

Economy Principle and Categorical Amalgamation

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Abstract

Recent ideas on economy and optimality in the Minimalist Program are not so new, but rather could be uncontentious in other fields of natural science such as physics and chemistry for instance. Category amalgamation or reduction is shown as an instance of those ideas.

Keywords:biolinguistics, ENFOLD, last resort principle, least effort principle, Minimalist Principle

1. Introduction

Recent ideas on economical and optimal considerations in biolinguistics now perceived as the Minimalist Program (MP) are not so new, but rather 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 which 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 MP, the derivation and representation in the Internal (intentional) language (I-language) should be optimal. In other words, conditions and/or principles on economy and optimality impose the best derivations and representations. In a particular language (grammar), L may select a set of optimal operations by the principles of economical and optimal conditions. Here, let us summarize the two fundamental principles proposed by Chomsky 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 apply to any operations and processing in biolinguistics, and could eventually be compatible with natural science.

2. Matching Projections in the Minimalist Program

In the principles-and-parameters approach, Haider (1988) investigates the Matching Effect of 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. The classical 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 operation like 'Superimpose a projection, P on an existing projection, P'.' See Haider (1988) and Groos and Riemsdijk (1983) for more on the matching effect.

Let us propose here that superimposition is now technically called ENFOLD.³ ENFOLD enfolds two categories in case the first categorial head is empty. Note that those categories may be restricted to Functional Categories (FC). We will also propose the opposite operation as UNFOLD. Naturally, UNFOLD unfolds compressed categories (stacking of categories) to visually show the 'virtual' configurational (vertical) structures in the sense of Zubizarreta and Vergnaud (1982).

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

To mention a few, we will consider multiple SPECs. It is not so impossible to regard multiple SPECs as stacking of XPs, i.e. maximal projections. Hence, SPECs in multiple SPEC projections must be equidistant in the sense of Equidistance of Chomsky (1995).

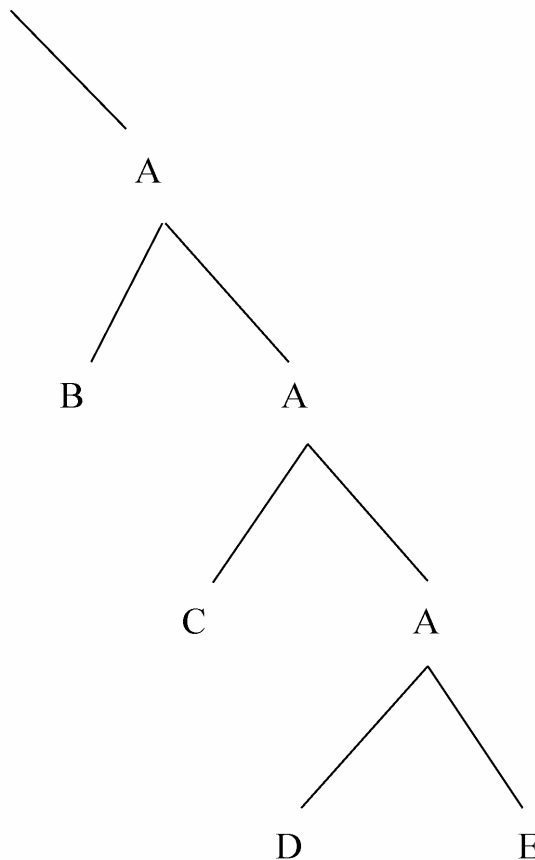
Next, let us consider Heads. A complement merges with a head H, which leads to creating a head ascendant structure. (HAS). A question arises. Does maximal projection, XP merge with HAS, creating another maximal projection? There may be two options as follows:

Option 1: A maximal projection merges with a HAS. This case is not an adjunction, but no distance among them (HASs).

Option 2: A maximal projection merges with another maximal projection. This case is an adjunction.

Let us consider the following tree: (4)

(4)



In (4), **A** denotes either a maximal projection or HAS. Suppose that **E** is a head, then, **A** is a HAS assuming a category **E**.

Suppose vP and TP. Then, in a certain environment, vP and TP can be enfolded. It

is tempting to speculate that the difference between English and French can be uniformly explained by enfoldment. Consider the following:⁴

- (5) a. $[_{TP} [_{vP} DP\text{-subj} VP]]$
 |_____|
 b. $[_{TP/vP} DP\text{-subj} [_{vP} V DP]]$

In support of the VP internal subject hypothesis, no DP subject raising to SPEC-TP is assumed. Instead, the operation, ENFOLD applies to enfold TP and vP here. The outcome is straightforward. Once the enfolded structure is created, then, the verb raises to v, but does not necessarily raise to T in French. On the other hand, the verb similarly raises to v in English, but no Tense affix hopping to the verb is necessary.

3. Subject wh-in-situ in English

Let us now consider the following:

- (6) Who saw John?

As argued in the earlier MP, WH in the subject position appears in-situ, hence, no displacement takes place. We will return to this in section 4.

- (7) $[_{CP} C_{[=Q]} [_{TP} \text{who saw John}]]$

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

- (8) $[_{CP} O_{p[=Q]} C_{[+Q]} [_{TP} \text{who saw John}]]$
 |_____| feature checking

However, it causes problems in that it lacks generalization. Other WH words can move to SPEC-CP from non-subject positions while WH in the subject position appears in situ.

Notice, however, if one assumes a matching projection of CP-TP, then it is not impossible to assume that virtually the subject WH does not copy/move at all, but does stay in situ. Practically the subject WH proves to be in SPEC-CP as follows:

- (9) a. $[_{CP/TP} \text{who}_{[+Q]} C/T_{[+Q][Past]} \text{see John}]]$
 b. $[_{CP/TP} \text{who}_{[+Q][Past]} \text{see John}]]$

V, see is raised to v-head from V and as noted in section 2, if it is the case that vP, TP, and CP are enfolded in a triple way, then, see in an appropriate form is in C/T/v, manifesting a V2 phenomenon weakly in English. Note that English is a defective V2 language. Furthermore, the analysis may extend to wh-in-situ languages. Consider the following Japanese examples:

- (10) a. Taroo-ga nani-o katta ka (= no)?
 Taro NOM what ACC bought Q
 “What did Taro buy?”
- b. Dare-ga sono hon-o katta ka (= no)?
 who NOM that book ACC bought Q
 “Who bought that book?”

Note that Japanese is an SOV language and wh-in-situ. ka is traditionally regarded as a Q marker, which is a scope marker of interrogation of WH. Note that no is its colloquial form. It is not so impossible to say that ka is a visible counterpart of the invisible feature of Q in C-head. In other words, it is pronounced at PHON. Morphologically, ka is an enclitic, which is not independently used.

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

- (11) 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. In Japanese, CP, TP, and vP are stacked by ENFOLD.

Consequently, we will postulate here that WH replacement is not involved in wh-in-situ languages such as Japanese, Korean, and Chinese among others in any sense; no feature movement at LF nor syntactic movement.⁵

With the revival of the classical matching effect as a new operation: ENFOLD, the projections of the empty head may be enfolded into the actual projection derived by the operation of Merge.

4. V2 and Matching Projections

In Germanic languages, V2 is respected as a default setting even in English. In the previous section, it is argued whether WH in the subject position was in situ or not. Consider again:

(12) Who saw John?

As noted earlier, this sentence seems superficial to be a *wh*-in-situ case. Chomsky (2005) posits that *WH* is extracted to the edge of *vP*, and then further on to the edge of *CP*, regarding *CP* and *vP* as phases. For the sake of simplicity of expository purposes, we will use *vP* instead of *v*P*, which is Chomsky's term. The edge-feature as well as the Agree-feature in *C*- head can trigger *WH* movement. *T*-head, to which the Agree-feature is inherited from *C*-head, raises *WH* to *SPEC-TP* from the edge of *vP*. Then, the edge-feature of *C*-head attracts *WH* to *SPEC-CP* from the edge of *TP*. We will however propose that sentence (12) is a matching effect structure. *TP* and *vP* are enfolded by *ENFOLD*, then, *CP* and *TP* are further enfolded. Consequently, *CP-TP-vP* can be enfolded. In other words, who is on the edge of *vP*, of *TP*, and of *CP*. The two features of *C*, i.e. the Agree- and the edge-features, directly seek the goal of *WH*, who in *SPEC-vP* in the enfolded structure as (13).

(13) [_{CP/TP/vP} who [_{C /T' /v} C/T/v [_{vP} who see John]]]

Verb *see* in an appropriate superficial form is a head of *v*, *T*, and *C*. Enfolding of categories is a more economical option in the sense of effective derivation. Consider:

- (14) a. *Whom did who see?
 b. Who saw whom?

In multiple *WH* questions, *ENFOLD* applies to fold *CP*, *TP*, and *vP*. Thus, the structure (14b) is roughly represented as follows:

(15) [_{CP/TP/vP} who [_{C /T' /v} C/T/v [_{vP} who see whom]]]

In a classical analysis in the past, ungrammatical (14a) resorts to the violation of Superiority among others. But, it can be ruled out by virtue of the Matching projection violation. It is impossible for *Acc. WH* to move/copy, since *CP* and *TP* are already enfolded, thus, if *Acc. WH* moves to *SPEC-CP/TP*, this move is inadequate, because of *Acc. WH* is incorrectly raised to *SPEC-TP* as well as *SPEC-CP*. Hence, *whom* cannot find the landing site.⁶

(16) [_{CP/TP} who [_{C /T} did [who see whom]]] X
 |_____|

The economy of derivation is a priority criterion: If any operation whatever is more economical than other ones, it applies first, which is a default setting of universal operations. It is suggested that *ENFOLD* should apply at *SPELL-OUT*.

5. Concluding Remarks

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

Notes

This paper is a modified version of Imai (2006).

- 1 For the Minimalist Program that we follow here, see Chomsky (1995), (2000a), (2000b), (2004), (2005). Chomsky (2016) states that the Basic Property of I-language would be acquired in the course of evolution of the faculty of language. It follows that Economy Principle, Least Effort Principle, and Last Resort Principle are included in the Basic Property. And for further topics on linguistics and the natural sciences, see Imai (2002).
- 2 The definition parts of the principles (1)-(2) are paraphrased here based on Chomsky (2000a).
- 3 Bohm (1980) inspired me to motivate use his terms, which are 'enfold' and 'unfold'.
- 4 A/B indicates a superimposed matching projection, now called an enfolded structure.
- 5 See Watanabe (1992) on Japanese syntactic movement of WH among others.
- 6 Note that since CP and TP can be enfolded in a matching situation, no head movement of did takes place from T to C in (16). Notice however that TP and vP cannot be enfolded because of the lexical item, that did appear in T-head. Thus, a structure such as (14a) is never generated at the outset in the matching structure. I am ignoring some technical possibilities here.

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Received: November 29, 2022

Accepted: December 12, 2022