The Enhancement/Repression of Phasehood*

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The aim of this paper is to contribute to the phase theory (Chomsky 2000, et preq) by modifying it so that it can suit to more empirical facts. I propose phases must conform to some syntactic conditions in order to behave as such. Two conditions are put forth. One is that the specifiers of phases must be occupied by some element, and the other that their complements must be headed by semantically independent terms. When phases satisfy these two conditions, they are enhanced; otherwise they are repressed. In terms of this phase system, I examine extraction from DP and that from CP. The system will be shown to provide a unified explanation for these sorts of extraction.

0. Introduction

The theory of phases, since Chomsky (2000) advanced it within the minimalist framework of generative grammar, has been embraced by many researchers and developed rapidly on the theoretical level (see Chomsky 2001, 2004). Phases are taken to be substages of derivation, each consisting of a subarray of lexical items, playing important roles in capturing the successive cyclicity of derivation and in conditioning the application of syntactic operations. At the present, Chomsky and many of his followers agree that CP and vP constitute a phase, and also acknowledge the possibility that other phrases like DP may be phasal (see, in particular, Svenonious 2004 and Bošković 2005).

However, we still only stand at the dawn of the phase theory. The theory is far from being mature on the empirical level, because it has several empirical problems to solve. One of them has to do with extraction. As is pervasively acknowledged, extraction is possible out of nonspecific noun phrases, but not out of specific ones. This constraint is known as the Specificity Condition (Fiengo and Higginbotham 1980; see also Chomsky 1973, 1977, Bowers 1988, Karimi 1989, 1999, Enç 1991, Mahajan 1992, Diesing 1992, among others). In addition, extraction is permitted if executed from nonfinite wh-questions, but not if from finite ones (Chomsky 1986; Cinque 1990; Rizzi 1990; Coopman and Stevenson 1991, and others). Thus, finite and nonfinite clauses behave asymmetrically in extraction from them. These two contrasts in extraction are illustrated in (1) and (2), respectively:

(1) a. Who did James see [$_{DP}$ (a) picture(s) of *t*]?
b. *Who did James see [$_{DP}$ the/this/Richard's picture of *t*]?

(2) a. What did James wonder [$_{CP}$ whether to discover *t*]?
b. *What did James wonder [$_{CP}$ whether Richard discovered *t*]?

If DP forms a phase whether specific or not, and CP is phasal whether finite or nonfinite, then the question arises why the contrasts noted above come into existence. Namely, if phases are responsible for conditioning syntactic operations like movement, it is incumbent on the phase theory to explain the specificity condition on extraction from DP and the finite-nonfinite asymmetry in extraction from CP. This task is what I embark on in this paper.

To dissolve the problem mentioned above, I propose phases behave as such only when some syntactic conditions are met. Two conditions on the exertion of phasehood are put forth. One is that phases have to contain some element in their specifiers, and the other that they have to select

complements headed by semantically independent terms. If phases satisfy these two conditions, the phasehood is exerted. In this case, I say phases are enhanced. If either of the conditions is not met, phases are not allowed to behave as such. In this case, I say phases are repressed. In terms of the phase system just outlined, I provide a unified explanation for the contrasts in (1) and (2), and by so doing I hope to be able to make some contribution to the development of the phase theory.

I set up in section 1 the details of the proposal in this paper, and in the subsequent sections (2 and 3) implement it to account for the contrasts in question. In the latter sections, I flesh out the relevant data and show to what extent the proposal is empirically adequate. I summarize the results of the paper in section 4.

1. The phase system of enhancement/repression

The gist of the main proposal in this paper is that syntactic factors determine whether phases are active or not. I propose two conditions on the exertion of phasehood, one that requires phases to fill their specifiers with some element, and the other that requires their complements to be headed by semantically independent terms. I define semantically independent terms as elements which on their own contribute to semantic interpretations. In this definition, such elements as need the semantic aids of others in order to be properly interpreted are not semantically independent. Only when the two conditions are both satisfied, phases are activated to exert the phasehood; otherwise, they are not active. In the former case, phases are enhanced, and in the latter case, phases are repressed. (I borrow the terms "enhance" and "repress" from molecular biology. The reason for this will become clear in section 4.)

Enhanced and repressed phases are illustrated in the following schemata:

(3) H = phase head, Y = semantically independent term, Z = semantically dependent term
   i. $[_{HP}$ XP H $[_{YP}$ ... Y ...]]
   ii. $[_{HP}$ H $[_{YP}$ ... Y ...]]
   iii. $[_{HP}$ XP H $[_{ZP}$ ... Z ...]]
   iv. $[_{HP}$ H $[_{ZP}$ ... Z ...]]

It is only in (3i) that the phase HP is enhanced, where HP contains XP in its specifier and selects the complement YP headed by the semantically independent term Y. (3ii) and (3iii) show, respectively, that HP does not fill its specifier with any element, and that HP's complement is not headed by semantically independent terms. In neither case is HP allowed to behave as phasal; that is, it is repressed. If phases satisfy neither of the two conditions put forth here, they are of course repressed. This case is shown in (3iv).

Although phases are assumed in the current framework to have several syntactic properties, I concentrate on one of them throughout this paper. The phasal characteristic that I deal with is the one as the derivational point of the operation Spell-Out. Spell-Out applies at each time phases are completed, to transfer syntactic objects to the morpho-phonological component and the semantic component. (A phase is completed when the lexical array it consists of is exhausted and all the requirements of its head are fulfilled.) Syntactic objects transferred by Spell-Out become inaccessible to syntactic operations (for example, they are not allowed to undergo the operation Move). A caution is in order here. Spell-Out does not strip a phase of its whole content. It is only its c-command domain that Spell-Out transfers to the other components. Therefore, after Spell-Out applies, the c-command domain of a phase is no longer accessible to syntactic operations. This constraint is dubbed the Phase-Impenetrability Condition, abbreviated as the PIC.

In the phase system being proposed here, however, not all phases undergo the operation Spell-Out. The system allows only enhanced phases to do so: such phases are allowed to exert the phasehood, so that they exhibit the phasal characteristic as the derivational point of Spell-Out.

Namely, when a phase is completed and enhanced, Spell-Out applies to it, giving rise to the PIC effect. Repressed phases, on the other hand, do not undergo Spell-Out, since the phasehood is literally suppressed. Therefore, the PIC effect does not show up in repressed phases. To take (3) as an example, Spell-Out applies only to the enhanced phase HP in (3i), making its c-command domain YP inaccessible to syntactic operations. The phase HP in (3ii-iv) is repressed, so that it cannot undergo Spell-Out and hence its c-command domain (YP/ZP) remains accessible to syntactic operations.

The phase system thus set up is summarized in (4):

(4) *The phase system of enhancement/repression*
- i. Phases must be enhanced to exert the phasehood.
- ii. In order to be enhanced, phases must conform to both of the two conditions (a) and (b):
  - a. Their specifiers are filled with some element.
  - b. Their complements are headed by semantically independent terms.
- iii. Otherwise, phases are repressed so as not to behave as such.

2. Extraction from DP

In this section, I examine extraction from noun phrases in terms of the phase system (4). First of all, I account for the grammatical contrast in (1), repeated in (5):

(5) a. Who did James see [$_{DP}$ (a) picture(s) of *t*]?
b. *Who did James see [$_{DP}$ the/this/Richard's picture of *t*]?

Before proceeding, I assume the DP hypothesis (Abney 1987, inter alia) and that DP constitutes a phase (Svenonious 2004 and Bošković 2005). In addition, I assume with Karimi (1999) and others that determiners — including genitives, demonstratives, quantifiers, and numerals — are marshaled within the DP according to whether they are characterized as specific or as nonspecific (cf. Jackendoff 1977; for the definition of specificity, see Enç 1991 and Abott 1995). Genitives and demonstratives are inherently specific, so that they are generated in DP's specifier. Quantifiers and numerals, if interpreted as specific, are generated in the same position as genitives and demonstratives, but if not, in the head of DP. As is clear from the above, noun phrases form a DP regardless of their specificity. In fact, many researchers (e.g. Longobardi 1994, 2001; Reinhart 1997) have been in agreement with the view that noun phrases have a DP-layer whenever they function as an argument of the verb (in this paper I deal with argumental noun phrases only).

Accordingly, the bracketed noun phrases in (5) are divergent in structure, particularly in the position of their determiners, as shown below:

(6) a. *who* ... [$_{DP}$ D/[$_{D}$ *a*] [$_{NP}$ [$_{N}$ *picture(s)*] *of* t_{who}]]
b. **who* ... [$_{DP}$ *the*/*this*/*Richard's* D [$_{NP}$ [$_{N}$ *picture*] *of* t_{who}]]

The nonspecific noun phrase in (6a) and the specific one in (6b) both form a DP-phase. These two DP-phases satisfy the condition (4iib), because the noun *picture*, the head of the DP's complement, is semantically independent. The nonspecific DP-phase in (6a), however, does not observe the condition (4iia), since there is no element in its specifier. It is then repressed so as not to exert its own phasehood. Therefore, the operation Spell-Out does not apply to that DP-phase, so that its c-command domain (i.e. the NP) remains accessible to syntactic operations. For this, extraction is possible out of the DP-phase in (6a).

The specific DP-phase in (6b), on the other hand, satisfies the condition (4iia), since the specific determiner occupies its specifier position. As a consequence, the two conditions on the exertion of phasehood are met, hence the DP-phase being enhanced. Spell-Out applies to it,

stripping off its c-command domain. This portion then becomes inaccessible to syntactic operations. This is why the specific DP in (6b) forbids extraction. In this way, the phase system (4) accounts for the specificity condition.[1]

Things do not go so simple, however. The effect of the specificity condition does not show up in all classes of noun phrases. For example, process (or event) nouns exhibit no such effect. This is illustrated in (7) (examples from (7) to (8) are cited from Davies and Dubinsky 2003):

(7) a. Who did Ashley participate in/watch/protest [the coronation of *t*]?
b. What did they observe/hear about/remember/decry [the production of *t*]?
c. Which patient did the med students participate in/observe/miss [the operation on *t*]?

When it comes to result (or representational) nouns, the situation becomes more serious:

(8) a. Who did you paint/??see [that portrait of *t*]?
b. Who did you write/??read [those essays about *t*]?
c. Who did Tom finish [his/*my book about *t*]?

Nouns like *picture*/*portrait* and *essay*/*book* are classified as result nominals. Result nouns are used in a considerably limited way. They must be selected by causative verbs semantically linked to their denoted entities: for example, *picture*/*portrait* requires selecting verbs like *paint*, and *essay*/*book* does those like *write*. As long as result nouns observe this selectional condition, they do not exhibit the effect of the specificity condition. If they are not selected by the verbs that they require, they cannot stand as such. Therefore, in (8a) and (8b), the nouns *portrait* and *essays* are not regarded as result nominals when *read* and *see* are used as the main verb. In this case, these nouns are concrete nominals. As shown, this class of nouns displays the effect of the specificity condition, unlike the other classes (see also (1)).

(8c) deserves more attention. The sentence is acceptable only when interpreted to mean 'finish writing his (or Tom's) book': it does not have an interpretation such as 'finish reading his book'. In addition, that interpretation assigns the genitive pronoun an agentive reading and disallows it to refer to persons other than the writer of the book (here Tom). This is the reason (8c) turns to be ungrammatical when the genitive *my* is used. In this case, the noun *book* should be conceived of as a concrete nominal, rather than a result one: the situation is quite absurd where Tom's writing a book results in creating the book which someone else possesses or finishes writing. Therefore, the use of *my* in (8c) obliges the noun *book* to be a concrete nominal, giving rise to the effect of the specificity condition.

Let us now examine extraction from process noun phrases in (7). The crux of the matter lies in the idiosyncrasy of the determiner used in process noun phrases. First of all, determiners other than *the* cannot co-occur with process nouns. (9) demonstrates this (examples from (9) to (11) are taken from Davies and Dubinsky 2003; italics are mine):

(9) a. Scientists observed *the revolution* of a satellite around Mars. (process/result)
b. Scientists observed *a revolution* of a satellite around Mars. (result/*process)

As (9b) shows, the use of the determiner *a* disallows the noun *revolution* to behave as a process nominal. However, process nouns do not always require the determiner *the*, as seen in (10):

(10) Scientists observed *revolution* of a satellite around Mars.

This fact can be interpreted to mean the determiner *the* in process noun phrases does not contribute to their semantic interpretation. Finally, process nouns with the determiner *the* are not disallowed

to occur in the subject position of *there* constructions, where specific noun phrases are forbidden to appear. This is illustrated in (11):

(11) And then, there was *the revolution* of a satellite around Mars on the video transmission, which the scientists had not expected.

Accordingly, we can conclude that the determiner *the* in process noun phrases lacks a specific reading. Longobardi (1994) dubs the determiner *the* of this type an expletive determiner.

This conclusion leads us to assume that the expletive determiner *the* is generated in the head of DP, not in DP's specifier. Recall that the specifier position of DP accepts only specific determiners. Hence, the bracketed noun phrases in (7) are assigned such a structure as depicted in (12):

(12) *wh-phrase* ... [$_{DP}$ [$_{D}$ *the*] [$_{NP}$ [$_{N}$ *coronation*/*production*/*operation*] *of*/*on* t_{wh}]]

As seen, the DP-phase in (12) satisfies the condition (4iib), because its complement is headed by semantically independent nominals, but does not the condition (4iia), because there is no element in its specifier. Note that the expletive determiner *the* is generated in the head D. In consequence, the DP-phase is repressed and its c-command domain (i.e. the NP) remains accessible to syntactic operations since the operation Spell-Out does not apply to it. This accounts for why extraction is possible out of the DP-phase in (12). Therefore, it is not surprising that process noun phrases do not exhibit the effect of the specificity condition.

Let us turn to extraction from result noun phrases in (8). A clue for solving the problem has been alluded to in the text. We should recall that result nouns stand as such only when selected by causative verbs semantically linked to their denoted entities. In view of this semantic requirement of result nouns, I assume that they are not semantically independent. If this assumption is correct, then it follows under the present phase system that result nouns repress the phasehood of the DPs whose complements are headed by them. Consider in this respect the following diagram:

(13) *who* ... [$_{DP}$ *that*/*those*/*his* D [$_{NP}$ [$_{N}$ *portrait*/*essays*/*book*] *of*/*about* t_{who}]]

The bracketed portion in (13) depicts the internal structure of the result noun phrases in (8). The DP-phase in (13), although filling its specifier with the specific determiner, does not select the complement headed by semantically independent terms, hence disobeying the condition (4iib). It is then repressed. Since it cannot undergo Spell-Out, its c-command domain is still accessible to syntactic operations. Therefore, the DP-phase allows extraction in spite of being specific.[2] If the noun *portrait*/*essays*/*book* is a concrete nominal, the DP-phase fulfills the two conditions on the exertion of phasehood. In this case, it is enhanced, so that Spell-Out applies to it, making its c-command domain inaccessible to syntactic operations. The DP-phase in that case hence displays the effect of the specificity condition.[3]

3. Extraction from CP

In this section I examine extraction from CP. In addition to (2), repeated in (14), I deal with further examples relevant to extraction from CP, given in (15) and (16).

(14) a. What did James wonder [$_{CP}$ whether to discover *t*]?
b. *What did James wonder [$_{CP}$ whether Richard discovered *t*]?

(15) a. Which of the new books do you wonder [when you should buy *t*]?
b. Which pasta do you wonder [when you should cook *t*]?

(Ishii 2006: 219)

(16) ?What did you wonder [who bought *t*]?

(Aoun and Li 1991: 170)

(15) shows that wh-questions with a subjunctive tense allow extraction just like nonfinite ones, and (16) suggests that even finite wh-questions permit extraction if their wh-words function as a subject.[4] In particular, (16) is important in that it indicates that finite wh-questions do not always display the island effect. Therefore, it ruins the idea that every finite CP exerts the phasehood.

I begin by accounting for the grammatical contrast in (14). In order to do so, I have to introduce into the discussion the difference between the temporal interpretations of finite and infinitival tenses. As pointed out by many researchers, infinitival tenses do not denote a temporal reference independently, unlike finite ones. Their temporal interpretations are dependent on matrix clauses. For example, consider (17):

(17) a. James seems to be smart.
b. James wants to discover a new fact.

In both of (17a) and (17b), the embedded infinitival clause lacks an independent temporal reference, which must be determined by the tense or verb of the matrix clause. In (17a), the state of James being smart is envisaged at the reference point the matrix tense temporally denotes, i.e. the time of the sentence being uttered. In (17b), the lexical meaning of the matrix verb *want* manipulates the temporal interpretation of the infinitival clause, assigning it the interpretation that the event time of James discovering a new fact is in the future relative to that of him wanting to do so. In neither of (17a) and (17b) does the infinitival tense denote an independent temporal reference (for more details about the semantics of infinitival tenses, see Baker 1989, Hornstein 1990, Enç 1996 and others).

According to the difference between the temporal interpretations of finite and infinitival tenses mentioned above, it is safe to assert that the former are semantically independent but the latter are not. This enables us to account for the contrast in (14) in terms of the phase system proposed here. Consider the following schemata:

(18) a. *what* ... [$_{CP}$ *whether* C [$_{TP}$ PRO [$_{T}$ *to*] *discover* t_{what}]]
b. **what* ... [$_{CP}$ *whether* C [$_{TP}$ *Richard* T_{finite} *discovered* t_{what}]]

The bracketed portion in (18) depicts the internal structure of the embedded clause in (14). The nonfinite clause in (18a) and the finite one in (18b) both form a CP-phase. Either of the CP-phases satisfies the condition (4iia), since they contain the wh-word *whether* in their specifiers. However, the nonfinite CP-phase in (18a) does not observe the condition (4iib), since its complement TP is headed by the infinitival tense, which is not semantically independent. Therefore, the CP-phase is repressed. The operation Spell-Out does not apply to it, and hence its c-command domain remains accessible to syntactic operations. For this, extraction is possible out of the CP-phase in (18a).

The finite CP-phase in (18b) selects the complement TP headed by the semantically independent finite tense. It thus fulfills the condition (4iib) as well as (4iia). This means the CP-phase is enhanced. Accordingly, Spell-Out applies to it, rendering its c-command domain inaccessible to syntactic operations. This explains why the CP-phase in (18b) disallows extraction. In the way thus, the finite-nonfinite asymmetry in extraction from CP is accounted for in terms of the present phase system.

Let us turn to (15). Ishii (2006) suggests that subjunctive tenses behave like infinitival ones in that they do not denote an independent temporal reference. Consider (19) in this respect:

(19) a. James demands that Richard (should) study more.
b. James requires that Richard (should) invent a new theory.

Like the verb *want* in (17b), verbs like *demand* and *require* manipulate the temporal interpretation of the subjunctive clauses they select. For example, the verb *demand* in (19a) assigns the subjunctive clause the interpretation that the event time of Richard studying is in the future relative to that of James demanding. Thus, subjunctive tenses also lack an independent temporal reference.

Accordingly, (15) can be accounted for in the same way as (14a).

(20) *wh-phrase* ... [$_{CP}$ *when* C [$_{TP}$ *you* [$_{T}$ *should*] *buy*/*cook* t_{wh}]]

In (20), which in its bracketed portion shows the internal structure of the embedded clause in (15), the CP-phase satisfies the condition (4iia), because the wh-word *when* occupies its specifier position, but does not the condition (4iib), because the head of its complement is a subjunctive tense and hence is not semantically independent. In consequence, the CP-phase is repressed, so that it cannot undergo Spell-Out and its c-command domain is still accessible to syntactic operations. Therefore, extraction is possible out of subjunctive wh-questions (for an alternative account of (15), see Ishii 2006).

Let us finally consider (16). In order to account for (16), I follow Gerge (1980), Chomsky (1986) and Agbayani (2000, 2006), assuming that subject wh-phrases do not move to CP's specifier unlike nonsubject ones (contra Cheng 1991; Rizzi 1996). This assumption is based on the claim that wh-movement of subjects causes a vacuous movement, which has been often thought of as an illicit operation (for more details, see the references cited above).

If this assumption is correct, then (16) is accounted for as follows:

(21) *what* ... [$_{CP}$ C [$_{TP}$ *who* T_{finite} *bought* t_{what}]]

The structure of the embedded clause in (16) is depicted in the bracketed portion in (21). The CP-phase therein satisfies the condition (4iib), because its complement is headed by the semantically independent finite tense, but does not the condition (4iia), because its specifier position is empty. Note that the subject wh-phrase *who* does not move to that position, lingering in the specifier of TP. Therefore, the CP-phase is repressed. Since Spell-Out does not apply to it, its c-command domain remains accessible to syntactic operations. This is why the embedded wh-question in (16) permits extraction despite of being finite.

4. Summary and remaining problems

In this paper I have advanced the phase system of enhancement/repression in which phases become active or inactive according to whether they are in conformity with syntactic conditions to fulfill. In terms of this system, I examined the specificity condition on extraction from DP and the finite-nonfinite asymmetry in extraction from CP. As a consequence, the system was shown to account for these facts about extraction in a unified way. Moreover, I extended the system to further examples bearing on extraction from DP and CP, showing that it fares well with them as well.

However, the proposed system is challenged by a few other facts about extraction. First, it cannot explain why concrete nouns forbid extraction from the adjunct phrases that modify them (see (22)), and second, it gives no account to why adverb extraction from CP does not display a finite-nonfinite asymmetry (see (23)).

(22) a. *Which wood was Gene hoping to find [a table of *t*] for the kitchen?
b. *What sort of fur was George looking for [a dog with *t*]?

(Davies and Dubinsky 2003: 16)

(23) a. *How did you wonder [whether [John fixed the car *t*]]?
b. *How did you wonder [whether [to fix the car *t*]]?

(Cooper and Stevenson 1991: 360)

In (22) the extraction site is in the adjunct phrase modifying the concrete noun. As shown, this sort of extraction is impossible. In (23) the wh-adverb *how* is extracted out of the embedded wh-question. Extraction of this kind is disallowed regardless of whether the clause is finite or nonfinite. To account for these facts is a task left in the future research.

Finally, I must admit that the phase system put forth here is modeled upon a similar system posited in a language-independent discipline. The discipline is molecular biology. Molecular biologists detected ages ago an elaborate system of the gene expression. The system is orthogonal to the transcription of DNA sequences (which ends up with generating amino acids), which is regulated by several factors in an ingenious way. One of the factors is called a promoter. Promoters are a particular base sequence on the DNA strand, playing a role as the initiation point of the transcription. In order to execute the transcription, however, promoters must be activated. The factors responsible for activating promoters are called enhancers. They combine with promoters, stimulating them to initiate the transcription. In addition, promoters are sometimes deactivated so as not to implement the transcription. The factors that function as deactivating promoters are referred to as repressors. Thus, replacing "transcription" with "Spell-Out", "DNA sequences" with "syntactic objects", and "promoters" with "phases" in the above, we will understand how similar to the gene system the proposed one is (for other affinities between the gene system and the syntactic one, see Fujita 1997).

Chomsky (2005) states that "[w]ith the conceptual barriers imposed by the format framework overcome, we need no longer assume that the means of generating structural expressions are highly articulated and specific to language" (pp. 9). He goes on to say that "we can seriously entertain the possibility that they might be reducible to language-independent principles, whether or not there are homologous elements in other domains and organisms" (ibid). The present paper, therefore, can be viewed as an attempt to embody that possibility. I hope the paper will help pave the way to a new perspective on the syntactic system of language.

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1 The phase system (4) is challenged by the following example:

(i) * Who did James destroy [$_{DP}$ pictures of *t*]?

In (i) the lexical meaning of the verb *destroy* requires the object (DP) to be specific. Therefore, the DP exhibits the effect of the specificity condition, disallowing extraction. However, the DP is not associated with any overt determiner. If, as the surface suggests, the DP does not contain any element in its specifier, it should be repressed under the present system. Therefore, it is predicted that the DP should permit extraction, contrary to fact.

For avoiding this problem, I follow Karimi (1999), assuming that specific DPs without an over determiner have a null counterpart in the specifier position. If this assumption is correct, the DP in (i) fills its specifier with a null determiner, hence fulfilling the condition (4iia) as well as (4iib). It is then enhanced, so that it forbids extraction, as desired, because its c-command domain becomes inaccessible to syntactic operations by virtue of Spell-Out.

[2] In an earlier version of this paper, I accounted for (8c) by assuming that genitive determiners with an agentive reading are generated within the NP, the lexical domain of noun phrases. Under this assumption, in (8c) the genitive pronoun *his* stays within the NP and the specifier position of the DP is empty. As a result, the DP conforms to neither of (4iia) and (4iib).

[3] Davies and Dubinsky (2003) (henceforth, D&D) provide an alternative analysis. D&D attempt to explain examples like (8) by positing abstract noun incorporation (Baker 1988). D&D claim that the noun is covertly incorporated into the verb only when the following conditions are met: (i) the noun is a result nominal; (ii) it is the complement of a causative verb semantically linked to the denoted result; and (iii) the subject of the verb controls the agentive subject of the result noun. And D&D suggest that noun phrases become transparent to extraction when noun incorporation applies to the head noun (cf. the Government Transparency Corollary (Baker 1988)). For example, (8a) satisfies all the conditions mentioned above, and hence noun incorporation is successfully executed, as shown in (i). Thus, the DP in (i) is transparent to extraction.

(i) *who*$_3$ *did you*$_1$ *paint*$_2$ [$_{DP}$ *that* [$_{NP}$ PRO$_1$ *portrait*$_2$ *of* t$_3$]]

However, D&D only descriptively generalize the circumstances in which the noun is allowed to undergo incorporation, and do not explain in principle why noun incorporation is possible out of noun phrases when satisfying the three conditions. We should notice that the conditions that D&D posit are quite the same as those on extraction from result noun phrases. Therefore, D&D's analysis merely rephrases the problem in other words.

[4] However, there is some disagreement in the literature about the acceptability of a sentence like (16). Agbayani (2000, 2006), for example, observes that finite wh-questions with a wh-subject exhibit the island effect as usual. In this paper, I do not treat an idiolectal variation of the judgment of such sentences, proceeding on the acceptability of (16).

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