

Agreement Phenomena and the C-I Interface*

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Abstract

The purpose of this paper is twofold. First, it aims to show that some types of long distance dependencies that are usually considered as results of the Move (=Internal Merge) operation turn out to be results of the Agree operation. Based on the observation of Scottish Gaelic, Adger and Ramchand (2005) argue that the Agree operation licenses a silent little pro within relative clauses and that this way of licensing is not applicable in English. However, this paper argues that licensing a pro by means of an Agree operation is not only available in Scottish Gaelic but also in many other languages, including English. The second purpose is to explore semantic interpretations. It examines noun phrases without semantic contents (such as PRO and pro) to show that they induce the Agree operation in order to receive their specific semantic contents, and that this is due to the requirements of the Conceptual-Intentional interface. This paper extends the discussion to more general agreement patterns to show their relationship with semantic interpretations.

Keywords: Agree, Empty Category, A-movement, A'-movement, Specificity

1. Introduction

This paper discusses long distance dependencies, as illustrated in (1), where the symbol *e* indicates an empty category of some type.¹

- (1) a. What did John buy *e*?
- b. John seems *e* to be honest.

In (1a), the sentence-initial *wh*-phrase *what* has to have some kind of relationship with *e* in the post-verbal position across some syntactic items. Similarly, in (1b), the subject *John* has to establish a relation with the position shown by *e* in front of the infinitival *to*. This long distance dependency has been a contentious issue since the advent of generative grammar. Problems concerning the dependencies have become more prominent in the recent framework, called the Minimalist Program, where syntax has only two main fundamental operations: one is the Merge operation and the other is the Agree operation.

Given that the two operations exist within one framework, some questions arise. For example, (i) which operation is responsible for capturing long distance dependencies? (ii) Do we need to assume two different operations? In addition, we need to interrogate the role that the Agree operation plays; does it really work in syntax and why? Specifically, this paper aims at tackling the two questions in (2).

- (2) a. Is the Agree operation necessary in capturing long distance dependencies in addition to the Move operation?
- b. If the Agree operation is empirically necessary, what theoretical underpinning exists?

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To address the question in (2a), I use the sentences that are traditionally considered to be involved with A'-movement in (3) and with A-movement in (4).

- (3) a. ??What were you wondering how to fix e?
 b. Which car were you wondering how to fix e?
(Kroch (1989: 3))
- (4) a. (it seems that) everyone isn't there yet.
 b. I expected [everyone not to be there yet].
 c. everyone seems [e not to be there yet].
(Chomsky (1995: 327))

This paper shows that the answer to (2a) is positive, thereby offering some of the long distance dependencies licensed by the Agree operation. To answer (2b), I adhere to the interface-requirement that the Agree operation is driven by the requirement from the Conceptual-Intentional (C-I) interface. Finally, apart from the questions in (2), I will extend the discussion to more general agreement phenomena.

The organization of this paper is as follows. In the next section, I will review Adger and Ramchand (2005), who argue that Scottish Gaelic uses the Agree operation to license an empty pronoun within relative clauses, and I will offer the proposal of the current paper. Section 3 will focus on A'-movement and section 4 on A-movement. These two sections will illustrate two ways of licensing long distance dependencies: one is the Move operation and the other is the Agree operation. Section 5 will illustrate that what is licensed in A'-movement and A-movement can be analyzed as an identical item.

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(6) Dè am bocs a chuir thu am peann
 Which the box C.Rel put.Past you the pen
 ann/*anns.

in-3Sg/*in.Def

‘Which box did you put the pen in?’

(Adger and Ramchand (2005: 169))

In (6), the preposition should be in the default form *ann*, which makes a sentence grammatical whereas the presence of a definite morpheme causes the ungrammatical result.

Based on this observation, Adger and Ramchand conclude that the sentence in (6) involves the Agree operation instead of the Move operation. Their reasoning is that, if Move were operative, it would leave the copy/trace of the moved *wh*-phrase behind, which would induce the agreement morpheme *-s* on the preposition.

Assuming that the Agree operation is responsible in this case, Adger and Ramchand consider a silent little *pro* to occur instead of a copy/trace. For example, the derivation of (7a) is shown in (7b).

(7) a. an duine a bhuaileas e
 the man C.REL strike.FUT he
 ‘the man that he will hit.’

b. $a[C, \Lambda, ID:dep] \dots pro[D, ID:] \rightarrow$
 $a[C, \Lambda, ID:dep] \dots pro[D, ID:dep]$
 $\lambda x \dots x$

(Adger and Ramchand (2005: 174))

(7a) is an expression where the relative clause *a bhuaileas e* is

adjoined to the noun phrase *an duine* “the man.” The feature composition of the relative head *a* not only contains a category feature of C, but also a feature that functions as a lambda operator. The latter feature receives a specific value from its antecedent *an duine* “the man.” They further assume that CP contains a silent little *pro* inside. The *pro*, they assume, has a feature called an identification feature/ID, but its value is not specified. Therefore, the value has to be determined from C by means of the valuation relation between the *pro* and C, which is conducted by the Agree operation.^{3,4}

In addition, Adger and Ramchand briefly discuss English relative clauses and make a tentative conclusion that English does not have a similar licensing mechanism with the Agree operation in relative clauses.

2.2. Proposal

Contrary to the claim by Adger and Ramchand, the current paper shows that, other than Scottish Gaelic, the licensing mechanism through the Agree operation is also found in other languages. Specifically, I propose (8).

- (8) The Agree operation works in licensing long distance dependencies.

The question whether the Agree operation is necessary in capturing long distance dependencies in languages is an empirical problem. The current paper shows that some linguistic facts reveal the necessity of the Agree operation in licensing two distant syntactic units, α and β , as illustrated in (9).

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- (9) a. $[_{XP} \alpha \dots [_{YP} \beta]]$ (Move from β to α)
 b. $[_{XP} \alpha \dots [_{YP} \beta]]$ (Agree of α with β)
-

As (9) shows, long distance dependencies found in languages are not only licensed with the Movement operation in (9a) but also with the Agree operation in (9b).

3. *Wh*-Phrases and Agree

Let us start our discussion by focusing on A'-movement, which is the type of movement to [Spec, CP]. When we focus on [Spec, CP], α in (9) should be *wh*-phrases, and the two operations involved should distinguish the two types of *wh*-phrases.⁵ As many literatures have already pointed out, *wh*-phrases are divided into two groups: *which*-NP and other *wh*-phrases. Some examples are given in (10).

- (10) a. ??What were you wondering how to fix e?
 b. Which car were you wondering how to fix e?
 (Kroch (1989: 3))

- (11) a. ?Which problem do you wonder how to solve e?
 b. *What the hell do you wonder how to solve e?
 (Rizzi (2001b: 97))

In all sentences in (10)/(11), *wh*-phrases have to establish a semantic relation with the post-verbal position indicated by e, with the intervening *wh*-phrase *how* obstructing the two. This environment is called a *wh*-island context. It is important to note that despite that fact

that the *wh*-phrases in (10) and (11) stand in the same position, their grammaticality differs according to their types. Specifically, *which* NP does not induce the violation of the *wh*-island while *what (the hell)* does.

Various accounts have been set forth to elaborate the contrast between *what (the hell)* and *which* NP. For example, Pesetsky (1987, 2000) introduces the notion of Discourse-linking/D-linking and claims that D-linked *wh*-phrases are licensed by means of unselective binding or feature movement. Cinque (1990), following Rizzi (1988), argues that *wh*-phrases are distinguished according to their referentiality. According to Cinque, a referential *wh*-phrase binds and licenses a pronominal variable. Lasnik and Stowell (1991) focus on the weak crossover, and claim that some null operators license null R-expressions. Various previous literatures focus on different linguistic phenomena and use different terminology to distinguish *which*-NP from other *wh*-phrases. However, this paper uses the general term *specificity* to discuss the contrast.

The common point of view in the studies raised above is that specificity plays an important role and that *wh*-phrases with a non-specific interpretation undergo the Movement operation whereas *wh*-phrases with a specific interpretation do not move (or undergo a different type of movement).

This paper also adopts the assumption that *wh*-phrases with a non-specific interpretation move from a lower position to a higher position whereas those with a specific interpretation do not move. However, the problem is how the latter should establish a semantic relation with a lower empty category. We have to appeal to the Agree operation because, in the Minimalist Program, we are left with only

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one operation if we cannot use the Move operation. This line of reasoning leads us to conclude that the Agree operation for licensing an empty category in a lower position is not an exclusive property in Scottish Gaelic, but it is also seen in English. Furthermore, this paper assumes the analysis by Adger and Ramchand that *pro* exists when a *wh*-phrase does not move.

Based on this idea, let us take a further look at other empirical data offered by previous studies. The important point is that various *wh*-phrases are in the same position but they behave differently, depending on the operation that they should undergo.

First, differences are found in the Condition C effects.

(12) a. *[How many stories about Diana_i]_j is she_i likely to invent
e_j?

b. [Which stories about Diana_i]_j did she_i most object to e_j?

(Heycock (1995: 558))

(12a) is ungrammatical, and the *how many* NP preferably receives a non-specific interpretation. This indicates that the *wh*-phrase undergoes the Movement operation. Therefore, its copy occupies the base position of this *wh*-phrase. The R-expression *Diana* within the copy induces the violation of the Binding Condition (C) when the expression is bound by the pronoun *she*. On the other hand, if a *wh*-phrase with a specific interpretation is base-generated in its surface position and if a *pro* occupies the “base-position” of the *wh*-phrase (a position indicated by *e*), then this violation is not likely to be induced. In fact, as (12b) shows, the sentence is grammatical when a specific *wh*-phrase *which* NP occurs.⁶

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Second, a difference in types of *wh*-phrase is found in “base-positions.” The contrast is shown in (13).

- (13) a. ?How many books do you wonder whether I think e are on
the table?
b. *How many books do you wonder whether I think there
are e on the table? (Rizzi (2001a: 155))

In (13), both sentences contain the same type of the *wh*-phrase *how many NP*, but they differ in grammaticality. Recall that the preferred interpretation of the NP is a non-specific reading. However, as (13b) shows, if this reading is forced by embedding its base-position into the *there*-construction, the sentence is ungrammatical. This is because the *wh*-phrase undergoing the Move operation violates the *wh*-island condition with *whether* intervening. On the other hand, as (13a) shows, *how many books* can have a specific interpretation, which causes a slight degradation due to the lack of the preference of this reading. However, the *wh*-phrase with this interpretation can successfully avoid a more severe degradation induced by the *wh*-island violation because *how many books* is base-generated into [Spec, CP].

Third, let us consider cases where a *wh*-phrase depends on its antecedent in specificity. Specifically, (14) shows that the weak crossover effect is not observed in the cleft sentence.

- (14) It was John_i [who_i his_i mother was talking about t_i].
(Lasnik and Stowell (1991: 715))

The current analysis argues that the *wh*-phrase in (14) receives a

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specific interpretation due to its antecedent *John* (the definite noun phrase) and that it is not associated with the movement operation. Therefore, it is base-generated in the surface position [Spec, CP].

In this type of construction, the antecedent should be specific in interpretation as shown in (15).

- (15) a. ?What is it which is bothering you?
 b. *What the hell is it which is bothering you?
 (den Dikken (2013: 53-54))

In (15a), where the antecedent changes into the *wh*-phrase *what*, a question sentence is considered to be fine because *what* can be interpreted as being specific or non-specific in the semantic component. On the other hand, as shown in (15b), in this type of question sentence, the expression *the hell*, which requires a *wh*-phrase to have a non-specific interpretation, cannot be attached to the *wh*-phrase because the attachment contradicts the semantic requirement that the *wh*-phrase in this construction be interpreted as specific.

We have shown three pieces of evidence to verify the claim that *wh*-phrases behave differently, depending on semantic interpretations. A *wh*-phrase with a non-specific interpretation undergoes the Move operation with its copy left behind in the base position. On the other hand, specific *wh*-phrases do not make use of Move, but they instead undergo the Agree operation to license the pro in their base-positions.

A theoretical question to address is why the dichotomy between the two types of *wh*-phrases is observed.⁷ I will discuss this point in section 6 where semantic effects of the Agree operation are examined.

Anticipating the conclusion of the section, I here argue that a *wh*-phrase with a specific interpretation licenses a silent little *pro* in a lower position, while the licensing mechanism is not available to a *wh*-phrase with a non-specific one. Thus, the latter cannot be base-generated into a surface position. Furthermore, there is a reason that the former (that is, a *wh*-phrase with a specific interpretation) must be base-generated at its surface position. The reason comes from the notion specificity. Specificity is a discourse-related notion (see Pesetsky (1987) among others), and it has been a wide-spread assumption that discursively related features reside in CP domain. Based on this assumption, I argue that a *wh*-phrase with a specific interpretation is externally merged into the CP domain. In other words, CP induces the base-generation of *wh*-phrases with a specific interpretation into the CP domain.

In this section, we have focused on *wh*-phrases in [Spec, CP]. *Wh*-phrases behave differently. These empirical facts strongly support the claim that Agree is necessary in capturing long distance dependencies in English. Specifically, Agree is in charge of the establishment of a relationship between *wh*-phrases with a specific interpretation and their counterparts, *pro*.

4. Subject Phrases and Agree

This section will address issues concerning noun phrases in [Spec, TP]. Their movement into [Spec, TP] is called A-movement. In (9), the category XP should be TP and α should be NP. It is expected that noun phrases in [Spec, TP] will be divided into two groups because the Agree operation, other than the Move operation, is also involved in licensing long distance dependencies in English.

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To examine this prediction, we look at the scope of items in [Spec, TP]. For example, Chomsky (1995) argues that A-movement does not leave a trace behind, as shown in (16).

- (16) a. (it seems that) everyone isn't there yet.
 b. I expected [everyone not to be there yet].
 c. everyone seems [e not to be there yet].

(Chomsky (1995: 327))

Boeckx (2004) also observes similar data and offers a generalization that only weak noun phrases (noun phrases with a non-specific interpretation) can reconstruct into the base position at LF. Specific scopal relations from Boeckx (2001) are shown in (17)-(19).

- (17) Someone from New York is likely to win the lottery.

(someone > likely, likely > someone)

- (18) Everyone seems not to be there yet.

(everyone > not; *not > everyone)

- (19) Every coin is 3% likely to land heads.

(every > likely; *likely > every)

(Boeckx (2001: 512, 517, 508))

As shown in (17), the weak noun phrase *someone* can scopally interact with *likely*. On the other hand, as (18) and (19) show, strong noun phrases, such as *everyone* and *every* NP, do not have a scopal relation with other scope items such as *not* in (18) or *likely* in (19).⁸

These linguistic facts are what the current proposal predicts. It shows that items occupying the same surface position should behave

differently. This prediction is manifested by (16)-(19). Different behaviors are exemplified with the presence/absence of interactions with other scope items. Therefore, we can conclude that the difference is attributed to the application of different operations; i.e., Move or Agree operations.

If the current discussion is on the right track, then two consequences emerge. First, the current analysis can correctly account for the sub-extraction phenomena of subject phrases. It is commonly considered that extraction out of a subject phrase is impossible. Chomsky (2008) considers the examples in (20) and (21).

(20)*It was the CAR (not the TRUCK) of which [the (drive, picture) caused a scandal].

(21)*Of which car did [the (driver, picture) cause a scandal].

(Chomsky (2008: 147))

The most important point here is that, in both (20) and (21), the subject phrase is specific in interpretation. The sub-extraction operation cannot apply to the noun phrases with a specific interpretation in (20) and (21). What about subject phrases with a non-specific interpretation? Since, as discussed so far, the phrases behave differently from those with a specific one, it is predicted that those with a non-specific interpretation should undergo the sub-extraction operation. In fact, (22) shows that the prediction is borne out: *wh*-phrases can move out of the subject phrases with a non-specific interpretation.⁹

(22) a. [Of which car]_i did some pictures e_i cause a scandal?

shows that the prediction is correct because the subject, *few girls*, does not have scope within the adjective *difficult*.

- (25) a. Few girls would be difficult for Jim to talk to \neq
 b. It would be difficult for Jim to talk to few girls.

(Postal (1974: 224))

(25a) and (25b) differ in scopal interpretations between *few* and *difficult*: (25a) is not ambiguous while (25b) is. Specifically, (25a) only has the following interpretation: Few girls are such that Jim would have difficulty talking to them (*few* > *difficult*). On the other hand, (25b) can have the other interpretation: Jim would have difficulty in only talking to few girls (*difficult* > *few*). Importantly, in (25a), the subject *few girls* cannot be interpreted within scope of *difficult*, which indicates that the subject does not undergo the Move operation.

In summary, this section has focused on subject phrases in [Spec, TP]. Subject phrases occupy [Spec, TP] at the surface level and are actually divided into two types.

Note that the previous section discussed A'-movement while this section has focused on A-movement. Both *wh*-phrases in [Spec, CP] and subject phrases in [Spec, TP] show the differences between the two types of operation. Therefore, these discussions show that Move is not the only syntactic operation, but the Agree operation also works as one of the necessary syntactic operations.

5. A Silent Pro Licensed by Agree

I have so far demonstrated that syntactic units in the Spec

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positions of CP/TP are divided into two types, according to the type of operations. When items do not undergo the Move operation, the base-position is occupied by a silent little *pro*.

According to Diesing (1992), noun phrases receive two different interpretations depending on their quantificational force. She proposes the following structure:

- (26) a. [IP NP [_{vP} PRO [_{VP} ...]]]
 b. [IP NP_i [_{vP} t_i [_{VP} ...]]]

She argues that noun phrases are generated into either [Spec, vP] or [Spec, TP]. When they occur in [Spec, vP], they have to move to [Spec, TP]. On the other hand, when they occur in [Spec, TP], the lower base position is occupied by a silent PRO.

What the current analysis has to make clear is the feature composition of what she calls a PRO while keeping in mind that Adger and Ramchand assume a silent *pro* without an indentificational feature. Diesing (1992) assumes a PRO in the governed position [Spec, vP]. In the 1980s, *pro* and PRO were assumed to differ in various important aspects. However, since the advent of the Minimalist Program, much of the theoretical underpinnings for the distinction between *pro* and PRO have faded away. What remains is just one common property shared by both *pro* and PRO, which is shown in (27).

- (27) They both occur in an argument position, but do not have a complete semantic content.

Essentially, this indicates that these two items lack semantic content

so that their antecedents must define their semantic interpretation. This paper argues that they are just two different names of the same syntactic item (for expository purposes, this paper continues to use the term *pro*). Furthermore, I assume that the [+anaphoric] feature on *pro*/*PRO* is only for descriptive purposes so as to capture the claim that elements should receive appropriate interpretations from antecedents. This line of reasoning makes it possible to unify *pro* with *PRO*.

Such unification brings a merit. In many previous studies, A-movement and A'-movement are not discussed in a unified fashion. For example, Pesetsky (1987) and Cinque (2000) focus on A'-movement, and they rarely mention A-movement. On the other hand, Diesing (1992) and de Hoop (1996) mainly deal with A-movement without saying much about A'-movement. However, the current analysis clarifies the common property of both A- and A'-movements. It claims that items with non-specific interpretations undergo a movement operation, whereas items with a specific interpretation do not undergo a movement operation. However, the latter are base-generated in the surface position, with the Agree operation establishing the relationship between them and the *pro* that occurs in the position that is assumed to be the original position under the movement analysis.

One might argue against the current analysis that unifies both A-movement and A'-movement, which is demonstrated in sentence (28) and its structure in (29).¹⁰

(28) Which book did the man buy?

(29) [_{CP} which book did [_{TP} the man [_{VP} *pro*₁ [_{VP} buy *pro*₂]]]]

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Both *which book* and *the man* receive a specific interpretation, and each of them is related with the corresponding lower empty category (pro_1 and pro_2 , respectively) by means of the Agree operation. Note that there are two instances of *pro* in the same vP domain, and each *pro* has to establish an appropriate agreement relation. However, the problem here is how to establish the appropriate relation.

To guarantee the appropriate one-to-one correspondence between each phrase with a specific interpretation and its corresponding *pro*, at least two plausible ways are applicable. The first is that Agree can apply freely. Due to the free application of Agree, some sentences will have correct interpretations while others will be judged as gibberish. This line of reasoning is similar to the one found in Chomsky (2013, 2015), where the Merge operation is applied freely. When Chomsky's idea of the free application of Merge is extended to the Agree operation, Agree can apply freely. It follows that, in sentences (28)/(29), the two base-generated items can freely be related with any *pro* in any fashion, but the grammatical outcome comes about only when the relation is established between *which book* and pro_2 and *the man* and pro_1 . The other combinations result in ungrammatical sentences.

The other plausible line of reasoning is that an item in [Spec, TP] always hierarchically takes precedence over the one in [Spec, CP] in that the former is the first to induce a syntactic operation. In other words, the derivation proceeds in a strictly bottom-up fashion, following the locality principle. In (29), for example, the item generated in [Spec, TP] assigns the value to pro_1 , and then the one in [Spec, CP] gives the value to pro_2 . This results in a successful

interpretational relation. This derivation observes the principle of locality.¹¹

This paper does not offer an argument over which ideas are correct because such choice does not hinge on its current discussion. The most important issue is that data, such as (28)/(29), do not prevent the unification of A-movements with A'-movements.

To summarize this section, the current paper holds that *pro*, which Adger and Ramchand (2005) assume does not have an identification feature, and *PRO* that Diesing (1992) assumes in the VP domain should be analyzed as being subsumed under the same single item. Based on this idea, the current paper unifies A-movements with A'-movements such that when items with a specific interpretation do not undergo a movement operation, the Agree operation licenses the lower *pro*.

6. Semantic Effects of Agree

I have so far extended the application of the Agree operation, accounting for various linguistic facts. However, an unrestricted expansion of its application has a potential to contradict the requirement that linguistic mechanisms should be restricted as strictly as possible. Therefore, this section clarifies the condition under which the Agree operation applies. The current paper proposes (30) as the condition.¹²

(30) The Agree operation has effects on the interfaces.

Under the current Minimalist framework, the structure-building processes in the syntactic component are mapped on the Sensorimotor (SM) and Conceptual-Intentional (C-I) interfaces (roughly, sound and

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meaning, respectively). Therefore, it is a plausible assumption that a syntactic operation, such as Agree, makes effects on the interfaces. The effects on the SM interface are obvious; the agreement morphemes on verbs and case-realization on nouns are ubiquitous in languages. The current paper, however, following Chomsky (2008), pursues a C-I centric model—where the Agree operation is driven by the requirement of the C-I interface.

When we combine the C-I centric idea with the proposal in (30), we get (31):

- (31) The Agree operation determines the semantic interpretation.

(31) indicates that some element that is introduced into the derivation, along with an unspecified semantic value, must receive the value through the application of the Agree operation.

Up to this point, we have discussed items with a specific interpretation (that is, *which*-NPs in section 4 and subject DP in section 5) that assign a semantic interpretation to the *pro* in a lower position through the Agree operation. They are clear instances of (31).

To further demonstrate that (31) is plausible, we will take a look at the anaphor-binding discussed by Hasegawa (2005), who claims that semantic interpretations of anaphors are determined by means of the Agree operation. The sentence in (32) is a concrete example.¹³

- (32) a. John criticized himself
- b. [_{TP} T [_{VP} John [_{VP} V himself]]]
- [u-φ] [φ][u-C] [φ][u-C][Refl]
- ↑ ↑ ↑
- (cf. Hasegawa (2005: 58-59))

In (32), T enters into a multiple agreement relation with *John* and *himself*. The important point is that *himself* does not have a full semantic content in itself and it must receive a semantic content from its antecedent. This transmission of semantic content is conducted by the Agree operation.

The next example is the interpretation of PRO, as discussed in Landau (2000, 2004).^{14,15}

- (33) a. The chair dared to wear a T-shirt.
- b. [_{FP} F [_{VP} DP V [_{CP} C [_{TP} PRO T [_{VP} t_{PRO} V]]]]]
- ↑ ↑ ↑
- (Landau (2000: 67-68))

Similarly, in (33), F, which is realized as T or v, enters into the multiple agreement relation and determines the interpretation of the PRO as a result of an Agree relation.

Both anaphors and PROs offer supporting evidence that the Agree operation contributes to semantic interpretations, which supports the claim in (31).

It is important to recall that only items with a specific interpretation can give a semantic value to a lower pro without a semantic content (which makes a striking contrast to items with a

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non-specific interpretation that undergo the Move operation). In fact, the antecedent of an anaphor and the PRO must be specific in semantic interpretations.

(34) a. I wrote all/these books_i on each other_i's advance.

b. *I often write books_i, on each other_i's advance.

(Stepanov (2001: 79))

(35) John is eating an apple_i [_{SC} PRO_i unpeeled].

a. 'John is eating a certain apple unpeeled.'

b. #'John is eating a nonspecific apple unpeeled.'

(Tsai (2001: 137))

The difference in (34) is that noun phrases with specific interpretations, such as *all books* and *these books*, can bind the reflexive *each other* whereas non-specific noun phrases, such as *books*, cannot. Only specific noun phrases can entertain a relationship with semantic interpretations. As (35) shows, when the object *an apple* determines the semantic interpretation of the PRO, it does not have a non-specific interpretation; a specific interpretation is the only available interpretation.¹⁶

To recap, we can say that when there is an item without any semantic interpretation, the item must receive some interpretation by means of the Agree operation. The semantic determination through the Agree operation is a procedure by which an item undergoes the appropriate process at the interfaces and, in this sense, the Agree operation is interface-driven.

At this point, it is instructive to discuss various languages (that is, languages that show rich case inflection or have rich agreement

morphemes), other than English, to demonstrate that the Agree operation determines the semantic interpretation of a syntactic item in many languages. Given that the overt outcomes of the Agree operation are case-realization and agreement morphemes, it is important to note that many previous literatures have reported that the agreement phenomena, such as case and agreement morphemes, are related with semantic interpretations.

First, the relationship between case and meaning is found in the following Turkish sentence.

- (36) İki kız(-i) tanıyordum. (Turkish)
 two girl(-Acc) I-knew
 ‘I knew two girls.’ (Enç (1991: 6))

When an overt case appears, the object must receive a specific interpretation, whereas an object without an overt case marker only receives a non-specific interpretation. Therefore, there is a co-relation between the presence/absence of an overt case-marker and a semantic interpretation.

Agreement morphemes also show the same point. The following sentences are concrete examples:

- (37) No (*lo) oyeron a ningún ladrón.
 Not him heard.3PL to any thief
 ‘They didn’t hear any thieves.’ (Porteño Spanish)
 (Suñer (1988: 396))
- (38) Diariamente, la escuchaba a una mujer
 daily, her listen.3Sg.Past to a woman

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que cantaba tangos.

who sang.Indic tangos

‘Daily, he/she listened to a woman who sang tangos.’

(Suñer (1988: 396))

In (37), the indefinite noun phrase with a non-specific interpretation cannot license the presence of a clitic (*lo* in this case). On the other hand, in (38), when a relative clause is attached to the same indefinite noun phrase, the phrase easily receives a specific interpretation and licenses the occurrence of a clitic (*la* in this case). Following Suñer (1988), among others, the current paper assumes that the presence of a clitic is a realization of agreement morphemes. (37) and (38) constitute evidence for the relationship between agreement morphemes and semantic meanings.

I have reviewed two types of reflections exhibited by syntactic Agree operation: case-assignment and agreement realization. Each reflection exhibits a relationship with semantic interpretations. This relationship is supported by many previous literatures, and therefore, the claim in (31) is plausible.¹⁷

7. Implicational Relations between Agree and Semantics

I have so far discussed (31), which is repeated here as (39), and shown that a syntactic item without a complete semantic content enters into an Agree relation.

(39) The Agree operation determines the semantic content.

(=(31))

Here, we have to clarify the implicational relation that (39) gives rise to. What (39) has as its implicational relation is (40a), not (40b).

- (40) a. The determination of semantic interpretation implies the application of an Agree operation.
 b. The application of an Agree operation implies the determination of a semantic interpretation.

We can then find cases where, despite the involvement in the Agree operation, no semantic outcome arises. A typical example is subject-verb agreement in English and Turkish.

- (41) A man arrived yesterday.
 a. A certain man arrived yesterday. (specific)
 b. One man (rather than two) arrived yesterday.
 (nonspecific)
 (Tsai (1999: 1))

- (42) Üç çocuk/bazı çocuk-lar araba al-dı.
 three kid/some kid-PL car buy-PAST
 ‘Three/Some kids bought car/did car-buying.’
 (Aygen (2007: 60))

As both (41) and (42) indicate, the subject phrases in English and Turkish can receive either specific or non-specific interpretation even though the subject position inevitably agrees with their verb. Therefore, the Agree operation, which brings about agreement

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morphemes on a verb, does not always induce the semantic outcome. Consequently, (40b) is not true.

What I need to clarify is when (40b) is true and when it is not. Before discussing this question, it is important to note that we have discussed the plausibility of (31), which indicates that (40a) is always true. When an item with an unspecified semantic interpretation (such as *pro*, reflexives, and *PRO*) is introduced into the derivation, it receives some semantic content through the application of the Agree operation. This is the case in (40a): the determination of a semantic content implies the application of the Agree operation. If not only (40a), but also (40b) holds at the same time, we can get the mutual implication between the application of the Agree operation and the semantic determination; semantic interpretations and the application of the Agree operation are co-related with each other. Therefore, the question raised above is tantamount to the one of under what circumstances we can find such a mutual implication.

It seems true that many languages follow the generalization in (43).¹⁸

- (43) Both (40a) and (40b) hold under the circumstances where the overt phonological indication is observed.

In order to understand the generalization, first examine example (36) where the interpretation of objects depends on the case marker. In Turkish, an object has a phonological choice to be with or without an overt case marker. Under such circumstances, the Agree operation makes a strict co-relation with the semantic interpretation. By entering into an Agree operation, the object comes to receive a specific

interpretation, the effect of which is realized as an overt case marker. On the other hand, if an object does not enter into the Agree operation, its case value remains unspecified. Therefore, the semantic interpretation of such an object is not narrowed down at the interface; it can have either specific or non-specific interpretations.^{19,20}

In other circumstances (that is, a subject position in Turkish), a subject phrase has only one choice. That is, it must show an agreement relation with a verb. There is no optionality of phonological distinction on the realization of a case marker. In this case, the Agree operation does not have any semantic outcome. A subject phrase in Turkish can be either specific or non-specific in semantic interpretation, despite the presence of an agreement morpheme on a verb. In such circumstances, as the generalization in (43) shows, the Agree operation does not induce any semantic effect, and only (40a) holds.

I have shown some contexts where the Agree operation implies the determination of a semantic interpretation. When an item has a phonological choice to be overt or not, the correlation between agreement phenomena and semantic determination is observed. On the other hand, if no phonological choice is available, the Agree operation does not induce any semantic effects.

An alternative to the above claim would be to appeal to the language uniformity holding that, under any circumstances, the Agree operation always induces a semantic outcome, and its mutual implication always holds. To understand this alternative, let us examine the Turkish language again. As previously illustrated, it is true that a subject in Turkish does not show any distinction in terms of case markers, but a subject in nominalized clauses does. Sentences

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(44) and (45) are relevant examples.

- (44) [köy-ü haydut bas-tıġ-ın]-ı duy-du-m
 village-Acc robber raid-Fn-3Sg-Acc hear-Past-1Sg
 ‘I heard that robbers raided the village.’

(non-specific, generic reading as the only reading)

(Kornfilt (2008: 84))

- (45) [köy-ü bir haydut-un bas-tıġ-ın]-ı duy-du-m
 village-Acc a robber-Gen raid-Fn-3Sg-Acc hear-Past-1Sg
 ‘I heard that a (certain) robber raided the village.’

(specific for all speakers)

(Kornfilt (2008: 84))

In (44) and (45), the bracketed parts are nominalized clauses. Within each clause, the subject *haydut* (“robber”) receives a different interpretation, depending on the presence/absence of an overt case marker (with each interpretation shown below each sentence). Given that a subject in a nominalized clause differs in interpretation depending on the case-marker, this difference can be extended to usual (non-nominalized) clauses and it might turn out that a subject in usual clauses might also differ in interpretation as a reflection of the Agree operation, although the difference cannot be phonologically overt. Therefore, considering many other languages and other constructions, it could be possible to conclude that, even in languages without any overt phonological distinctions, the Agree operation can always induce a semantic effect. Consequently, the line of reasoning claiming that the Agree operation always induces a semantic effect might work as an alternative to the current paper, in which we have assumed (43): the same effect shows up only under circumstances where an overt phonological indication is observed.

However, the current paper does not adopt this alternative. It depends on further research on whether the theoretical results coming from well-studied languages apply in other less-known languages. At present, we simply do not have sufficient piece of evidence for that.²¹ The assertions of this paper are more modest. The generalization in (43) is true in many languages. Furthermore, phonological differences are a plausible clue that accounts for the differences observed among languages.

For the reasons above, this paper concludes that both (40a) and (40b) holds at the same time only when we observe phonological distinctions in some contexts.

8. Conclusion

This paper discussed the following questions:

- (46) a. Is the Agree operation necessary in capturing long distance dependencies in addition to the Move operation?
- b. If the Agree operation is empirically necessary, what theoretical underpinning exists?

As an answer to (46a), the current paper argues that the Agree operation is necessary in capturing some cases of long distance dependencies. As for (46b), the current paper appeals to the requirement from the C-I interface. Section 3 explored Adger and Ramchand (2005) as one of previous studies. They analyze Scottish Gaelic and assume *pro* without an identification feature. Following this analysis, the current paper supports the licensing of a *pro* in A- and A'-movements. Section 4 raised some specific examples of

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A'-movements. Section 5 focused on A-movements, while section 6 demonstrated that both A-movements and A'-movements can be unified as a single phenomenon that is related with the Agree operation. Section 7 asserted that the Agree operation has a semantic outcome. However, section 8 showed that semantic interpretations and the Agree operation do not show one-to-one correspondence. Therefore, semantic determination is a sub-case of the reflation of the Agree operation.

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Notes

- 1) Throughout this paper, I will use the symbol e to indicate an empty category, regardless of whether a different symbol is used in the original data from the previous studies that I will cite.

- 2) The list of abbreviations in the current paper is as follows: ACC: accusative case, DAT: dative case, DEF: definite, FN: factive nominal, FUT: future, GEN: genitive, INDIC: indicative, PL: plural, refl: reflexive, REL: relative, and SG: singular.
- 3) The *pro* that Adger and Ramchand assume will be discussed in more detail in section 6.
- 4) A reviewer raises a question of whether Scottish Gaelic has a *wh*-phrase with a non-specific interpretation and whether such *wh*-phrases, if any, show any differences from those with a specific interpretation. Adger and Ramchand do not mention these points, and therefore, the investigation of these points is left for further research.
- 5) Constructions and syntactic phenomena discussed in this section and the next sections are found in many other languages. However, due to limitation of space, this paper will focus on data from English.
- 6) At this point, I hasten to add that the contrast in reconstruction possibility found in (12) is only observed in Binding Condition (C), but not in Condition (A). The latter does not show such contrast in types of *wh*-phrases. Heycock (1995) emphasizes this point and focuses on Condition (C) of binding theory. I refer interested readers to section 3 of her paper for the relevant discussion.
- 7) I thank a reviewer for bringing this point to my attention.

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8) When *someone* in (17) has a specific interpretation, it behaves as a strong NP in that it only has a wide scope interpretation over *likely*. I thank a reviewer for clarifying this point.

9) The judgment of (20)/(21) and that of (22) are from different authors. However, Jiménez-Fernández, who raises (22), agrees about Chomsky's judgment of (20)/(21). Both (20) and (22) are ungrammatical for these two authors. I thank a reviewer for clarifying this point.

10) Head movement, which is not relevant to the discussion here, is abstracted away from the structure. In addition, the indexes 1 and 2 are attached to the two instances of *pro* for ease of discussion.

11) If the second idea shown here is on the right track, then crossing constraints receives the same account.

- (i) a. Who_j is that book_i too boring to send e_i to e_j?
- b. *What_i is John_j too boring to send e_i to e_j?

(Cinque (1990: 100))

An item that is merged first in a bottom-up derivation takes priority over the other item in licensing a higher empty category, and an item that is merged later licenses a lower item.

12) (31) has the implication in (ia), not (ib). I will discuss this point later.

- (i) a. The determination of semantic interpretation implies the application of an Agree operation.
- b. The application of an Agree operation implies the determination of a semantic interpretation.

13) In (32), some features and movement relations that are not relevant to the current discussion are abstracted away from the details.

14) I will not show the irrelevant details in (33).

15) If the discussion of *pro* and *PRO* in section 5 is on the right track, then the *PRO* in Landau (2000) can be reduced to the *pro* in the current paper.

16) A reviewer asks how the current analysis account for the grammaticality of the following sentences:

- (i) a. No boy criticized himself.
- b. No one tries *PRO* to buy the house.

The point is the semantics of *no*-NP. It is well-known that *no*-NP exhibits duality in semantics. In some cases, *no*-NP behaves similarly to strong NPs such as *all* NP and *both* NP. In other, *no*-NP shows the same properties as weak NPs. For example, it can occur in *there* constructions, as shown below.

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- (ii) a. There are some/three/no unicorns in the garden.
 b. *There are all/most/both unicorns in the garden.

(de Hoop (1996: 14))

Therefore, (i) is another example of non-specific properties of *no*-NP. For the lack of a general consensus of semantics of *no*-NP, I leave the exact nature of *no*-NP for further research.

17) Under the recent Minimalist framework, Agree and Move are independent from each other (Chomsky 2013, 2015). If a movement into a higher position has a semantic outcome, we can say that every syntactic operation has a semantic outcome. There are a number of literatures arguing for the relationship between a movement into a higher position and a semantic determination.

18) This is reminiscent of the Uniformity Principle in Chomsky (2004), which claims for the importance of phonological clues.

19) Öztürk (2005) claims that indefinite noun phrases without a case are incorporated into a higher head, and they should only receive a non-specific interpretation. Therefore, any additional operation will result in a non-specific interpretation.

20) As a result, a noun phrase with a non-specific interpretation, together with its result, is sent to the interface. The concern as to whether all information is sent to the interface, or part of it is sent, or nothing is sent depends on languages. In Turkish, I assume that case-information is

not sent to the interface. However, in Arabic, some of the information is sent to the interface, and as a result, partial agreement appears.

21) See Aygen (2007) for Turkish, supporting the alternative discussed here.

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