

The Cluster Formation of Phrases *

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Yu, Chongtaek. 2004. The Cluster Formation of Phrases. *The Linguistic Association of Korea Journal*, 12(3), 105-128. Cluster is an external or internal Merge of more phrases than one at a vP -phase (=in an argument structure), making their goal (G)/head (H)-features form a set of G/H-features. The clustered WH-phrases form a set of [WH-phrase[+WH_n, μQ_n]_{(WH-phrase1), ..., (WH-phrase_{n-1})}]. In coordinate structure, any phrase may not be moved out of the clustered conjuncts. In an expletive construction, a clustered expletive *it/there* agrees simultaneously with v/T for covert Agree (CA)/overt Agree (OA). An English complex verb (V-b) seems to be an obligatory and unique H-clustered phrase. Cluster may be one of the economic principles in narrow syntax (NS).

Key words: cluster, simultaneous Agree, phase, multiple WH-phrase, conjuncts, expletives, complex verbs

1. Introduction

Feature movement is assumed to be no longer in Minimalist Program, since Attract is completely done away with in Chomsky (2000, 2001a, b). Thus there is no modified lexical items with features attached to them. A feature cannot move or be attached to a lexical item alone, so that a feature chain never exists in NS. If covert Move is not allowed in NS, uninterpretable features should be covertly checked and valued by Agree in situ or overtly in a Spec-position. An uninterpretable EPP-feature (=OCC-feature in Chomsky (2001b))¹⁾, which is an additional probe P, is

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1) An EPP-feature is still stipulative in the case of [Spec, T_{nonfin}] and redundant in the case of [Spec, T_{fin}]. See Park (2002).

- step ②: φ -(and Case) checking for object *wen*
 step ③: φ -(and Case) checking for subject *wer*
 step ④: the movement of $[[_{wer} wer FF_{S(wen)}]]$ to the Spec-C

As shown in (1), Grenwendorf (2001) gives us a very persuasive idea that an operation Clustering takes place in NS in case of a multiple WH-question. I am willing to call Clustering “Cluster” in this paper. Cluster depends on economy principles, since the simultaneous Agree of $[[_{wer} wer FF_{S(wen)}]]$ with C is more economical than the two times of Agrees of *wer* and *wen* with the same C. In this case, Cluster is an operation by which the leftmost WH-phrase_{agr(argument)} with [+WH, uQ]-features gathers the other WH-phrase(s) with homogeneous features at a νP -phase and forms a set of [+WH_n, uQ_n]-features. The index “n” indicates the total number of the leftmost WH-phrase_{agr} and (a) WH-phrase(s) gathered by Cluster. Then the WH-phrase with $G[[+WH_n, uQ_n]$ -features]—most of all, the leftmost WH-phrase_{agr}—moves to Spec-C, where the G agrees simultaneously with the $[[[+Q, uWH], +OCC]]$ of C]P in their relation.

If feature movement is no longer in Chomsky (2000, 2001a, b) unlike Grenwendorf (2001), the WH-phrase *wen* may move overtly to the WH-phrase *wer_{agr}* in the argument structure. If so, the Cluster of phrases with G/H-features can be assumed as in (2):

- (2) Cluster is an external or internal Merge of more phrases than one at a νP -phase(=in an argument structure), making their G/H-features form a set of G/H-features.

According to (2), the set of G-features, in case of multiple WH-questions, seems to agree with a P simultaneously at each upper strong phase,⁷⁾ while the set of H-features, in case of a V-b, undergoes

7) Suppose we take CP and νP to be phases. Nevertheless, there remains an important distinction between CP/ νP phases and others; call the former *strong* and the latter *weak*. See Chomsky (2001a).

a non-feature-driven movement in a mass to T for phonetic realization in PF.⁸⁾

In the section 2, I will consider the relation between Phase Impenetrability Condition (PIC) and Agree, and in the section 3, I will consider the cluster formation of multiple WH-phrases, conjuncts in coordinate structures, expletives and their associates, and V-bs at their own vP -phases on the basis of the operation Cluster (2).

2. PIC and Agree

2.1. PIC

Chomsky (2001a) takes CP and vP to be strong phases. The strong phases are potential targets for movement. Thus C and v may have a [+OCC]-feature which provides a position for XP-movement. Spell-Out applies cyclically at a vP/CP phase. The computational burden is further reduced if phonological component can forget earlier stages of derivation. That follows from PIC(=MI (21)), for strong phase HP with H:⁹⁾

- (3) The domain of H is not accessible to operations outside HP, but only H and its edge.

Given $HP = [\alpha [H \beta]]$, β is the domain of H, and α is its edge. Accessibility of H and its edge is only up to the next strong phase, under the PIC. Elements of HP are accessible to operations within the

8) Non-feature driven movements or adjunction movements, i.e., head movement and stylistic rules like Extraposition, etc. may be applied not in syntax, but in phonology. See Yang (1998).

9) Locality conditions require "short movement" in successive stages, leading to convergence in the final stage. We can express a version of this idea as a "PIC," further strengthening the notion of cyclic derivation. See Chomsky (2000, 2001a).

smallest strong phase but not beyond. The PIC requires that A'-movement target the edge of every phase CP and vP.

Yang (2002) assumes that the PIC (3) may be redefined as follows:

- (4) In phase with H, the domain of H is not accessible to operations outside, only H and its edge are accessible to such operations.
- (a) Phase H = v, C (and possibly D for languages like Korean)
- (b) Domain = Complement of H
- (c) Edge = Spec of H

If the PIC is a universal condition for D_{NS}, as assumed in (3-4), WH-phrases should move through the Spec-v to the Spec-C for OA:

- (5) (a) [CP [TP Who_i [vP t_i loved her]]]?
 (b) [CP Who_i do [TP you [vP t_i think [CP t_i [TP t_i [vP t_i loved her]]]]]]?]

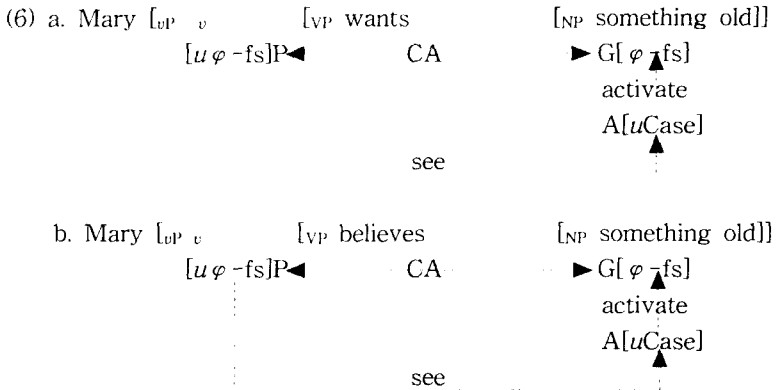
In (5a), the WH_{subj(ect)} *who* moves to the Spec-T for OA, since the T contains the [[uφ-fs], +OCC]-features. The WH_{subj} *Who*, which is originally base-generated in the edge of v, *can* move directly to the Spec-T without violating the PIC.¹⁰ In (5b), the matrix verb *think* seems to select as its complement the embedded clause whose C contains only a [+OCC]-feature. Thus the WH_{subj} *who* moves from the embedded Spec-T through the embedded Spec-C to the matrix Spec-C. The WH_{subj} *who* moves to the matrix Spec-C necessarily through the matrix Spec-v which is the escape hatch for it due to the PIC. The matrix light verb *v* contains an optional [+OCC]-feature to agree overtly with the categorial feature [+D] of the WH_{subj} *who*, so that the [[uφ

10) In a WH_{subj} question, the requirement for a question to have an interrogative specifier can be satisfied by simply projecting the clause as far as IP, since the relevant IP has the interrogative operator WH_{subj} as its specifier, hence, the IP is interpretable as a question at LF without the need to project the structure any further into a CP. See Radford (1997).

-fs], +OCC]-features of v]P can simultaneously be eliminated by the G[+[D] of *who* for OA, and by the G[[[φ -fs], u Case]] of *that*-clause] for CA at the v P-phase.¹¹⁾

2.2. CA or OA

As mentioned above, a G cannot be attracted covertly to the Spec of a P, since Attract exists no longer in NS. Chomsky (2001b) finally comes to an assumption that there is no covert Object-Shift OS. Let us examine CA relations between P and G in (6) below:



In (6a), the [$u\varphi$ -fs]P, which is the uninterpretable φ -features of the light verb v , sees the Activator[u Case]. Then the uninterpretable Case-feature A[u Case] activates the G[φ -fs] of the object [NP something old], which is invisible to the P. Finally, CA deletes both uninterpretable features—[$u\varphi$ -fs]P and G[u Case]—in the (P, G) relation at the v P-phase shortly after Transfer hands D_{NS} over to \emptyset . In (6b), CA deletes both uninterpretable features—[$u\varphi$ -fs]P and G[u Case] like (6a). I therefore assume that CA between a light verb v and a direct

11) Such a categorial feature as [+D] is not added to the other feature(s) for the convenience of description.

object takes place under external Merge,¹²⁾ that is, without the overt or covert Move of an object to the Spec-*v*. The most significant evidence is that the English light verb *v* may not contain an uninterpretable [+OCC]-feature unlike Icelandic.¹³⁾

Let us examine how Agree relations are established in the infinitival complements of W(ant)-verb and B(elieve)-verb:

- (7) a. I want [_{CP} [_{TP} John to love Mary]]
 b. I believe [_{TP} John_i to love himself_i]

In (7a), it is assumed that the *W*-verb selects the CP-clause as its complement.¹⁴⁾ Suppose the infinitival subject *John* moves to the matrix Spec-T in such a passive sentence as **John_i is wanted t_i to love Mary by me*. The unconvergent derivation results from violating the PIC. The CP is the phase whose head *C* does not allow its complement(=domain) to move to the next strong phase. Contrary to (7a), the *B*-verb in (7b) selects the TP-clause as its complement.¹⁵⁾ The TP is not the phase, so that it can allow the infinitival subject *John* to move to the matrix Spec-T in such a passive sentence as *John_i is believed t_i to love Mary by me*. If Chomsky (2001a, b) do not allow the covert movement of

12) Under external Merge, α and β are separate objects: under internal Merge, one is part of the other. Argument structure is associated with external Merge (base structure); everything else with internal Merge (derived structure). See Chomsky (2001b).

13) Languages differ with regard to the OS-option: e.g., Icelandic allows it freely and multiple subject/specifier constructions partially, while standard English/Romance do not. See Chomsky (1995, 2001a).

14) See Postal (1974), Morin (1979), Chomsky & Lasnik (1977), Chomsky (1981), and Kayne (1983).

15) A phase is CP or ν P, but not TP or a verbal phrase headed by H lacking φ -features and therefore not entering into Case/agreement checking: neither finite TP nor unaccusative/passive verbal phrase is a phase. The head of the phase is inert after the phase is completed, triggering no further operations. The phase head cannot trigger Merge or Attract in a later phase. See Chomsky (2000).

-complete) of the subject *John*, while the latter cannot be eliminated by the former. As a result, the subject *John* should again form the second (P, G) relation with C for CA. In this case, it seems that the P is the uninterpretable φ -complete of C.¹⁷ If the infinitival C does not contain φ -complete in case of English, the A[uCase] which activates G[[φ -fs] of *John*] has no other way to be deleted for the Full Interpretation FI. In (8b), the first (P, G) relation for OA is the same with the first one in (8a), but the second (P, G) relation for CA is quite different from the second one in (8a). As mentioned in (7), the B-verb selects the TP-clause as its complement from the lexical array LA, so that the G [[φ -fs] of *John*] activated by the A[uCase] forms the second (P, G) relation with the [[u φ -fs]P of the matrix *v*] for CA. At last, both the [u φ -fs] of the probe C and the [uCase] of the subject *John* are eliminated at the final CP-phase shortly after the second D_{NS} is handed over to \emptyset and Σ by Transfer.

3. The cluster formation of phrases

3.1. The cluster formation of multiple WH-phrases

Let us take a careful look at (P, G) relations for the simultaneous Agree of multiple WH-features by means of the PIC and order restriction of Cluster:¹⁸

- (9) a. What did you buy where?
 b. [_{CP} did [_{TP} you [_{VP} [_{VP} buy [what where;_i] t_i]]]]

has an EPP-feature. T_{def} has only a [person]-feature. See Chomsky (2001a).

17) The claim that English infinitival C has some φ -features is crucially supported by the fact that Kwa C used by African Ewe people manifests inflectional morphology. See Yang (1998).

18) In case of English multiple WH-questions, the order restriction of Cluster, i.e., WH-phrase WP_{arg(ument)} WP_{adj(unct)...}, seems to be strictly observed in an argument structure. See Grenwendorf (2001).

- c. [_{CP} [what_i[+WH₂, uQ₂]_(where_i)]_k did [_{TP} you [_{LP} t_k [_{VP} buy [t_j where_i] t_i]]]]]
- (10) a. Where did you buy what?
 b. [_{CP} did [_{TP} you [_{VP} [_{VP} buy [what where_i] t_i]]]]]
 c. [_{CP} [where_i[+WH₂, uQ₂]_(what_i)]_k did [_{TP} you [_{LP} t_k [_{VP} buy [what_j t_j] t_i]]]]]
- (11) a. When did you buy what?
 b. [_{CP} did [_{TP} you [_{VP} [_{VP} buy [what when_i] t_i]]]]]
 c. [_{CP} [when_i[+WH₂, uQ₂]_(what_i)]_k did [_{TP} you [_{LP} t_k [_{VP} [buy [what_j t_j] t_i]]]]]
- (12) a.*Where did who go?
 b.*[_{CP} did [_{TP} [_{VP} [who where_i] [_{VP} go t_i]]]]]
 c.*[where_i did [_{TP} who_j[+WH₂, uQ₂]_(where_i)] [_{LP} [t_j t_i] [_{VP} go] t_i]]]

(9b-c) are the derivational structures of (9a), (10b-c) of (10a), (11b-c) of (11a), and (12b-c) of (12a). (9-12b) are the initial derivational structures after Cluster applies at their own vP-phases. And (9-12c) are the final derivational structures after one of the clustered WH-phrases moves to the Spec-C at their own CP-phases. As shown in (9-10c), the WH-phrases *what* and *where* can move alternatively to the Spec-v which perhaps has an escape hatch due to PIC.¹⁹⁾ It means that the English light verb *v* may have an optional [+OCC]-feature in a direct WH-phrase_{obj} question.. If *where_{adj}* is not clustered to *what_{agr}* in the vP-phase, the unvalued [[+WH, uQ]-features of *where*] will be left in situ after Transfer operates. If *where_{adj}* violates the PIC, its goal cannot agree with the probe C. It seems that only the clustered WH-adjunct may remain at the vP-phase without any further movement. Thus the [[[u φ -fs], +OCC] of v]P agrees overtly with the G[[[φ -fs], uCase] of *what*] in their relation. Whether the leftmost clustered WH-phrase *what_{agr}* moves through the Spec-v to the Spec-C

19) Time and place WH-words such as *when* and *where* can cross over another WH-word, but they cannot cross over the WH-word in the subject position. See Bach (1971), Kuno & Robinson (1972), and Aoun & Li (1993).

for OA or not, the Cluster order at the ν P-phase is “*what_{agr} where_{adj}*.” At the CP-phase, the $[[+Q, uWH, +OCC]$ of C]P agrees simultaneously with the $G[what [+WH_2, uQ_2]_{(where)}]$ or $G[where[+WH_2, uQ_2]_{(what)}]$ in their relation. (11b) has the same Cluster order as (10b). In the case of (11b), *when_{adj}* moves through the Spec- ν to the Spec-C instead of *what_{agr}* for OA. At the CP-phase, the $[[[+Q, uWH], +OCC]$ of C]P agrees simultaneously with the $G[when[WH_2, uQ_2]_{(what)}]$ in their relation. This gives us an evidence that the order restriction of Cluster such as $WP_{arg} WP_{adj}$ applies necessarily to a multiple WH-question containing a WH-direct-object and a WH-adjunct. Although the Cluster order is *who_{agr} where_{adj}* at the ν P-phase as in (12b), (12c) finally yields the ungrammatical sentence at the CP-phase. That is why *where_{adj}* cannot move any more when the $[[u\varphi -fs], [+OCC]]$ of T]P merges with the $G[[[who[+WH_2, uQ_2]_{(where)}]-[[\varphi -fs], uCase]]]$.²⁰ It is due to the $[-OCC]$ -feature of C] that *where_{adj}* cannot move through the Spec-T to the Spec-C for OA. Of course, *where_{adj}* seems to be featureless after Cluster operates. As mentioned above, the $([[[\varphi -fs], -OCC]$ of C]P establishes a CA relation with the $G[[+WH, uQ]$, of *who*. I therefore come to an assumption that Cluster order is $WP_{arg} WP_{adj} (WP_{adj}\dots)$ at a ν P-phase in a multiple WH-question.

Cluster, which applies at the ν P-phase(=in the argument structure), must be an operation to make a derivation economic in NS. Thus it may be added to the existing “Move = Agree + Pied Piping + Merge,”²¹ as shown in (13):

(13) Move = Cluster + Agree + Pied-piping + Merge

As assumed in (13), Cluster seems to a part of Move at a ν P-phase.

20) The subject *who* moves directly to Spec-T without violating PIC since it is base-generated in the edge of ν . See Yang (2002).

21) If there is no Spec-head relation, then the EPP-feature OCC cannot be satisfied by Merge alone. It follows that internal Merge requires Agree. See Chomsky (2001b).

Let us further look at the Cluster of WH-phrases at a *v*P-phase and simultaneous Agree of [+WH_n, *u*Q_n]-features at a CP-phase:

- (14) a. Who believes who to be innocent?
 b. [_{CP} [_{TP} [_{iP} [who who_i] [_{VP} believes] [_{TP} t_i to [_{iP} t_i be innocent]]]]]
 c. [_{CP} [_{TP} who_m[[+WH₂, *u*Q₂]-[[φ -fs], *u*Case]]_{(who)_i] [_{iP} t_m [who_i]_j] [_{VP} believes] [_{TP} t_i to [_{iP} t_i be innocent]]]]}
- (15) a. Who speaks where when in which language?
 b. [_{CP} [_{TP} [_{iP} [who where_i when_j in which language_k] [_{VP} speaks t_i t_j t_k]]]]
 c. [_{CP} [_{TP} who_m[[+WH₄, *u*Q₄]-[[φ -fs], *u*Case]]_{(where)_i}_{(when)_j}_{(in which language)_k} [_{iP} [t_m (where)_i]_p (when)_j]_q (in which language)_k]_s] [_{VP} speaks t_i t_j t_k]]]]

(14b-c) are the derivational structures of (14a) at the *v*P-phases and at the CP-phase, respectively. (15b-c) are the derivational structures of (15a) at the *v*P-phase and at the CP-phase, respectively. In (14b), OA takes place in the ([[*u* φ -f], +OCC] of T_{def}]P, G[[[φ -fs], *u*Case] of *who*) relation, and then the infinitival subject *who* moves to the matrix subject *who_{agr}* by Cluster. Nevertheless, the G[[[φ -fs], *u*Case] of *who*] which cannot be deleted by the probe T_{def} moves cyclically to the Spec of the matrix *v* due to the selectional feature of the B-verb. It follows that the matrix light verb *v* has an optional [+OCC]-feature. As shown in (14c), the [[[+Q, *u*WH], -OCC] of the matrix C]P agrees simultaneously and covertly with the G[who[+WH₂, *u*Q₂]_(who)] in the Spec-T. In (15b), the three WH-phrases such as *where*, *when*, and *in which language* cyclically move to the leftmost WH-phrase *who_{agr}* by Cluster at the *v*P-phase. As also shown in (15c), the [[[+Q, *u*WH], -OCC] of the matrix C]P agrees simultaneously and covertly with the G[who[[+WH₄, *u*Q₄]-[[φ -fs], *u*Case]]_(where) _(when) _(in which language)] in the Spec-T at the CP-phase. As a result, four steps are made for the

simultaneous Agree of multiple WH-features: ① the Cluster of multiple WH-phrases, ② the Move of *who_{agr}* and the pied-piping of features, ③ OA between [[[*u* φ -fs], +OCC] of T]P and G[[[φ -fs], *uCase*] of *who_{agr}*], and ④: CA between [[+Q, *uWH*, -OCC] of C]P and G[who[+WH₄, *uQ₄*](where) (when) (in which language)].

I have discussed the Cluster of WH-phrases and simultaneous Agree of their features in normal questions (NQs). Let us in turn consider them in echo questions (EQs):

(16) a. U: Does Mary like ice cream?

b. E: Does who like ice cream?

c. E: Does who like what?

(17) a. [_{CP_u} does [_{CP_{eq}} [_{TP} who_i like [_{VP} t_i ice cream]]]]

b. [_{CP_u} does [_{CP_{eq}} [_{TP} who_k[[+WH₂, *uQ₂*]-[[φ -fs], *uCase*]](_{what_i})_j like [_{VP} [t_k (what_i)_j t_i]]]]

In (16b-c), E is the EQ response to the utterance U. They are the syntactic EQs to the NQ (16a).²²⁾ (17a-b) are the derivational structures of the EQs (16b-c), respectively. According to Sobin (1990), the syntactic EQ has inherently layered double CPs: one is the outer CP of U CP_u, and the other the inner CP of EQ CP_{eq}. In (16a-b), the inner C_{eq} is assumed to have [[+Q, *uWH*], -OCC]-features due to COMP-freezing, while the outer C_u is also assumed to have [[+Q, *uWH*], \pm OCC]-features. Thus it seems to me that a simple EQ has two CP-phases unlike an NQ. In case of the single WH-question (17a), the subject *who_{agr}* first moves to the Spec-T, in which OA takes place in the ([[[*u* φ -f], +OCC] of T]P, G[[[φ -fs], *uCase*] of *who*)) relation. The outer C_u has only [[+Q, -*uWH*], -OCC]-features, since the interrogative U is the

22) EQs are divided into syntactic types: pseudo EQs, which involve completely usual questioning strategies and syntax, and syntactic EQs, which involve a discourse strategy called COMP-freezing and unselective binding of in-situ WH-phrases. See Sobin (1990).

non-WH-question. The inner Spec- C_{eq} is frozen, so that the auxiliary verb *does* can make a non-feature-driven movement straightly to the outer Spec- C_u in PF. The inner [[[+Q, u WH], -OCC] of C]P agrees covertly with the G[who[+WH, u Q]] that still remains in the Spec-T at the CP_{eq} -phase. In case of the multiple WH-question (17b), the object *what_{agr}* moves to the subject *who_{agr}* by Cluster, forming [who_{agr} what_{agr}] at the vP -phase. At last, the inner [[[+Q, u WH], -OCC] of C]P agrees simultaneously and covertly with the G[who[+WH₂, u Q₂]_(who)] that still remains in the Spec-T at the CP_{eq} -phase.

3.2. The cluster formation of conjuncts

As pointed in Ross (1968), no conjunct may be moved out of a coordinate structure because of the Coordinate Structure Constraint (CSC), as shown in (18):²³⁾

- (18) a.*What sofa_i will be put the chair between some table and t_i?
 b.*What table will be put the chair between t_i and some sofa?

The derivational structures in (18) are not easy to handle syntactically except the CSC, but their ungrammaticality can now be explained by Cluster.

Let us in turn examine the Cluster of nominal conjuncts in coordinate structures and simultaneous Agree of their features:

- (19) a. John likes mountains, lakes, rivers, and seas.
 b.*Which mountains does John like lakes, rivers, and seas?
 c. Which mountains, which lakes, which rivers and which seas does John like?
- (20) a. John [_{vP} v [_{VP} likes [_{NP} mountains[[\varnothing -fs₄], u Case₄]_(lakes_i, rivers_j, and seas_k)]]]

23) In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct. See Ross (1968).

- b.* $[_{CP}$ which mountains $[+WH, uQ]_m$ does $[_{TP}$ John $[_{vP}$ t_m v $[_{VP}$ like $[_{NP}$ t_m $[[[\varphi -fs_4], uCase_4]_{(lakes_i, rivers_j, \text{ and } seas_k)}$ lakes $_i$, rivers $_j$, and seas $_k$]]]]]
- c. $[_{CP}$ does $[_{TP}$ John $[_{vP}$ v $[_{VP}$ like $[_{NP}$ which mountains $[[+WH_4, uQ_4]-[\varphi -fs_4], uCase_4]_{(which\ lakes_i, \text{ which } rivers_j, \text{ and } which\ seas_k)}$, which lakes $_i$, which rivers $_j$, and which seas $_k$]]]]]

(20a-c) are the derivational structures of (19a-c), respectively. In (21a), the three nominal conjuncts are clustered to *mountains_{agr}* by Cluster at the *vP*-phase, forming $[_{NP}$ mountains $[[\varphi -fs_4], uCase_4]_{(lakes, rivers, \text{ and } seas)}$ lakes, rivers, and seas] without Move. The $[[[u\varphi -fs], +OCC]$ of *vP* agrees simultaneously and covertly with the $G[[\varphi -fs_4], uCase_4]_{(lakes, rivers, \text{ and } seas)}$ of mountains]. However, the partial $G[[+WH, uQ]$ of which mountains] cannot possibly be moved from the whole clustered conjuncts to the Spec-c at the CP-phase, as shown in (20b). If the defective clustered WH-phrase [which mountains $[[[+WH, uQ]-[\varphi -fs_4]], uCase_4]_{(lakes, rivers, \text{ and } seas)}$] moves to the Spec-*v* for OA, it violates the PIC at the *vP*-phase. That is why it lacks $[+WH_3, uQ_3]$ of being $[+WH_4, uQ_4]$. In case of (20c), the initial derivation will be convergent after Spell-Out, since the complete clustered WH-phrases [which mountains $[+WH_4, uQ_4]-[[\varphi -fs_4], uCase_4]_{(lakes, rivers, \text{ and } seas)}$] can move through the Spec-*v* to the Spec-c strictly observing the PIC. In short, any phrase may not be moved out of the clustered conjuncts.

Let us further take a look at the Cluster of clausal conjuncts in coordinate structures and simultaneous Agree of their features:

- (21) a. I think that the nurse polished her trombone, and that the plumber computed my tax.
 b.*Who do you think polished her trombone, and that the plumber computed my tax?
- (22) a. $[_{CP}$ $[_{TP}$ I $[_{vP}$ v $[_{VP}$ think $[_{CP}$ $[_{CP}$ that the nurse polished her trombone $[[\varphi -fs_2], uCase_2]_{(that-clause)_i}$, and $[_{CP}$ that the plumber computed my tax $]]_j$]]]]]
- b.* $[_{CP}$ do $[_{TP}$ you $[_{vP}$ v $[_{VP}$ think $[_{CP}$ $[_{CP}$ who $[[+WH, uQ]-[\varphi -fs]$,

$u\text{Case}] \text{ polished her trombone}][[\varphi\text{-fs}_2], u\text{Case}_2]_{(\text{that-clause})}$, and
 $[_{\text{CP}} \text{ that the plumber computed my tax};]]]]]$

(22a-b) are the derivational structures of (21a-b), respectively. I assume that the clausal conjuncts may have their own θ -roles, φ -fs, and Case-fs just like NPs.²⁴ Thus the left clausal conjunct_{agr} in (22a) is assumed to have the $[[[\varphi\text{-fs}_2], u\text{Case}_2]_{(\text{that-clause})}]$ after the first operation Cluster applies without Move at the νP -phase. The G $[_{\text{CP}} \text{ that the nurse polished her trombone}][[\varphi\text{-fs}_2], u\text{Case}_2]_{(\text{that-clause})}]$ agrees with the $[[u\varphi\text{-fs}], [-\text{OCC}]]$ of νP simultaneously and covertly in situ. Contrary to (22a), the clustered WH-phrase_{carg}—[who $[[+\text{WH}], u\text{Q}]-[\varphi\text{-fs}], u\text{Case}]$ —never moves to the matrix Spec-c at the CP-phase, since it may not be moved out of the clustered conjuncts.

3.3. The cluster formation of expletives

In this section, I will try to examine the Cluster of expletives and their associates in expletive constructions, and the simultaneous Agree of their features. According to the Adjacency Condition proposed in Chomsky (1981), at S-structure, the verb assigns objective Case to an adjacent NP:

- (23) a. The police have arrested John.
 b.*The police have John arrested.

If the transitive verb *arrested* is not adjacent to its direct object, the derivation is unconvergent after Spell Out, as shown in (23b). An English light verb ν may not contain an uninterpretable $[-\text{OCC}]$ -feature unlike Icelandic, so that it prevents an object from shifting to its Spec position. It seems that the light verb ν permits only a direct

24) Because a *that*-clause is inherently Case-marked, it has only to occupy an argument position in order to satisfy the θ -role assignment condition. See Yim (1984).

WH-phrase_{obj} to move there.

There are four kinds of *it*-expletive constructions in English:²⁵⁾

- (24) a. I blame *(it) on you [that we can't go].
 b. I find *(it) stupid [that Mary didn't say anything].
- (25) a. Nobody expected (it) of you [that you could be so cruel].
 b. We require (it) of our employees [that they wear a tie].
- (26) a. John said *(it) to his friends [that we had betrayed him].
 b. John thought *(it) to himself that Mary was coming here.
- (27) a. John will see to it [that you have a reservation].
 b. We agree to it [that she should join us].

The expletive *it* follows the Adjacency Condition in all of the above sentences: immediately after the transitive verbs in (24-26) and the prepositions in (27). The *that*-clause seems to be always extraposed to the end of the sentence in PF.

When a *that*-clause appears ahead of an expletive in a sentence, or when there is an obligatory expletive missing immediately after a transitive verb from a sentence, the derivation will be unconvergent after Spell-Out:

- (28) a. [That he had solved the problem] we didn't really find
 ____ /*it very interesting.
 b. We didn't really find it/*____ very interesting that he had
 solved the problem.

Based on the sentences in (24-28), my assumption is that an expletive *it* is not a specifier of C²⁶⁾ but an object of a transitive

25) See Authier (1991) and Kim (2004).

26) Kim (2004) assumes following Stroik (1996) that Expletives are generated in the Spec of CPs at a base argument structure, and then they must move into the Spec of AGR_o projection to satisfy Case checking. Yoon (2002) also assumes

verb/preposition, and that its immediate complement is a *that*-clause at a *vP*-phase.

Let us look at the Cluster of an expletive *it* and its complement *that*-clause and simultaneous Agree of their features:

- (29) a. I take it that you will never pay.
 b. They doubt it very much that they will go.
 c. John said to his friends [that we had betrayed him]. (=26a)
 d. It is quite natural that he should be angry.
- (30) a. I [_{vP} [_{VP} take [_{NP} [_{NP} it][[[φ -fs₂], *uCase*₂]_(that-clause_i)] [_{CP} that you will never pay]_i]]].
 b. They [_{vP} [_{VP} doubt [_{NP} [it][[[φ -fs₂], *uCase*₂]_(that-clause_i)] t_{ij}] very much [_{CP} that they will go]_i]].
 c. John [_{vP} [_{VP} said [_{CP} that we had betrayed him][[[φ -fs], *uCase*]]]] to his friends.
 d. [_{CP} [_{TP} [_{VP} [_{NP} [it][[[φ -fs₂], *uCase*₂]_(that-clause_i)] [_{CP} that he should be angry]_i] [_{VP} is quite natural]]]]]]]

(30a-d) are the initial derivation structures of (29a-d), respectively. In (30a-b), the expletive *it*, which contains [*uCase*] and [φ -complete],²⁷ merges externally with the θ -marked *that*-clause in the larger NP. The expletive *it* forms the complete [[[φ -fs₂], *uCase*₂]_(that-clause_i)] soon after the initial operation Cluster applies at the *vP*-phase. At last, the [[*u* φ -fs] of *v*]P agrees simultaneously and covertly with the clustered expletive [[[it][φ -fs₂], *uCase*₂]_(that-clause_i)] at the same phase. In (30b), the featureless [_{CP} *that*-clause] may be extraposed to the end of the sentence in PF. It does not violate the Chomsky's (1986) Injunction against X'-Movement. If the featureless [_{CP} *that*-clause] moves through

that the expletive *it* moves covertly to the Spec of *vP* in PF and checks the EPP-feature of *v*.

27) As supposed in Chomsky (1995), an expletive *it* has Case- and φ -features unlike a pure expletive *there*.

the expletive *it* to the Topic position, the derivation crashes after Spell Out like (28a). Contrary to (30a-b), (30c) does not include an expletive *it* in its numeration, so that Cluster never operates at the ν P-phase. Only the G[[[φ -fs], ν Case] of *that*-clause] goes into agreement covertly with [[ν φ -fs] of ν P], while the featureless [$_{CP}$ *that*-clause] may be extraposed to the end of the sentence in PF. In case of (30d), the clustered expletive [[it][[[φ -fs₂], ν Case₂]_(that-clause)] moves to the Spec-T and agrees simultaneously with the [[[[ν φ -f], +OCC] of T]P at the CP-phase, while the featureless [$_{CP}$ *that*-clause] may be extraposed to the end of the sentence in PF.

Many grammarians have discussed the complicated *there*-constructions for a long time, but it seems that they are still problematic in syntax. The following are taken from Lasnik (1992):

- (31) a. Someone_i t_i is here.
 b. Someone_i is likely t_i to t_i be here.
 c.*[There]_i is likely t_i someone_j to t_j be here.
 d.*Someone is likely [there] to be here.
 e.*Someone is likely to be [there] here.
 f. [There] is someone here.
 g. [There]_i is likely t_i to be someone here.

Unless the expletive *there* merges externally with T, *someone* may move (through the intermediate Spec-T) to the (matrix) Spec-T, as shown (31a-b). If *there* merges externally with T anywhere, *someone* may not move to the matrix Spec-T as well as the intermediate Spec-T, as shown in (31c-d). It means that *someone* is always frozen in situ. In (31e), if *someone* moves through the intermediate Spec-T to the matrix Spec-T instead of the expletive *there*, the derivation yields the ungrammatical sentence after Spell-Out. The expletive *there* in (31f) seems to merge externally(=purely) with the T, but *there* in (31g) is certain to merge internally(=impurely) with the matrix T.²⁸⁾ Thus my

intuition comes to an assumption that an expletive *there* merges externally with its associate and forms a set of G-features by means of Cluster at a ν P-phase.

Let us now look at the Cluster of an expletive *there* and its associate and simultaneous Agree of their features.

- (32) a. There is likely to be someone here. (=31g)
 b.*There is likely someone to be here. (=31c)
- (33) a. [_{CP} [_{TP} is likely [_{CP} [_{TP} to [_{νP} [_{NP} [_{NP} there][[φ -fs₂], uCase]_(someone_i) someone_i] here]]]]]]
 b. [_{CP} [_{TP} there[[φ -fs₂], uCase]_{(someone_i)j} is likely [_{TP} t_j to [_{νP} [_{NP} t_j someone_i] here]]]]]
 c. [_{CP} there[[φ -fs₂], uCase]_{(someone_i)j} is likely [_{TP} t_j someone_{i,k} to [_{νP} [_{NP} t_{i,k} here]]]]]

(33a) is the derivational structure of (32a) soon after Cluster operates at the ν P-phase. The nominal expletive *there* forms a set of [[φ -fs₂], uCase]_(someone_i). It has a defective [φ -fs], while its associate has a complete [φ -fs] and [uCase].²⁹⁾ It is assumed that the [φ -fs₂] containing only a φ -complete is enough to delete the uninterpretable features of a P. (33b) is the derivational structure of (32a) after Move applies at the CP-phases. The clustered expletive [there[[φ -fs₂], uCase]_{(someone_i)j}] can move through the intermediate infinitival Spec-T to the matrix Spec-T due to the PIC and agrees simultaneously with both the infinitival [[u φ -fs] of T_{def}] and the matrix [[u φ -fs] of T] at each CP-phase. (33c) is the derivational structure of (32b). *Someone*, which is the associate of *there*, cannot possibly move to the Spec-T_{def}, since it has already lost its [[φ -fs₂], uCase] by means of Cluster.

28) Case is transmitted from nominative *there* to *someone*, via *t*, which thereby becomes visible for θ -marking. See Lasnik (1992).

29) Chomsky (1998) claims that the defective nominal *there* should be assumed to have a defective φ -feature, i.e., [person]-feature.

3.4. The cluster formation of complex verbs

So far, I have examined the clustered phrases at the vP -phases and their simultaneous Agree with Ps on the basis of Cluster (2).

Let us in turn look at a H-clustered phrase at a vP -phase. Under VP-Internal Subject Hypothesis,³⁰ it seems that an English V-b is an obligatory and unique H-clustered phrase:

(33) a. Someone laughed.

b. The rose loves sunlight.

(34) a. $[_{CP} [_{TP} [_{vP} \text{someone } [_{v'} [v \text{ laughed}_i [[vV\text{-fs}]-[u\varphi\text{-fs}], -OCC] [_{VP} [_{V'} t_i]]]]]]]$

b. $[_{CP} [_{TP} [_{vP} [_{v'} \text{the rose } [_{v'} [v \text{ loves}_i [[vV\text{-fs}]-[u\varphi\text{-fs}], -OCC] [_{VP} [_{V'} t_i \text{ sunlight}]]]]]]]]]$

(34a-b) are the initial derivational structures at the vP -phase, i.e., in the argument structure. In the unergative clause (34a), the intransitive *laughed* merges internally with the light verb v by means of Cluster, forming a H-clustered V-b, i.e., $[\text{laughed}[[vV\text{-fs}]-[u\varphi\text{-fs}], -OCC]]$.³¹ It is assumed that the non-lexical item v may be included in the feature set. The intransitive verb has no $[u\varphi\text{-fs}], +OCC]$, so that it is free from seeing and activating an object at the vP -phase. The V-b undergoes a non-feature-driven movement to T for phonetic realization in PF.³² In the accusative clause (34b), the transitive verb *loves* selects the inner and outer Spec-C as its complement. The H-clustered V-b forms a set of $[\text{loves}[[vV\text{-fs}]-[u\varphi\text{-fs}], -OCC]]$ at the vP -phase.

30) Subjects originate in Spec-VP, and are subsequently raised into Spec-IP position. See Fukui & Speas (1986), Kuroda (1988), and Koopman & Sportiche (1991).

31) V raises overtly to the light verb v , forming the complex $Vb = [v V v]$. Assuming unergatives to be concealed accusatives, the only other VP construction is that of unaccusatives lacking the v -shell. See Chomsky (1995).

32) See Chomsky (1998) and Yang (1998b).

4. Conclusion

This paper examined the relations between PIC and CA/OA and then the cluster formation of multiple WH-phrases, conjuncts, expletives and their associates, and V-bs at their own ν P-phases on the basis of Cluster. Cluster is an external or internal Merge of more phrases than one at a ν P-phase (=in an argument structure), making their G/H-features form a set of G/H-features. Cluster may be added to the existing Move: Move = Cluster + Agree + Pied Piping + Merge.

In a multiple WH-question, Cluster order is $WP_{arg} WP_{adj} (WP_{adj}\dots)$ at a ν P-phase. The clustered WH-phrases form a set of [WH-phrase [+WH_n, μQ_n]_(WH-phrase1), (...), (WH-phrase(n-1))]. In an echo question, an inner C_{eq} has [[+Q, μWH], -OCC]-features due to COMP-freezing, while an outer C_u has [[+Q, μWH], $\pm OCC$]-features. In a coordinate structure, any phrase may not be moved out of the clustered conjuncts. In an expletive construction, a clustered expletive *it/there* agrees simultaneously with ν/T for CA/OA. Under VP-Internal Subject Hypothesis, an English V-b seems to be an obligatory and unique H-clustered phrase.

This paper finally comes to an assumption that Cluster may be one of the economic principles in NS.

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