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Article

A Case for Movement of the Clausal Subject of the *Tough*-Movement Construction

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1. Introduction

A clausal type of internal argument that appears superficially at a left edge of a sentence (as in raising and topicalization constructions) has been reported to show two apparently conflicting syntactic properties. In some cases, the lowest copy of the clausal argument needs to be a syntactic constituent of a nominal (rather than clausal) type in categorial terms; in others, the lowest copy needs to contain a CP structure that is identical to its antecedent at the left-edge position. The first property is well documented in the literature (see Koster 1978 and Alrenga 2005, among many others), while the latter is extensively explored in Takahashi (2010) on the basis of the reconstruction effects of bound pronouns. In the present paper I will engage in a similar argument in the domain of the *tough*-movement construction. I will present empirical evidence in favor of the existence (in the original gap position) of a CP constituent that is identical to the clausal element serving superficially as the matrix subject of the relevant *tough*-movement construction, explore the movement processes involved in the derivation from the viewpoint of the "predicate-*n*P movement" analysis of the *tough*-movement construction laid out in Tomizawa (2023), and attempt to unify the "CP movement" analysis and the "predicate-*n*P movement" analysis.

It will be proposed that a clausal argument is an inherently unlabelable {PRN, CP} constituent, where PRN = pronoun. The Labeling Algorithm forces either of the terms to dislocate. This dislocation interacts with other syntactic constraints and lexical properties and determines the superficial distribution of the clausal argument and an optional appearance of expletive *it*. It will be claimed that the dislocation of CP out of the unlabelable {PRN, CP} is a central element of the so-called *tough*-movement operation that ultimately yields the *tough*-movement construction where the CP serves as the matrix subject.

The paper is organized as follows. In section 2, new empirical data will be presented that strongly suggests that the clausal subject of the *tough*-movement construction has its CP copy in its original

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position within the infinitival complement to the *tough*-predicate. The rest of the paper is not the defense of this observation but is devoted to the question how this "movement" from the original gap position to the matrix subject position is made possible. Before going into the details of the movement process, the distribution of clausal arguments will be discussed in section 3, where it will be proposed that a clausal argument is generated as an inherently unlabelable {PRN, CP} constituent. Section 4 will present the syntactic processes involved in the derivation of the *tough*-movement examples in section 2 while maintaining the basic tenet adopted in the analysis of the *tough*-movement construction in Tomizawa (2023) (namely, neither improper movement nor late merger is permissible). Section 5 will attempt to unify the proposal on the "clausal" *tough*-movement cases presented in this paper and the analysis of the standard *tough*-movement cases in Tomizawa (2023) and present some consequences, which include the accounts of the lack of resumptive pronouns and some anti-pronominal effects observed in the *tough*-movement construction. Section 6 is a summary of the paper.

2. Reconstruction of the clausal subject in the *tough*-movement construction

When a clausal type of internal argument to a given predicate appears superficially at a left edge of the sentence as in raising and topicalization constructions, the original gap position sometimes shows a nominal property rather than a clausal one. Typical examples are provided by the internal argument of the verb *hope*. *Hope* is lexically specified as taking a clausal complement but not a nominal complement, which explains the contrast in grammaticality between (1a) and (1b) below. Notice that when the clausal complement to *hope* is passivized or topicalized as in (2a, b), the resulting sentences are degraded. (These examples are taken from Alrenga 2005.)

(1) a. Most baseball fans hoped that the Giants would win the World Series.
    b. *Most baseball fans hoped that.

(2) a. *That the Giants would win the World Series was hoped.
    b. *That the Giants would win the World Series, their fans have never stopped hoping.
    c. It was hoped (by most baseball fans) that the Giants would win the World Series.

These facts have led researchers to hypothesize that the clausal elements in the left edges of the sentences in (2a, b) are actually base-generated there and some kind of nominal element has undergone movement from the complement position of *hope* to the vicinity of the clausal antecedents in the left-edge positions. The nominal status of the null copy in the complement position of *hope*, then, violates the categorial selectional feature of the verb, just as in (1b).

Takahashi (2010), on the other hand, presents data that shows that when a clausal type of internal argument to a given predicate appears superficially at a left edge of a sentence in raising and topicalization

constructions, a pronoun within this left-edge clausal element may be bound to a quantificational expression that c-commands the clausal argument's original, thematic position. Thus, both (3a) and (3b), taken from his paper, allow the pronoun *his* to be bound to *every professor*.

(3) a. That some student from his class cheated on the exam seems to every professor to be believed (in) by Mary.

b. That some student from his class cheated on the exam, I think (that) every professor raised.

Since this bound pronoun interpretation requires *him* to be A-bound by *every professor*, it follows that the original gap positions to the right of *believed (in)* in (3a) and *raised* in (3b), respectively, contain a clausal constituent identical to the clausal argument in the left-edge position.

Bearing these apparently conflicting phenomena in mind, let us turn our attention to the *tough*-movement construction, where we will observe similar apparently conflicting phenomena. First of all, when a clausal type of constituent serves as the subject of the *tough*-movement construction, the grammaticality status of the construction varies, as shown by (4a, b) below, taken from Alrenga (2005).

(4) a. *That the Giants would win the World Series was difficult to hope.

b. That these consonants behave exceptionally eventually proved impossible to attribute to their status as coronals.

The source of the variation in grammaticality most likely lies in the lexical properties of the verbs that license the original gaps corresponding to the clausal subjects. Suppose that just as in raising and topicalization, the clausal type of subject in the *tough*-movement construction also has a nominal (but not a clausal) element in its original gap position. Then, the sentence (4a) violates the lexical specification of *hope*, which needs a clausal type of complement in categorial terms. In the sentence (4b), by contrast, the verb *attribute* takes a nominal complement and this categorial lexical specification gives rise to no categorial mismatch with the categorial property of the null element occupying this gap position.

When it comes to reconstruction effects with regard to bound pronoun interpretation, however, the relevant data strongly suggests that the original gap in the *tough*-movement construction contains a clausal constituent that is identical to the clausal element in the matrix subject position. Thus, not only (5a) but also (5b) allows the pronoun *his* to be bound to *every professor*.[1]

(5) a. It's easy for [every professor]$_i$ to assert that someone from his$_i$ class is a genius.

b. That someone from his$_i$ class is a genius is easy for [every professor]$_i$ to assert.

That *his* is bound to *every professor* is trivial in the expletive *tough* construction (5a).[2] In the *tough*-

1　I owe the observation to my informants.

2　In reality, it may not be, because *every professor* in (5a, b) is contained within the PP headed by *for* and, hence, fails to c-command *his*. However, the antecedent-variable relation between *every professor* and *his* is established through the mediation of the PRO subject controlled by the quantified antecedent in this construction: *every professor* controls PRO and this bound variable PRO, in turn, c-commands *his*, as illustrated in (i) below. This configuration ensures that *his* is bound to

movement construction (5b), on the other hand, the formal licensing of the bound pronoun in terms of the c-command relation with *every professor* requires a postulation of a copy of *his* within the c-command domain of this quantificational antecedent. Given this observation, the simplest and hence the most plausible approach worth pursuing is that a copy of *that someone from his class is a genius* is present within the complement position of *assert*.

What we have witnessed in this section is that just as in raising and topicalization constructions, the clausal type of subject in the *tough*-movement construction has an apparently conflicting properties in that its original gap is required to be of a nominal type in some cases and, in other cases, to contain a clausal constituent identical to the clausal element that serves as the matrix subject. The latter property, which comes from the consideration of the reconstruction effects with regard to bound pronoun interpretation, suggests strongly that the matrix clausal subject somehow originates in the original gap position. The derivational processes involved here are the main topic of the paper and will be tackled in section 4, after we present an outline of the analysis of the distribution of clausal arguments in section 3. An attempt will be made to unify this "clause movement" analysis of the *tough*-movement construction that has a clausal subject, on one hand, and the "predicate-*n*P movement" analysis of the *tough*-movement construction in general laid out by Tomizawa (2023), on the other, in section 5.

3. General distribution of clausal arguments

Here I will resurrect the old argument entertained around the 1960s about the internal structure of clausal arguments and present a variant of this argument compatible with the current minimalist assumptions.

3.1. Clausal argument = inherently unlabelable {pronoun, CP}

In his analysis of the structure of clausal arguments, Rosenbaum (1967) proposes that a noun phrase can be optionally expanded into [Det $N_{[+PRO]}$ S], where [+PRO] stands for a pronominal feature. The sentences in (6a, b) below share the underlying structure roughly represented as in (7).

(6) a. That the doctor came at all surprises me.

b. It surprises me that the doctor came at all.

(7) [$_{NP}$ Det $N_{[+PRO]}$ S] surprises me.

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every professor.

(i) … easy [$_{PP}$ for [every professor$_i$]] [$_{CP}$ PRO_i to assert [that someone from his$_i$ class is a genius]]

I will assume throughout the paper that "*for* + DP" in both the expletive *tough* construction as in (5a) and the *tough*-movement construction as in (5b) is a PP that expresses the evaluator/judge/experiencer of the event denoted by the relevant *tough*-predicate. See on this view, Chomsky (1973, 1977), Nanni (1978), Heycock (1994), Longenbaugh (n.d.), Saltzmann (2023), in particular. On a different view, see Hartman (2011) and Brillman (2017), among others, where *for* can be a complementizer.

When $N_{[+PRO]}$ is deleted by a pronoun deletion transformation, (6a) is yielded. When an extraposition transformation applies to S, (6b) is generated. For similar ideas about the internal structure of clausal arguments I will refer the reader to Ross (1967), Kiparsky and Kiparsky (1970) just to name a few.

The idea that is materialized by the configurational structure in (7) can be fleshed out in other ways within the current minimalist framework. As one implementation along these lines, I would like to propose that a clausal argument is a {pronoun, CP} complex with no label, as in (8).

(8) A clausal argument is an inherently unlabelable {PRN, CP} constituent, where PRN = pronoun.

This proposal has two immediate consequences. First, the correlation between a clausal argument (CP) and its expletive associate (PRN) is established at the beginning of the derivation.[3] Second, since the {PRN, CP} constituent lacks a label, one of the two terms is forced to dislocate in the light of the Labeling Algorithm.

(9) Labeling Algorithm (Chomsky 2013, 2015)

Given a syntactic object (SO) {α, β},

a. if α is a head and β is not a head, then α is selected as the label of SO,

b. if both α and β are identical in a certain prominent feature, the prominent feature is taken to be the label of SO,

c. if α is a copy and β is not a copy, then α is the label of SO.

Let me note here that, being a pronoun, PRN in (8) can be a head but it cannot provide a label to {PRN, CP} in the light of the clause (9a). This is supported empirically by the simple fact that a pronoun generally does not project any further: it generally rejects a complement, a specifier, and a modifier.

Returning to the labeling issue, when PRN is dislocated, the structure (10a) below is yielded, where {~~PRN~~, CP} obtains the CP label in the light of the clause (9c). The antecedent PRN has to have its Case-feature checked at some stage of the derivation. When CP is dislocated, on the other hand, the structure (10b) below is generated, where {PRN, ~~CP~~} obtains the label PRN. Now that {PRN, ~~CP~~} is a constituent with the label PRN, it needs to have its Case-feature checked at some point of the derivation.

(10) a. … PRN … {~~PRN~~, CP} …

b. … CP … {PRN, ~~CP~~} …

There are two other (logically) possible derivations for an inherently unlabelable {PRN, CP} constituent. One is illustrated in (11a) below, where the unlabeled {PRN, CP} undergoes Internal Merge for reasons independent of the Labeling Algorithm. The other possibility is illustrated in (11b), where PRN and CP are dislocated by separate applications of Internal Merge. (Note that the linear order of PRN and CP in (11b) is irrelevant for the current discussion.)

3 This idea can be viewed as an implementation of the earliness principle (Pesetsky 1989).

(11) a. … {PRN, CP} … ~~{PRN, CP}~~ …

b. *… PRN … CP … {~~PRN~~, ~~CP~~} …

I will assume, following Chomsky (2013), that a lower member (copy) of a chain is invisible for labeling of a constituent that consists of itself and other overt material. However, this does not mean that the lower member is well-formed without a label. Let us assume that lower members (copies) of a chain also need labels. Then, in (11b) above, for example, the lower copies ~~PRN~~ and ~~CP~~ each receive the labels of PRN and CP, respectively. Then, the labels of ~~PRN~~ and ~~CP~~ cause a trouble in specifying the label of {~~PRN~~, ~~CP~~} in (11b) because ~~PRN~~ and ~~CP~~ lack a shared label. Thus, we have the following generalization.

(12) *{~~α~~, ~~β~~}, where α and β are dislocated for labeling by separate applications of Internal Merge.

Returning to (11a) above, the lower copy ~~{PRN, CP}~~ also needs to receive a label from its antecedent. Since the dislocation of {PRN, CP} illustrated in (11a) can be successive-cyclic, crossing multiple phases as in the cases of topicalization, the inheritance of a label from chain members should not be constrained by the Phase Impenetrability Condition. On the basis of this consideration I will stipulate that the unlabeled lower member (copy) of a chain can receive a label from the upper member in the semantic component:

(13) Chain members share a label in the semantic component.

A final remark is in order. PRN in the unlabeled {PRN, CP} constituent can be overt (= *it*) or covert (= pro). I will assume that English has a certain preference on the choice of PRN as specified in (14).

(14) A covert PRN (= pro) is generally preferred over an overt PRN (= *it*) in the configuration where the existence of the former is "recoverable."

The formulation (14) is still not sophisticated but the idea behind it is that PRN is covert in English in certain limited configurations that license its appearance and in other configurations it is overt. Configurations that require an overt PRN include the subject position that is not c-commanded by its CP associate (e.g., *it is clear that*-clause), the complement position of prepositions (e.g., *see to it that*-clause), and the "predication" position in the sense of Moro (1997) and Den Dikken (2018) (see also Kiparsky and Kiparsky 1970).

Bearing these considerations in mind, let us overview the superficial distribution of clausal arguments in the cases of verbs *hope* and *contemplate* in the following subsections. In so doing, I will introduce additional auxiliary assumptions about lexical specifications of these verbs and syntactic operations.

3.2. *Hope* class of verbs

As noted in section 2, *hope* is lexically specified as taking a clausal complement but not a nominal one, whereas as we will review in section 3.3, the verb *contemplate* is lexically specified as taking a nominal (rather than clausal) complement. As for these categorial selectional specifications, let us adopt the following assumption.

(15) Categorial selectional specifications of predicates are satisfied in the semantic component.

Even in cases where the complement of a predicate is dislocated in narrow syntax before obtaining its label, the “trace” needs to receive a label from its antecedent and satisfy the categorial selectional specification of the relevant predicate in the semantic component.

Now consider the verb *hope*. *Hope* has the following complementation paradigm.

(16) a. Most baseball fans hoped that the Giants would win the World Series. (= 1a)

b. *Most baseball fans hoped that. (= 1b)

c. It was hoped (by most baseball fans) that the Giants would win the World Series. (= 2c)

d. *That the Giants would win the World Series was hoped. (= 2a)

e. *That the Giants would win the World Series, their fans have never stopped hoping. (= 2b)

The active sentence (16a) has the underlying structure in (17a) below, where EA = external argument. In (17a), the unlabeled {PRN, CP} constituent may undergo dislocation of PRN, as shown in (17b). As a consequence of this dislocation, {PRN, ~~CP~~} obtains the label CP. The label CP allows *hope* to satisfy its categorial selectional specification. In addition, the dislocation of PRN to adjoin to HOPE is a case of Noun Incorporation. Noun Incorporation is one mode of Case-checking (see Baker 1985) and hence the Case-feature of PRN is checked off. Thus, when PRN is covert (= pro), (17b) yields the sentence (16a).

(17) a. EA v HOPE {PRN, CP}

b. EA v HOPE+PRN {~~PRN~~, CP}

c. *EA v HOPE {PRN, ~~CP~~} … CP

In the meantime, let us suppose that in (17a), dislocation applies to CP rather than PRN. Then a structure like (17c) above is generated, where for expository purposes the antecedent of CP is extraposed. This structure is illegitimate because the {PRN, ~~CP~~} constituent obtains a label (i.e., PRN) that is incompatible with the categorial selectional specification of *hope*, which is clausal rather than nominal.

In the passive cases (16c, d), their underlying structures are identical to (18a) below, where PASS is a light verb devoid of an external argument. In (18a), if dislocation applies to PRN in {PRN, CP} and PRN internally merges with the projection of T, then the structure (18b) is created. An overt PRN (= *it*) can strengthen T and the constituent consisting of PRN and the projection of T has a label. This derivation yields the passive sentence (16c) with an expletive subject.

(18) a. T PASS HOPE {PRN, CP}

b. PRN T PASS HOPE {~~PRN~~, CP}

c. *CP T PASS HOPE {PRN, ~~CP~~}

d. *CP {PRN, ~~CP~~} T PASS HOPE ~~{PRN, CP}~~

If, on the other hand, dislocation applies to CP and the latter internally merges with the projection of T in (18a), then we have the structure (18c) above. The treatment of the structure (18c) hinges crucially on

the treatment of clausal subjects in general. I will adopt the conventional treatment of clausal subjects, by which I mean that clausal subjects cannot stay in Spec-TP, as evidenced by the fact that they do not involve in Subject Aux Inversion. The most plausible reason why clausal arguments cannot stay in Spec-TP is that they do not have formal features that agree with T. Put simply, CP does not strengthen T. Thus, the constituent formed by the merger of CP and the projection of T in (18c) does not have a label, which leads to an ungrammaticality.

To exhaust logical possibilities, we will examine another derivation that is illustrated in (18d) above. In (18d), the unlabeled {PRN, CP} constituent itself undergoes movement to the subject position, followed by dislocation of CP from within the subject {PRN, ~~CP~~}. The dislocation of CP from the subject {PRN, ~~CP~~} has two consequences. First, the subject {PRN, ~~CP~~} obtains the label PRN, which strengthens T and determines the label of the constituent consisting of {PRN, ~~CP~~} and the projection of T. Second, the original copy of ~~{PRN, CP}~~ in the complement position of *hope*, which has been unlabeled, receives the label (i.e. PRN) from its antecedent in the subject position. Now that ~~{PRN, CP}~~ has the label PRN, it violates the categorial selectional specification of the verb.

To recap, the ungrammatical sentence (16d) has two possible derivations as illustrated in (18c, d) but neither derivation terminates.

The topicalization sentence (16e) has the underlying structure (19a) below. Dislocation of CP generates the structure (19b), which violates the categorial selectional specification of *hope* since {PRN, ~~CP~~} has the label PRN.

(19) a. EA v HOPE {PRN, CP} (= 17a)

b. *CP EA v HOPE {PRN, ~~CP~~}

c-i. EA v HOPE+PRN {~~PRN~~, CP}

c-ii. *EA {~~PRN~~, CP} v HOPE+PRN ~~{PRN, CP}~~

d. *EA CP v HOPE+PRN {~~PRN~~, ~~CP~~}

Let us suppose, then, that instead of the CP dislocation, PRN is dislocated first by Noun Incorporation as shown in (19c-i) above, followed by topicalization of the residual {~~PRN~~, CP}, by which {~~PRN~~, CP} drops at the edge of vP phase, as illustrated in (19c-ii), on its way to the matrix Spec-CP (or Spec-TopicP). Now that the original {~~PRN~~, CP} in the complement position of *hope* has the label CP, it satisfies the categorial selectional specification of the verb. However, the derivation (19c-ii) has an inadequacy in that it is no different from the ungrammatical derivation illustrated in (19d) above, where PRN and CP are separately dislocated in violation of the generalization (12). Since the generalization (12) is a notion that directly follows from the Labeling Algorithm and hence is worth maintaining, the existence of the derivation that would cancel the effects that the generalization (12) captures should be excluded in one way or another. Although the details are still unclear, I will conclude here that the derivation along the lines of (19c-i) and

(19c-ii) should be unavailable.

In sum, the topicalization example in (16e) does not have a convergent derivation.

3.3. *Contemplate* class of verbs

The verb *contemplate* is lexically specified as taking a nominal (rather than clausal) complement. *Contemplate* has the following complementation paradigm. (The examples in 20a-d and 20f are drawn from Alrenga 2005.)

(20) a. *Even Aristotle contemplated that the moon is made of cheese.

b. Even Aristotle contemplated the possibility that the moon is made of cheese.

c. *It was even contemplated (by Aristotle) that the moon is made of cheese.

d. That the moon is made of cheese was even contemplated by Aristotle.

e. The idea was contemplated earlier.

f. That the moon is made of cheese, Aristotle never should have contemplated.

First of all, if CONTEMPLATE is externally merged with a DP complement as in (21a) below, a simple active sentence like (20b) is generated. If the structure is passivized as in (21b) below, a simple passive sentence like (20e) is obtained. In both examples, the categorial selectional specification of CONTEMPLATE is satisfied by the DP complement.

(21) a. EA v CONTEMPLATE DP

b. DP T PASS CONTEMPLATE ~~DP~~

Let us now turn to the derivation where CONTEMPLATE is externally merged with a clausal type of complement as in (22a) below. In order to specify the label of the unlabeled {PRN, CP} constituent, dislocation applies to either PRN or CP. When PRN is dislocated by Noun Incorporation, (22b) below is yielded; when CP is dislocated by, say, extraposition, (22c) is generated.

(22) a. EA v CONTEMPLATE {PRN, CP}

b. *EA v CONTEMPLATE+PRN {~~PRN~~, CP}

c. *EA v CONTEMPLATE {PRN, ~~CP~~} … CP

The derivation (22b) is not permissible because the label of {~~PRN~~, CP}, which is CP, is incompatible with the categorial selectional specification of CONTEMPLATE, which is nominal. By contrast, the label of {PRN, ~~CP~~} in the derivation (22c) gives rise to no similar categorial mismatch, but the structure is illegitimate in the sense that the CP dislocation is "vacuous." Thus, the active sentence with a clausal complement as in (20a) cannot be generated.

The passive sentences in (20c, d) share the underlying structure illustrated in (23a) below. If PRN is dislocated to externally merge with the projection of T, the structure (23b) is generated, where the {~~PRN~~, CP} constituent obtains the label CP, which is incompatible with the categorial selectional specification of

CONTEMPLATE. Thus, the passive sentence (20c) is ungrammatical.

(23) a. T PASS CONTEMPLATE {PRN, CP}

b. *PRN T PASS CONTEMPLATE {~~PRN~~, CP}

c. *CP T PASS CONTEMPLATE {PRN, ~~CP~~}

d. CP {PRN, ~~CP~~} T PASS CONTEMPLATE ~~{PRN, CP}~~

If CP is dislocated, instead of PRN, then the structure (23c) above is yielded, where the raised CP cannot engage in the strengthening of T because of the lack of formal features. Thus, the structure (23c) does not terminate. If the unlabeled {PRN, CP} constituent is dislocated (i.e. passivized) first, followed by dislocation (topicalization) of CP out of the raised {PRN, CP}, then we have the structure (23d) above. In (23d), the dislocation of CP allows the {PRN, ~~CP~~} constituent in the subject position to have the label PRN, which strengthens T and determines the label of the constituent consisting of {PRN, ~~CP~~}, on the one hand, and the projection of T, on the other. In addition, the label of the {PRN, ~~CP~~} constituent is shared with the other member of the chain it heads, so that the original copy in the complement position of CONTEMPLATE comes to have the label PRN, which matches the categorial selectional specification of the verb. Thus, the sentence (20d) is legitimate with the derivation illustrated in (23d).

Let us examine the derivation of the topicalization example in (20f). The derivation of the sentence starts with the active structure (24a) below. If dislocation (topicalization) applies directly to CP, we have the derivation illustrated in (24b) below, where CP drops at the edge of the vP phase on its way to Spec-CP (or Spec-TopicP). Thanks to the CP dislocation the {PRN, ~~CP~~} constituent in the complement position of CONTMEPLATE obtains the label PRN, satisfying the categorial selectional specification of the verb.

(24) a. EA v CONTEMPLATE {PRN, CP} (= 22a)

b. CP EA ~~CP~~ v CONTEMPLATE {PRN, ~~CP~~}

c. CP EA {PRN, ~~CP~~} v CONTEMPLATE ~~{PRN, CP}~~

Another derivational possibility for (20f) is illustrated in (24c) above, where dislocation applies first to the unlabeled constituent {PRN, CP} and the latter moves to the edge of the vP phase, from where CP alone is topicalized. By the dislocation of CP, the {PRN, ~~CP~~} constituent at the edge of vP obtains the label PRN, which is shared by the originally unlabeled ~~{PRN, CP}~~ constituent in the complement position of CONTMEPLATE, satisfying the categorial selectional specification of the verb. In sum, either of (24b, c) is available for the derivation of the grammatical topicalization example like (20f).

To summarize section 3, a clausal argument is introduced to the derivation as an inherently unlabelable constituent and its superficial distribution is determined by the interaction of the Labeling Algorithm, Case- and formal features of the associate pronoun (PRN), categorial selectional features of the predicate that selects the clausal argument.

4. The derivation of the clausal subject in the *tough*-movement construction

In this section I will present an account of the derivation of the *tough*-movement construction given in section 2 that shows reconstruction effects with respect to a bound pronoun in the clausal constituent that serves as the subject. In section 4.1 I will briefly review Tomizawa's (2023) analysis of the *tough*-movement construction so as to set the stage for the discussion that follows. In section 4.2 I will show how the clausal subject is derived in the *tough*-movement construction.

4.1. Tomizawa's (2023) analysis

Tomizawa (2023) proposes that the *tough*-movement construction involves the following important derivational steps: (i) A'-movement of a predicate-*n*P, (ii) introduction of D, (iii) extraction of CP out the DP projection, and (iv) A-movement of the residual DP to the subject position. To take an example, the derivation of the sentence (25), taken from Longenbaugh (2017), proceeds along the derivational steps in (26a-g), where D_e = a null D.

(25) Pictures of his_i friends will be hard to convince [any artist]$_i$ to sell.

(26) a. … to convince any artist to sell [$_{DP}$ D_e [$_{nP}$ pictures of his friends]]

b. [[$_{nP}$ pictures of his friends] [$_{CP}$ to convince any artist to sell D_e ~~pictures of his friends~~]]

c. [$_{DP}$ D [[$_{nP}$ pictures of his friends] [$_{CP}$ to convince any artist to sell D_e ~~pictures of his friends~~]]]

d. [$_{AP}$ HARD [$_{DP}$ D [[$_{nP}$ pictures of his friends] [$_{CP}$ to convince any artist to sell D_e ~~pictures of his friends~~]]]]

e. [$_{AP}$ [$_{CP}$ to convince any artist to sell D_e ~~pictures of his friends~~] [$_{AP}$ HARD [$_{DP}$ D [[$_{nP}$ pictures of his friends] ~~to convince any artist to sell D_e pictures of his friends~~]]]]

f. [$_{aP}$ *a*+HARD [$_{AP}$ [$_{CP}$ to convince any artist to sell D_e ~~pictures of his friends~~][$_{AP}$ ~~HARD~~ [$_{DP}$ D [[$_{nP}$ pictures of his friends] ~~to convince any artist to sell D_e pictures of his friends~~]]]]]

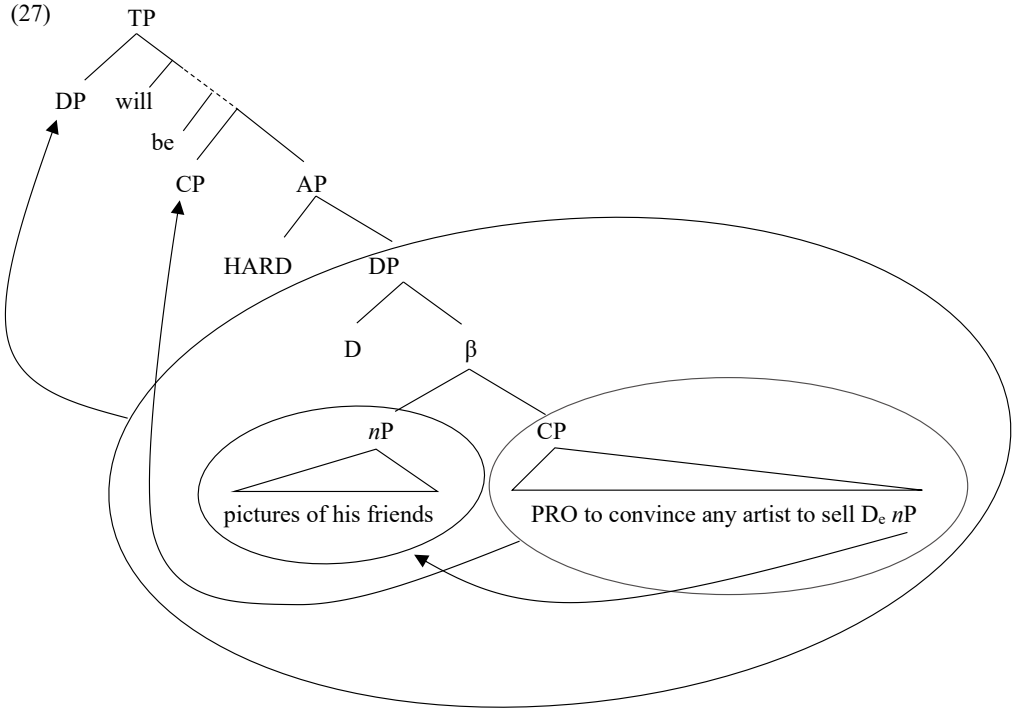
g. [$_{TP}$ [$_{DP}$ D [[$_{nP}$ pictures of his friends] ~~to convince any artist to sell D_e pictures of his friends~~]] will be [$_{aP}$ *a*+HARD [$_{AP}$ [$_{CP}$ to convince any artist to sell D_e ~~pictures of his friends~~] [$_{AP}$ ~~HARD~~ ~~[$_{DP}$ D pictures of his friends to convince any artist to sell D_e pictures of his friends~~]]]]]

h. pictures of his friends ~~to convince any artist to sell pictures of his friends~~ will be HARD to convince any artist to sell ~~pictures of his friends HARD pictures of his friends to convince any artist to sell pictures of his friends~~

The *n*P within the complement DP of *sell* in (26a) undergoes A'-movement to merge with the infinitival CP, as in (26b). This *n*P projects and merges with another D, as in (26c). (Notice that this is the process shared with the formation of a complex DP construction with a restrictive relative clause.) The resulting constituent merges with the *tough*-predicate HARD, as in (26d). Then, the infinitival CP is extracted and

internally merged with the AP, as in (26e). Next, HARD is raised to adjoin to the adjectivizer *a*, as in (26f). Then, at a later stage of the derivation, the DP sister of HARD undergoes A-movement to the matrix subject position, as in (26g), yielding the sequence given in (26h). This derivation can be schematically represented as a tree diagram as in (27), where raising of HARD to *a* is omitted.

(27)



This analysis holds four pieces of significance. First, it does not hinge on the so-called improper movement of the subject. What occupies the matrix subject of the *tough*-movement construction is not a simple DP (*pictures of his friends*) but a complex DP (*pictures of his friends* ~~*to convince any artist to sell*~~) that is a sister constituent of the *tough*-predicate. This movement is a typical instance of A-movement.

Second, the simple nominal expression *pictures of his friends* has its ultimate derivational roots within the complement DP of *sell*, where *his* is formally licensed as a bound pronoun by the c-commanding quantificational antecedent *any artist*.

Third, the determiner of the matrix subject DP is introduced only after *n*P is internally merged with the infinitival CP. Thus, this D does not have a copy within the infinitival CP. This means that the edge of the matrix subject DP does not have a reconstruction position within the infinitival CP. This explains the edge/interior contrast in reconstruction originally observed by Sportiche (2002) and others. Compare (25) above, which permits the bound pronoun interpretation of *his*, with the example (28) below, taken from Rezac (2006), where a bound pronoun interpretation of *her* is unavailable.

(28) *Her$_i$ work is hard to convince [every woman in the group]$_i$ to share.

Fourth, and finally, no counter-cyclic late merger is necessary to account for the derivation of the *tough*-movement construction.

Keeping these pieces of significance as the basic tenet of the framework adopted in this paper, let us proceed to the reconstruction effects of the clausal subjects observed in section 2.

4.2. The clausal subject of the *tough*-movement construction

The examples (5a, b) are reproduced below as (29a, b), where *his* can be interpreted as a pronoun bound to *every professor*.

(29) a. It's easy for [every professor]$_i$ to assert that someone from his$_i$ class is a genius.

b. That someone from his$_i$ class is a genius is easy for [every professor]$_i$ to assert.

In both examples, *every professor* in PPs control the PRO subjects in the infinitival clauses. It is this PRO that binds the bound pronoun *his* in the expletive *tough* construction (29a). Exactly the same holds in the case of the *tough*-movement construction (29b). Thus, the discussion in the rest of this section is devoted to how, in (29b), the clausal argument generated in the complement position of *assert* finds its way into the subject position of the matrix sentence.

The verb *assert* is lexically specified as taking either a clausal complement or a nominal one. Since it takes a clausal complement in both (29a, b), the underlying structures of the relevant verbal domains are the one given in (30a) below, where CP_1 = [that someone from his class is a genius]. Turning to the *tough*-predicates in (29a, b), EASY takes an infinitival complement, which is also clausal, so that its underlying structure is as in (30b) below, where CP_2 = [PRO to assert {PRN_1, CP_1}].

(30) a. … ASSERT {PRN_1, CP_1}

b. … EASY {PRN_2, CP_2}

Let us first consider the derivation for the expletive *tough* construction (29a). PRN_1 in (30a) dislocates (= incorporates) to ASSERT, as shown in (31a) below, and has its Case-features checked through this process; the residual {~~PRN_1~~, CP_1} obtains the label CP, which matches with the categorial selectional specification of ASSERT, and stays there. At a later stage of the derivation, the infinitival complement clause [PRO to assert that someone from his class is a genius] is constructed successfully. This clause, which is represented as CP_2 in the present discussion, forms an unlabelable constituent with PRN_2 and externally merges with EASY, as shown in (31b) below. Since {PRN_2, CP_2} in (31b) lacks a label, dislocation applies to either PRN_2 or CP_2. If PRN_2 is dislocated to the matrix subject position, we have the structure (31c) below. This is the derivation responsible for the grammatical expletive *tough* construction (29a).

(31) a. … ASSERT+PRN_1 {~~PRN_1~~, CP_1}

b. … EASY {PRN_2, CP_2}

c. PRN_2 is EASY {~~PRN_2~~, CP_2}

d-i. *CP_2 is EASY {PRN_2, ~~CP_2~~}

d-ii. *CP_2 PRN_2 is EASY {~~PRN_2~~, ~~CP_2~~}

By contrast, application of dislocation to CP_2 in (30b), as illustrated in (30d-i) above, does not have a legitimate derivation for a couple of reasons. If, in (30d-i), CP_2 occupies the specifier position of T, it is too "weak" to strengthen T, so that the constituent consisting of CP_2 and the projection of T remains unlabeled. If, on the other hand, CP_2 is dislocated to a topic position rather than to Spec-TP, then the specifier position of T must be filled by PRN_2, as shown in (30d-ii) above. This derivation is in violation of the generalization (12), which prohibits separate applications of dislocation to both terms of an inherently unlabeled constituent. In sum, the labeling issue of the {PRN_2, CP_2} constituent in the configuration (30b) can be resolved by dislocation of PRN_2, but not by dislocation of CP_2.[4]

Next consider how the *tough*-movement construction (29b) is derived. The derivation is more complex than the one we just saw for the expletive *tough* construction because of the dislocation of the clausal complement of ASSERT. Our interest is therefore focused on the syntactic processes that contribute to the licensing of this clausal complement. To anticipate the conclusion, there are four logically possible derivations, depending on the choice of the term that undergoes dislocation and the choice of the position that this term "moves" to. Of the four, two are excluded for principled reasons; one of the remaining two seems to be illegitimate. In what follows, I will look at the legitimate derivation first, the seemingly illegitimate one follows, and the two excluded derivations are taken up last.

The legitimate derivation involves A'-movement of CP_1 to the dominating CP_2, followed by formation of an argumental "PRN_2-CP_2" pair. For expository purposes, let us start with the infinitival structure CP_2 as shown in (32a) below, where [$_\alpha$ PRN_1 CP_1] is a tree-structure representation of the unlabeled constituent made up of PRN_1 and CP_1 (namely, {PRN_1, CP_1}) and CP_1 is [that someone from his class is a genius]. (Hereafter, Greek letters are used to indicate that the relevant constituents are unlabeled.)

(32) a. [$_{CP2}$ PRO to ASSERT [$_\alpha$ PRN_1 CP_1]]

CP_1 in (32a) dislocates (i.e., undergoes A'-movement) to merge with the dominating CP_2, as shown in (32b) below. By this dislocation, α in the complement position of ASSERT obtains the label CP, which is compatible with the categorial selectional specification of the verb.

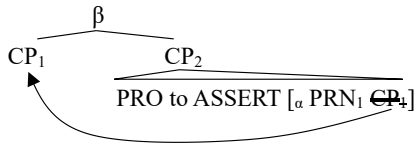
4 Let me note that the labeling issue of the type found in (30b) can also be resolved by dislocation (= raising) of {PRN_2, CP_2}, followed by topicalization of CP_2, as illustrated below. This type of derivation seems to be responsible for the generation of sentences like (ii).

(i) a. … easy {PRN_2, CP_2} (= 31a)

b. CP_2 {PRN_2, ~~CP_2~~} is easy ~~{PRN_2, CP_2}~~

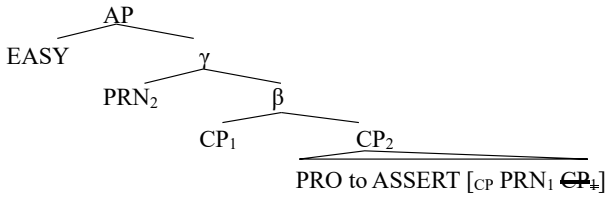
(ii) To please John is easy.

(32) b.



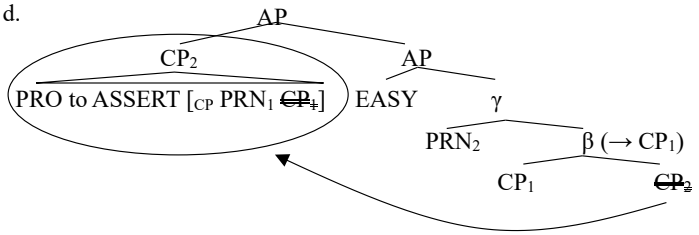
Notice here that CP_2 is an argument of EASY and has to be coupled with PRN_2. Thus, PRN_2 is paired with β. When the resulting constituent (= γ) is externally merged with EASY, we get the structure (32c) below.

(32) c.



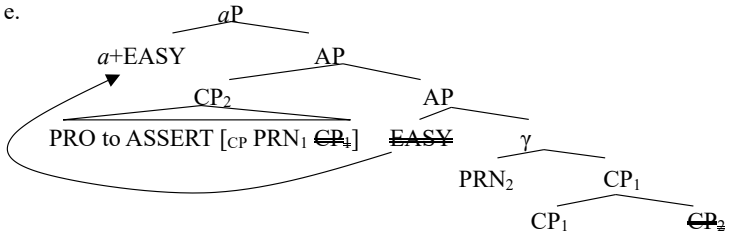
Next, CP_2 in (32c) is dislocated and adjoins to AP, as shown in (32d) below. Thanks to this dislocation of CP_2, β obtains the label CP_1.

(32) d.



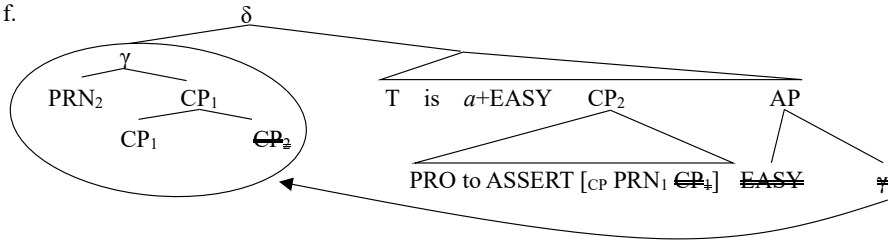
Next, EASY in (32d) raises to adjoin to an adjectivizer *a*, as shown in (32e) below.

(32) e.



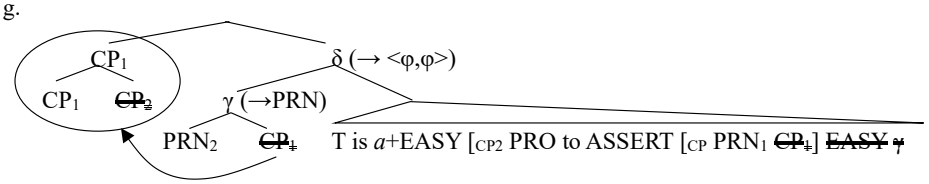
At a later stage of the derivation where both *be* and T have been introduced, γ moves to adjoin to the projection of T, as shown in (32f).

(32) f.



Now, the CP_1 within the left edge of δ in (32f) above undergoes topicalization, yielding the structure (32g) below.

(32) g.



As a consequence of this topicalization, γ in the subject position obtains the label PRN, which strengthens T and labels δ as <φ,φ>. In this way, this derivation terminates. Note that since CP_1 is a constituent [that someone from his class is a genius], the structure (32g) very roughly has the following sequences of strings.

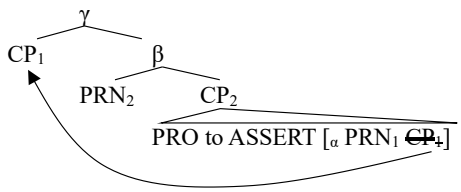
(32) h. [that someone from his class is a genius ~~to assert that someone from his class is a genius~~] [~~to assert that someone from his class is a genius~~] is EASY (for every professor) [to assert ~~that someone from his class is a genius~~] ~~EASY~~ [~~that someone from his class is a genius~~] [~~to assert that someone from his class is a genius~~]

The second logically possible derivation for the sentence (29b), which seems to be illegitimate, is different from the derivation outlined in (32a-g) in the order of the A'-movement of CP_1 and the formation of an argumental "PRN_2-CP_2" pair. Starting with the CP_2 structure in (33a) below, {PRN_2, CP_2} is formed first as in (33b), followed by A'-movement of CP_1 to adjoin to the {PRN_2, CP_2} as in (33c).

(33) a. $[_{CP2}$ PRO to ASSERT $[_{\alpha}$ PRN_1 $CP_1]]$ (= 32a)

b. $[_{\beta}$ PRN_2 $[_{CP2}$ PRO to ASSERT $[_{\alpha}$ PRN_1 $CP_1]]]$

c.



Although this derivation is successful in labeling α as PRN, it is nonetheless questionable in that CP_1 extracts out of CP_2 in one fell swoop. This is because CP_2 is a phase and extraction out of CP_2 needs to

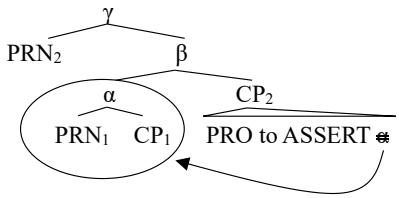
use the edge of CP_2. When CP_1 stops at the edge of CP_2, the structure is identical to (32b) above. Thus, the derivational step from (33b) to (33c) is nothing but illusory and, in addition, there is no need for the CP_1 at the edge of CP_2 to move to internally merge with the constituent consisting of CP_2 and PRN_2 (namely, β in 33c). I conclude therefore that the derivation outlined in (33a-c) is excluded in favor of the derivation in (32a-d) above.

Let us turn to the remaining two logically possible derivations for the sentence (29b) and confirm that they are excluded for principled reasons. These two derivations start with the underlying structure (34a) below and are to undergo A'-movement of the unlabeled $[_{\alpha}\ PRN_1, CP_1]$, rather than CP_1. What distinguishes the two derivations under consideration is the order of the A'-movement of α and the formation of an argumental "PRN_2-CP_2" pair, which apply separately at later stages of their derivations.

(34) a.　$[_{CP2}$ PRO to ASSERT $[_{\alpha}\ PRN_1\ CP_1]]$　　(= 32a/33a)

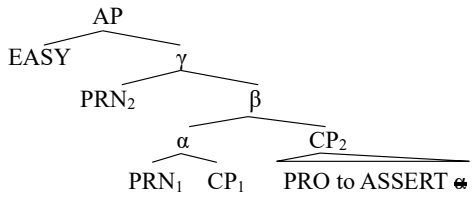
Suppose that A'-movement of α precedes the argumental "PRN_2-CP_2" formation. Then the resulting structure is (34b):

(34) b.



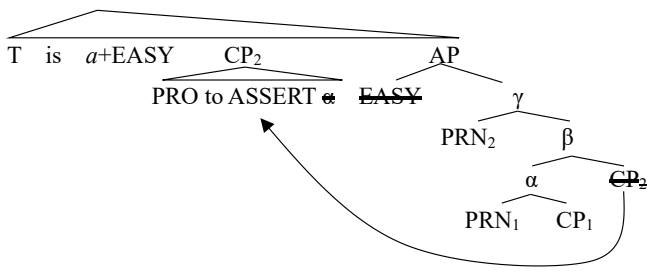
Next, γ externally merges with EASY as in (34c) below.

(34) c.



It would be expected that in the derivational steps that follow, CP_2 dislocates to adjoin to AP, an adjectivizer *a* is introduced and attracts EASY, and *be* and T are separately introduced. After these operations, the following structure is generated.

(34) d.

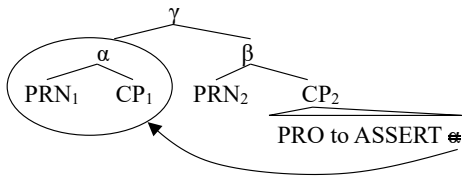


We now arrive at the derivational step to fill the specifier position of the matrix T. Three possibilities may emerge. One is to raise α in (34d). This is in violation of the generalization (12). Another possibility is to raise β in (34d) to Spec-TP, followed by topicalization of CP_1. Thanks to this CP_1 topicalization, α obtains the label PRN_1, which in turn labels β as PRN_1 as well. Now that β in Spec-TP has the label PRN_1, it successfully strengthens T. However, this label specification causes an inadequacy at the original copy of β in (34d). As a chain member, the original copy of β in (34d) shares the label PRN_1, so that the dominating γ now consists of PRN_2 and PRN_1. Thus, the label of γ remains unspecified. The third possibility to fill Spec-TP is to raise γ in (34d), followed by topicalization of CP_1. This derivation has a similar labeling problem. Thanks to the topicalization of CP_1 out of γ in Spec-TP, α within γ obtains the label PRN_1 and β, in turn, obtains the same label. Then, γ comes to have PRN_2 and PRN_1 and its label remains unspecified. In sum, all the three possibilities are excluded and the derivation along (34a-d) are unavailable.

The fourth and last logically possible derivation for the sentence (29b) is the one in which the A'-movement of $[_{\alpha}\ PRN_1\ CP_1]$ follows the formation of the argumental "PRN_2-CP_2" pair, as illustrated in (35b).

(35) a. $[_{CP2}$ PRO to ASSERT $[_{\alpha}\ PRN_1\ CP_1]]$ (= 32a/33a/34a)

b.



This order of the applications of the two operations is questionable in the first place, given the consideration presented above in the discussion of the second logically possible derivation for (29b): α needs to drop at the edge of CP_2 before adjoining to β. In addition, even in the situation where the structure (35b) were somehow generated successfully, it would not terminate. Just as in the third case outlined in (34a-d), extractions of CP_1 and CP_2 do not result in successful labeling of α, β, and γ. Thus, this fourth possible derivation for the sentence (29b) is excluded.

To summarize the discussion in section 4.2, the derivation of the *tough*-movement construction with a clausal subject always involves the derivational steps outlined in (32a-g); namely, dislocation (A'-movement) of CP_1 to adjoin to the dominating CP_2 takes place first, followed by formation of argumental $[PRN_2, CP_2]$ pair.

5. Remarks on unification

The analysis of the *tough*-movement construction with a nominal subject reviewed in section 4.1 and the proposal on the *tough*-movement construction with a clausal subject presented in section 4.2 are not one

and the same.

However, their similarities might be obvious. First of all, in the "nominal" *tough*-movement cases, nP_1 "moves" out of $\{D_1, nP_1\}$ to adjoin to CP_2, followed by introduction of another D_2, as illustrated in (36) below. In the case of "clausal" *tough*-movement cases, CP_1 "moves" out of $\{PRN_1, CP_1\}$ to adjoin to CP_2, followed by introduction of PRN_2, as in (37) below.

(36)　… EASY $[_{\gamma}\ D_2\ [_{\beta}\ nP_1\ [_{CP2}$ PRO to please $\{D_1, \cancel{nP_1}\}\ ]]]$

(37)　… EASY $[_{\gamma}\ PRN_2\ [_{\beta}\ CP_1\ [_{CP2}$ PRO to assert $\{PRN_1, \cancel{CP_1}\}\ ]]]$

As far as configurational structures are concerned, these derivations are very similar to each other.

In addition, D_1 in (36) and PRN_1 in (37) are similar categorially. Let us pursue this similarity further. Since we have empirical evidence to the effect that, in general, PRN is sometimes realized overtly as a genuine pronoun (i.e., *it*), PRN_1 in (37) is maintained and D_1 in "nominal" *tough*-movement cases as in (36) is recast as D of the type that is similar to PRN. That is to say, this D_1 is a pronoun-like element that rejects a complement, a specifier, and a modifier.

This view of D_1 in (36) has three consequences. First, every *tough*-movement construction now has an inherently unlabelable constituent of the type $\{D_1, nP_1\}$ or $\{PRN_1, CP_1\}$. This inherent unlabelability, in effect, forces dislocation of nP_1 or CP_1. (Dislocation of D_1 or PRN_1 is logically possible but the resulting derivation does not terminate for independent reasons.) This is a unique property that characterizes the *tough*-movement construction.

This fills in the missing piece of Tomizawa's (2020, 2023) analyses of the *tough*-movement construction, where the motivation for the extraction of nP_1 from $\{D_1, nP_1\}$ is not fully established.

Second, the label of the inherently unlabeled $\{D_1, nP_1\}$ and $\{PRN_1, CP_1\}$ is uniformly specified as D_1 or PRN_1, thanks to dislocation of nP_1 and CP_1. Both D_1 and PRN_1 are nominal, and as far as the Case-feature checking is successful, they do not have to be spelled out overtly because of the general preference for a covert element over an overt counterpart. Thus, the original gap of the *tough*-movement construction cannot be filled by an overt resumptive type of pronoun, as shown in (38a-d), taken from Lasnik & Fiengo (1974).

(38) a.　*John$_i$ is easy to please him$_i$.

b.　*John$_i$ is easy to please Mary and him$_i$.

c.　*John$_i$ is easy to please a woman who likes him$_i$.

d.　*[Prime numbers]$_i$ are easy to prove (Euclid's) theorems about them$_i$.

That resumptive pronouns are impossible even in island contexts as in (38b-d) is a striking property of the original gap of the *tough*-movement construction. This property can be predicted by the analysis in this paper because the gap occurs in the position where Case-feature checking is successful and, hence, a null pronominal-type D is preferred over an overt counterpart.

Third and lastly, the analysis of the original gap as an inherently unlabelable $\{D_1, nP_1\}$ accounts for some anti-pronominal effects in the *tough*-movement construction, as exemplified in (39a) and (40a). (These examples are drawn from Stanton 2016.)

(39) a. *Mondays are tough to go to class on. ("Interval" referring DP)
b. John's talk will be easy to leave after. ("Event" referring DP)

(40) a. *10,000 feet is tough to fly to. ("Location" referring DP)
b. Cardboards are easy for cats to hide in. ("Entity" referring DP)

In (39a, b), both *on Mondays* and *after John's talk* are temporal expressions, but the functions of the DPs *Mondays* and *John's talk* are different from each other semantically. Stanton (2016) characterizes the DP complement of *on* as "referring to points or spans in time" (p. 91), whereas the DP complement of *after* is characterized as "referring to events that occupy certain portions of time" (ibid.). Locational prepositions can be distinguished similarly. Thus, the DP complement of *to* as in (40a) is characterized as referring "to points or regions of space" (p. 95), while the DP complement of *in* as in (40b) is characterized as "referring to physical entities that occupy certain portions of space" (p. 96).

Stanton proposes that both the "Interval"-taking temporal preposition (like *on* in 39a) and the "Location"-taking locative preposition (like *to* in 40a) need to take a DP that always consists of a D and an NP denoting "Interval" or "Location." Put simply, the D and the NP cannot be separated. However, nP_1 must be separated (= dislocated) in order for (39a) and (40a) to be generated, under the inherently unlabelable $\{D_1, nP_1\}$ analysis pursued in this section. Thus, the ungrammatical *tough*-movement examples in (39a) and (40a) are illegitimate.

5. Summary

This paper has claimed that an inherently unlabelable constituent of the form {pronoun, CP} or {D, *n*P} is the crucial element that ultimately yields the *tough*-movement construction. The analysis and discussion have started with the presentation of new empirical data that supports the reconstruction effects of the matrix clausal subject into the original gap position in the *tough*-movement construction in the light of the availability of bound pronoun interpretation and have preceded to provide an account of the syntactic processes involved in the derivation within the theoretical framework (pursued in Tomizawa 2020, 2023) which is devoid of late merger and improper movement. The account has been built on the proposal that a clausal argument is an inherently unlabelable {pronoun, CP} constituent and this idea of inherently unlabelable syntactic constituent has been attempted to be extended to the {D, *n*P} constituent in the *tough*-movement construction that has a nominal subject, with some favorable consequences in the accounts of the absence of resumptive pronouns and some anti-pronominal effects.

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A Case for Movement of the Clausal Subject of the *Tough*-Movement Construction

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The paper claims that an inherently unlabelable constituent of the form {pronoun, CP} or {D, *n*P} is the element that makes a crucial contribution to the derivation of the *tough*-movement construction. The analysis and discussion start with the presentation of new empirical data that supports the reconstruction effects of a bound pronoun that is contained in the clausal element serving as the subject of the *tough*-movement construction. The clausal element in question is introduced into the derivation as an inherently unlabelable {pronoun, CP} constituent forcing its CP term to dislocate. Since the syntactic processes proposed here to account for the derivation of the *tough*-movement construction with a clausal subject are similar to the processes for the derivation of the *tough* construction that has a nominal subject (put forth in Tomizawa 2023), it is proposed that the {D, *n*P} constituent in Tomizawa's (2023) analysis is also an inherently unlabelable constituent in the sense that this D is a pronoun-like element that rejects a complement, a specifier and a modifier. It is shown that the pronoun-like nature of this D is responsible for the unavailability of resumptive pronouns and some anti-pronominal effects observed in the *tough*-movement construction.