not yielded, in violation of the EPP or FI for unlabeled {T {v ... }}. As regards this, Mizuguchi (2018, 2019) argues that in subject *wh*-movement like (16), C and T form a syntactically bundled head: T is externally pair-merged (or adjoined) to C, and that the clause is structured as (26a), not as (26b):

(26) a. {<C, T> {v ... }}
b. {C {T {v ... }}}

In (26a), through adjunction via external pair-Merge, T becomes part of C and does not form an independent set. Provided that an adjoined element, being put on a different plane or in a separate dimension, behaves as if it were not there and is syntactically invisible and inaccessible (Chomsky 2004, 2020, 2021 – see also 5.2 for pair-Merge), the composite head <C, T> is equivalent to C, with the result that the labeling requirement on T does not arise; in other words, T is de-activated for its pair-merge to C. The derived structure for (16) is not (19) but (27):[20]

(27) {who$_2$ {<C, T> {who$_1$ {v {break {the window}}}}}}

20 For relevant discussion, see also Bošković (2022, to appear), who argues for a position for a locally moved subject *wh*-phrase, which is distinct from Spec,CP and Spec,TP. For the present paper, the position is the Spec of <C, T>, with no need to assume an additional position in the clausal architecture.

In (27), *who* moves to the Spec of <C, T>. The internal MERGE satisfies MY and at the same time, the object is correctly labeled. <C, T>, which is on a par with C, functions as a phase head. Given this, the object *{who$_1$ {v {break {the window}}}}*, being the complement of <C, T>, can be transferred when *who* is internally merged, making *who$_1$* inaccessible to the subsequent computation. Recall that phase heads can be exempt from being transferred, with <C, T> available for the computation in the derived Workspace. Since *who* and <C, T> agree in Q, (27) can correctly be labeled <Q, Q> thanks to MS locating the agreeing feature when applied to (27). The derivation (27) guarantees both the satisfaction of MY and correct labeling.[21]

Mizuguchi (2018, 2019) further argues that the complementizers C and <C, T> are externalized as distinct morphological forms in languages, with <C, T> realized as a null complementizer Ø while C as an overt complementizer in English, proposing (28) (the reader is referred to the references for detailed discussion regarding (28)):

(28) **Externalizations of C**

Syntax	Externalization
<C, T>$_{\text{tensed}}$	Ø
<C, T>$_{-\text{tensed}}$	*to*
C	*that*

(Mizuguchi 2019: 341)

He claims that the *that*-trace contrast follows from (28):

(29) Who do you think (*that) will come to the meeting?

Given (28), consider (29) under the analysis proposed in this paper. In the *that*-trace context, (26b) is structured and C is realized as *that*. As discussed, in this case, whether the subject *wh*-phrase moves to Spec,TP or skips the Spec position, a labeling problem will occur and FI will be violated for either incorrect labeling or labeling failure. Since

21 For arguments for the bundling of two heads such as C and T, see Park (2022) and the references cited in Mizuguchi (2019: 336, footnote 10). With Merge in place, composite or bundled heads are not drawn from the lexicon as single heads but can be formed syntactically by (pair-)merging two heads, as discussed in Epstein, Kitahara, and Seely (2022).

if is an overt complementizer like *that*, it can reasonably be assumed that *if* is another realization of C and that the embedded clause is structured as (26b) in (25) just as in the *that*-trace context. (25) cannot circumvent a violation of FI through pair-merging T to C and constructing (26a).

On the other hand, the absence of *that* in (29) (as well as in (16)) indicates that <C, T> is generated; the labeling requirement on T does not arise for de-activation of T through pair-merge of T to C in the derivation. As discussed, neither incorrect labeling nor labeling failure occurs with (26a) due to Transfer for MY.

With these independent arguments in place, it can be concluded that an ECP violation like (25) is reducible to the properties of CI or FI. Both grammatical examples such as (16) and ungrammatical ones like (25) and (29) or ECP violations can be explained under the proposal in this paper.

5.2 Adjunction

A second empirical argument for the free Transfer approach to MY is adjunction. Chomsky (2004, 2015, 2020) argues that Merge subsumes two types and that adjunction is due to pair-Merge (or pair-MERGE, given that Merge is an operation on the Workspace), which yields an ordered pair <X, Y>, not an unordered pair or set, the generation of which is the job of set-Merge (or set-MERGE), saying that "set-Merge and pair-Merge are descendants of substitution and adjunction in earlier theories" (Chomsky 2004: 118), with pair-Merge being a formally distinct operation and the next simplest operation after set-Merge (Chomsky, Gallego, and Ott 2019; Chomsky 2020).

Mizuguchi (2022b) reconsiders pair-Merge under the assumption that Merge is the simplest structure-building operation. Based on Tourlakis's (2003) assumption, which is a variant of Kuratowski's (1921), that <X, Y> is on a par with {X, {X, Y}}, he proposes that pair-Merge can reduce to MERGE (see also Omune 2020 for this proposal). For instance, consider adjunction in (30), where PP is adjoined to VP:

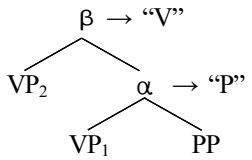
(30) John read the book during the concert.

Mizuguchi (2022b) proposes that the structure of VP adjunction under MERGE is (31):

(31) {VP_2 {VP_1, PP}}

According to Mizuguchi, in the derivation of (31), VP and PP are merged to form {VP, PP} and then VP moves out for labeling because V and P do not agree in any feature and {VP, PP} cannot be labeled in the absence of shared agreeing features; the movement allows {VP, PP} (marked as α in (32)) to be given the label P under the assumption that lower copies are ignored for the purpose of labeling (more generally, MS) (Chomsky 2013). The whole object (= β) will be labeled V through MS locating the head of VP (or VP_2):[22]

(32)



In (31), VP_2 and VP_1 are in the Workspace but MERGE does not violate MY: under the MS approach to MY, VP_2 c-commands VP_1, hence protecting VP_1; under the approach proposed in this paper, on the other hand, {VP_1, PP} is transferred for internal MERGE (i.e., movement of VP). Under both approaches, VP_1 is not accessible and MY is satisfied.[23]

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22 Kim and Park (2022) argue that in adjunction, the host XP and the adjunct YP are merged to form {XP, YP} and that YP is transferred to make the set labeled XP via the invisibility of YP. This suggests that they assume free Transfer discussed in the present paper. In this paper, for the purpose of discussion, I assume Mizuguchi's (2022b) analysis of adjunction, leaving the detailed comparison with Kim and Park's (2022) approach to adjunction, which must be done considering the overall organization of the grammatical system. See also Bode (2020) for how the adjunction structure is labeled.

23 Mizuguchi (2022b) argues that {VP_1, PP} is transferred for Determinacy, which can be considered a consequence of MY.

An anonymous reviewer wondered whether it is also possible to derive (i) from {VP, PP} in adjunction:

(i) {$_{\beta}$ PP_2 {$_{\alpha}$ VP, PP_1}}

In principle, the derivation is possible under MERGE but generates a structure in which VP is adjoined to PP, which causes incorrect labeling (i.e., β will be labeled "P" or "PP", not "V" or "VP"). Mizuguchi (2022b) argues, however, that in *wh*-questions such as (ii), PP does move out of {VP, PP} without incurring a labeling problem:

(ii) In which city did you meet Susan?

The Adjunct Condition (one side of Huang's 1982 Condition on Extraction Domain or CED) favors the free Transfer approach over the MS approach. Consider (33):

(33) a. *Which concert did you read the book {during t}?
b. *Who did Mary cry {after John hit t}?

As shown, the adjunct is an island for extraction. The islandhood is straightforward if MY is warranted by free Transfer as I have proposed: the transfer makes the adjunct PP and its terms, along with VP_1, inaccessible to further operations. On the other hand, under the MS approach, extraction from the adjunct will be possible: though VP_1 may be protected by VP_2, becoming inaccessible, the adjunct and its terms are accessible to further operations in the absence of cc-configurations.[24]

Moreover, notice that the free Transfer approach explains Chomsky's (2004: 117) remarks on adjuncts. As he puts it, the adjunct is attached to its host on a separate plane, with the host retaining all its properties on the "primary" plane and the adjunct not affecting the host, which is evidenced by the asymmetry between the adjunct and its host; the adjunct is syntactically de-activated (see also Chomsky 2020, 2021). To employ Bode's (2020) metaphor, in adjunction, X + Y = X. For instance, when an adverb is adjoined to VP, the derived structure will be "VP," not "AdvP" or "VP/AdvP." The adjunct is on a separate plane because it is transferred from the Workspace/derivation (the primary plane), dispatched to the interface levels (a separate plane) for interpretation and externalization, due to movement of its host so that MY can be satisfied.[25]

Given Mizuguchi's (2022b) analysis of adjunction under MERGE, adjunction argues for the free Transfer approach to MY.

The reader is referred to the said work for detailed discussion of (ii).

24 It has been noted that not all adjuncts are islands for extraction. This suggests under labeling theory that XP-YP formed out of the host and the adjunct can be labeled without the adjunct being inaccessible to further operations. For one approach, see Kim and Park (2022).

25 See Chomsky (2020), who also says that neither the host nor the adjunct is accessible. Given that the adjoined element and the host are asymmetric (as discussed, the adjunction structure is given the label of the host, which suggests that it is indeed accessible to MS), I assume that only the adjoined element is inaccessible. As Chomsky notes, things are complicated with adjunction.

5.3 Phrasal movement

In the last two sections, I have discussed two empirical cases which argue for the free Transfer approach to MY. In this section, I consider phrasal movement as one more empirical case, which poses a problem to MS, but not to free Transfer, in warranting MY.

First, consider the following example:

(34) Which book did John read?

In (34), as shown in (35), *which book* moves to Spec,CP via Spec,vP:

(35) {{which book}$_3$ {C {did {John {{which book}$_2$ {v {read {which book}$_1$}}}}}}}

In (35), *{which book}$_1$* is protected from accessibility by *{which book}$_2$*, which in turn is protected by *{which book}$_3$* because *{which book}$_3$* c-commands *{which book}$_2$*, which in turn c-commands *{which book}$_1$*. Notice, however, that the terms of *{which book}$_2$* and those of *{which book}$_1$* are not protected because MS does not apply in the absence of c-command between the terms; *which* and *book* cannot c-command out of *{which book}*, with no cc-configurations formed between *which* and *which* and between *book* and *book* in *{which book}$_3$*, *{which book}$_2$* and *{which book}$_1$*. As a result, in (35), more than one accessible item is yielded in the derived Workspace and MY is violated.

Likewise, consider remnant movement in (36) discussed in Chomsky (2021: 19):

(36) (I wonder) how likely to win John is.

In (36), as illustrated in (37), the object *{how likely John$_1$ to win}$_1$* is protected by the object *{how likely John$_3$ to win}$_2$* but *John$_3$* (for that matter, any other term) does not c-command out, hence does not protect *John$_1$*. *John$_3$* and *John$_1$* are both accessible in the derived Workspace, with the result that MY is violated:

(37) {{how likely {John$_3$ to win}}$_2$ {C {John$_2$ {is {how likely {John$_1$ to win}$_1$}}}}}

These examples argue that MY is violated when internal MERGE applies to a phrase or the object in the form {X, Y} as the terms X, Y do not c-command out.

As for examples like (34) and (36), Chomsky (2021) suggests that though MS is helpless, PIC can make lower copies inaccessible to further operations and can warrant MY: at the phase level, Transfer applies and phase complements are shipped off to the CI and SM interfaces, getting inaccessible. Since *{which book}$_1$* and *{which book}$_2$* in (35) and *John$_1$* in (37) are terms of the objects that have become inaccessible due to PIC, no violation of MY will arise.

Phrasal movement suggests that PIC is more general than MS in warranting MY. MS has trouble making inaccessible terms of the object {X, Y} in the absence of c-command relations when internal MERGE applies to it; on the other hand, PIC or free Transfer under the proposal in this paper makes a certain domain inaccessible without considering c-command relations between moved elements (including their terms) and their copies.

Briefly summarizing this section, I have provided three arguments for the proposed approach to MY, empirically endorsing the claim that the redundancy between MS and PIC is removed by free Transfer.

6. MY and A-movement

In this paper, I have argued that MY is warranted by free Transfer, which makes not only the object but also its terms inaccessible to further operations. In this section, I discuss a case of internal MERGE where both approaches to MY face a problem.

Consider the following example:

(38) (I'm sure) a student of physics will discuss the issue.

In (38), the object *{a {student {of {physics}}}}* moves from Spec,vP, its theta-marked or base position, to Spec,TP, the derived subject position, and the following object is constructed in the Workspace:

(39) {{a {student {of {physics}}}}$_2$ {T {{a {student {of {physics}}}}$_1$ {v {discuss {the {issue}}}}}}}

In (39), *{a {student {of {physics}}}}$_1$* is protected by *{a {student {of {physics}}}}$_2$* thanks to MS since the latter c-commands the former. But as discussed in 5.3, the terms of *{a {student {of {physics}}}}$_1$* cannot be protected by those of *{a {student {of {physics}}}}$_2$* in the absence of c-command relations. Furthermore, unlike in (36), PIC (Phase Theory) is also helpless in warranting MY since the movement occurs within a phase and the terms of *{a {student {of {physics}}}}$_1$* cannot be made inaccessible in the absence of a phase head. (38) thus poses a problem to the MS approach to MY.

In discussing remnant movement cases such as (36), Chomsky (2021), in his footnote 30, suggests that if remnant movement is terminal and is not subject to further operations that affect grammatical status or CI interpretation, MY will not be violated. In (38), movement of *{a {student {of {physics}}}}* terminates in Spec,TP, not subject to any further operations, thanks to which MY is not violated. This way out, however, is problematic. Recall that given MY, which is a condition on MERGE, derivations are rendered strictly Markovian and that the history is not preserved in the current stage; linguistic recursion is different from normal recursion, where history of derivations is contained in the current state. As far as MY is in place, MERGE is constrained from increasing the number of accessible items more than one, and computational resources are restricted at any point of the derivation; the operation has no choice but to introduce at most one new accessible term in the derived Workspace. In other words, MY applies to the output of MERGE.

Notice that this also casts doubt on the MS approach to MY. Recall that for Chomsky, [{Y_2, {Z, {X, Y_1}}}] is not a problem for MY because Search stops when it selects Y_2, and selection of Y_1 is blocked by Y_2, with Y_1 not accessible to further operations. Notice, however, that this is possible only when operations actually apply in the next step or apply to the input of MERGE, not when the WS is mapped to the WS′ by MERGE. As far as MY applies to the output of MERGE, MS cannot be resorted to for the satisfaction of MY, irrelevant for the purpose in question.[26]

26 Goto and Ishii (2019, 2020) propose that MY (Determinacy in their discussion) applies when operations apply in the next step. This proposal, however, impairs the strictly Markovian nature of linguistic recursion. As Chomsky (2021) argues, as far as SMT holds for organic systems, recursion in language should work in such a way as to construct the fewest possible new items accessible to subsequent operations, with MY

Now consider (38) under the free Transfer approach to MY. Under this approach, Transfer can apply to TP (or T′), leaving Spec,TP accessible to further operations:

(40) {{a {student {of {physics}}}}$_2$ {T {{a {student {of {physics}}}}$_1$ {v {discuss {the {issue}}}}}}}

In (40), the object *{a {student {of {physics}}}}$_1$* and its terms are rendered inaccessible through Transfer, with the result that MERGE satisfies MY.

Recall from section 4 that (40) will cause an interpretive problem at CI in that it is labeled incorrectly: when labeling applies to (40), MS will locate the head of the subject as the label, with the result that (40) is not interpreted as clausal (TP) but as nominal (DP). Transfer must apply to *{{a {student {of {physics}}}}$_1$ {v {discuss {the {issue}}}}}*, excluding *{a {student {of {physics}}}}$_2$* and T, in which case (40) will be labeled <ϕ, ϕ> via MS locating agreeing ϕ-features on D and T, and can be interpreted as clausal. However, as I have discussed, this mode of Transfer fails to maximize computational effects, violating efficiency principles, unless a phase head is involved.

The example (38) or A-movement (movement to Spec,TP) poses a problem to both approaches to MY: the movement will end up either with an MY violation or with incorrect labeling, which causes an interpretive problem at CI. If the discussion in the present paper is on track, it follows as a consequence of MERGE satisfying MY that internal MERGE is not involved in the derivation of A-movement. Considering that the VP-internal subject hypothesis is empirically well evidenced, with a theta role assigned to the subject VP-internally, merge of the subject directly as Spec,TP will not be a solution to the problem.

I propose that in the case of A-movement, the subject is base-generated, hence externally merged, both as Spec,vP and as Spec,TP. Consider (41):

(41) {SUB$_2$ {T {SUB$_1$ {v, VP}}}}

In the derivation of subject movement to Spec,TP like (41), the Workspace contains two SUB's (=(42a)) and MERGE maps one Workspace into another as shown in (42b-e), to finally construct (41):

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applying to the output of MERGE.

(42) a. [SUB_2, T, SUB_1, v, VP]
b. [SUB_2, T, SUB_1, {v, VP}]
c. [SUB_2, T, {SUB_1 {v, VP}}]
d. [SUB_2, {T {SUB_1 {v, VP}}}]
e. [{SUB_2 {T {SUB_1 {v, VP}}}}]

Notice that in (42), each application of MERGE satisfies MY in that the operation generates the fewest possible new items accessible to further operations, with only one accessible item added in each derived Workspace.

The two SUB's are interpreted not as distinct but as one and the same in A-movement, and the question is how this interpretation obtains without movement. The answer to this question is Stability, which requires that structurally identical elements (X ≡ X) receive the same interpretation. For instance, Stability ensures that *{the student}* in the WS (=(43a)) and the one in the WS′ (=(43b)) are interpreted in the same way: they share the same structure, hence the same interpretation:

(43) a. WS = [..., praise, {the student}]
b. WS′ = [..., {praise {the student}}]

As Freidin (2021) argues, without Stability, the relevant interpretation, which is taken for granted, would not follow.

The same thing can be said about (42e), where structurally identical elements are present in the same Workspace. Given Stability, two SUB's, which are structurally identical, will have the same interpretation and will thus be interpreted as one syntactic object, pronounced in one position (that is, SUB_1 deletes) when externalization is activated. In other words, SUB_2 and SUB_1 are copies, forming a copy pair <SUB_2, SUB_1>. With Stability in place, how (41) was generated or how SUB_2 was formed (whether by external MERGE or by internal MERGE) does not matter; a copy relation

follows independently, with or without movement.[27, 28]

I have shown that MY is not satisfied in A-movement, which suggests that internal MERGE is not involved in examples such as (38). I have argued that two structurally identical subjects are externally merged, one as Spec,vP (more generally, in vP) and the other as Spec,TP, and that the copy relation between the two is established by Stability. Chomsky (2021) argues, based on (i) the preference of internal MERGE over external MERGE and (ii) Duality of Semantics, which says that external MERGE is associated with theta roles while internal MERGE with discourse/information-related functions, that SUB_2 in A-movement will be formed by internal MERGE. However, how does the computation know the association of external MERGE with theta roles? Whether external MERGE satisfies theta roles or not is known only when the derivation is subject to CI interpretation (that is, it is checked when interpreted at the CI interface after the derivation is transferred), but not when MERGE actually applies in the derivation (see also Chomsky 2023 for relevant discussion).

As for the preference, Chomsky (2019b, 2021) argues that internal MERGE involves search only within the syntactic object in question while external MERGE involves huge search in the sense that its search space is potentially the entire lexicon. But notice that this is just preference, not a rule or principle: it only says that internal MERGE should be taken over external MERGE as much as possible, leaving room for external MERGE when internal MERGE is not possible. As I have argued, in the case of A-movement, internal MERGE is indeed not possible: it either cannot satisfy MY if we adopt the MS approach in that terms in the A-moved phrase cannot c-command out, or can satisfy the

27 Chomsky (2021) proposes the operation FormCopy (FC), which is available freely and assigns the relation Copy to certain structurally identical inscriptions: FC determines that if two X's are structurally identical and in a cc-configuration, then they must be interpreted in the same way, with one automatically deleted. Given FC, the Copy relation can be assigned to the pair <SUB_2, SUB_1>. As Freidin (2021) discusses and correctly points out, given Stability, there is no need to introduce FC or the notion of copy. As he mentions, "copies are governed by a general requirement of "Stability" where they must share the same structure and interpretation" (Freidin 2021: 13). See also Chomsky (2023) for the status of FC.

28 Chomsky (2021: 21) argues that in order to be a legitimate copy pair, it must satisfy theta theory, which requires that theta roles be assigned univocally: a single theta assigner cannot assign two theta roles to the same element. This explains why <John, John> cannot be a copy pair in (i):

(i) John saw John. (John ≠ John)

Notice that this is abided by in (41): only SUB_1 is assigned a theta role by a theta assigner, which does not assign a theta role to SUB_2. SUB_2 can form a copy pair with SUB_1, sharing a single theta role with SUB_1.

condition but causes ill-formedness at the interfaces for incorrect labeling under the free Transfer approach. Considering this, we would expect the preference not to obtain in the case of A-movement; instead, external MERGE will be in place, thanks to which MY is satisfied and the clause is labeled and interpreted correctly.[29]

In addition to this argument, A-movement without internal MERGE proposed here can give a version of the unified account to A-movement and (obligatory) Control sentences such as (44):

(44) John tries to win the game.

Traditionally, Control sentences were analyzed without movement (i.e., with PRO). Hornstein (1999, 2000), however, proposes that A-movement is involved in Control, with a controller raising to Spec,TP, arguing that A-movement and Control are derivationally equivalent. Chomsky (2021) argues that in the derivation of Control like (44), *John*$_2$ is not due to internal MERGE but by external MERGE for Duality of Semantics since *John*$_2$ and *John*$_1$ in (45) are each assigned a distinct theta role in the position in which it is merged:

(45) {John$_2$ {T {tries {to {~~John~~$_1$ {v {win {the {game}}}}}}}}}

John John

On the other hand, in A-movement cases like (46), *John*$_2$ is due to internal MERGE because it is not associated with a theta role:

(46) {John$_2$ {will {~~John~~$_1$ {v {win {the {game}}}}}}}

In both (45) and (46), FC establishes a copy relation between *John*$_2$ and *John*$_1$, forming

29 As an anonymous reviewer correctly notes, going against preference is definitely not a rule or principle, either. As discussed, however, if the derivation does not go against preference and internal MERGE is chosen for A-movement, the result is that a problem will arise either with MY (under the MS approach) or with labeling (under the free Transfer approach); on the other hand, if external MERGE is taken, no such problems will arise.

a copy pair <*John*$_2$, *John*$_1$>. For Chomsky, X_2, which forms a copy pair with X_1 via FC, are merged in two ways, which is governed by Duality of Semantics.

Given that a controller is in Spec,TP, the discussion in this paper suggests that movement is not involved in Control but that a controller and a controlee (PRO in GB) are externally merged as illustrated in (45): external merge of the subject is involved in Control as well, just as in A-movement. The proposal in this paper thus argues for the thesis that A-movement and Control are fundamentally the same, sharing the same derivational process behind the scenes. Unlike Hornstein, however, it is not movement (internal MERGE + Stability) that is relevant to the two: for the present paper, they are unified under external MERGE + Stability (for Chomsky, FC). On the other hand, as discussed, a unified analysis of A-movement and Control is not possible under Chomsky's proposal.

The external MERGE + Stability analysis of A-movement can also give an answer to the subject island (aka the Subject Condition or the other side of CED). Consider (47):

(47) a. *Who did {a picture of t} hit Bill?
b. *Who were {pictures of t} taken?

It has been argued in the literature that the subject island is due to movement: movement of the subject freezes it for extraction (e.g., Wexler and Culicover 1980; Chomsky 1986; Stepanov 2007). However, as discussed, the subject is not internally merged and does not move. Moreover, as Bošković (2018) persuasively argues, it can be concluded that movement is not the factor that causes islandhood.

I argue that the ungrammaticality follows from Stability. Recall that Stability ensures that two elements share the same structure and interpretation. The common assumption in the literature is that phases include clausal, verbal, and nominal heads (C, v, D, respectively). Then if the *wh*-phrase moves out of the subject in (47), it must first move to the edge of D since Transfer applies at the phase level, which yields the structure (48):

(48) {who$_2$ {D {picture {of {who$_1$}}}}}

Notice, however, that (48) is *not* structurally identical to the subject in the domain of vP, which is *{D {picture {of {who}}}}*:

(49) {who$_2$ {D {picture {of {who$_1$}}}}} ... {D {picture {of {who}}}}

Consequently, the subject in Spec,TP and the one in vP cannot be interpreted as one and the same through Stability; in other words, there will be no copy relation between the two subjects. In the absence of a copy relation, the former will not be properly interpreted in the absence of a theta role and FI will be violated at the interfaces.

Two subjects will not share the same structure and interpretation, either, when extraction is from the subject in vP; that is, (48) is created in the domain of vP and *{D {picture {of {who}}}}* is generated in Spec,TP. Whether extraction is from Spec,TP or from within vP, a copy relation cannot be formed through Stability between the two subjects in the absence of structural identity. The subject island follows from external MERGE + Stability.[30]

As far as the proposed analysis of A-movement is correct, it also argues for a non-movement approach to the *there*-expletive construction such as (50): the expletive, which is in Spec,TP, is externally merged in its surface position without movement (Bošković 2002):

(50) There seems to be someone in the garden.

If *there* moves to Spec,TP (as in Moro's 1997 predicate raising analysis or as in Sabel's 2000 stranding analysis), the satisfaction of MY, as I have discussed with (38), will end up with the derivation which is incorrectly labeled, ruled out by FI at CI.

I have argued that given MY, A-movement is due to external MERGE + Stability. Before leaving this section, I consider A′-movement in relation to MY. A′-movement is movement to the phase edge. This suggests that when an element is internally merged, MY can be warranted thanks to free Transfer without causing a labeling problem. To see this, once again consider *wh*-movement in (51):

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30 Needless to add, this argument applies not only to raising to subject but also to raising to object (A-movement to Spec,VP), which is observed with the ECM object (Lasnik 1999, 2001; Chomsky 2015) and with specific objects (Mahajan 1992). Extraction from specific objects, Mahajan argues, is ungrammatical, which is due to violation of Stability under the analysis proposed in this paper:

(i) a. *Who did Mary steal {that picture of t}?
b. *Who did Mary make {most movies about t}? (Mahajan 1992: 510)

(51) What will the professor recommend?

The assumption about phase heads, as argued in section 4, is that they allow themselves to be exempt from being transferred. In (51), the *wh*-phrase moves to Spec,CP via Spec,vP. Upon movement to the phase edges, TP and VP can be dispatched when Transfer applies to CP and vP since C and v are phase heads. The internal MERGE satisfies MY: Transfer makes lower *wh*-phrases and their terms inaccessible to further operations. Moreover, since phase heads can be exempt from being transferred, the object created can be labeled correctly:

(52) a. {v {recommend what}}
b. {$what_2$ {v {recommend $what_1$}}}
c. {$what_3$ {C {the professor {T {$what_2$ {v {recommend $what_1$}}}}}}}

In (52b), MS can locate the phase head and the object is labeled v thanks to movement of *what* out of Spec,vP (recall that lower copies are ignored for MS); T selects vP, with the selectional relation, hence FI, satisfied. As for (52c), thanks to the transfer of the phase complement, MS can find both C and the head of *what*, which agree in Q, and (52c) is labeled <Q, Q> through feature sharing between the two heads.

In the case of A′-movement or movement to the phase edge, thanks to phase heads, phase complements alone can be shipped off by free Transfer upon internal MERGE, which satisfies MY and at the same time can make correct labeling possible. Given the discussion in this paper, we thus get the following picture for the two types of movement: A-movement (including Control) is due to *external* MERGE + Stability while A′-movement is due to *internal* MERGE + Stability. Under the proposal here, phase-internal and cross-phrasal relations are associated uniformly with external and internal MERGE, respectively.

We have seen how internal MERGE is not an option for A-movement but how about external MERGE for A′-movement? I argue that this option is ruled out due to the preference of internal MERGE over external MERGE. Recall from Chomsky (2019b, 2021) that internal MERGE involves Search only within the syntactic object in question while external MERGE involves huge search because its search space is potentially the entire lexicon. In the case of A′-movement, the preference will obtain because thanks to phase heads, internal MERGE does not cause any problems with MY or labeling.

In this section, I have argued for a non-movement analysis of A-movement, where two structurally identical subjects are in the Workspace. As regards (42), an anonymous reviewer notes that (42d) and (5) are indistinguishable in the sense that two identical syntactic objects are in the Workspace (SUB in (42d) and *what* in (5)), wondering why (42d) is possible. Notice that (5) violates MY while (42d) does not: as for (42d), the Workspace contains two SUB's from the beginning (see (42a)) while as regards (5), the Workspace originally contains only one *what* (*what*$_1$), with the other *what* (*what*$_2$) created by MERGE; that is, (5) is the result of MERGE violating MY. To the extent that MERGE abides by MY, (5) will be impossible.

On the other hand, as for (42), it is not due to MERGE but to FS (footnote 3); MY is not violated in the generation of (42). This further suggests that determinate application of MERGE is possible as far as the Workspace is created without violating MY. This is empirically evidenced by (53), the Workspace of which originally contains identical syntactic objects *John* (*John* as the subject and *John* as the object), but mapping one Workspace into another by MERGE can proceed in a determinate manner to generate (53):

(53) John$_2$ saw John$_1$.

7. Conclusion

Provided that genuine explanation is achieved through constructing the simplest theory, we expect the grammar to be free from redundancy. In this paper, I have argued for such a theory under a more restrictive version of Merge, called MERGE. MERGE satisfies the condition that constraints mapping the WS to the WS′, called MY. Considering internal MERGE, I have pointed out the redundancy between MS and Phase Theory or PIC in warranting MY. I have claimed that the redundancy can be removed by arguing that PIC is a consequence of Transfer, which applies freely and restricts accessibility of not only a moved element but also its terms, proposing a free Transfer approach to MY. Three empirical arguments were discussed as evidence for the claim. As a consequence of the discussion, I have also argued that A-movement is due to external MERGE, not to internal MERGE, proposing that phase-internal and cross-phasal relations correspond uniformly to external and internal MERGE, respectively.

In conclusion, this paper is one illustration of the hypothesis that the simplest theory, hence genuine explanation, is possible for language, endorsing the conjecture that the Faculty of Language is perfectly designed.

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Received: 2023. 01. 05.
Revised: 2023. 03. 07.
Accepted: 2023. 03. 10.