On MaxElide*

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1. Introduction

Ellipsis phenomena in natural language have attracted much attention since the early days of generative linguistics (see, for instance, Ross 1969 and Sag 1976). Researchers have never lost interest in them to this day, as can be seen in a wide variety of studies in the literature (too numerous to mention, but see van Craenenbroeck and Merchant 2013 for an overview). One of the reasons that makes ellipsis worth investigating is the conviction that its exploration will provide insight into the nature of Universal Grammar; after all, children are supposed to have no positive evidence regarding "silence" and whatever properties ellipsis exhibits must directly reflect their innate linguistic knowledge.

From this perspective, there should be no rules specific to ellipsis. The challenge then is to prove that all the constraints on ellipsis are in fact derivable from universal principles of grammar.

This paper deals with one such constraint called MaxElide. Indeed, there have been attempts to derive it from economy principles. The main purpose of the present study is to demonstrate that they are not successful. Then I will discuss the possibility of deducing MaxElide from a general principle of movement.

The organization of the paper is as follows. Section 2 introduces MaxElide along with the core data it is designed to explain. Section 3 summarizes and refutes two previous proposals (Funakoshi 2012, based on

Spell-Out Economy, and Messick and Thoms to appear, based on Economy of Derivation) that allegedly eliminate MaxElide from the theory of grammar. Section 4 outlines an alternative account that makes use of the F-over-F Principle (Müller 2011), an updated version of Chomsky's (1973) original A-over-A Principle, which applies to movement operations. Section 5 is a conclusion.

2. MaxElide

It has been pointed out that ellipsis is subject to a constraint called MaxElide (Merchant 2001, 2008, Takahashi and Fox 2005). Merchant (2008:141) presents the following formulation:[1]

(1) *MaxElide*
Let XP be an elided constituent containing an A'-trace. Let YP be a possible target for deletion. YP must not properly contain XP ($XP \not\subset YP$)

MaxElide can correctly capture the impossibility of VP ellipsis in such typical examples as (2a) (whenever elided constituents are explicitly indicated, they are shaded).

(2) a. *Mary was kissing someone, but I don't know who she was [$_{VP}$ kissing *t*].
b. Mary was kissing someone, but I don't know who [$_{TP}$ she was [$_{VP}$ kissing *t*]].

The elided constituents in (2) (VP in (2a) and TP in (2b)) contain an A'-trace left by the movement of *who* and hence are subject to (1). In this particular structure, both VP and TP are possible targets for deletion (English allows both VP ellipsis and sluicing). MaxElide rules out (2a), because there is a deletable constituent, namely the TP complement of the [+WH] C, that properly contains the missing VP. In other words, MaxElide demands that ellipsis apply to the largest constituent available containing an A'-trace.

It should be noted that when there is no operator-variable relation of

the sort present in (2), MaxElide simply does not apply. Consider the following pair of examples without any A'-dependency (adapted from Agüero-Bautista 2007:371).

(3) a. Mary said you would arrive, and Sue also said you would.
b. Mary said you would arrive, and Sue also did.

In (3), there are in fact two deletable constituents, namely, the matrix and embedded VPs. Although the matrix one properly contains the embedded one, this does not matter for MaxElide because they do not contain any A'-trace. This is why (3b) does not block (3a).[2]

There is another situation where MaxElide effects are suppressed. It is the situation where ellipsis of the biggest of the potentially deletable constituents is in fact prohibited for an independent reason. Observe the following examples, where focused elements are in capital letters (Schuyler 2001:8).

(4) a. I think YOU should ride the TALLEST camel, but I don't know which one PHIL should.
b. I think you SHOULD adopt one of these puppies, but I can't predict which one you actually WILL.

As in (2), there is an A'-trace in the elided domain in (4), left by the movement of *which one*. This means that MaxElide does apply to (4), but because of (5), VP ellipsis is not blocked in (4).

(5) Constituents containing a focused element cannot be possible targets for deletion.

In (4a) the TP complement of the embedded [+WH] C cannot undergo sluicing because it contains the focused subject *PHIL*, thereby allowing VP to be deleted instead. The same logic extends to (4b), where the auxiliary verb *WILL* is focused, preventing TP deletion but allowing VP deletion which leaves the auxiliary verb intact. Put differently, the embedded VP is actually the largest deletable constituent in (4), and hence MaxElide is satisfied there.[3]

3. Putative Deduction of MaxElide

MaxElide in (1), as it stands, is nothing more than an observation, and it would be desirable if one can offer a principled account of it. Two possible approaches come to mind, and as a matter of fact, both of them have been explored, their shared basic intuition being that some notion of economy is at work that prefers (2b) to (2a).

One plausible approach, advocated by Funakoshi (2012), is to try to reduce MaxElide to the operation Spell-Out itself, assuming that ellipsis is closely related to Spell-Out (see Holmberg 2001 among others).

The other approach, advanced by Messick and Thoms (to appear), is to take into account derivational steps of movement (the *wh*-movement in (2), for instance).

In the remainder of this section, I will discuss the two attempts to eliminate MaxElide and show that they are not successful.

3.1. Spell-Out Economy

Based on the theory of ellipsis where Spell-Out domains correspond to ellipsis sites, Funakoshi (2012) argues that MaxElide can be reduced to (6):

(6) *Spell-Out Economy*
Spell-Out as much as you can when the derivation reaches a phase.

(6) requires that in the schematic structure in (7), where Ph stands for a phase head, XP, instead of YP, be spelled out if that operation is legitimate.

(7) $[_{PhP}$ Ph $[_{XP}$ ZP X $[_{YP}$ WP]]]

Funakoshi suggests that the postulation of (6) is justifiable from a computational perspective, maintaining that it contributes to reduction of memory load.

Funakoshi assumes that only syntactic objects that contain no uninterpretable features can be spelled-out (due to the Principle of Full Interpretation (Chomsky 1986)). He also makes the auxiliary assumption that categorial selection involves feature checking, whereby an

uninterpretable feature of a selected head (say, V selected by *v*) is erased by local merger). He claims that his system captures what categories are targeted by Spell-Out in various syntactic environments (see Funakoshi 2012 for details).

Let us see how Funakoshi explains the data in (2), repeated below.

(2) a. *Mary was kissing someone, but I don't know who she was [$_{VP}$ kissing *t*].
b. Mary was kissing someone, but I don't know who [$_{TP}$ she was [$_{VP}$ kissing *t*]].

He assumes that the assignment of the EPP-feature (see for instance Chomsky 2001) to *v* is optional. If *v* does not have the EPP-feature, the following derivational steps will ensue (erased uninterpretable features are indicated by strikethrough).

(8) a. [$_{vP}$ she$_{[uCase]}$ $v_{[uT]}$ [$_{VP}$ kissing$_{[\sout{uv}]}$ who$_{[\sout{uCase}, uQ]}$]]
b. [$_{CP}$ who$_{[\sout{uCase}, \sout{uQ}]}$ C$_{[uV, \sout{EPP}]}$ [$_{TP}$ she$_{[\sout{uCase}]}$ was$_{[\sout{uC}]}$ [$_{vP}$ t_{she} $v_{[\sout{uT}]}$ [$_{VP}$ kissing$_{[\sout{uv}]}$ t_{who}]]]]
c. [$_{CP}$ who$_{[\sout{uCase}, \sout{uQ}]}$ C$_{[uV, \sout{EPP}]}$ [$_{TP}$ she was kissing]]

In (8a) the lack of the EPP-feature on *v* results in non-spell-out of VP. This is because VP contains an uninterpretable feature (the unchecked [uQ] feature on *who*) at this stage. At the next phase level, illustrated in (8b), TP is eligible for spell-out since it contains no uninterpretable feature. CP, however, is not, because C has an uninterpretable feature, namely, [uV].

If, on the other hand, *v* has the EPP-feature, not only TP but also VP can potentially be spelled out. Consider the following steps:

(9) a. [$_{vP}$ she$_{[uCase]}$ $v_{[uT, EPP]}$ [$_{VP}$ kissing$_{[\sout{uv}]}$ who$_{[\sout{uCase}, uQ]}$]]
b. [$_{vP}$ who$_{[\sout{uCase}, uQ]}$ [$_{vP}$ she$_{[uCase]}$ $v_{[uT, \sout{EPP}]}$ [$_{VP}$ kissing$_{[\sout{uv}]}$ t_{who}]]]
c. [$_{vP}$ who$_{[\sout{uCase}, uQ]}$ [$_{vP}$ she$_{[uCase]}$ $v_{[uT, \sout{EPP}]}$ [$_{VP}$ kissing]]]
d. [$_{CP}$ who$_{[\sout{uCase}, \sout{uQ}]}$ C$_{[uV, \sout{EPP}]}$ [$_{TP}$ she$_{[\sout{uCase}]}$ was$_{[\sout{uC}]}$ [$_{vP}$ t_{who} [$_{vP}$ t_{she} $v_{[\sout{uT, EPP}]}$ [$_{VP}$ kissing]]]]]
e. [$_{CP}$ who$_{[\sout{uCase}, \sout{uQ}]}$ C$_{[uV, \sout{EPP}]}$ [$_{TP}$ she was, [$_{VP}$ kissing]]]]]]

The crucial difference between (8) and (9) is that in the latter, the EPP-feature on *v* triggers overt movement of the *wh*-phase, as in (9b). Thanks to this movement, VP now contains no uninterpretable feature and thus is targeted by Spell-Out, which results in VP deletion, as in (9c). When the derivation reaches the CP level, as in (9d), the *wh*-phrase moves further into Spec of CP. This time Spell-Out targets TP, just as in (8c), making TP ellipsis or sluicing possible.

In order to block the unwanted derivation in (9), Funakoshi crucially follows Ura (1994) in assuming that English does not tolerate multiple specifiers. If this is true, then *v* in the regular transitive clause cannot bear the EPP-feature, ruling out (9).

There is, however, convincing evidence for *wh*-movement passing through Spec of *v*P even under sluicing. This of course means that Funakoshi's analysis of MaxElide based on Spell-Out Economy is untenable.

Using pair-list readings (see Engdahl 1980 for an initial observation) as a diagnostic for cyclicity, Agüero-Bautista (2007) demonstrates that the remnant *wh*-phrase in sluicing undergoes successive cyclic movement, contra Fox and Lasnik (2003), who argue that it moves in one fell swoop. Consider the ambiguity of the question in (10) (Agüero-Bautista 2007:415):

(10) Which book did each professor say that Pete read? (SA, PL)
(11) a. (Each professor said that Pete read) *Aspects*.
b. Prof. Smith said that Pete read *Aspects*; Prof. Jones said that Pete read *Syntactic Structures*; Prof. Esteriade said that Pete read *The Sound Pattern of English*; . . .

In reply to (10), one can give the single answer (SA) in (11a) or the pair-list answer (PL) in (11b).[4] The pair-list answer is possible because the *wh*-phrase in (10), the thematic object of *read*, can reconstruct into a position c-commanded by the universal quantifier *each professor*. If the launching site of *wh*-movement is structurally higher than the position of the universal quantifier, the pair-list interpretation disappears, as shown in (12) (Agüero-Bautista 2007:416).

(12) Which professor said that Pete read each book? (SA, *PL)

Note that in (12) the *wh*-phrase is the subject of the matrix clause, c-commanding everything in the rest of the sentence. The only way to answer (12) is by identifying the name of the single professor who said that Pete read each book, say, "Prof. Baker." It is impossible to give a pair-list answer like (11b) to (12).[5]

With this correlation between the pair-list interpretation and the possibility of *wh*-reconstruction in mind, let us see whether reconstruction of a *wh*-phrase into an intermediate position is available. Consider the following example involving extraction out of a weak island (adapted from Agüero-Bautista 2007:422):[6]

(13) Which (particular) problem do you wonder [whether each student should solve]? (SA, *PL)

Notice that the quantifier *each student* appears inside the weak island headed by *whether*. Although the launching site of the *wh*-phrase is the object position of *solve*, c-commanded by the quantifier, (13) lacks the pair-list interpretation. Thus, (13) invites single answers like (14a) but not pair-list answers like (14b).

(14) a. (I wonder whether each student should solve) the syntax problem.
b. I wonder whether Jay should solve the syntax problem; Bridget, the semantics problem; Vivian, the phonology one; . . .

The relevant observation is that *wh*-phrases cannot reconstruct into weak islands (Longobardi 1991). Therefore, there is no way the *wh*-phrase can be put back to a position where it is c-commanded by the quantifier in (13). This is why the pair-list reading is missing in (13).

What is noteworthy is the fact that pair-list readings become available when the universal quantifier is placed outside the weak island, as shown in (15) (Agüero-Bautista 2007:424).

(15) Which (particular) problem does each professor wonder [whether you should solve]? (SA, PL)

In contrast to (13), (15) permits not only single answers like (16a) but also pair-list answers like (16b).

(16) a. Each professor wonders whether I should solve the syntax problem.
b. Noam wonders whether I should solve the syntax problem; Morris wonders whether I should solve the phonology problem; . . .

Why is this the case? Let us consider the following representation for (15) in which all copies of the *wh*-phrase are indicated:

(17) [$_{CP}$ which problem does [$_{TP}$ each professor [$_{vP}$ which problem [$_{VP}$ wonder [$_{CP}$ whether [$_{TP}$ you should [$_{vP}$ which problem [$_{VP}$ solve which problem]]]]]]]]

We know from (13) that the *wh*-phrase cannot reconstruct into the embedded interrogative clause. However, it can appear in the matrix Spec of *v*P, underlined in (17), at LF. In this position, it is indeed c-commanded by the universal quantifier, which results in the pair-list reading. In short, the availability of the pair-list reading in (15) argues for the existence of the intermediate copy in the matrix Spec of *v*P and counts as evidence for successive cyclic *wh*-movement and multiple Specs of *v*P in English. This goes against Funakoshi's analysis of MaxElide which relies on the assumption that English never permits multiple specifiers.

A skeptic might propose that things are different in cases where ellipsis is involved. In particular, one might raise the possibility that for some reason, multiple Specs of *v*P are not allowed in ellipsis contexts like (9).

Bearing this in mind, let us now turn to sluicing. If it involves regular successive cyclic *wh*-movement, followed by clausal ellipsis (see Merchant 2001 among numerous others), we expect that the interpretative contrast of the kind that holds between (13) and (15) should extend to the elliptical process. Agüero-Bautista (2007:437) shows that this prediction is borne out. Compare (18b) and (20b) in response to (18a) and (20a), respectively.

(18) a. A: Bill asked someone whether each candidate should bribe a senator.
b. B: Really? Which senator [Bill asked someone whether each candidate should bribe]? (SA, *PL)
(19) a. A: John McCain.
b. A: Bill asked someone whether Kerry should bribe John McCain, whether Bush should bribe Edward Kennedy, . . .
(20) a. A: Each candidate asked someone whether Bill should bribe a senator.
b. B: Really? Which senator [each candidate asked someone whether Bill should bribe]? (SA, PL)
(21) a. A: Edward Kennedy.
b. A: Bush asked someone whether Bill should bribe Kennedy, Kerry asked someone else whether Bill should bribe McCain, . . .

(18b), with the universal quantifier embedded within the weak island, corresponds to (13) and (20b), with the universal quantifier appearing outside of the island, corresponds to (15) in relevant respects. As expected, the former does not permit the pair-list answer in (19b) (the single answer in (19a) is acceptable), whereas the latter is ambiguous, allowing both the single answer in (21a) and the pair-list answer in (21b). The sluiced sentence in (20b) has the following representation similar to the one in (17):

(22) [$_{CP}$ which senator [$_{TP}$ each candidate [$_{vP}$ which senator [$_{VP}$ asked someone [$_{CP}$ whether [$_{TP}$ Bill should [$_{vP}$ which senator [$_{VP}$ bribe which senator]]]]]]]]

The availability of the pair-list interpretation indicates that there exists an intermediate copy in the matrix Spec of *v*P (which is underlined in (22)). The copy is c-commanded by the universally quantified matrix subject, which is why the pair-list reading obtains. Data like (20b) show that *wh*-movement in sluicing proceeds in a successive cyclic fashion. This implies in turn that multiple specifiers are allowed in English even under ellipsis, at least as far as *v*P is concerned, contrary to Funakoshi's (2012) crucial assumption.

In brief, Funakoshi's proposal is problematic. In particular, there is solid evidence for *wh*-movement in English passing through Spec of *v*P, which undermines his analysis of MaxElide. In addition, to account for the

focus effects in (4), Funakoshi makes the additional assumption that an element with focus has an uninterpretable feature to be checked by a functional head above CP. Under his system, this leads to spell-out/ellipsis of *v*P (rather than VP) in cases like (4), banning spell-out/ellipsis of TP at the same time (see Funakoshi 2012 for details). But there seems to be no known evidence that ellipsis targets different categories in (3) and (4) (VP in (3) and *v*P in (4) under Funakoshi's analysis). Theoretically, it is far from clear whether (6) contributes to computational efficiency: as the number of spell-outs is reduced, the portion of syntactic structure a speaker must retain for each spell-out gets larger.

3.2. Derivational Economy

Messick and Thoms (to appear) (henceforth, M&T) attempt to eliminate MaxElide from the theory of grammar. They argue that observable MaxElide effects can be captured by derivational economy.

As mentioned above in relation to (4), constituents containing a focused element cannot be deleted for reasons having to do with recoverability. Thus focusing on an appropriate element can "rescue" otherwise impossible VP ellipsis from being blocked by ellipsis of a larger constituent (TP in (2), for example).

M&T refer to cases like (2a) as *salvageable*, because focus can potentially "salvage" them (see (4)). They call the other cases where focus has no effect *unsalvageable*.

Let us consider (23a,b), which represent unsalvageable cases (M&T to appear, see also Hartman 2011).

(23) a. Mary is eating cake. What is JOHN *(eating)?
b. If you aren't drinking water, then what ARE you *(drinking)?

Here focusing (on the subject *JOHN* in (23a) and the copula *ARE* in (23b)) does not help in sharp contrast to (4). Notice the ellipsis clause in (23) is a matrix question with T-to-C movement, whereas its counterpart in (4) is an embedded question without T-to-C movement. It is natural then to attribute the impossibility of VP ellipsis in (23) to the presence of this extra head

movement, which is exactly what M&T do.[7] Adopting Griffiths and Lipták's (2014) parallelism constraint in (24), which is a "hard," inviolable constraint, they claim that head movement, just like A'-movement, leaves a variable.[8]

(24) *Scopal Parallelism in Ellipsis*
Variables in the antecedent and elided clause must be bound from parallel positions.

The relevant portions of LF representations for (23a) and (4a) are given in (25) and (26), respectively (AC stands for antecedent clause, EC for ellipsis clause).

(25) AC: [$_{CP}$ cake [$_{TP}$ Mary is [$_{vP}$ cake [$_{VP}$ eating cake]]]]
EC: *[$_{CP}$ what is [$_{TP}$ JOHN is [$_{vP}$ what [$_{VP}$ eating what]]]]

(26) AC: [$_{CP}$ the TALLEST camel [$_{TP}$ YOU should [$_{vP}$ the TALLEST camel [$_{VP}$ ride the TALLEST camel]]]]
EC: [$_{CP}$ which one [$_{TP}$ PHIL should [$_{vP}$ which one [$_{VP}$ ride which one]]]]

Above, only A'-movement and head movement are indicated, because they are what matters for the purpose of parallelism. Assuming that each step of the movement introduces a new operator-variable relation (see Hartman 2011), we must check all the binding relations created by movement of a single element. M&T assume indefinites and contrastive foci are able to undergo (successive-cyclic) QR (Quantifier Raising) (Chomsky 1976, May 1985). Given this assumption, *cake* in (25) and *the TALLEST camel* in (26) can move in LF in the parallel way that the *wh*-phrases move in syntax, satisfying (24). However, as already mentioned, the AC and the EC in (25) are not parallel with respect to head movement in violation of (24). This explains why data like (23) are ungrammatical.

This analysis correctly predicts that examples like (23) become grammatical if the AC involves T-to-C movement, as shown in (27) (M&T to appear), whose LF structure is given in (28).

(27) Who will Bill kiss, and who will JOHN?

(28) AC: [$_{CP}$ who will [$_{TP}$ Bill will [$_{vP}$ who [$_{VP}$ kiss who]]]]
EC: [$_{CP}$ who will [$_{TP}$ JOHN will [$_{vP}$ who [$_{VP}$ kiss who]]]]

As one can see easily, the two clauses are isomorphic in terms of head-binding as well as A'-binding, satisfying (24).

M&T examine another class of unsalvageable cases, exemplified in (29) (see Lasnik and Park 2013).

(29) a. *John thinks you should kiss SARAH, but I don't know who BILL does.
b. *Abby said they heard about a Balkan language, but I don't know what kind of language BEN did.

(29a,b) represent cases where long-distance *wh*-movement has taken place out of VP ellipsis. Despite the presence of focus, (29) is ill-formed. Consider the following LF representation for (29a).

(30) AC: [$_{TP}$ John thinks [$_{CP}$ SARAH [$_{TP}$ you should [$_{vP}$ SARAH [$_{VP}$ kiss SARAH]]]]]
EC: *[$_{CP}$ who [$_{TP}$ BILL does [$_{vP}$ who [$_{VP}$ think [$_{CP}$ who [$_{TP}$ you should [$_{vP}$ who [$_{VP}$ kiss who]]]]]]]]

What is crucial here is the well-known fact that QR cannot cross finite clausal boundaries (see May 1985, Hornstein 1995 among others). Thus, the focus *SARAH* in the AC can raise no further than the embedded Spec of CP. On the other hand, the *wh*-phrase *who* in the ellipsis clause undergoes successive-cyclic movement out of the embedded clause. As a result, the two kinds of A'-binding relations in (30) are not parallel, rendering the ellipsis illegitimate.[9]

As in the case of (23), (29) is expected to become acceptable if the AC is made parallel to the EC. This expectation is fulfilled. Compare (29a) with (31).

(31) I know who JOHN thinks you should kiss, but I don't know who BILL does.

(32) AC: [$_{CP}$ who [$_{TP}$ JOHN [$_{vP}$ who [$_{VP}$ thinks [$_{CP}$ who [$_{TP}$ you should [$_{vP}$ who [$_{VP}$ kiss who]]]]]]]]

EC: [$_{CP}$ who [$_{TP}$ BILL does [$_{vP}$ who [$_{VP}$ think [$_{CP}$ who [$_{TP}$ you should [$_{vP}$ who [$_{VP}$ kiss who]]]]]]]]

(32) provides the relevant portions of LF structures for (31). It is clear that the A'-binding relations in the AC and those in the EC, both created by overt *wh*-movement, are completely parallel in compliance with (24).

Keeping this discussion in mind, let us consider how M&T deal with archetypical, salvageable cases of MaxElide illustrated in (2), repeated below:

(2) a. *Mary was kissing someone, but I don't know who she was [$_{VP}$ kissing *t*].
b. Mary was kissing someone, but I don't know who [$_{TP}$ she was [$_{VP}$ kissing *t*]].

They claim that we do not have to resort to MaxElide to explain the impossibility of VP ellipsis in (2). Following Fox and Lasnik (2003), they make the crucial assumption that *wh*-movement in sluicing can proceed in one fell swoop. Under this assumption, the elided embedded clauses in (2a,b) have the derivations in (33a,b), respectively.

(33) a. *[$_{CP}$ who [$_{TP}$ she was [$_{vP}$ who [$_{VP}$ kissing who]]]]
b. [$_{CP}$ who [$_{TP}$ she was [$_{vP}$ [$_{VP}$ kissing who]]]]

Unlike Funakoshi (2012), M&T do posit *wh*-movement through Spec of *v*P, as shown in (33a). The intermediate *wh*-movement is absent under sluicing in (33b) in line with Fox and Lasnik's (2003) proposal. Given that these derivations belong to the same reference set and compete with each other for economy purposes, (33b), according to M&T, blocks (33a) because of (34), which is Zwart's (1996) formulation of the relevant condition presented in Chomsky 1993.

(34) *Economy of Derivation*
Use as few steps as possible in deriving an output representation.

In brief, the ill-formedness of (2a) is due to (34) rather than (1) under M&T's account.[10]

M&T can deal with (3) and (4), because as far as such data are concerned, (1) and its variant they employ (see note 1) yield the same results (see M&T's work for details).[11]

This account, however, has both theoretical and empirical problems.

First, the theoretical status of (34) itself is unclear within the latest framework (see Chomsky 2008, 2013), where strictly local applications of syntactic operations are adopted and the notion of derivational economy is to be dispensed with.

Second, the postulation of one-fell-swoop *wh*-movement poses a similar problem. The alleged movement under sluicing requires global computation. Under Chomsky's (2008) system, when *v*P is constructed in (33b), the *wh*-phrase *who* must move to its edge in order to remain syntactically active. If it does not, it will be trapped inside VP and never reach the Spec of CP, causing the entire derivation to crash. As we saw above, Agüero-Bautista (2007) demonstrates that *wh*-movement under sluicing *can* be successive cyclic. The null hypothesis under the strictly local view of derivation is that it *must* always be.

Third, M&T's analysis faces serious empirical problems. For instance, it cannot explain data such as the following (Schuyler 2001):

(35) a. John knows which professor we invited, but he is not allowed to reveal which one (*we did).
b. PETE knows which puppy you should adopt, but JAN doesn't know which one (*you should).

The key difference between (35) and (2) has to do with the fact that the AC in the former involves syntactic *wh*-movement, whereas that in the latter does not. The relevant portion of LF representation for the AC in (35a) is given in (36).

(36) [$_{CP}$ which professor [$_{TP}$ we [$_{vP}$ which professor [$_{VP}$ invited which professor]]]]

Being overt, the *wh*-movement in (36) without any ellipsis *must* proceed via Spec of *v*P. The parallelism constraint in (24) demands that there be parallel A'-binding relations in the EC, leading to the following LF representations:

(37) a. *[$_{CP}$ which one [$_{TP}$ we did [$_{vP}$ which one [$_{VP}$ invite which one]]]]
b. [$_{CP}$ which one [$_{TP}$ we [$_{vP}$ which one [$_{VP}$ invited which one]]]]

Importantly, (24) actually forces the *wh*-movement under sluicing in (37b) to be successive cyclic, just like its counterpart in (37a). (37a,b) are equally costly in terms of the economy condition in (34). Data like (35) with MaxElide effects in parallel ellipsis contexts are problematic for M&T's economy account.

A similar kind of argument against M&T's analysis can be made based on ellipsis in *tough* infinitives, which have been analyzed in various ways as involving A'-movement (see Chomsky 1977, Hornstein 2001, and Hicks 2009 among numerous others). Since MaxElide is sensitive to A'-movement, they are expected to exhibit relevant effects under ellipsis.

Consider (38) (Messick 2013:174).

(38) On most days, it is easy to please John, but today, it is not easy to [$_{VP}$ please John].

(38), involving no A'-movement with the subject position occupied by expletive *it*, shows that *to* in the complement of *tough* predicates can in principle license VP ellipsis. With this in mind, observe the contrast in (39), analogous to that in (35) (Messick 2013:174-175).

(39) a. *On most days John is easy to please, but today, he is not easy to [$_{VP}$ please].
b. On most days, John is easy to please, but today, he is not [$_{VP}$ easy to please].

Unlike (38), (39) does involve A'-movement with the subject position occupied by the thematic object of *please*. As shown in (39), ellipsis in this case must target the larger VP in accordance with MaxElide. Under Chomsky's (1977) analysis, the AC in (39) has the following LF:[12]

(40) $[_{TP}$ John is $[_{vP}$ $[_{VP}$ easy $[_{CP}$ OP $[_{TP}$ to $[_{vP}$ $\mathbb{OP}$ $[_{VP}$ please $\mathbb{OP}]]]]]]]$

In (40) the null operator merged directly with *please* undergoes successive-cyclic movement. The ECs in (39) share exactly the same successive-cyclic movement, as required by the parallelism constraint. The only difference between (39a) and (39b) is that the lower VP gets deleted in the former, whereas the higher one does in (39b). Their LF structures are given below:

(41) a. *$[_{TP}$ he is not $[_{vP}$ $[_{VP}$ easy $[_{CP}$ OP $[_{TP}$ to $[_{vP}$ $\mathbb{OP}$ $[_{VP}$ please $\mathbb{OP}]]]]]]]$
b. $[_{TP}$ he is not $[_{vP}$ $[_{VP}$ easy $[_{CP}$ OP $[_{TP}$ to $[_{vP}$ $\mathbb{OP}$ $[_{VP}$ please $\mathbb{OP}]]]]]]]$

(41a,b) are indistinguishable as far as the movement steps are concerned. Hence, the derivational economy condition cannot choose one over the other. Clearly, M&T's analysis fails again.

It is worth pointing out that M&T's analysis cannot explain some of the examples that prompted Merchant (2001, 2008) to postulate MaxElide in the first place. Relevant examples are given in (42) (Merchant 2008:142).

(42) a. ??Ben knows who she invited, but Charlie doesn't know who she did $[_{VP}$ invite].
b. ??Ben knows who she invited, but Charlie doesn't know who $[_{TP}$ she $[_{VP}$ invited]].
c. Ben knows who she invited, but Charlie doesn't $[_{VP}$ know $[_{CP}$ who $[_{TP}$ she $[_{VP}$ invited]]]].

As in (35) and (39), the AC involves syntactic A'-movement in (42). This implies that due to the parallelism constraint, the ECs in (42) share exactly the same successive-cyclic movement steps. Then, there is no way for M&T

to pick the most economical derivation in (42), leaving the degraded status of (42a,b) unexplained.

In a nutshell, M&T's account cannot handle MaxElide effects observed in cases where the AC contains syntactic A'-extraction. MaxElide in (1), on the other hand, can capture such cases.[13]

Before closing this subsection, let us discuss another class of salvageable cases that M&T try to account for in terms of economy. Observe the contrast between (43) and (44) where the adverbial *wh*-phrase *when* undergoes movement (Hartman 2011):

(43) You say you'll pay me back, but you haven't told me when (you will).
(44) You know Anna is going to resign. The only question is: when (*will she)?

In (43) the EC contains an embedded question, whereas in (44) it contains a matrix question. In the former, both VP ellipsis and TP ellipsis are acceptable, but in the latter only TP ellipsis is. Assuming that *when* is merged in an TP-adjoined position, the structure of the embedded question in (43) looks like the following:

(45) $[_{CP}$ when $[_{TP}$ when $[_{TP}$ you will $[_{vP}$ $[_{VP}$ pay me back]]]]]

Recall that MaxElide is a constraint that applies specifically to constituents containing an A'-trace. Since neither the VP nor the lower TP in (45) contains an A'-trace, MaxElide applies vacuously, and ellipsis can target both of the constituents, as in (43). Now, consider the following representations for the matrix question in (44).

(46) a. *$[_{CP}$ when $[_{C'}$ will $[_{TP}$ when $[_{TP}$ she will $[_{vP}$ $[_{VP}$ resign]]]]]]
b. $[_{CP}$ when $[_{C'}$ C $[_{TP}$ when $[_{TP}$ she will $[_{vP}$ $[_{VP}$ resign]]]]]]

(46a,b) illustrate the illegitimate VP ellipsis and the legitimate TP ellipsis, respectively.[14] Just as in (45), MaxElide prohibits neither VP ellipsis nor TP ellipsis. The crucial difference between (46a) and (46b) lies in the presence

of T-to-C movement in the former and its absence in the latter. Lasnik (1999b) notes that sluicing renders T-to-C movement unnecessary in a matrix clause. Given that movement is costly, (46a) is less economical than and thus blocked by (46b). If a focused element makes sluicing impossible, then the VP ellipsis option should be allowed, a prediction borne out by such examples as (47).

(47) If Anna isn't going to resign today, then when WILL she?

Above, the auxiliary verb *WILL* is focused and thus the TP containing it cannot be deleted, as stated in (5). When it survives ellipsis, it undergoes movement to C, leading to the surface string in (47).

Although M&T's economy account of (2) must be rejected, their account of (44) seems to be basically on the right track.

4. A Possible Alternative

The above discussion has revealed that the previous attempts to derive MaxElide from a general economy condition (in combination with some additional assumptions) are unsuccessful. So MaxElide, repeated below, remains as a valid generalization to be accounted for.

(1) *MaxElide*
Let XP be an elided constituent containing an A'-trace. Let YP be a possible target for deletion. YP must not properly contain XP (XP $\not\subset$ YP)

How can we explain MaxElide in a principled way?

I must admit that I am not ready to answer this intriguing question, but I would like to speculate briefly on a possible avenue for future research.

Let me point out that MaxElide is reminiscent of the following rather famous locality principle proposed originally by Chomsky (1973:235):

(48) *A-over-A Principle*
If a transformation applies to a structure of the form $[_{\alpha} \ldots [_{A} \ldots]_{A} \ldots]_{\alpha}$, where α is a cyclic node, then it must be so interpreted as to apply to the maximal phrase of the type A.

Many researchers have shown that (48) is problematic in a number of respects. For instance, Bresnan (1976) proposed to "relativize" (48) in such a way that it applies to transformations cross-categorially (see Bresnan 1976 for justification and technical details). A modern, feature-based version of (48) is given in (49), where [•F•] is a feature that triggers movement (Müller 2011:42) :

(49) *F-over-F Principle*
In a structure $\alpha_{[\bullet F \bullet]} \ldots [\beta_{[F]} \ldots [\gamma_{[F]} \ldots] \ldots] \ldots$, movement to [•F•] can only affect the category bearing the [F] feature that is closer to [•F•].

(49) is a minimality principle similar in spirit to Chomsky's (1995) Attract Closest Principle. In the configuration in (49), only $[\beta_{[F]}]$ can be targeted by movement, because the category β, which properly contains γ, is closer to α.

One can apply (49) to ellipsis, provided that it is in fact a species of movement. Interestingly enough, several authors have argued for a movement analysis of ellipsis. For example, noting similarities between VP ellipsis and VP topicalization in English, Johnson (2001) claims that the former involves the latter. Building on Johnson's work, Authier (2011) contends that TP ellipsis in French modal constructions is derived by TP topicalization, followed by phonological deletion.

Suppose then that ellipsis of relevant kinds involves movement, topicalization in particular. Data like (2) exhibiting typical MaxElide effects will be assigned the following structure:

(50) $\ldots [_{\text{TopP}[\bullet \text{top} \bullet]} \ldots [_{\text{TP}[\text{top}]} \ldots [_{\text{VP}[\text{top}]} \ldots] \ldots] \ldots] \ldots$

Here only TP, which is closer to the [•top•] feature than VP, can be topicalized and elided, and this is exactly what we find in (2). Examples such as (35), (39), and (42) can also be handled in a similar way.

Let us turn to "salvaged" cases like (4), whose structure is given below.

(51) ... $[_{TopP[\bullet top\bullet]}$ ... $[_{TP}$ ... FOCUS ... $[_{VP[top]}$...] ...] ...] ...

All one needs to deal with (4) is the assumption, which replaces (5), that TP cannot be endowed with a [top] feature if it contains a focused material. This can probably be achieved in a local manner: only subject in Spec of TP or T can make TP ellipsis unavailable in relevant cases. Since VP in (51) does not contain focus, it can undergo topicalization/ellipsis, which is why (4a,b) are grammatical.

Thus, (49) seems to take care of the second half of MaxElide, namely, the restriction on proper containment. What about the first half? Why does MaxElide apply only to constituents containing an A'-trace?

Consider (3), recapitulated below:

(3) a. Mary said you would arrive, and Sue also said you would.
b. Mary said you would arrive, and Sue also did.

The question is: why is (3a) allowed? Notice that the elided VP in (3a) is assumed to contain an A-trace of the subject, because *arrive* is an unaccusative verb. But some authors including Lasnik (1999a) have argued that A-movement simply does not leave traces. If this is true, the VP in question does not contain any trace. This means that the VP does not have to have fully articulated structure and can be an empty pronominal (Wasow 1972, Lobeck 1995) requiring no topicalization. If the ellipsis in (3a) does not involve movement, it is free from the F-over-F Principle and hence is not blocked by its counterpart in (3b).

The irrelevance of A-movement to MaxElide can clearly be seen in examples like (52) with the raising verb *seem* (Stephen Ryan, personal communication).

(52) a. John seems to like math, but Mary doesn't seem to.
b. John seems to like math, but Mary doesn't.

The same account of (3) extends to (52) without any modification. In particular, (52a) can utilize the empty pronominal strategy, to which the F-over-F Principle is irrelevant.

In (2), (4), (35), (39), and (42), where expected MaxElide effects are observed, the lowest VP in the EC does contain a trace left by A'-movement. In order to accommodate the trace, the EC must have full syntactic structure. In other words, all instances of ellipsis in these examples obligatorily involve movement and hence are subject to the F-over-F Principle.

The proposed analysis capitalizing on the dual nature of ellipsis (as well as MaxElide in (1)) can explain data like (53) and (54) (Stephen Ryan, personal communication).

(53) John asked someone if Mary passed the exam, but
  a. I don't know who he asked if she did.
  b. *I don't know who he did.
  c. I don't know who.
(54) I know who JOHN asked if Mary passed the exam, but
  a. I don't know who GEORGE asked if she did.
  b. I don't know who GEORGE did.

The VP ellipsis in (53a) is legitimate because the elided constituent without any A'-trace can be a phonologically empty pronominal.[15] The ellipsis sites in (53b,c), containing the A'-trace of *who,* must result from movement. Thus, (53b) and (53c) are subject to the F-over-F Principle, which rules out the former.

As expected and shown in (54b), (53b) can be salvaged by focusing the subject immediately following the *wh*-phrase ((54b) has the configuration in (51)). The grammaticality of (54a), just as that of (53a), comes as no surprise.[16]

If the line of thinking pursued here is on the right track, MaxElide does not have to refer to the presence of an A'-trace in an elided constituent, a welcome result.

In short, there is a possibility that MaxElide can be deduced from the F-over-F Principle. The analysis I sketched out above, however, has a number of obstacles it must overcome. The most obvious has to do with the

observation that in English, VP ellipsis seems to behave differently from VP topicalization in certain areas (see Aelbrecht and Haegeman 2012) and TP topicalization seems impossible. The analysis must explain why this is so, taking advantage of the difference in phonological overtness or the option of using the empty pronominal strategy in ellipsis (Lobeck 1995).

5. Conclusion

This paper critically examined the previous attempts to deduce MaxElide (Funakoshi 2012, based on Spell-Out Economy, and Messick and Thoms to appear, based on Derivational Economy) and established that they failed. As a possible alternative, I outlined a movement-based analysis, whose essential ingredients are: (a) ellipsis comes in two types, the movement type (Johnson 2001) in which constituents targeted by ellipsis undergo syntactic movement, and the empty pronominal type (Wasow 1972, Lobeck 1995) in which phonologically null VP generated at the ellipsis site never undergoes movement, (b) the former kind is subject to the F-over-F Principle (Müller 2011), and (c) only A'-movement leaves traces (Lasnik 1999a). I must leave a close scrutiny of the analysis and its associated problems for future work.

Notes

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1. Technically speaking, "traces" are simply "copies" in the current framework (see Chomsky 1993 and subsequent works), but these terms are used interchangeably in this paper.

Takahashi and Fox's (2005:229) version, adopted in Hartman 2001 and Messick and Thoms to appear (the latter is to be discussed in Section 3.2), is given in (i), where XP reflexively dominates YP if XP dominates YP or XP = YP:

(i) *MaxElide*
Elide the biggest deletable constituent reflexively dominated by the PD (Parallelism Domain).

(i) is supplemented by the following conditions (Takahashi and Fox 2005:229):

(ii) For ellipsis of EC [elided constituent] to be licensed, there must exist a constituent, which reflexively dominates EC, and satisfies the parallelism condition in (ii). [Call such a constituent a *Parallelism Domain (PD)*.]
(iii) *Parallelism*
PD satisfies the parallelism condition if PD is *semantically identical to another constituent AC, modulo focus-marked constituents*.

(i) is a generalized version of (1), designed to cover interpretations of bound pronouns. It has been pointed out, however, that Takahashi and Fox's (2005) attempt faces a number of problems (see Hardt 2006). Hartman (2011) and Messick and Thoms (to appear) restrict their use of (i) to cases like (2), (3), (4) without bound pronouns.
2. Under Takahashi and Fox's (2005) system (see note 1), the optionality in (3) is captured in terms of two different PDs. See Hartman 2011 and Messick and Thoms to appear.
3. I will not focus on the optionality in examples such as (ia,b) (Schuyler 2001) (I will touch upon an example similar to (ib) later in Section 3.2., though).

(i) a. I think one of my classmates adopted the puppy, but I don't know which one (did).
b. I think you should adopt one of these puppies, but I don't know when (you should).

(ia,b) contain the *wh*-subject and the *wh*-adverbial, respectively. Assuming that both of the A'-traces are outside *v*P, Merchant (2008), Hartman 2011, Funakoshi 2012, Messick and Thoms to appear, and the present analysis all can explain the superficial lack of MaxElide effects in question. In other words, such examples do not help us choose among the competing analyses. For the same reason, I will not discuss cases where *wh*-subjects or *wh*-adverbials are extracted out of an embedded clause that undergoes ellipsis (see Hartman 2011 for relevant data).
4. (10) is actually three-way ambiguous. In addition to the two kinds of replies given in (11), one can appropriately answer it by saying:

(i) (Each professor said that Pete read) her favorite book.

(i) is what is known as the functional answer. For ease of exposition, I will put functional answers aside.
5. See Agüero-Bautista 2007 for discussion of interactions between the (im)possibility of pair-list interpretations and the binding principles.
6. I replaced *why* in the original example with *whether* to make it parallel to

the example in (15). Nothing crucial hinges on this replacement (see Agüero-Bautista 2007:422, footnote 10).
7. To be precise, M&T must assume that all auxiliary verbs originate from *v*P in order to make sure that VP in the ellipsis clause in (23) does not define a deletable PD (Parallelism Domain) (see note 1).
8. M&T differ from Hartman (2011) in maintaining that A-movement does not leave a trace/variable.
9. In (29b) the indefinite *a Balkan language* can take matrix scope via the mechanism of existential closure/binding (see Fox and Lasnik 2003 for details; see also note 10). Even if this option is taken, (24) will not be met, with the EC containing successive-cyclic A'-movement.
10. One may well wonder how the derivation in (33b) satisfies the parallelism condition in (24). M&T, following Fox and Lasnik (2003), assume that indefinites have the option of being bound by existential closure. Then the LF for the AC in (2a) can be as follows (see Reinhart 1997):

(i) AC: $[_{CP}\ \exists f\ \lambda f'\ [_{TP}$ Mary was $[_{vP}\ [_{VP}$ kissing f'(someone)]]]]
EC: $[_{CP}$ who $[_{TP}$ she was $[_{vP}\ [_{VP}$ kissing who]]]]

(i) satisfies (24), because the variables in the two clauses are bound by the operators in clause-initial parallel positions.
11. As mentioned in note 2, M&T suggest that (3a) and (3b) do not compete with each other, because they arise from applying ellipsis to different PDs. As for (4), all they have to say is that (5) holds and that (34) is a "soft," violable condition, comparing only convergent derivations.
12. For present purposes, what matters is that sentences like (39) contain A'-movement. The two-step movement analysis of the kind presented by Hornstein (2001) and Hicks (2009), whereby the subject originates from its thematic position, can equally be adopted here. The argument in the text goes through because, no matter what kind of analysis is used, the movement steps in the AC and those in the EC are exactly the same.
13. Note that Funakoshi's (2012) analysis cannot explain why (42b) is ill-formed, because Spell-Out automatically applies to the TP complement of [+WH] C. Neither MaxElide in (1) nor the proposal in the next section can account for the difference between (2a) and (42a,b), if real, in the degree of ungrammaticality.
14. M&T assume that the ellipsis site in (46b) includes the C head, based on Merchant's (2001) "sluicing-comp generalization," which states that no non-operator material may survive sluicing. Here sluicing is consistently regard as TP ellipsis. All that matters for the present discussion is the observation that sluicing somehow bleeds T-to-C movement.
15. If we take the alleged correlation between VP topicalization and VP ellipsis seriously (Johnson 2001), the ellipsis in (53a) must not involve topicalization, as one can see from the ungrammaticality of (i).

(i) *John asked someone if pass the exam, Mary did.

16. Examples like (53) are significant because they clearly indicate that ellipsis is not a matter of sentence pronunciation/processing but a matter of grammar: if the least amount of pronunciation/processing is what needs to be attained, it is not obvious at all why the shortest sentence in (53c) does not block the longest one in (53a) in spite of the fact that it blocks the medium-sized one in (53b).

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