On Matching Projections in the Minimalist Program

Takashi IMAI

0. Introduction

So unique in linguistics would not be some ideas of a version of generative grammar now perceived as the Minimalist Program on economical and optimal considerations, but rather they could be uncontentious in other fields of natural science such as physics and chemistry for instance. One can think of Fermat's Principle of Least Time that states that light propagates between two points in such a way as to minimize its travel time or Jacobi's Principle of Least Action defining that a true trajectory makes the action stationary or the Principle of Least Potential Energy saying that a system in a state of rest in an inertial reference frame occupies a stationary value of its potential energy function. (Cf. Lemons (1997).) Such "Least effort" notions are natural selections for physical as well as linguistic (grammatical) principles explicated in a series of Chomsky's recent work[1], and would be eventually common for everything.

In the Minimalist Program (MP) of generative grammar, the derivation and representation in the Internal (intentional) language (I-language) should be optimal. A particular language (grammar), L may select a set of optimal operations in accordance with the principles on economical and optimal conditions. In the MP, conditions and/or principles on economy and minimality impose best derivations and representations. Here we will see two fundamental and important principles in the MP as follows[2]:

(1) the Least Effort Principle
Eliminate anything unnecessary in the following cases:
(i) superfluous elements in representations
(ii) superfluous steps in derivations

(2) the Last Resort Principle
Avoid crash in derivations as possible.

Those principles are applicable in any operations and processing in case of Copy/Move, Merge and any rule in generative grammar, and in a sense could eventually be compatible in natural science.

1. Matching Projections and the MP

Haider (1988) investigates the Matching Effect maintaining two premises: no empty categories and

no empty derivations. An immediate consequence of Haider's work is now quite compatible with the Minimalist conception in the sense of economy and optimal derivations. A matching projection is defined as in (3):

(3) A *matching projection* is a projection superimposed on an existing projection such that the nodes of the primary projection serve as secondary nodes of the superimposed projection. (Haider 1988: (35))

The process that Haider proposes is a kind of universal rule like "Superimpose a projection, P on an existing projection, P'." See Haider (1988) and Groos and Riemsdijk (1983) for more on the matching effect.

It is proposed here that superimposition is now called "FOLD." FOLD folds two categories in case that the first categorial head is empty, (FC). We will also propose the opposite operation as "UNFOLD." Hence, UNFOLD unfolds compressed elements (such as shells) to visually show the "virtual" configurational (vertical) structures in the sense of Zubizarreta and Vergnaud (1982).

Some immediate consequences of Foldedness would be to account for multiple SPECs, Adjunctions, raising, head movement, that-trace effect, structural parallelism between sentences (clauses) and noun phrases.

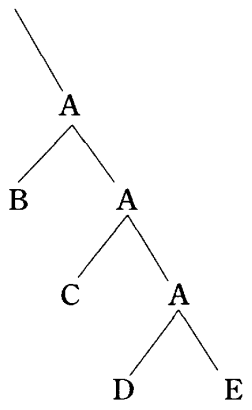
Let us first consider multiple SPECs. It is not so impossible to regard multiple SPECs as stacking of XP, i.e. maximal projections and is assumed that stacked projections are similar to a foldable antenna of a portable radio or TV set which expands at any length as one may wish. Hence, SPECs in multiple SPEC projections must be equidistant in the sense of Equidistance of Chomsky (1995).

Next, we will consider Heads. A complement merges with a Head, which leads to creating a head ascendant structure. (HAS). A question arises. Does maximal projection, XP merge with HAS, creating another maximal projection? There may be two options as follows:

1 HAS merges with another HAS≠Adjunction, but no distance among them (HASs)
2 A maximal projection merges with another maximal projection = Adjunction

Let us consider the following tree:

(4)



A denotes either a maximal projection or HAS. Note that the outmost layer creates a maximal projection.

Suppose vP and TP, then, in certain environment, vP, which is FC, and TP can be folded. Note that the difference between English and French can be uniformly explained in this idea. Consider the followings:

(5) a. $[_{TP}\ [_{vP}$ DP-subj VP]]

b. $[_{TP \setminus vP}$ DP-subj $[_{VP}$ V DP]][3]

In support of VP internal Subject hypothesis, no DP subject raising is assumed. Instead, this operation is least costly. Let us assume that non-Tensed categories head new tense heads, now termed T ' (T-bar), thus, a maximal projection of it is TP'(TP-bar). T ' would be realized as "to" or 0/ (null element) in English infinitives.

2. Subject WH-in-situ

Let us now consider the following:

(6) Who saw John?

According to Chomsky, WH in the subject position appears in-situ, hence, no movement takes place.

(7) $[_{CP}$ C $[_{TP}$ who saw John]]
[+Q] [+Q]

Only WH features move to CP-SPEC for feature checking. Hence we get (8):

(8) $[_{CP}$ Op C $[_{TP}$ who saw John]]
[+Q] [+Q]
feature checking

It causes a problematic case in that it lacks generalization. Other WH words can move to CP-SPEC from non-subject positions while WH in subject position appears in situ.

Notice however, if one assumes matching projection of CP-TP, then it is not impossible to consider that virtually subject WH may stay in situ, whose features can only move, or in fact, do not move at all. But, it turned out to be in CP-SPEC as follows:

(9) $[_{CP\setminus TP}$ who C\T see John]
[+Q] [+Q] [+Pst]
feature checking

(9') $[_{CP\setminus TP}$ who saw John]
~~[+Q] [+Q]~~

V, **see** is in C\T, then, it is the case of V2 position, manifesting a V2 phenomenon case in English. Note that English is a defective V2 language.

Consider the following Japanese examples:

(10) a.Taroo-ga nani-o katta *ka* (=no) ?
b. dare-ga sono hon-o katta *ka* (=no) ?

Japanese linguists traditionally regard **ka** as Q marker, which is a scope marker of interrogation of WH. It is not so impossible to say that **ka** is a visible counterpart of invisible feature of Q in C-Head. Morphologically, **ka/no** is an enclitic, which is not independently used.

Now, let us assume the status of Clitics as follows:

I) Clitics may only be visible at PHON in the parallel structure of morphology

Only feature(s) of Clitics may exist in narrow syntax. A node with a bundle of features can project its projection.

We will postulate here that WH movement does not involve in Wh-in-situ languages such as Japanese, Korean, Chinese among others in any sense: no feature movement at LF and no syntactic movement in the sense of Watanabe (1992).

With the introduction of the classical matching effect, the projections of empty head may be folded into the actual projection derived by the operation of Merge. Projections can be folded.

3. V2 and Matching Projections

In Germanic languages, V2 is respected as a default setting even in English, which is a defect V2 language. WH in subject position seems to be in situ. Consider:

(11) who saw John ?

In the recent MP model, this sentence is considered as WH-in-situ case unlike other interrogative sentences. On the contrary, we propose that the sentence is a matching effect structure. Thus, CP-TP can be folded. In other words, **who** is in SPEC of TP and of CP.

(12) $[_{CP\setminus TP}$ who $[_{C'\setminus T'}$ $[_{C\setminus T}$ saw [t John]]]

Verb **see** in an appropriate superficial form is a head of both T and C at PHON. Note that this structure is a V2 case. Folding of categories is more economical in the sense of effective derivation. Consider:

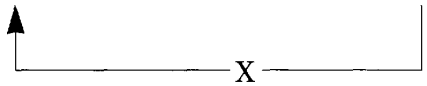
(13) a. *whom did who see t?
b. who saw whom?

In multiple WH questions, FOLD applies to fold CP and TP, thus, the structure (13b) is roughly represented as follows:

(14) $[_{CP\setminus TP}$ who $[_{C'\setminus T'}$ saw [t whom]]]

In a classical analysis in the past, ungrammatical (13a) resorts to the violation of the Superiority among others. But, it can be ruled out by virtue of the Matching projection violation. It is impossible for Acc WH to move, since the structure is already folded, thus, the unfilled places are filled already with categories. Hence, **whom** cannot find the landing site of its own.

(15) $[_{CP\setminus TP}$ who $[_{C'\setminus T'}$ did $[_{VP}$ t see whom]]][4]



Economy of derivation is a priority criterion: any operation whatever is more economical than others, it applies first, which is a default setting of universal operations. Note that in the MP model, FOLD applies before SPELL-OUT.

4. Concluding Remarks

What we have seen thus far is how the matching effect tells us about the optimal and economical consideration along the line of minimalist program. An immediate consequence of FOLD in matching projections would derive straightforwardly from accounting for multiple SPECs, Adjunctions, raising, head movement, that-trace effect, structural parallelism between sentences and noun phrases among others which we will leave here for further investigation.

Notes
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1. For the Minimalist Program that we follow here, see Chomsky (1995), (2000a), (2000b), (2001). And for further topics on linguistics and natural science, see Imai (2002).

2. The definition parts of the principles (1)-(2) are paraphrased here based on Chomsky (2000a).

3. A\B indicates a superimposed matching projection.

4. Note that since CP and TP are folded in a matching situation, no head movement of **did** takes place from T to C in (15). Thus, a structure as (13a) is never generated at the outset in the matching effect. Following the VP internal subject hypothesis, which is widely accepted, it can be said that Subject-WH originally appears in the VP. If so, Subject-WH at least moves to TP-SPEC once. I am ignoring some technical possibilities here.

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