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| Abstract | This paper proposes an alternative to Chomsky's (2021) account of PROs using the "interpretive" operation called Form Copy (FC). Given the underlying structures in (1), FC applies and assigns a copy relation to the two inscriptions of the student in each example, while the second inscription is given a null spell-out as indicated by the strikeouts.<br>(1) a. The student might expect the student to get an A (PRO structure)<br>b. The student might be expected the student to get an A (trace structure)<br>After pointing out a number of problems with this account, this paper proposes to replace FC by a copy creating operation Duplicate, and the derivations of the two examples give the structures in (2), where /X/ and are the sound and meaning of X, respectively. Crucially it is proposed that A-movement is a movement of the sound of the relevant element and the meaning is left behind in situ.<br>(2) a. /The student/ might expect /THE/ to get an A<br>b. /The student/ might be expected to get an A<br>(2a) contains two copies of , one contained in , the other represented as . The upper copy is created by Duplicate applying to the lower copy . The fact that /THE/ is spelled out as null (=PRO) is captured by the assumption that it has received Null Case from to (a la Chomsky and Lasnik (1993).<br>(2b), on the other hand, does not contain any copies, and the fact that the trace is not pronounced is simply the result of its sound having raised to SpecTP to receive Nominative Case. In other words, the alternative proposal claims, pace Chomsky, that there is no significant parallelism between (1a) and (1b). |

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# An Alternative to Chomsky's (2021) "Form Copy" Account of PRO*

Shigeo TONOIKE

**Abstract**

This paper proposes an alternative to Chomsky's (2021) account of PROs using the "interpretive" operation called Form Copy (FC). Given the underlying structures in (1), FC applies and assigns a copy relation to the two inscriptions of *the student* in each example, while the second inscription is given a null spell-out as indicated by the strikeouts.

(1) a. The student might expect ~~the student~~ to get an A (PRO structure)
b. The student might be expected ~~the student~~ to get an A (trace structure)

After pointing out a number of problems with this account, this paper proposes to replace FC by a copy creating operation Duplicate, and the derivations of the two examples give the structures in (2), where /X/ and <X> are the sound and meaning of X, respectively. Crucially it is proposed that A-movement is a movement of the sound of the relevant element and the meaning is left behind in situ.

(2) a. /The student/ might <the student> expect /THE/ to <THE> get an A
b. /The student/ might be expected to <the student> get an A

(2a) contains two copies of <*the*>, one contained in <*the student*>, the other represented as <*THE*>. The upper copy <*the*> is created by Duplicate applying to the lower copy <*THE*>. The fact that /*THE*/ is spelled out as null (=PRO) is captured by the assumption that it has received Null Case from to (a la Chomsky and Lasnik (1993).

(2b), on the other hand, does not contain any copies, and the fact that the trace is not pronounced is simply the result of its sound having raised to SpecTP to receive Nominative Case. In other words, the alternative proposal claims, pace Chomsky, that there is no significant parallelism between (1a) and (1b).

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## 1. Introduction: A Bit of Background

In early years of generative grammar, sentences like (1a) containing a so-called "understood subject", are derived from a deep structure like (1b) by a rule called Equi-NP Deletion, giving a surface structure like (1c), where the strikeout indicates that the phonetic material is deleted.

(1) a. The student expects[1] to get an A.
b. The student expects the student to get an A.
c. The student expects ~~the student~~ to get an A.

This analysis was abandoned because, as noted by Chomsky (2021), it incorrectly predicts that (2a) means something similar to (2b), whereas in fact it means something similar to (2c).

(2) a. Many students expect to get an A.
b. ≠Many students expect that many students will get an A.
c. =Many students expect that they will get an A.

During the GB period, the understood subject was reanalyzed as a null syntactic element referred to as PRO (big PRO) with two mutually conflicting features [+Anaphor] and [-Pronominal] under the GB framework with Binding Conditions A and B in (3).

(3) Condition A: Anaphors are bound in their governing categories.
Condition B: Pronominals are free in their governing categories.
(4) a. The student expected himself to get an A.
b. The student expects that he will get an A.
c. The student expects PRO to get an A.

Anaphors like *himself* in (4a) obey Condition A, and pronominals like *he* in (4b) obey Condition B. PRO in (4c), being both an anaphor and a pronominal at the same

1 Chomsky (2021) uses examples with *try*. But we will use *expect* because of expository convenience coming from the fact that it allows not only a control complement but also an ECM complement and a *that* clause complement.

time have to obey both conditions. The only way they can avoid violating them is by lacking a governing category. From this follows the famous PRO Theorem: PROs are not governed. Because the Binding Conditions do not regulate them, a new regulatory theory for PRO was called for and Control Theory was created. But that was not a completely satisfying situation because there were two modules, Binding Theory and Control Theory.

Two proposals were made that would resolve this problem. One is that of Chomsky and Lasnik (1993), who proposed to incorporate PRO in Binding Theory, ascribing the phonetic emptiness of PRO to the Case, referred to as Null Case, assigned by the infinitival *to*.

Hornstein (2001), on the other hand, noting the locality parallelism between PRO and trace, proposed a Movement Theory of PRO. The problem with this proposal, as again pointed out by Chomsky (2021), was that it incurred violation of θ-Criterion in (5). Therefore, it required some revision of the criterion

(5) θ-Criterion (Chomsky (1981: 31).
Each argument bears one and only one θ-role, and each θ-role is assigned to one and only one argument.

With this situation in the background, Chomsky (2021) proposes a new account of PRO with his proposed operation Form Copy (henceforth FC), given informally in (6).

(6) If X c-commands Y and X and Y are structurally identical, then assign a copy relation to X and Y and delete the phonetic shape of Y.

Given (7a) (in a somewhat simplified set-theoretic notation), where two "inscriptions" *the student* and *the student* are introduced by External Merge (EM), FC gives (7b) as an output, where the copy relation is represented by co-indexing for expository purpose and strikeout indicates deletion of the phonetic shape. The second inscription is what has been referred to as PRO.

(7) a. {the student, {expects, {the student, {to get an A}}}}
b. {the student$_i$, {expects, {~~the student$_i$~~, {to get an A}}}}

The two inscriptions have separate θ-roles assigned by *expect* and *get*. This is due to what Chomsky refers to as Duality of Semantics cited below. Both inscriptions enter the derivation by EM, and therefore they have distinct θ-roles.

(8) Duality of Semantics (Chomsky 2021:18)
EM is associated with θ-roles and IM with discourse/information-related function.

Compare the derivation in (7) with that in (9). (9b) is derived from (9a) by Internal Merge (IM). Therefore, due to Duality of Semantics, the first inscription does not have a θ-role. The second copy ~~*the student,*~~ is what has traditionally been referred to as a trace.

(9) a. {seems, {the student, {to need an A}}}
b. {the student, {seems, {the student, {to need an A}}}}
c. {the studenti, {seems, {the ~~*studenti*~~ {to need an A}}}}}

Chomsky assumes/proposes that derivations are Markovian.

(10) Markovian principle of derivation (Chomsky 2021:16)
The next step doesn't have access to the history.

Because of this Markovian property, the two inscriptions of *the student* in (7b) and those in (9b) are indistinguishable to FC. FC therefore can apply to the two inscriptions in (9b), giving (9c).

Thus, the similarity and difference between PROs and traces fall out automatically. Chomsky says that this is an enabling function of S(strong) M(inimalist) T(hesis) (Chomsky 2021: 24).

This proposal can be viewed as a modern version of Equi-NP Deletion. Therefore, the problem of quantified controller in (2a) persists. Chomsky (2021) says that it does not arise because the derivation does not stop at (11c) but goes on to (11d) at/before the C-I interface.

(11) a. Many students expect to get an A.
b. {expect, {many students, {to get an A}}}

c. {many students$_i$ {expect, {~~many students$_i$~~, {to get an A}}}}

d. for many students x expect x to get an A

## 2. Problems with the FC Account.

Though it is claimed that the FC account of obligatory control PRO is an example of the enabling function of SMT we see a number of problems with it.

### 2.1. Derivational Complexity

Compare the three examples in (12). The FC account predicts that the derivation of (12a), an obligatory control structure, is more costly than that of the trace structures (12b), or the one with a complement clause containing a pronominal in (12c). The derivation of (12a) involves formation of the inscription *the student* by EM twice, whereas in the derivations of (12b-c), formation of *the student* by EM applies only once, and the "copy" is created by IM, or EM of a pronoun.

(12) a. The student expects to get an A.

b. The student is expected to get an A.

c. The student expects that he will get an A.

The difference is small when the syntactic object (SO) in question is small as in (12). But the SO can contain a relative clause as shown by brackets in (13) and there is no limit to the size of the relative clause. If cost of building an SO can be measured by the number of EM applications involved, the cost of building (13a) becomes increasingly close to double that of building (13b-c).[2] (13a) and (13c) mean basically the same thing, and there is no evidence to suggest that the cost of building the former is much greater than that of building the latter.

(13) a. The student [that ...] expects to get an A.

b. The student [that ...] is expected to get an A.

c. The student [that ...] expects that he will get an A.

2 For instance, the SO in question can be as long as (i).

(i) the student that you say you thought that one of his professors believes that his class mates were saying ... that they believe t to have cheated in the exam

**2.2. Lack of a Unifying Theory of Control=PRO,**

Another problem is the lack of a unifying theory of control. It is well-known that there are other types of understood subjects, namely PRO of non-obligatory control as exemplified in (14a), as well as PRO of arbitrary reference as exemplified in (14b).

(14) a. The student worked hard [PRO to get an A.] (Non-obligatory control)
b. [PRO to see] is [PRO to believe]. (Arbitrary reference)

Since PROs and their controllers are not in c-command configurations in these examples, the FC account has nothing to say about them. A unified account of PROs is clearly called for.

**2.3. Lack of a Unified Account of Coreference**

Furthermore, the following three examples mean basically the same thing. Therefore, the coreference relations between the matrix subject *the student* and PRO, *himself*, and *he* call for a unified treatment. The FC account has nothing to say about (15b-c).[3]

(15) a. The student expects PRO to get an A
b. The student expects himself to get an A
c. The student expects that he will get an A

**2.4. Problem with Quantified Controller: Inclusiveness Condition violation**

We saw above that the problem with quantified controllers like *many students* does not arise because an operator-variable construction (OVC) is introduced, eliminating the second occurrence of the quantifier. However, the introduction of a variable in (11d) runs afoul of the Inclusiveness Condition of Chomsky (1995) because variables are not a(n arrangement of a) lexical feature. In other words, variables don't exist as such in the Lexicon,

(16) Inclusiveness Condition:
The interface levels consist of nothing more than arrangement of lexical features. (Chomsky 1995: 225)

3 Chomsky (2021) notes that reflexives and pronominals undergo an FC like interpretation at the C-I interface. But that is not a unified account.

Needless to say, introduction of a variable by Variable Insertion a la Fox (2002) violates the Inclusiveness Condition. Therefore, it has to be shown how the variable in (11d) gets generated there without violating the condition.

**2.5. Overgeneration**

Chomsky et al (2023: 32 Note 85) note that FC is optional and that the following examples are generated incorrectly by narrow syntax.

(17) a. *John tried Mary to win
b. *John tried John to win

They say that these are "potentially SM-blocked but CI convergent derivations" but it is necessary to show how exactly they are SM-blocked.

**2.6. PRO Generalization:**

All "understood subjects" lack their phonetic shapes, needless to say. If they are all PROs, they all lack a phonetic shape regardless of whether they are obligatory control PROs, non-obligatory control PROs or PRO of arbitrary reference, as shown in (18).

(18) a. The student worked hard PRO to get an A. (Non-obligatory control)
b. PRO To see is PRO to believe (Arbitrary reference)

The fact that PROs other than obligatory control PROs also lack phonetic shape is left unaccounted for.

**2.7. What Exactly Are Copies?**

The most serious problem with the FC account in our view is what counts as copies. According to Chomsky the two underlined parts are copies in both (19a) and (19b). They are different from each other in that the second inscriptions lack a phonetic shape. But that is the effect of FC and should be ignored in copy relation. However, there is another important difference. In (19a), both inscriptions each have a θ-role, whereas in (19b), only the second inscription has a θ-role, and the first inscription lack a θ-role. In that sense the two inscriptions are not identical.

(19) a. The student expects ~~the student~~ to get an A.
+θ +θ

b. The student is expected ~~the student~~ to get an A.
-θ +q

The mixed nature of the alleged copies become more blatant when the derivation of examples like (20a) is examined in detail. (Here the superscripts are to distinguish different copies.)

(20) a. The student will expect to get an A

b. {the student[1], {will, {the student[2], {expect, {(the student[3]), {to, {the student[4], {get an A}}}}}}}}

c. {the student$_i$[1], {will, {~~the student~~$_i$[2], {expect, {(~~the student~~$_i$[3]), {to, {~~the student~~$_i$[4], {get an A}}}}}}}}

d. {-θ, {+θ, {-θ, {+θ}}}}

(20a) will have to be analyzed to have the structure in (20c). Ignore the SO in parenthesis for the time being. The SO *the student*[2] is generated as the subject of *expect*, and IM applies to it and creates *the student*[1] in Spec *will*, giving rise to three identical inscriptions. If IM applies to *the student*[4], it creates another inscription *the student*[3] and there are four identical inscriptions. FC applies to the three pairs of inscriptions, and gives (20c). Schematically (20c) can be represented as (20d).

The question at this point is: Are all the inscriptions in (20c) copies? Clearly, two elements must be treated as copies even though their phonetic shape are different with different θ-roles. So, suppose we ignore the phonetic shapes of the relevant inscriptions and their difference in θ-roles. The question then boils down to whether inscriptions are copies even if they differ in the existence/absence of a θ-role. Of the four inscriptions, the first and the third lack a θ-role, and the second and the fourth have a θ-role. The former do not contribute to the argument structure of the predicates, and the latter do. There seems to be something seriously wrong in treating them as equally copies.

Another way to look at them is to see whether they satisfy θ-criterion. The second and the fourth have a θ-role and satisfy the criterion. If all copies have the same property, the first and the third (if it exists) violate the criterion. Therefore, just like in the case of Hornstein's movement analysis of PRO, θ-criterion must be

modified to accommodate the offending instances.

In the following section we will present an alternative treatment of understood subjects that overcomes these problems.

## 3. Proposal: D-based Analysis

Basically following and expanding on Tonoike's (2018, 2019) proposal, we propose an alternative account of PROs.

To lay a groundwork for the new proposal, we first make five assumptions regarding 1) copy creation, 2) how the work space (WS) is formed, 3) a crucial role that D(eterminers)s play in copy relations, 4) the nature of A-movement and 5) Case property of PRO.

### 3.1. Privileged Status of D and Proposed Operation Duplicate

We propose to replace Chomsky's "interpretive" operation of Form Copy by an operation of creating a copy, call it Duplicate, which applies to an element in the work space (WS). For instance, given an SO X as in (21a), Duplicate creates (21b). More specifically, given *THE* in WS in (22a), Duplicate creates (22b). ([...] indicates WS.) We assume furthermore, that copy relation created by Duplicate is the only source of coreference within a clause.[4]

(21) a. [... X ...] Duplicate-->
b. [... $\{X_i, X_i\}$ ...] (or [... $X_i^2$ ...])
(22) a. [... THE ...]
b. [... $THE_i^2$ ...]

Duplicate can apply freely, but we also assume that some element can act as a "probe" triggering its application. As noted by Helke (1970), the subject of such idioms as "crane one's neck" has to be coreferential with the possessive. This can be captured by assuming that these verbs have a feature, call it [+Duplicate] for obvious reasons, and act as a probe and must locate an appropriate candidate for its subject. In the following illustration, THE is assumed to be [3rd person, Masculine, Singular] and

4 For coreference in discourse as in the following example, see Tonoike (2018, 2019).
(i) A: How is your father?
B: He's doing well.

*crane* has [+Duplicate].

(23) a. The$_i$ man craned his$_i$/*her$_j$ neck.
b. [man {craned, {THE's, neck}}][5] Duplicate -->
c. [man, THE$_i$, {craned, {THE$_i$'s neck}}]
d. {{THE$_i$, man}, {craned {THE$_i$'s, neck}}}

In (23b), the feature [+Duplicate] requires Duplicate to apply, placing a copy in WS, which results in (23c). (As we see directly below, the placement of *THE$_i$* in WS is done by a separate operation, SELECT.) *THE$_i$* and *man* undergo EM, and the resulting SO gets EM-ed as the subject of *crane*. THE$_i$'s, with its Genitive Case, is spelled out as *his*.

Tonoike (2019) proposes similar treatment for reflexive examples like (24a), referring to [+Duplicate] as [+Anaphor]. Duplicate and two applications of EM derive (24c) from (24b).

(24) a. The man shaved himself.
b. [man, {shaved, {THE's, self}}]
c. {{THE$_i$, man}, {shaved, {THE$_i$'s, self}}}

*THE's self* in this case is spelled out, not as the expected *hisself* but as *himself* by a low-level morphological rule.

### 3.2. SELECT

In the early years of minimalism, it was assumed that lexical items are taken out of the Lexicon in the beginning of a derivation by the operation dubbed Select. However, Chomsky et al (2023:2) propose that "lexical items are drawn as needed from the Lexicon". This makes sense because that will reduce the amount of excess baggage that must be carried along. We call this new selection operation SELECT.

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5 This is a simplified structure. According to Tonoike (2018, 2019) the structure is more complex. A noun phrase *the man's neck* for instance has the structure in (i)

(i) [$_{DP}$ THE [$_{NumP}$ THE man's [Num [$_{NP}$ neck]]]

The outer *THE*, though spelled out as null, heads the whole DP, and *THE man('s)* is in Spec of Number Phrase, whose head takes an N as its complement and assigns Genitive Case to its Spec.

### 3.3. SELECT from WS

It is assumed currently that IM is less costly than EM, because the former accesses an element already available in the SO that it is applying to, rather than applying to two elements taken out of the Lexicon. It is natural, then, to assume that selection from an SO in WS is allowed and is less costly than selection from the Lexicon. Furthermore, since it is desirable to reduce excess baggage as much as possible, we assume that SELECT applies only when it is needed. Needless to say SELECT can apply only to accessible elements.

(25) SELECT by phase

Lexical items, are taken out onto WS either from the Lexicon or from an OS already in WS.[6]

### 3.4. Coreference as D Copies

Tonoike (2018, 2019) proposes, following Postal (1966), that pronouns are Ds. Following Tonoike (2018, 2019), we assume that all NPs are headed by a D, whether it is spelled out as overt or null, and the coreference between them is captured by the identity of the Ds heading them. For instance, the coreference between *the student* and *he* in (26a) is captured by the identity of Ds involved in the derivation in (26b) through (26f). [ ] indicates WS. We use THE to represent a 3rd person, masculine, singular D.

(26) a. The student thinks that he is a genius.

b. [{that {THE is a genius}}] Duplicate -->

c. [{that, {$THE_i^2$ is a genius}}] SELECT from WS, SELECT from the Lexicon-->

d [think, student, $THE_i$, {that, {$THE_i$ is a genius}}] EM-->

e. {{$THE_i$, student}, {think, {that, {$THE_i$ is a genius}}}}

In (26b), SO *{that THE is a genius}* has already been formed, and before the phase is transferred, Duplicate can apply to THE, creating two copies as in (26c). Before the CP is transferred, SELECT takes $THE_i$ and places it on WS. Moving to the next phase, SELECT picks *think* and *student* from the Lexicon and add them to WS, giving (26d).

6 When a lexical item X is needed to be merged with some other element Y in WS, X is taken out on to WS first and then X and Y are EM-ed. This is in accordance with the Duality of Semantics. But if Duality of Semantics can be defined as resulting from merge with a theta-assigner, X can be EM-ed directly without Y being placed on WS.

Now *think* is EM-ed, then $THE_i$ and *student* are EM-ed, and the resulting SO is EM-ed, giving (26e). (Notice that the effect of A-movement is suppressed for simplicity.) $THE_i$ in the complement clause is spelled out as *he* with Nominative Case. The other copy with a complement NP is spelled out as *the*. The copy relation captures the coreference between *the student* and *he*. We will come back to the details of how Case is assigned and determines the phonetic shapes of the pronouns below.[7]

### 3.5. A-Movement as IM of the sound for Case

Again, following Tonoike (2018, 2019), we assume that in A-Movement, the sound of an SO, X, which we represent as /X/, can be separated from its meaning, which we represent as <X>, and undergo IM to get Case assigned and have its phonetic shape determined. (27a), for instance, is derived from (27b) by IM of the /THE/ to Spec of *has*, leaving its meaning <THE> behind.[8]

(27) a. He has gotten an A.
b. {has, {THE, {gotten, {an, A}}}}
c. {/THE/, {has, {<THE>, {gotten, {an, A}}}}}
Case θ

If /THE/ has [3rd person, masculine, singular], it is spelled out as *he* with Nominative Case assigned by *has*. The end result is very similar to what was once referred to as a chain, /THE/ being the head and <THE> being the tail of the chain, but a crucial difference is that here /THE/ and <THE> are completely different. What matters semantically is <THE> and /THE/ is simply the location where it is pronounced. Since there is only one semantic element, there is only one copy, <THE>.

### 3.6. Case

Following Chomsky and Lasnik (1993), we assume that all PROs (those contained in

7 Duplicate and SELECT of $THE_i$ is needed due to the fact that *think* is going to need a subject. However, since the following derivation is possible, with $THE_i$ merged in a higher phase, it must be assumed that the SELECT-ed element need not be merged in the next higher phase, but can be further SELECT-ed into a higher phase WS.

(i) $The_i$ student says that the professor thinks that hei is a genius.

8 To be more precise, /X/ represents the morpho-phonological code of X, which will be realized as a phonetic shape when an appropriate Case feature value is assigned.

an infinitival clause) bear Null Case assigned by the infinitival *to*,[9] and that a DP with null Case is spelled out as null.

### 3.7. Sample Derivations

#### 3.7.1. Obligatory Control PRO

Given the above assumptions, the derivation of a PRO example in (28a) proceeds as shown. We assume that *expect*, when used as an obligatory control verb, has the feature +[Duplicate] just like *crane*, which forces duplication of a closest relevant lexical item. (For simplicity, we omit { } around /.../ and <...>.)

(28) a. The student expects to get an A.

b. [Pres, expect, student, to, [{$_{v*P}$ THE, {get, {an, A}}}]] Duplicate -->

c. [Pres, expect, student, to, {$THE_i^2$, {get, {an, A}}}] SELECT-->

d. [Pres, expect, student, to, $THE_i$, {$THE_i$, {get, {an, A}}}] EM (to) -->

e. [Pres, expect, student, $THE_i$, {to, {$THE_i$, {get, {an, A}}}}] IM (/$THE_i$/)-->

f. [Pres, expect, student, $THE_i$, {/$THE_i$/, {to, {<$THE_i$>, {get, {an, A}}}}}] EM-->

g. [{Pres, {{$THE_{i,}$, student}, {expect, {/$THE_i$/, {to, {<$THE_i$>, {get, {an, A}}}}}}}}] IM-->

h. [{/$THE_{i,}$, student/, {Pres, {<$THE_{i,}$, student>, {expect, {/$THE_i$/, {to, {<$THE_i$>, {get, {an, A}}}}}}}}}] Nom θ Null θ

i. C-I: {Pres, {{$THE_{i,}$ student}, {expect, {to, {$THE_i$, {get, {an, A}}}}}}}

j. S-M: /THE, student expects, to, get, an, A/

(28b) represents the WS at the stage where *{*THE *get an A}* is formed. Driven by the need of *expect* to have a subject, Duplicate applies to *THE*, creating two copies with the same subscript as in (28c). SELECT places one copy out onto the next higher WS, giving (28d). After EM of *to*, giving (28e), the sound of the complement subject /*$THE_i$*/ raises to Spec of *to*, giving (28f). Notice here that we are assuming that this operation, A-Movement in traditional terms, does not leave a copy. The only thing that

9 PROs in gerundive clauses will have Null Case assigned by an abstract gerundive head. We will also assume, as was assumed standardly before, that Nominative Case is assigned by a finite Tense and accusative Case is assigned by a transitive (light) verb.

is left behind is the meaning "copy" <$THE_i$>. /$THE_i$/ gets Null Case from *to*. At (28f), first *expect* is EM-ed with the infinitival clause, then $THE_i$ and *student* are EM-ed, and the result is EM-ed in the subject position of *expect*, giving (28g), where Pres is EM-ed and /$THE_i$ student/ is IM-ed and receives Nominative Case from Pres, giving (28h). When the sound is "peeled off", we get the C-I representation in (28i) and the S-M representation in (28j). A copy relation holds only between the two inscriptions $THE_i$ in (28h), and there is no copy relationship between /THE/ and <THE>.[10]

Notice that this explains the fact that PRO is obligatorily controlled by the matrix subject: the matrix verb requires Duplicate to apply, making a copy of THE, and the only thing that can be EM-ed as the subject of *expect* is a DP headed by this copy $THE_i$.[11] When there is an extra copy $THE_i$ in WS, economy prohibits SELECT from taking another D from the lexicon.

The proposed Duplicate account has no role to play in the derivation of an A-movement trace example in (29a) or (30a). They are derived from the structures in (29b) and (30b), respectively, by IM of /the student/ leaving <the student> behind.

(29) a. The student seems to need an A
b. {seems, {to, {the student need an A}}}
c. {/the student/, {seems, {to, {<the student> need an A}}}}
Nom θ

(30) a. The student is expected to get an A
b. {is expected, {to, {{the, student}, {get an A}}}}
c. {/the student/, {is expected, {to, {<the, student>, {get an A}}}}
Nom θ

We assume that the infinitival *to* can but does not have to assign Null Case. The Case-less sound /*the student*/ moves directly to a position where it can receive Nominative Case. There is only one argument with a θ-role, namely <the student> and no copy relation has been established.

10 Needless to say, here and below as well, if any of these operations fails to apply, the derivation will crash. So there is no need to stipulate all this.

11 Here we are assuming, with Chomsky (2021), that the infinitival complement does not constitute a phase. If the infinitival complement constitutes a phase as Landau (2024) claims, then the obligatory control nature must be accounted for by some other means.

### 3.7.2. Non-obligatory Control PROs

Non-obligatory control PROs as exemplified in (31a) are generated as shown in (31b-e).

(31) a. The student worked hard [PRO to get an A].
b [student, worked hard, [to, {THE get an A}]] Duplicate, SELECT--->
c. [student, worked hard, $THE_i$, [to, {$THE_i$, {get an A}] EM (*to*), IM (/$THE_i$/)-->
d. [student, worked hard, $THE_i$, {/$THE_i$/ {to, {<$THE_i$> get an A}}}] EM-->
e. [{{$THE_i$, student}, {worked hard}}, {/$THE_i$/, {to, {<$THE_i$>, {get an A}}}}] EM (adjunction)
f. {{{$THE_i$, student}, {worked hard}}, {/$THE_i$/, {to, {<$THE_i$>, {get an A}}}}}}

Before the infinitival phase is transferred, Duplicate and SELECT apply to $THE_i$ and place in it WS, giving (31c) after EM of *to*. IM of /$THE_i$/ applies, giving (31d). Null Case is assigned to /$THE_i$/, accounting for its null spell-out. EM applies to *work*, *hard*, $THE_i$, and *student*, giving the matrix clause in (31e). (Further application of IM (A-movement) is omitted here.), (31f) is derived from (31e) by adjoining the infinitival clause to the matrix clause.

### 3.7.3. Split Antecedent

The fact that non-obligatory control PROs can have split antecedents falls out automatically under the proposed account. Consider the following derivation. It is assumed that the two Ds are distinct in their gender specifications: [masculine] and [feminine].

(32) a. He sat down with her to make plans for their honeymoon.
b. [sat down, with, [{to, {{$THE_i$, $THE_j$}[2] make plans for their honeymoon}}]]
c. [sat down, with, $THE_i$, $THE_j$, [{to, {{$THE_i$, $THE_j$} make plans for their honeymoon}}]]
d. [sat down, with, $THE_i$, $THE_j$, [{/$THE_i$, $THE_j$/, {to, {<$THE_i$, $THE_j$> make plans for their honeymoon}}}]]
e. {$THE_i$, {sat down, {with, $THE_j$}}}, {/$THE_i$, $THE_j$ /, {to, {<$THE_i$, $THE_j$> make plans for their honeymoon}}}

Notice that in (32b) the subject of the embedded clause is a set consisting of two Ds, and it has undergone Duplicate. SELECT takes each of the two Ds separately onto

WS, giving (32c). The sound of the subject /$THE_i$, $THE_j$/ undergoes IM to Spec of to. In the next phase, $THE_j$ undergoes EM with *with*, and the resulting SO is EM-ed with *sat down* and the resulting SO is further EM-ed with $THE_i$, giving (32e). (The rest of the derivation is omitted.) /$THE_i$, $THE_j$/ with Null Case assigned by *to* is spelled out as null (PRO).

### 3.7.4. Operator-Variable Construction: In-situ O-V Construction

Again following Tonoike (2018, 2019), we will assume that OVCs hold in situ, without a recourse to covert operations like Quantifier Raising originally proposed by May (1977, 1985) or a more recent version proposed by Fox (2002). Consider a simple example like (33a), which is analyzed to have the structure in (33b) after IM of the sound of the subject. In the meaning part of the subject <*all the boys*>, all the three ingredients of an OVC, namely the operator=quantifier *all*, the variable, *the*, and the restriction *boys* are present, if it is assumed that a D can act as a variable when it is in construction with an operator. If that is on the right track, then OVCs contained in (34), with no overt D, can be analyzed to contain a D, if it is assumed that a D is spelled out as null when in construction with quantifiers like *every*, *some*, *any*, and *no*. This is indicated by strikeout in (34b).

(33) a. All the boys will leave.
b. {/all the boys/, {will, {<all the boys>, leave}}}
O-V-R(estriction)

(34) a. Every boy will leave.
b. {/every ~~the~~ boy/, {will, {<every the boy>, leave}}}
O-V-R

Under this account of OVCs, (2a), the problematic example under the Equi-NP Deletion account, poses no problem.

(35) a. Many students expected to get an A (=2a)
b. [Pres, many, students, expect, {to, {THE get an A}}] Duplicate, SELECCT -->
c. [Pres, many, students, expect, $THE_i$, {to, {$THE_i$ get an A}}] IM (/THEi/)-->
d. [Pres, many, students, expect, $THE_i$, {/$THE_i$/, {to, {<$THE_i$> get an A}}}]
e. [Pres, many, students, $THE_i$, {expect, {/$THE_i$/ {to, {<$THE_i$> get an A}}}}]
EM-->

f. [Pres, {{many THE$_i$ students}, {expect, {/THE$_i$/, {to, {<THE$_i$> get an A}}}}}]
IM-->

g. {/many THE$_i$ students/, {Pres, {<many THE$_i$ students>, {expect, {/THE$_i$/, {to,
O-V-R V
{<THE$_i$> get an A}}}}}}}

The subject of *get an A* inside the complement clause need not be a full DP *like many (THE) students* and be *only THE*, as in (35b), hence by economy it must be *THE*. The derivation proceeds just as in (26) except that *many* is EM-ed to *THE$_i$ students* in (35f). This gives the desired structure where there is one operator *many* and it binds two variables, namely two copies of THE$_i$ in (35g).

### 3.7.5. PRO of Arbitrary Reference

Let us turn to PRO of arbitrary reference. Following the insight of Epstein (1984), we assume that PRO of arbitrary reference is a null version of *anyone*, which we represent as ANY-THE-ONE where ANY is a quantifier corresponding to *any*, THE the definite determiner functioning as a variable and ONE is a restriction denoting a person. (36a) is derived from the partially constructed structure in (36b), where Duplicate and SELECT apply to give (36c). A-Movement of *THE$_i$* gives (36d). A series of EMs builds another infinitival clause as shown in (36e), and A-Movement gives three SOs in (36f). EM of the three SOs gives (36g). The quantifier <*ANY*> binds the two variables <*THE$_i$*>s.

(36) a. To see is to believe. (ANY-THE-ONE=anyone; one=person)

b. [ANY, ONE, to, see, is, {to, {THE, believe}}] Duplicate, SELECT -->

c. [ANY, ONE, to, see, is, THE$_i$, {to, {THE$_i$, believe}}] A-Movement-->

d. [ANY, ONE, to, see, is, THE$_i$, {/*THE$_i$*/, {to, {<THE$_i$>, believe}}}] EM etc.-->

e. [{to, {{ANY, {THE$_i$, {ONE}}}, {see}}}, is, {/THE$_i$/ {to, {<THE>$_i$,
believe}}}] A-Movement-->

f. {/ANY, {THE$_i$, ONE}/, {to, {<ANY, {THE$_i$, ONE}>, see}}}, is, {/THE$_i$/,
{to, {<THE>$_i$, believe}}}] EM-->

g. {{/ANY, {THE$_i$, ONE}/, {to, <ANY, {THE$_i$, ONE}>, see}}}, {is, {/THE$_i$/,
Null O V R Null
{to, {<THE$_i$>, believe}}}}
V

### 3.7.6. Pronouns

Now compare the obligatory control example (1a) with (37a) with essentially the same interpretation. This example can be derived from the structure in (37b), where the complement *that* clause has already been formed. *THE* here is assumed to be [3rd person, Sigular, Masculine].

(37) a. The student expects that he will get an A

b. [student, expects, [that, {will, {THE, {win, {the, race}}}}]] Duplicate -->

c. [student, expects, [that, {will, {$THE_i^2$, {win, {the, race}}}}]] A-Movement-->

d. [student, expects, that, {/$THE_i$/, {will, {<$THE_i$>, $THE_i$, {win, {the, race}}}}}] SELECT+EM-->

e. [student, $THE_i$, {expects, {that, {/$THE_i$/, {will, {<$THE_i$>, {win, {the, race}}}}}}}] EM-->

f. {{$THE_i$, student}, {expects, {that, {/$THE_i$/, {will, {<$THE_i$>, {win, {the, race}}}}}}}}

(The last steps leading to A-Movement of the matrix subject are omitted.) /$THE_i$/ with [Nom] gets spelled out as *he*. The copy relation captures the coreference relation between *the student* and *he*.

From this demonstration, it has turned out that all cases of coreference can be reduced to copy relation created by Duplicate.

## 4 Problems of the FC Account Solved

In this section we will see how the problems with Chomsky's (2021) FC account are solved in the proposed new account.

### 4.1. Derivational Complexity Problem

The problem of derivational complexity does not arise in the proposed account because the obligatory control structure does not require two "structurally identical" NPs (or DPs) as seen in the derivation in (28). All the three structures in (38) involve the structure building process of the underline part only once. Therefore, there is no substantive difference between (38a) and (38b) as well as (38c).

(38) a. <u>THE student that ...</u> expects THE to get an A

b. /THE student that ... /is expected <<u>THE student that ... ></u>to get an A

c. THE student that ... expects that THE will get an A

**4.2. Lack of a Unifying Theory of Control**

The proposed alternative account gives a unifying theory of PROs. The lack of a phonetic shape in all PROs is due to the Null Case assigned by the infinitival *to*. In fact, obligatory control PROs are like reflexives in that duplication is forced by the feature [+Duplicate], whereas non-obligatory control PROs are like pronominals in that they come about by free application of Duplicate. The two kinds of PROs, however, share the same property of having Null Case assigned by the infinitival *to*. This captures the insight of GB theory that PROs are both [+anaphor] and [+pronominal].

**4.3. Lack of a Unified Account of Coreference**

The problem of lack of unified account of coreference in Chomsky's account is solved in the proposed account because as far as clause-internal coreference is concerned, coreference, be it with PROs (of obligatory control as well as non-obligatory control), pronouns or reflexives, is all reduced to copy relations resulting from the application of Duplicate. Copies are created by Duplicate, and nothing else.

**4.4. Inclusiveness Condition Violation**

No violation of the Inclusiveness Condition occurs in the proposed analysis, because variables are Ds in association with an operator, hence do not need to be introduced in the course of derivation. It is not necessary to delete a quantifier and introduce a variable. because in the proposed account the quantifier can only be added to a higher copy.

**4.5. Overgeneration.**

The problem of overgeneration does not occur in the proposed analysis because the examples in (39) are excluded due to the fact that there is no element that assigns Case to *Mary* and *John* and warrants their phonetic shapes. In other words, they are assigned Null Case and hence cannot have an overt spell out.

(39) a. *John tried Mary to win
b. *John tried John to win

Furthermore, we must assume that the verb *try* has the feature [+Duplicate]. Therefore,

it cannot have a matrix subject distinct from the complement subject. This provides an account of how they are SM-blocked: being null they should not be pronounceable.[12]

### 4.6. PRO Generalization:

The generalization that all instances of PROs lack a phonetic shape is an automatic consequence of the fact that the relevant infinitival *to* assigns Null Case. Chomsky's FC account treats the uniform null property as an accidental fact about PROs. The choice seems obvious.

### 4.7. Uniform Nature of Copy Relations

In Chomsky's account, both a PRO and its antecedent and a trace of A-movement and its antecedent are treated as copies. But if our proposal about A-movement being IM of the sound of the affected SO is correct, then a PRO and its antecedent are copies in the sense that the D of the antecedent is the copy of the D that is realized as PRO, but such a copy relationship does not hold between an A-Movement trace and its antecedent. The A-movement antecedent consists of nothing but the sound of the moved element.[13] In other words, the alleged enabling function of SMT treating PROs and traces in the same way is a spurious generalization.

## 5. Concluding Remark

As an alternative to Chomsky's account of obligatory control PROs and traces using Form Copy as a putative enabling function of SMT, we proposed that the derivation of (obligatory control) PROs and that of traces have nothing in common except the fact that they both involve construction of the subject NP(DP). More specifically, we have proposed that there is a true operation of creating copies, namely Duplicate, and that it applies to a D in WS, and it is the (sole) source of coreference among DPs, and that the lack of a phonetic shape of PRO comes about as a result of the Null Case

12 It might be objected that the use of [+Duplicate] feature is ad hoc. However, some such feature is needed in order to block generation of following examples.

(i) a. *The woman craned the man's/his neck.
b. *The woman perjured the man's self/himself

If these verbs have [+Duplicate], these strings will never be generated.

13 A possible exception to this is the quantificational property that could get a free ride on the movement of the sound, resulting, for instance, in the *every>seem* reading of (i).

(i) Everybody seems to know the answer

assigned by the infinitival *to* and the lack of a phonetic shape of traces comes about as a result of its sound having undergone A-Movement to SpecTP to receive Nominative Case. If this proposal is on the right track, it means that the sound and meaning of a syntactic object (including a lexical item) should be allowed to behave independently of each other.[14]

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14 Tonoike (2018) also claims that the same is true of A'-Movement. *Wh*-Movement in English, for instance, moves only the sound of a *wh*-phrase together with a null counterpart of the Japanese particle *ka*, and the meaning of the *wh*-phrase stays in situ. If this is correct, all movement operations (IM) are the movement of the sounds.