A Paradigm in A-Movement and A-bar Movement*

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Problems with Chomsky's feature system in A- and A'-movements are identified and considered, highlighting problems which successive cyclic movement (especially wh-movement) poses in intermediate stages. It is argued that there is a feature paradigm in A- and A'-Agree and that agreement is related to both A- and A'-movements in intermediate stages as well. A revised feature composition for A- and A'-sets (probes and goals) in English is introduced.

Key words: probe, goal, A-set, A'-set, Agree, One-Fell Swoop Principle

1. Introduction

The primary purpose of this paper is to consider some systematic patterns in Match and Agree in TP-domain and CP-domain and to examine the possibility of the existence of a paradigm in A-movement and A-bar movement. I will look at three possible ways of defining the nature of probes and goals namely in terms of: (a) individual identical features, (b) sets containing identical features, (c) functional items and lexical items containing identical features. I will also consider how A-

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and A'-movements work systematically in the computational system. The problems which successive cyclic wh-movement poses in intermediate phases will be considered. It will be argued that there is a feature paradigm in A- and A'-Agree and their related movements. Based on this feature paradigm, we can account for successive cyclic wh-agreement and movement in wh-questions.

2. The Nature of Probes and Goals

In the Minimalist Program, the most important elements of the computational system are probes and goals. This raises two questions: (i): What is the nature of probes and goals? and (ii) How do probes and goals work in the computational system? Hong (2004, 2005) explores these issues, treating A- and A'-Agree and their related movement operations. There are three possible ways of defining the nature of probes and goals namely in terms of: (a) individual identical features, (b) sets containing the relevant identical features, (c) functional items and lexical items themselves. The first possibility cannot be accepted for the following reason:

(1) Probe and goal must both be active for Agree to apply
Chomsky (1999, p. 4)

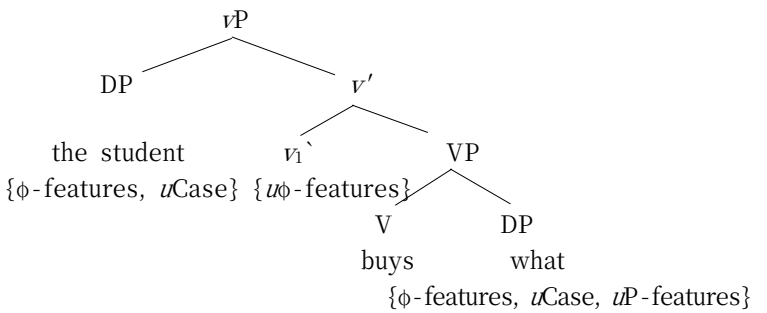
In order to enter into Agree, both a probe and a goal should be active as stipulated in (1). According to Chomsky (1998, 1999), uninterpretable features render both probes and goals active. If we accept this idea, given the first possibility, all the relevant features entering into Agree should always be uninterpretable and unvalued features, since according to Chomsky (1998, 1999), all uninterpretable features are initially unvalued when they enter the derivation. Any feature which is interpretable is inactive, so cannot enter into Agree. Another problem is, if both matching features are uninterpretable and unvalued, how the operation Agree can work between two uninterpretable and unvalued features. In particular, it is not clear how one unvalued feature values

another corresponding identical unvalued one under the operation Agree. For these reasons, both a probe and a goal should be at least a set or more than a set. Thus, under the second possibility, these ϕ-sets participate in A-Agree as probes or goals in the computational system. On the other hand, in A'-Agree, like the ϕ-set, the related features seem to comprise a separate set. If this is true, in the case of wh-arguments such as *who* and *what*, they both have a ϕ-set and an A-bar related set as goals. If they have two goals, one is related to A-Agree and the other is related to A'-Agree. The second possibility assumes that the features carried by items are not an unstructured list, but rather are grouped into subsets. For example, in relation to ϕ-features which are related to A-Agree, person, number, and gender features can comprise a set. This full member set can be referred to as a complete ϕ-set. This set can be a probe or a goal in A-Agree in the computational system. Finally, in relation to the third possibility, both functional items and lexical items have an unstructured set comprising a list of features which are related to A-Agree and A'-Agree. However, under the third possibility, we do not have such an A-agreement feature set. Consider the following sentence:

(2) What do you think that the student buys?

If movement is driven by both feature agreement and an EPP feature, A-movement is triggered by the EPP feature when the probe has ϕ-features, while A-bar movement occurs when the probe has P(eripheral)-features which are related to force, topic, and focus, etc. Suppose all functional items, C, T, and *v* are probes. In the first stage of the derivation of the sentence in (2), we will have the following structure:

(3)



The first Agree is applied to both *what* and v.[1] Under the third possibility, although the ϕ-features of v are fully matched with the ϕ-features of *what,* the features of *what* are not fully matched with those of v, since *what* has more features including P-features for A'-Agree. So the uninterpretable and unvalued features of v are deleted and valued by Agree, while those of *what* cannot be. According to Chomsky (1998, p.24), in the following construction, C_2, C_1, and v_2 are associated with P-features, but not for v_1:

(4) Spec-C_2 ... Spec-v_2 ... Spec-C_1 ... Spec-v_1 ... XP

In the above construction, XP (i.e. a wh-expression) raises through the Specs in succession, landing finally in Spec-C_2. The result is the 4-membered A-bar chain (Spec-C_2, Spec-v_2, Spec-C_1, Spec-v_1) and the 2-membered A-chain (formed by Object Shift). This means that in the structure in (3) at least the ϕ-features of the wh-expression *what* should enter into Agree with those of v_1 and its relevant Case feature should be deleted and valued at this stage.[2] If the Case feature of *what*

1) An important theoretical issue here is whether the light-verb serves as both an A-head and an A-bar head. Roberts (1994) argues that UG does not allow a given head to have a dual state. However, under the second possibility, we assume that v has two separate subsets which are related to A-Agree and A-bar Agree. Thus, if we accept the second possibility, unlike Roberts (1994) v can have a dual status.

is not deleted and valued by Agree with v_1, there is no further chance to delete the Case feature of *what.* Although v_2 containing ϕ-features can also be another candidate as a probe for deleting the Case feature of *what* in the matrix clause, this can result in improper movement. For this reason, the wh-expression *what* needs at least more than one subset for A- or A-bar Agree within its set. Thus, the third possibility that probes and goals are lexical items and functional items themselves containing all features as one set should at least be revised or rejected. If the computational system works under the second possibility, we can assume the following Generalised One-Fell Swoop Principle (GOFSP):

(5) Only a complete set can delete and value the uninterpretable and unvalued features of the paired matching (in)complete sets.

Based on the assumptions that probes and goals are sets composing relevant matching features and that A-bar Agree is analogous to A-Agree, the separate A-and A-bar Agree operations are applied to probes and goals under the GOFSP in (5).

3. One-Fell Swoop Principle in A-Movement

Consider A-Agree involving A-movement with the following example:

(6) John is likely to be elected

The above sentence has the following structure in the first stage:

(7) [$_{TP}$ to [$_{vP}$ [$_{VP}$ be elected John]]]
{*u*incompl ϕ-set, *u*EPP} {compl ϕ-set, *u*Case}

2) Chomsky (1999, p.4) states that structural Case is not a feature of the probes, T and *v*, but it deletes under agreement if the probe is appropriate: ϕ-complete. Thus, Case itself is not matched, but deletes under the matching of ϕ-features.

The infinitive T of raising predicates is defective, so it has an incomplete ϕ-set containing only a person feature. On the other hand, the goal of *John* has a complete ϕ-set, so it can delete the feature of the incomplete ϕ-set of the probe by Agree under the GOFSP. However, the features of the complete ϕ-set of the goal are not fully matched, so the Case feature cannot be deleted and valued. The goal, the ϕ-set of *John* is still active, so it can enter into Match and Agree with the next probe after moving to spec T in the infinitive clause. After satisfying the EPP feature, the goal, the ϕ-set of *John* enters into an agreement relation with the next probe in the following stage:

(8) [$_{TP}$ is likely [$_{TP}$ John to be elected John]]
{*u*compl ϕ-set, uEPP}{compl ϕ-set, *u*Case}{~~*u*incompl ϕ-set, *u*~~EPP}

In the above stage, the finite T has a complete ϕ-set, so this complete ϕ-set enters into an agreement relation with the goal, the complete ϕ-set of *John*.[3] Both the probe and the goal are fully matched with each other. Their uninterpretable features are deleted by Agree under the GOFSP. The Case feature of the goal is also deleted and valued, since all the features of the complete ϕ-set of the goal are fully matched. Finally, *John* is merged in spec T to satisfy the EPP feature of T:

(9) [$_{TP}$ John is likely [$_{TP}$ John to be elected John]]
{~~*u*compl ϕ-set~~, ~~*u*EPP~~} {compl ϕ-set~~, *u*Case~~}

When the intermediate T has an incomplete ϕ-set and the DP *John* has a complete ϕ-set, the operation Agree is applied only to the incomplete ϕ-set. So, the following situation leads to the further Agree and

3) In the raising construction, the copy of *John* will enter into Match and Agree with the finite T, since it is located inside the checking domain. So, the all uninterpretable and unvalued features of the moved John and the copied John are simultaneously deleted and valued by the probe, the complete ϕ-set of the finite T. This can occur in passive sentences and other raising constructions in the same way.

movement:

(10) When a probe is an incomplete ϕ-set (A-set) and a goal is a complete ϕ-set (A-set), there is further Agree and movement.

On the other hand, when the finite T has a complete ϕ-set and the DP *John* has a complete ϕ-set, the operation Agree is applied mutually. Thus, the A-movement is terminated.

(11) When a probe is a complete ϕ-set (A-set) and a goal is a ϕ-complete set (A-set), A-Agree and A-movement are terminated.

4. One-Fell Swoop Principle in A-bar Movement

According to Chomsky's (1998) feature system, in English wh-questions, an interrogative C has an uninterpretable Q feature that must be deleted through Agree and an EPP feature that triggers overt movement of the closest available wh-expression. So, given this feature system, in the case of wh-movement, since the wh-feature participates in A-Agree like a Case feature, we might hypothesise that the probe of C has a singleton set containing only one feature (Q-feature) as a member, while the goal of wh-expression has two members (Q-feature, and Wh-feature) in its set:

(12) The feature composition of A'-sets
Probe: {{*u*Q}} Goal: {{iQ}, *u*Wh}
(*u*Wh= an uninterpretable and valued wh-feature)

Since the Q-feature is related to the peripheral system (force, topic, focus·), I will call this singleton set a P-set. This singleton P-set is a subset of the whole sets (A-sets) of both the probe and the goal, as shown in (12). Like ϕ-sets in A-Agree, both a probe and a goal should

have identical P-sets in order to participate in A-Agree. On the other hand, the wh-feature is just attached to the P-set in the goal in order to make it active, just as the Case feature attached to ϕ-set of NP renders the ϕ-set active. If this singleton P-set assumption is valid, the deletion of the uninterpretable Q-feature of C takes place under Match and Agree with the corresponding singleton P-set of the wh-expression, which contains an interpretable identical feature. Consider the following sentence:

(13) Where will he go?

This will have the following structure at the point where C is merged with its TP complement:

(14) $[_{CP}$ C $[_{TP}$ he will go where]]
{{*u*Q}} {{*i*Q}*u*Wh}

If wh-movement is parallel to A-movement, like the uninterpretable Case feature, the uninterpretable wh-feature is also deleted under Match and Agree of the singleton P-sets in A'-sets between the interrogative C and the wh-expression *where*. Although the deleted uninterpretable wh-feature cannot reach LF, the intrinsically valued wh-feature is visible in PF. So, we can see morphophonological regularities in wh-expressions.

5. Problems in the Singleton Set Assumption

Based on the assumptions that the nature of probes and goals are identical sets and the computational system abides by the Generalised One-Fell Swoop Principle, we have assumed the following feature paradigm for A- and A-bar Agree in English:

(15)

	A-Agree	:	A-bar Agree
Probe:	{{*u*Person, *u*Number}}		{{*u*Q}}
Goal:	{{*i*Person, *i*Number}*u*Case}		{{*i*Q} *u*Wh}

(u**Wh**= an uninterpretable and valued wh-feature)

For a long distance wh-movement, Chomsky (1998, 1999) assumes that a wh-expression moves through the edge of each phase, before reaching its final landing site. Consider the following sentence:

(16) What did John say (that) Mary ate?

The derivation of the above sentence will be as follows (**what** is a copy here):

(17)[$_{CP2}$ What [$_{C}$did][$_{TP}$ John [$_{vP2}$ **what** [$_{v}$say][$_{CP}$ **what** [$_{C}$ that][$_{TP}$ Mary]

[$_{vP1}$ **what** [$_{v}$ ate **what**]]]]

If the wh-movement is a successive cyclic through the edge of each phase as in the above structure, the question that arises here is how movement to intermediate positions is triggered. According to Chomsky (1998, p.14), Move is a composite operation of Agree and Merge:

(18) A third operation is Move, combining Merge and Agree
Chomsky (1998, p.14)

So, whenever the wh-expression *what* moves to the edge of each intermediate phase, Match and Agree should take place. However, in (17), neither *v* nor intermediate C seems to have a Q-feature as a singleton set. If they have it as a singleton set, they can enter into Match and Agree with the corresponding set of the wh-expression. If they do, they will delete the uninterpretable wh-feature that makes the

singleton set of the wh-expression *what* active. In that eventuality, the singleton P-set of the wh-expression *what* will be no longer active, so it cannot enter into Match and Agree with other probes subsequently. This means that it cannot move further. So, under the singleton P-set assumption, Agree between probes, light verbs *v*s and declarative Cs and a goal, a wh-expression does not seem to happen in the intermediate phases. If this is not possible, how can a wh-expression move to spec *v*P and spec CP?

Unlike English, wh-agreement in intermediate positions in Cs is seen in many wh-movement languages. McCloskey's (2002) Irish examples give us some evidence of wh-agreement in Cs in the non-final stages of successive-cyclic wh-movement. Consider the following sentence:

(19) an t-ainm a hinnseadh duinn a bhi ar an ait
the name aL was-told to-us aL was on the place
'the name that we were told was on the place'
McCloskey (2002, p. 185)

In Irish, the form of the complementiser in a finite clause is different depending on the configuration. Finite complement clauses are normally introduced by the particle *go*. However, any finite clause out of which movement applies to an A'-position is introduced by a different particle *aL* (as it is conventionally written) as in (19). If the variable position is occupied by a resumptive pronoun, *aN* appears in the C positions. In McCloskey (1990, 2001, 2002), the link between *aN* and a resumptive pronoun is assumed to be one of binding. On the other hand, based on Chomsky (1977), the above example is related to wh-movement. Thus, the operator feature (Rel-OP) which is related to relative clauses can be in the P-set of Cs as an element instead of the Q-operator feature for interrogative clauses. The particle *aL* in Cs can be a reflex of valuation of feature agreement in the P-sets between Cs and the invisible relative pronouns. Thus, the example in (19) provides a sort of visual evidence of wh-agreement of the P-sets between Cs and a relative operator in successive cyclic wh-movement through spec CPs. Further evidence for

wh-agreement comes from the *que-qui* alternation phenomena (which Kayne (1976) terms MasQUErade) in French:

(20) a. Tu crois *que* lequel a demissione?
You think that which has resigned?
'You think that which one has resigned?'
b. Lequel crois-tu *qui* a demissione?
Which think-you *who* has resigned?
'Which one do you think has resigned?'
Radford (2001, p.43)

The complementiser *que* is normally considered as a counterpart of English *that.* When the wh-pronoun *lequel* is in-situ, *que* is invariable. However, in structures like (20b) it is spelled-out as the form *qui,* when the wh-pronoun *lequel* moves to spec CP in the matrix clause. This appears to indicate that the complementiser is spelled out as *qui* when there is a relevant agreement, but as *que* when there is not. Radford (2001) argues that *qui* appears in C when the complementiser agrees in both ϕ-features and P-features with its subject. He calls this agreement Complex Agreement, since this agreement is related to both ϕ-features and P-features. Based on Radford (2001), I assume the following characterisation of Complex Agree in (21):

(21) Complex Agree is an operation which is applied to both matching A-sets and A'-sets simultaneously.

Thus, when, at a certain stage, a phase head has both an A-set and an A'-set, and those sets enter into Match and Agree with matching goals simultaneously, Complex Agree can be applied there. And, when the phase head is assigned an EPP-feature based on Complex Agree, Complex Movement can be applied there:

(22) Complex Movement is a composite operation which consists of Complex Agree and Merge.

This movement should be distinguished from A-movement or A'-movement, since it is related to both the matching A-sets and A'-sets.

Following Chomsky (1998, 1999, p.6) and Radford (2001), if we accept (21) and (22), C is one-to-one associated with a ϕ-complete T but not with a ϕ-complete *v*. In Chomsky (1998,1999), C has a close relation with T in ϕ-completeness, since T is selected by C. According to Chomsky, control structures and finite clauses have the selectional relation C-Tcomp, while raising clauses have the relation V-T_{def}.[4)]

The following example supports his argument:

(23) Lequel crois-tu *que*/**qui* le premier ministre a vire?
Which think-you that/*who-3Sg the prime minister has sacked?
'Which one do you think the prime minister has sacked?'

As can be seen from the example in (23), only a local wh-moved *subject* in spec CP triggers Complex Agreement, not a wh-moved object, since only the wh-moved subject is related to ϕ-complete T, which is associated with C. However, *qui* cannot appear in intermediate C positions when a wh-subject undergoes a long distance wh-movement as illustrated below:

(24) Lequel crois-tu *que/*qui* Jean va croire *qui* a demissione
Which think-you *that/*who* John will think who has resigned
'Which (person) do you think John will think has resigned?'

The above sentence has the structure in (25):

(25) [$_{CP1}$ Lequel crois-tu *que/*qui* [$_{TP1}$ Jean va croire [$_{CP2}$ *qui* [$_{TP2}$ a demissione]]]]

There is no Complex Agreement between C and the wh-moved subject

4) See Chomsky (1998,1999), and Nasu (2002) for more discussions.

in the intermediate CP_2. The absence of Complex Agree between them leads to the appearance of *que* in the relevant C position. In CP_2, C agrees in both ϕ-features and P-features with the wh-subject *lequel* in spec TP, while, in CP_1, C agrees only in P-features with the moved wh-subject, since the ϕ-features of C in that position are associated with those of T in TP_1. Thus, there is agreement only in P-features between C and the moved wh-subject. That is why *que* appears in CP_1. So, these *que-qui* alternation phenomena in French seem also to be a piece of evidence in support of wh-agreement in successive-cylic movement through spec-CP.

According to Radford (2004), the following example in French presents evidence for wh-movement through agreement with *v*:

(26) a. Il a commis quelle betise?
He has committed what folly
'What mistake did he make?'
b. Quelle betise il a commise?
What folly he has committed
'What mistake did he make?' Radford (2004, p.403)

In French, wh-movement is optional in wh-questions, even though it is sometimes obligatory. In (26a), wh-in situ is allowed. Radford maintains that the participle *commis* command is in the default (masculine singular) form. The participle *commis* is a masculine singular form, but the in-situ wh-expression *quelle betise* contains a feminine singular marker *-e*. However, in (26b) the participle *commise* agrees with the moved wh-expression *quelle betise,* since both have the feminine singular marker *-e*. Both sentences in (26a) and (26b) might be expected to show Match and Agree of ϕ-sets between *v* and the wh-object, since the uninterpretable Case feature of the wh-object is deleted under Agree between them. Radford's argument for two different agreements in (26a) and (26b) is that the wh-movement structure in (26b) involves both ϕ-set and P-set agreement between *v* and the moved wh-expression, whereas the wh-in situ structure in

(26a) involves ϕ-set agreement but no P-set agreement between *v* and the in-situ wh-expression. Thus, if we accept his argument, wh-movement to intermediate positions seems to be related to wh-agreement (i.e. P-set agreement) between *v* and a wh-expression. Now, consider the following long distance wh-movement:

(27) a.*Combien de fautes Jean a-t-il dit**es** que Paul a fait**es**
how many of mistakes Jean has-he said that Paul has made
'How many mistakes did Jean say that Paul made?'

b. Combien de fautes Jean a-t-il dit que Paul a fait**es**
how many of mistakes Jean has-he said that Paul has made
'How many mistakes did Jean say that Paul made?'
Boeckx (2001, p.119)

In both sentences in (27a,b), the past participle *faites* in the lower clause agrees with the moved wh-expression. This means that this agreement involves both ϕ-sets and wh-features between *v* and the moved wh-expression. However, in the higher clause, when the participle agrees with the moved wh-expression in both ϕ-sets and wh-features, there seems to be a problem, as illustrated in (27a). The participle *dites* is a feminine plural form like the participle *faites.* However, the sentence in (27a) is ungrammatical. On the other hand, the participle *dit* in (27b) is a default form. This sentence is grammatical. When there is a visible morphological manifestation of agreement in the participle, we can assume that there is agreement in both the A-set and the A'-set based on Radford's (2001, 2004) argument. Thus, if we accept this assumption, this means that in the higher clause in (27a,b) either ϕ-set agreement or wh-agreement is missing between the higher *v* and the moved wh-expression. The question that we have here is which one is missing. Consider the following construction again:

(28) Spec-C_2 ... Spec-v_2 ... Spec-C_1 ... Spec-v_1 ... XP

In section 2, we argued that C_2, C_1, and v_2 are associated with P-features, but not for $v1$ along the lines of Chomsky (1998, 1999). But, in French wh-movement to spec-v_1 seems to be related to both ϕ-features and P-features. On the other hand, wh-movement to Spec-v_2 seems to be related to only P-features, since the Case feature of the moved wh-expression is deleted in spec-v_1 under ϕ-set agreement between $v1$ and the wh-expression. Thus, since only wh-agreement of P-features occurs in spec-v_2 the French participle *dit* appears as a default form in the higher clause.

Thus, if wh-movement to edges of intermediate phases is related to wh-agreement, the A'-set (containing a P-set) that we assumed in probes should be bigger than a singleton set, because a singleton set does not allow successive cyclic agreement and movement.

6. A Feature Composition of A- and A'-Sets

In order to get around the problems in the singleton set assumption, we can assume the following feature composition in probes and goals in A-bar (wh-) movement: (u**Wh** is an uninterpretable and valued feature)

(29) The composition of A'-sets
Probe: {uQ, uWh} Goal: {iQ, u**Wh**}

In this feature system, the uninterpretable wh-feature is also deleted by Match and Agree like other uninterpretable features.

Then, the questions that arise here are whether the Case feature is only a unique uninterpretable feature which does not have a matching feature in the Agree system, and whether its deletion should be treated in a different way. As discussed earlier, in Chomsky (1998, 1999), it is assumed that Case deletion correlates with the ϕ-completeness of probes:

(30) Structural Case is not a feature of the probes (T, *v*), but it deletes under agreement if the probe is appropriate -- ϕ-completeness.

Chomsky (1999, p.4)

So, under his assumption, the Case feature itself is not matched, but deletes under matching of ϕ-features of A-sets. However, Carstens (2001) casts doubt on the correlation between the Case deletion and the ϕ-completeness with Icelandic and French examples. According to him, the A-Agree operation can be applied under the following conditions:

(31) A-Agree
a. Either a probe α or a goal β under matching relation should be a complete A-set
b. Uninterpretable ϕ-features are valued and deleted
c. If the probe α has an intrinsic structural Case value, it values any unvalued Case feature of the goal β; the two Case feature then delete.

The Case feature of the probe α is an uninterpretable and valued feature. Relevant evidence is found in Chamorro:

(32) a. Ha-fagasi si Juan i kareta.
Agr-wash Juan the car
'Juan washed the car.'
b. Hayi$_i$ f*um*agasi t_i i kareta?
Who? WH[Nom].wash the car
'Who washed the car?'
c. Hafa$_j$ f*im*agasese-nna si Henry t_j para hagu?
What? WH[Obj].wash.Prog-agr Henry for you
'What is Henry washing for you?' Chung (1998, p.236)

When there is no wh-movement, as shown in (32a), the Case feature of verb appears in an unmarked form. On the other hand, when there is

movement of a wh-expression, their intrinsic Case values appear in T and *v* through Complex Agree in (32b,c). In (32b), since a wh-subject moves to spec CP via spec TP, a Nominative Case feature appears on the verb. Actually, the reflex of the Case feature on the verb is a reflection of the Case feature of T. On the other hand, in (32c) the wh-object moves to spec CP and its Case is reflected on the verb. This is a reflection of the Case feature of *v*. This Case agreement inflection on Vs indicates that T and *v* also have their own intrinsic Case features. Normally, a Case inflection is reflected in NPs, but these examples illustrate different phenomena. One of the Australian languages, Kayardild, also shows similar phenomena in the reflection of the Case inflection on V:

(33) Maku-ntha yalawu-jarra-ntha yakuri-naa-ntha
woman-OBL catch-past-OBL fish-MABL-OBL
dangka-karra-nguni-naa-ntha mijil-nguni-naa-ntha
man-GEN-INST-OBL net-INST-MABL-OBL
'The woman must have caught fish with the mans net.'

In (33), the Oblique Case of the verb *yalawu-jarra-ntha* is reflected on other nouns. Thus, as you see in Chamorro and Kayardild, T and *v* have their own Case features. Case deletion and valuation are also achieved by Match and Agree in the same way as for other uninterpretable features. Thus, all uninterpretable and unvalued features are deleted and valued by Match and Agree. There is no extra exceptional rule to delete a special uninterpretable feature. The questions that we have here are why we need these uninterpretable features (Case-feature and Wh-feature) and whether these features belong to the ϕ-set and the P-set. The answer to the first question is that both uninterpretable features are necessary for running the operation Agree in the computational system, since they make inactive features active. That is, interface conditions require their existence. So, these are not an imperfection. The lack of them would be a real imperfection. In the case of the second question, we can consider the following things. Normally,

ϕ-features and P-features of goals (which are related to the peripheral system: focus, topic, force) are interpretable features. However, unlike them, both the Case feature and the wh-feature are always uninterpretable features. So, they cannot reach LF. In addition, the Case feature and the wh-feature seem to be related to their relevant sets rather than individual features, since these features make all the interpretable features of their relevant sets active in the computational system. Owing to them, these interpretable features of the set participate in Agree in the computational system. Thus, I assume the following revised feature composition:

(34)	A-Agree	:	A-bar Agree
	Probe: {{*u*Person, *u*Number} ***u*Case**}		{{*u*Q} *u*Wh}
	Goal: {{*i*Person, *i*Number} *u*Case}		{{*i*Q} ***u*Wh**}

These interpretable features which are related to LF comprise a subset of the whole set. Thus, the groups of these semantic interpretable features (ϕ-set and P-set) are members of the whole A-sets and A'-sets with a Case feature and a wh-feature. That is, a ϕ-set is a member of an A-set, and a P-set is a member of an A'-set. Under this feature system, a complete A'-set of a probe is not a singleton set, since it also contains a wh-feature, just as a complete A'-set of a goal contains one.

7. Conclusion

In the recent work in the Minimalist Program, probes and goals are fundamental elements in the computational system. In this paper, I considered the nature of probes and goals. Through discussion of related empirical data and conceptual matters under Chomsky's (1998, 1999, 2001) feature framework, I argued that probes and goals should be sets containing the relevant identical features. It was considered how A- and A'-movements work systematically in the computational system with

empirical data. In the later part of this paper, problems of Chomsky's feature system in A- and A'-movements were revealed and considered. Thereby, I highlighted problems which successive cyclic movement (especially wh-movement) poses in intermediate phases. I showed that there is a feature paradigm in A- and A'-Agree and that agreement is related to both A- and A'-movements in intermediate phases as well, based on relevant data. With the revised feature composition of A'-sets (probes and goals), I argued that the problems which arose in successive cyclic wh-agreement and movement in wh-questions in the previous feature composition could be solved. Thus, under the new revised features system, probes and goals of the computational system obey the GOFSP when they enter into Agree.

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