Do-Support in the Minimalist Theory

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0. Introduction

This paper accounts for do-support phenomena with respect to negation, question, and focus constructions in English and Korean, within the minimalist theory of Chomsky (1993, 1994).\textsuperscript{1} It will be claimed that the English do-support phenomena and the Korean counterparts, ha-support phenomena, are accounted for by the same principles of the minimalist theory. The surface differences between the English do-support phenomena and the Korean counterparts are shown to be due to the minimal parametric differences in functional categories between English and Korean.

\textsuperscript{1} An earlier version of this paper was presented at the meeting of the Linguistic Society of Korea on 25 January, 1994.
1. Negation

Chomsky (1991) accounts for the difference in grammaticality between (1a, b) as due to the Head Movement Constraint (HMC), as follows:

(1) a. John did not write books.
    b. *John not wrote books.

Chomsky (1991) assumes that both (1a, b) may be derived from the D-structure (2):

(2) John I NEG AGR write books

For the derivation of (1b), Chomsky (1991) argues, I lowers to AGR, then to V, yielding the complex verb [V-AGR-I], and then at LF the complex verb has to raise back to the trace of AGR and then to the trace of I in order to eliminate the improper chain. The LF raising of the complex verb has to cross NEG, thus violating the HMC. Therefore, there is only one legitimate derivation: the one involving do-insertion, namely (1a).

In order to block the derivation of (3a), as opposed to (3b), from the D-structure like (3c), however, Chomsky (1991) has to propose the "least effort" condition that UG principles are applied whenever possible, with language-particular rules like do-insertion used only to "save" a D-structure yielding no output.

(3) a. *John did write books. (do unstressed)
    b. John wrote books.
c. John I AGR write books.

In other words, we have only to apply the UG principle of Verb Movement to derive (3b) from (3c), but we need to apply the language-particular rule of do-insertion to derive (3a) from (3c), which violates the "least effort" condition.

Such an account for (3a, b), however, is not available in Chomsky's (1994) bare theory, since (3a, b) do not have the same numeration: that is, the numeration for (3a) contains *did* but that for (3b) does not. In other words, according to Chomsky (1994), (3a, b) cannot be compared in terms of economy principles like the "least effort" condition, since (3a,b) are no longer assumed to be derived from the same underlying structure like (3c). Therefore, (3a) should be ruled out without comparing it with (3b) in terms of economy considerations.

There is one way to rule out (3a) independent of (3b) in the minimalist theory: the principle of Procrastinate. Under the minimalist assumption that the V-features of T and AGRs are weak in English, the derivation of (3a) violates the principle of Procrastinate, since the pre-Spell-Out do-insertion makes the V-features of T and AGRs discharged prior to LF. In other words, the do-insertion inserts do under T pre-Spell-Out, discharging the weak V-features of T and AGRs without V-raising prior to LF. But, then, the principle of Procrastinate has to be violated in the derivation of (1a), which is grammatical.

In order to tolerate the apparent violation of the principle of Procrastinate in cases like (1a), we need to resort to Chomsky's (1994) condition (4) on the principle of Procrastinate:

(4) Procrastinate selects among convergent derivations.
In other words, according to the condition of (4), the principle of Procrastinate does not apply in the derivation of (1a), since there cannot be any alternative convergent derivation from the numeration of (1a). But then the principle of Procrastinate should not apply in the derivation of (3a), either, according to the condition (4), since there seems to be no alternative convergent derivation from the numeration of (3a).

In order to make the principle of Procrastinate apply in the derivation of (3a), we need to modify the condition (4) into (5):

(5) Procrastinate selects among compatible convergent derivations.

"Compatible convergent derivations" are alternative convergent derivations that share a numeration except functional features. Thus, (3a, b) are compatible convergent derivations since the only difference between (3a, b) is the tense feature and \( \varphi \)-features of the main verb *write* and the dummy verb *do*, under the assumption that the dummy verb *do* is simply a phonetic realization of tense and \( \varphi \)-features. (1a, b) are also compatible derivations since the only difference between them is also the tense features and \( \varphi \)-features, but (1b) is not a convergent derivation. Therefore, according to (5), the principle of Procrastinate does not apply in the derivation of (1a).

Consider (6):

(6) John has not written books.

In (6) the \( V \)-features of \( T \) and AGRs are discharged by the overt raising of the auxiliary verb *has*. But (6) does not violate the principle of Procrastinate according to (5), since there is no alternative compatible
convergent derivation out of the numeration of (6). That is, if the auxiliary verb *has* does not raise to T and then to AGRs pre-Spell-Out, the derivation would never converge, since auxiliary verbs like *has* may not move, post-Spell-Out, being invisible at LF. On the other hand, the derivation of (6) converges even if the auxiliary verb *has* crosses the NEG *not*, since the * placed on the trace of *has* due to its crossing the NEG can be assumed to be invisible at LF, under the assumption that the trace of invisible *has* is also invisible at LF.\(^2\)

There are two types of negation in Korean: the short-form negation and the long-form negation, as illustrated in (7a, b):

(7) a. John-i koki-lul ani mek-ess-ta
   -NM meat-AC not eat-PAST-DEC\(^3\)
   'John did not eat meat.'

   b. John-i koki-lul mek-ci ani ha-ess-ta
   -NM meat-AC eat-P not do-PAST-DEC
   'John did not eat meat.'

In the short-form negation (7a), the negative *ani* 'not' is assumed to be adjoined to the verb *mek* 'eat', whereas in the long-form negation (7b) the negative *not* is assumed to project into a NEGP as we see in the structure (8) for (7b):

\(^2\) Refer to Chomsky and Lasnik (1993) for the claim that when Move-\(\alpha\) violates the Minimal Link Condition a * is placed on the trace, which is to be interpreted as indicating the marginality or the ungrammaticality of the expression.

\(^3\) The abbreviations are as follows:
   NM=Nominative Case; AC=Accusative Case; PAST=Past Tense; ASP=Aspect;
   DEC=Declarative Mood; QUE=Question Mood; HON=Subject Honorification
The derivation of (7b) from (8) is as follows. The verb *mek* adjoins to the postposition *ci* under the assumption that the verbs in Korean have the [+affix] feature in the base form. The amalgam *mek-ci* raises to AGR₀ and checks off the accusative Case of the object *kokî-lul* that raises to the SPEC of AGR₀P. The amalgam *mek-ci(+AGR₀)*, however, may not raise to AGRₛ to satisfy the [+affix] feature of T ess, due to
the principle of Greed. In other words, after the verb *mek* raises to *ci*, then to AGRO, the amalgam *mek-ci*‐AGRO has no [+affix] feature left to be satisfied, since the respective [+affix] features of *mek* and *ci* are satisfied by the adjunction of *mek* to *ci*. Therefore, the dummy verb *ha* has to be inserted under AGRS to satisfy the [+affix] feature of T ess. AGRS checks off the nominative Case of the subject *John-i* that raises to the SPEC of AGRS.P. The selectional restriction between NEG *ani* and P *ci* is checked when the amalgam *mek-ci* is raised to AGRO. Thus, ultimately the *ha*-support is due to the NEG *ani*.

Under the assumption that P is either a lexical category or a functional category,4) *ci* is considered as a functional category P, whose main function is to support the verb *mek* with the [+affix] feature, which blocks overt raising of V to AGRS. The PP may move to the SPEC of AGRO.P to get its accusative Case checked off in cases like (9):

    -NM meat-AC  eat-P-AC  not do-PAST-DEC
    'John did not eat meat.'

In the derivation of (9), after PP raises to the SPEC of AGRO.P, the object *koki-lul* raises again to the SPEC of AGRO.P, forming a multiple SPEC structure, to get its accusative Case checked off.5) Since the amalgam *mek-ci* may not move to AGRS, the SPEC of AGRS.P may not be in the equidistance domain for the movement of PP;6) thus, (10) is not grammatical.


4) For this assumption, refer to Emonds (1985).
5) For the process of forming a multiple SPEC structure, refer to Chomsky (1994).
6) For the equidistance condition, refer to Chomsky (1993).
For (10) to be grammatical, _mek-ci(-ka)_ has to move to AGR$_S$ to get the nominative Case of PP checked off.

Consider (11a, b):


-NM pretty-P-NM not do-DEC.

'Mary is not pretty.'


-NM pretty-P-AC not do-DEC.

'Mary is not pretty.'

For the derivation of (11a), the PP moves to the SPEC of AGR$_S$ to get its nominative Case checked off by AGR$_S$ and then the subject Mary-ka moves to the SPEC of AGR$_S$ again, forming a multiple SPEC structure. Thus, this derivation is under the assumption that only the verb with the [+accusative] DP-feature may check the accusative Case of the object in the SPEC of AGR$_0$P. Apparently, however, AGR$_0$ itself seems to check off the accusative Case in a secondary way. That is, in cases like (11b), the PP may get its accusative Case checked off by AGR$_0$ in the SPEC of AGR$_0$P, which is a secondary way of Case checking since it is simply to avoid a double (nominative) Case checking. If the PP raises to the SPEC of AGR$_S$P to get its (nominative) Case checked off by AGR$_S$, the double nominative Case checking is unavoidable as in (11a). Apparently, the secondary way of Case checking may not license a multiple Case structure; thus, in (11b) the nominative Mary-ka may not be replaced by the accusative Mary-lul.

Consider (12):

(12) sensayngnim-i o-si-ci ani ha-si-ess-ta
teacher -NM come-HON-P not do-HON-PAST-DEC

'The teacher did not come.'
Assuming that the honorific action feature \([+\text{HON}]\) is checked by AGRs, (13) is to be posited for (12):

(13)
The honorification feature of the verb *o-sí* is assumed to be checked off by the lower AGRs when the amalgam *o-sí-ci* is raised to the lower AGRs, whereas the honorification feature of the auxiliary verb *ha-sí* is checked off when it is inserted under the higher AGRs from the lexicon. The subject *sensayngim-i* gets its features (nominative Case feature, \( \varphi \) -features, and honorification feature) checked off by the DP-features of the lower AGRs and any additional features of the subject will be checked off by the DP-features of the higher AGRs. Thus, we claim that AGRs may be segmented into multiple AGRs's just as AGR has been segmented into AGRs, AGRo, AGRA, etc., in a clause.

Kang (1994) cites sentences like (14), arguing against the claim that the negative *ani* 'not' projects into a maximal projection NEG between the two AGR heads in the long-form negation as we see in (8) and (13).

    -NM meat-AC eat-P not do-P not do-PAST-DEC.

'It is not the case that John did not eat meat."

His argument is based on the assumption that the dummy verb *ha* is inserted under T in Korean as the dummy verb *do* is in English. Under such an assumption, (14) would contain multiple T's in a clause, which is anomalous since a clause may have only one tense. His argument, however, does not stand under the assumption that the dummy verb *ha* is inserted under AGRs, since AGRs may be segmented into multiple AGRs’s in a clause, as claimed above with respect to (13).

In (14), the two postposition *ci*’s are selected by the two NEG *ani*’s. The lower dummy verb *ha* is inserted under lower AGRs to satisfy the [+affix] feature of the lower *ci*, and the higher dummy verb *ha* is inserted under the higher AGRs to satisfy the [+affix] feature of T *ess.*
On the other hand, the two postposition ci's support the [+affix] verb mek and the [+affix] dummy verb ha, respectively. The subject John-i moves to the SPEC of the lower AGRsP to get its features checked off by the lower AGRs and then to the SPEC of the higher AGRsP to get its additional features checked off by the higher AGRs.

Consider (15):

    -NM meat-AC eat-P do-PAST-DEC.

The ungrammaticality of (15) can be accounted for simply by the fact that the postposition ci or ki is not selected or licensed and thus the ha-support is not legitimate.

In conclusion, in both English and Korean negation, do-support may occur due to the fact that the negative is posited as the head of NEGP, though through slightly different mechanisms. In languages like Korean, AGR may be multiplied in a clause and a functional P may take VP as its complement.

2. Question

Consider (16):

(16) Did John write books?

Following the suggestion by Chomsky (1991), the do-support in (16) can be accounted for as follows. Under the assumption that the structure for an interrogative sentence contains the [+Q] feature in C and that the
[+Q] is of [+affix], do has to be inserted under T in an interrogative sentence to satisfy the [+affix] feature of [+Q] in C through overt I-to-C Raising, since V-raising may not occur pre-Spell-Out due to the principle of Procrastinate. If there is an lexical element like a modal verb (e.g., can) available under T to support [+Q] in C through overt I-to-C Raising, then do-support need not occur as we see in (17):

(17) Can John write books?

Even in (16) and (17) the weak V-features of T and AGRs are discharged pre-Spell-Out by the insertion of do or the modal can. This, however, does not violate the principle of Procrastinate, since it does not induce overt movement of the verb and the pre-Spell-Out discharge of the weak V-features of T and AGRs by the inserted lexical items is a by-product of costless lexical insertion solely to lexically support the [+Q].

Consider (18):

(18) Has John written books?

In (18) [+Q] is supported by overt I-to-C Raising of has, which implies that has raises to I pre-Spell-Out, discharging the V-features of T and AGRs prior to LF. But (18) does not violate the principle of Procrastinate according to (5), since there is no alternative compatible convergent derivation out of the numeration of (18). On the other hand, (19) is ungrammatical because it violates the last resort condition of lexical insertion, in comparison to (18):

(19) *Does John have written books?
In other words, since (18) is grammatical without *do*-insertion, the version with *do*-insertion cannot be grammatical due to the last resort condition of lexical insertion.\(^7\) Unlike *do*, the auxiliary verb *have* cannot be considered as a pure phonetic realization of tense and \(\varphi\)-features for numeration.

Consider (20a, b, c):

\[(20)\ a. \text{Who did Jon see?} \]
\[b. \ast \text{Who did see Mary?} \]
\[c. \text{Who saw Mary?} \]

(20a) is as predicted: *do* is inserted under \(T\) to support \([+Q]\) in \(C\) by overt I-to-C Raising of *do*, and *who* moves to the SPEC of CP to get its operator-feature checked off by \(C\). For (20b, c), we may assume that I as well as \(C\) may check off the operator-feature of a *wh*-phrase and that a *wh*-phrase may get its operator-feature checked off in the SPEC of IP by I, if possible, instead of moving up to the SPEC of CP, due to the principle of Shortest Move.\(^8\) We may further assume that if the operator-feature of a *wh*-phrase is checked off in the SPEC of IP by I, the \([+Q]\) feature need not be posited in \(C\); hence, no CP projection in (20c). Therefore, *do*-support is unnecessary and hence impossible in (20c).

If a language has the interrogative sentence in which a lexical question morpheme is inserted in \(C\), then there would be no *do*-support in the interrogative sentence of the language since the \([+Q]\) feature of \(C\) is lexically supported by the inserted lexical question morpheme. In fact, this

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\(^7\) (i) also violates the last resort condition of lexical insertion because the version without *do*-insertion, i.e., (6) is grammatical:

(i) \(*\text{John does not have written books.}\)

\(^8\) For the argument that I can check off the operator feature of *wh*-phrase, refer to Pesetsky (1989).
is the case in Old English, as we see in (21):

(21) Hwæðer ge nu secan gold on treowum?
whether you now seek gold in trees
'Do you now seek gold in trees?'

If a language has the interrogative sentence in which a lexical question morpheme is inserted in some functional category and then moves to C without crossing T or AGRs, then there would be no do-support in the interrogative sentence of the language either, again since the [+Q] feature of C is lexically supported by the moved lexical question morpheme. In fact, this is the case in Korean, as we see in (22):

(22) John-i o-ess-ni?
- NP come-PAST-QUE
'Did John come?'

In the structure for (22), the question morpheme ni is base-generated under M (=Mood) and moves to C, as in (23):

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(23) CP
    /   \
   /     \    
  C'     C
    /  \
   /   \ 
  MP   C
     /  \
    /    \
   /      
  M'    M
         /   |
        /    ni
```
In conclusion, the [+Q] feature is posited in C of the interrogative sentence and the [+Q] feature must be lexically supported since it has the [+affix] feature. There are two ways to lexically support the [+Q] features: one is by do-support or V-raising as in Modern English and the other is by the insertion or movement of the question morpheme as in Old English and Korean.

3. Focus

Consider the English VP focus constructions (24a, b, c, d):

(24) a. John DID write books.
    b. John HAS written books.
    c. John IS writing books.
    d. DO be quiet.

Under the assumption that the VP focus construction is induced by the [+F] feature in T and that the [+F] feature is of [+affix], just as the [+Q] feature in C is, then (24a, b, c, d) can be accounted for as follows. In the derivation of (24a), do must be inserted under T pre-Spell-Out to lexically support the affixal feature [+F], since the verb write may not raise to T pre-Spell-Out due to the principle of Procrastinate. Even in (24a) the weak V-feature of T is discharged pre-Spell-Out by the do-insertion, but it does not violate the principle of Procrastinate, since it does not induce overt movement of the verb and

9) Instead of positing the [+F] feature in T, we might posit the functional category F (=focus) that projects to FP between VP and TP as in the case of Korean VP focus constructions to be discussed below.
the pre-Spell-Out discharge of the weak V-feature of T by the do-insertion is a by-product of costless lexical insertion solely to lexically support the [+F].

In the derivation of (24b, c), the auxiliary verbs has and is are raised to T to lexically support [+F] respectively, instead of do-insertion. The reason why the auxiliary verbs instead of do are raised to T in (24b, c) is the same as the reason why the auxiliary verb have is raised instead of do-insertion in (18).

Do-insertion in (24d) seems to be due to the fact that the verb be here is grammatically not an auxiliary verb even if semantically empty.

Consider the Korean VP focus construction (25):

(25) John-i koki-lul mek-ki-nun/man/to/kkaci ha-ess-ta
     -NM meat-AC eat-P—at least/only/also/even do-PAST-DEC
     'John at least/only/also/even ate meat.'

Under the assumption that each of the so-called Korean delimiters nun 'at least', man 'only', to 'also', kkaci 'even', etc., can be the head DEL of the maximal projection DELP between VP and TP, the ha-support in (25) may be accounted for as follows: ha has to be inserted under AGRs to satisfy the [+affix] feature of T ess since the verb mek may not raise to AGRs to satisfy the [+affix] feature of T ess due to the principle of Greed. In other words, the postposition ki is selected by DEL and the [+affix] features of the verb mek, the postposition ki and the delimiter are satisfied by the movement of the verb to the postposition and then to the delimiter, leaving no [+affix] feature to be satisfied.

Consider the structure (26b) for (26a):
(26) a. John-\textit{i} koki-lul mek-ki-man-\textit{ul} ha-ess-\textit{ta}  
\quad -\text{NM} meat-\text{AC} eat-P-only-\text{AC} do-PAST-DEC  

b.

\[ \begin{array}{c}
\text{MP} \\
\mid \\
\text{M'} \\
\mid \\
\text{TP} \\
\mid \\
\text{M} \\
\mid \\
\text{T'} \\
\mid \\
\text{ta} \\
\mid \\
\text{AGR}_{5}\text{P} \\
\mid \\
\text{SPEC} \\
\mid \\
\text{AGR}_{s}' \\
\mid \\
\text{ess} \\
\mid \\
\text{AGR}_{o}\text{P} \\
\mid \\
\text{SPEC} \\
\mid \\
\text{AGR}_{o}' \\
\mid \\
\text{ha} \\
\mid \\
\text{DELP} \\
\mid \\
\text{AGR}_{o} \\
\mid \\
\text{DELP}' \\
\mid \\
\text{PP} \\
\mid \\
\text{DEL} \\
\mid \\
\text{P'} \\
\mid \\
\text{man-\textit{ul}} \\
\mid \\
\text{VP} \\
\mid \\
\text{P} \\
\mid \\
\text{DP} \\
\mid \\
\text{V} \\
\mid \\
\text{John-\textit{i}} \\
\mid \\
koki-lul \\
\mid \\
\text{mek}
\end{array} \]

In the derivation of (26a) from (26b), the subject \textit{John-\textit{i}} raises to the SPEC of AGR$_5$P to check off its nominative Case, DELP raises to the
SPEC of AGR₀P to check off its accusative Case, and the object koki-lul raises to the SPEC of AGR₀P again, forming a multiple SPEC structure, to check off its accusative Case.

On the other hand, in order to account for the agreement between V and T in VP focus constructions as we see in (27a, b), we have to assume that V raises up to T even in VP focus constructions at LF.

(27) a. Mary-ka  ket-ki-nun   ha-n-ta.
    -NM walk-P-at least do-ASP-DEC
    'Mary at least walks.'

b. Mary-ka  yeyppu-ki-nun  ha-ta.
    -NM pretty-P-at least do-DEC
    'Mary at least is pretty.'

If the V is [–stative], then the T contains the aspect n as in (27a), whereas if the V is [+stative], then the T contains the null aspect as in (27b).\(^{10}\)

Compare (27a, b) to (28a, b):

(28) a. Mary-ka  ket-ki-nun   ket-nun-ta
    -NM walk-P-at-least walk-ASP-DEC
    'Walk, Mary does.'

\(^{10}\) The same agreement between V and T holds in negative constructions as we see in (ia, b):

(i) a. Mary-ka  ket-ci ani  ha-n-ta.
    -NM walk-P not do-ASP-DEC
    'Mary does not walk.'

b. Mary-ka  yeppu-ci ani  ha-ta.
    -NM pretty-P not do-DEC
    'Mary is not pretty.'

Therefore, we have to assume that V raises up to T in negative constructions at LF, too.
b. Mary-ka yeyppu-ki-nun yeppu-ta
   -NM pretty-P-at-least pretty-DEC
   'Pretty, Mary is.'

In (28a, b), in comparison with (27a, b), the verb is repeated instead of _ha_-insertion; that is, T is supported by the verb reduplication instead of _ha_-insertion. For the verb reduplication structures like (28a, b), we have only to assume that in Korean any verb may have the [+dummy] feature and behave just like the dummy verb _ha_ in VP focus constructions. The duplication verb as well as the dummy verb _ha_ should not conflict with the main verb in any features, which can be checked through the movement of the main verb up to T at LF.

In conclusion, the VP focus construction is induced by the focus feature [+F] in English and by the focus category DEL in Korean. In both English and Korean VP focus constructions, the dummy verb _do_ or _ha_ is inserted to support a category with the [+affix] feature related to the focus property. In Korean VP focus constructions, a reduplication verb may be inserted as a dummy verb instead of the dummy verb _ha_ under the condition that the reduplication verb does not conflict with the main verb in any features.

4. Conclusions

_Do_-support is not a language-particular rule of English but a general grammatical process to support some morphologically deficient element. Therefore, _do_-support phenomena across languages can be accounted for in terms of the general grammatical process, as demonstrated in this paper with respect to English and Korean negation, question and focus constructions.
References


