A Parallel Movement Solution to Puzzles of Discontinuous Ellipses

Brian Agbayani and Ed Zoerner

1. Introduction

This paper argues that a sideward/parallel movement analysis of so-called “Left-Peripheral Ellipsis” (LPE; Sag 1976) and Gapping constructions improves on the traditional deletion analysis in at least two important ways. First, it avoids the need to appeal to the notion of non-constituent deletion. Second, we attempt to show that directionality effects (Ross 1970 and others) can be derived without recourse to the head parameter or directionality stipulated in the application of transformational rules (which would require linear order in the narrow syntax and, further, would need to be parametrized); rather, we show that apparent directionality in LPE and Gapping constructions is a natural consequence of the interaction of Copy, Merge, PF-deletion of copies, and Cyclic Spell-Out—affect that is derived only under a movement-based approach.

Two puzzles motivate the new analysis. First, under standard views of PF deletion, a constituent is targeted by the operation, as in the following examples:

(1) a. I will eat parsnips, and you will [vr eat parsnips] too (VP-Ellipsis)
    b. Parsnips disgust someone, but I don’t know who [vr parsnips disgust] (Sluicing)

English LPE forms, though, seem to contravene this restriction on deletion. The apparent deletion seems to target a non-constituent on the “left side” of the clause, which includes at least the subject and the main verb (2a,b). We also find apparent discontinuous non-constituent deletion with Gapping (2c,d), which leaves subject and object as remnants.

(2) a. We often eat parsnips on Monday, and we often eat kale on Tuesday
    b. Kim will give Robin a book, and Kim will give Terry a magazine
    c. Robin eats fish Mondays, and Kim eats rice Mondays
    d. Max considers Terry a genius, and Dana considers Sandy a genius

In (2a,b), the apparent deletion targets a linear string rather than a constituent (note that the right conjuncts in these cases could not be kale on Tuesday or...
Terry a magazine). In (2c,d), we find apparent discontinuous deletion as well. In verb-final languages such as Japanese, problems also arise in that the apparent deletion takes place across a clause boundary:

(3) a. Robin-wa Kim-ni hon-o ageta, Robin-wa Terry-ni
    -TOP -DAT book-ACC give,pt -TOP -DAT
    zasshi-o ageta
    magazine- ACC give,pt
    ‘Robin gave Kim a book, and Terry a magazine’

The data in (2) and (3) point out what we shall call the Non- Constituent Puzzle. An attempt to avoid the puzzle with a general “delete under identity” rule (assuming we relax the requirement that deletion target a constituent) overgenerates ungrammatical deletions:

(4) a. *I prefer hot dogs with mustard, and you prefer hot dogs with ketchup
    b. *Kim will chop the parsnips, and Terry will boil the parsnips

A second motivation for a new analysis of LPE comes from directionality facts. Ross (1970) correctly notes that left-branching material appears to delete forward, and right-branching material appears to delete backward. In the English (2a), for instance, the elements we, often, and eat each occupy a left branch, and indeed the deletion proceeds forward (keeping the first occurrence and deleting all subsequent/forward occurrences). In the Japanese example of (3), the topic Robin-wa occupies a left branch and deletes forward; the right-branching verb ageta, however, deletes backward. Ross' generalization proves correct, but lacks explanatory power; nothing a priori would force left-branching material to delete forward rather than backward, for example. The Directionality Puzzle, then, consists of arriving at Ross' correct generalization through an appeal to independently motivated principles.

We pursue here a movement-based account of LPE in our effort to solve the Non- Constituent Puzzle and the Directionality Puzzle. Our work owes an intellectual debt to Johnson's (1994) movement analysis of Gapping, which we discuss in section 2, and in section 3 we extend his idea to LPE constructions. We then recast the analysis in terms of Sideward/Parallel Movement (Nunes 2001, 2004; Nunes & Uriagereka 2000) in section 4 in an effort to derive the properties of apparent non- constituent “deletion” from independently motivated design characteristics of the computational system. Section 5 discusses evidence suggesting that ‘verb height’ in a language directly correlates with the incidence of Gapping and LPE. This correlation is predicted by the movement analysis, but is not straightforwardly captured by the deletion approach. Section 6 concludes the paper.
2. The ATB movement analysis of Gapping

Gapping exhibits apparent verbal deletion in a right-hand conjunct clause in English, leaving a right-side remnant. The operation also seems to target auxiliaries along with the main verb.

(5) a. Robin ate beans, and Kim ate rice
   b. Dana should read *War and Peace, and Kim should read Ivanhoe

Johnson (1994) analyzes Gapping as resulting from Across-the-Board (ATB) verb movement from conjoined VPs. This analysis differs from the traditional deletion-based analysis (e.g. Ross 1967, 1970; Neijt 1979, among others) in several important ways. Note that Gapping does not underlyingly consist of two full clauses; we have VP-coordination rather than CP- or IP-coordination. The two occurrences of the verb undergo obligatory ATB verb movement out of the coordinate structure (to circumvent an otherwise fatal violation of the Coordinate Structure Constraint). The gap in the second conjunct, then, results not from deletion but rather from V-to-I movement. Furthermore, the subject of the first conjunct raises from [Spec, VP] to [Spec, IP].

(6) 

This analysis makes several correct predictions not captured by an analysis which takes Gapping to involve clausal coordination. First, Gapping constructions require non-coreferential subjects.

(7) *Pat, loves mysteries, and Pat/she, loves romances

The subject of the first conjunct, from its landing site of [Spec, IP], c-commands the in situ subject of the second conjunct within a single IP. Note that a verb deletion analysis which assumes clausal coordination cannot appeal to this syntactic explanation, since *Pat, loves mysteries, and she, loves romances would make a grammatical input form.
Johnson's analysis also correctly predicts that Gapping prohibits adjunction of an S-adverb to the second conjunct, which is actually a VP rather than CP:

(8) *Pat loves mysteries, and [vp probably, [vp Terry loves romances]]

Furthermore, Johnson's analysis is compatible with the fact that Gapping can show accusative case on the "subject" of the second conjunct for some speakers:

(9) Robin cooked the fish, and him/(?)he cooked the rice

The accusative form is more natural than the nominative form for the "subject" pronoun in the second conjunct for some speakers. This is difficult for an analysis which assumes conjoined CPs/IPs, since *Him cooked the rice is an illicit input form.

The facts outlined above suggest that the size of the coordinate structure in Gapping is sub-clausal; note that they do not directly argue against deletion in these structures. However, agreement mismatches under Gapping suggest a problem for the "deletion under identity" analysis that a movement approach overcomes. In the following example, PF-deletion should arguably fail to apply if a strict requirement of identity is necessary for its application.

(10) The president approves the education bill, and the senators approve the health bill

Under a verb movement approach to Gapping, identity problems such as this do not arise; the single raised verb would simply agree with the singular subject the president in its final landing site. (Section 5 discusses important evidence for movement in Gapping and Left Peripheral Ellipsis structures from the cross-linguistic patterning of verb height, and so we defer the most important arguments for movement in Gapping structures until then.)

The ATB movement analysis of Gapping crucially relies on V to I movement in English. The assumption that English has V-to-I movement is at odds with verb height asymmetries found in languages like French vs. English. However, the possibility of V to "I" in English is opened up under a clause structure that splits IP into several projections of separate heads (Pollock 1989). We therefore assume the following clause structure, which incorporates TP, whose head hosts tensed modal and tensed aspectual auxiliaries in English. We also incorporate an Aspectual projection where uninfl ected aspectual auxiliaries reside, and light vP, which assigns the external argument theta-role to its Spec (Chomsky 1995). We posit that in English the verb raises through v to the Aspect head in overt syntax if no auxiliary occupies that position.
V overtly raises as high as Aspect in English (subjects raise to [Spec, TP]), but as high as T in French (with Negation intervening between TP and AspP in both languages). We posit a categorial feature [+V] in Aspect, which motivates movement of the verb to the Aspect head (alternatively, [+V] could be checked by directly merging an aspectual auxiliary verb). We further propose that Gapping involves coordination of vP, rather than vP as originally proposed by Johnson.

Recall that an auxiliary can apparently “gap” along with a main verb, as in example (5b). Under the Johnson-style analysis, auxiliaries in T/Asp stand external to the coordination of vP constituents, where the actual “gapping” occurs. Thus, the vP-external position of auxiliaries gives the illusion that they delete along with the main verb in Gapping constructions.

The verb movement analysis of Gapping predicts that any language in which V does not raise out of vP cannot exhibit Gapping, because the verb would not be able to “escape” the vP coordination (a notion which we will address in section 5). Under this analysis, verb-raising out of vP is necessary though not sufficient to create Gapping structures. All languages with Gapping will have such verb-raising, though the converse may not necessarily hold.
3. Left Peripheral Ellipsis

3.1 LPE as ATB Movement (First Approximation)

As we discussed in section 2, Johnson (1994) gives an analysis of Gapping which involves Across-the-Board (ATB) movement of verbs from a coordination of (in effect) vP conjuncts. We will use his analysis as a starting point and make the following extension for Left Peripheral Ellipsis (LPE):

(13) LPE results from ATB verb movement from VP conjuncts.2

Crucially, LPE constructions, like Gapping constructions, do not come about from an underlying coordination of clauses. Rather, they involve conjoined VP constituents, with a single underlying subject base-generated in the [Spec, vP] position. The derivation for example (2a) is given below:

(14) a. \[
\begin{array}{l}
TP [1' \text{ often} [1' T [ASP-P Asp TP we } v [VP [VP eat parsnips on Monday] and \\
[VP eat kale on Tuesday]]]]]
\end{array}
\]

b. \[
\begin{array}{l}
TP we_{1}, [1' \text{ often} [1' T [ASP-P eat_{2} [VP } I_{1}, I_{2} [VP [VP [VP eat parsnips on Monday] and \\
[VP I_{2}, kale on Tuesday]]]]]]]
\end{array}
\]

We outline the key points of this analysis. First, the apparent deletion of the verb in the second conjunct is actually derived via verb movement. Second, for LPE-type constructions to result, the verb must raise in ATB fashion at least as high as the v position (in fact, in English it raises to higher Aspect). A prediction thus follows: a language in which the verb does not raise out of VP will lack LPE constructions; we attempt to show in section 5 that this prediction is borne out. Third, anything external to the VP-coordination (such as the subject or adverbs such as often) will appear to be part of the “deleted” material because it has scope over the entire VP-coordination even though there is but one base-generated instance. We see, then, a potential solution to the non-constituent puzzle: apparent non-constituent deletion simply results from ATB verb movement.

The same analysis applies straightforwardly to head-final languages. The derivation for (3) from Japanese is shown below (for the sake of simplicity, we leave Aspect out of these representations):

(15) a. \[
\begin{array}{l}
TP [VP Robin-wa [[VP Kim-ni hon-o ageta] [VP Terry-ni zasshi-o ageta]]]
\end{array}
\]

b. \[
\begin{array}{l}
TP Robin-wa, [VP I_{1} [[VP Kim-ni hon-o I_{2} ] [VP Terry-ni zasshi-o I_{3} ]]] ageta_{,}
\end{array}
\]

Here, the lone subject raises to the leftmost [Spec, TP] position, while the verbs undergo ATB movement to a high clause final head (perhaps as high as T, but at least as high as v). Apparent directionality effects, then, fall out as a result of properties of verb raising: either leftward to a head-initial position, or
rightward to a head-final position (Koizumi 2000). This analysis appeals to the head-initial/final status of the language in question, assuming linear order plays a role in movement transformations in narrow syntax.

Note that the appeal to verb movement in LPE structures unifies this construction with Gapping. Neijt (1979), assuming a deletion approach, explicitly argues that LPE and Gapping cannot be analyzed on a par. To the contrary, the movement-based approach suggests that LPE and Gapping can and should be analyzed as resulting from a common source. On this point, consider an observation of Neijt (1979) that LPE, but not Gapping, is compatible with as well as.

(16) a. Robin plays chess on Mondays as well as bridge on Tuesdays
    b. *Robin ate fish, as well as Kim rice

We claim that as well as functions as a “sub-clausal” coordinator; more specifically, we claim that as well as may conjoin any constituent that does not constitute a phase (in the sense of Chomsky 2000, 2001), which includes vP and CP. If as well as cannot conjoin at the vP level, then its incompatibility with Gapping is captured (since Gapping would involve vP coordination). The following shows that as well as does not conjoin at the CP level either:

(17) *[CP What did Robin buy], as well as [CP what did Kim sell]?

However, as well as may conjoin non-phase elements such as VP, and this makes it compatible with LPE (given that LPE involves VP coordination). We know independently that ATB movement is possible from as well as constructions, so this idea comes at no particular cost:

18. Of whom did you buy [[a painting ]] as well as [[a photo ]]?

The ATB verb movement analysis of LPE and Gapping thus appears to make the right empirical predictions.

Note that although V-to-v movement would be sufficiently high to yield LPE, it would not be high enough to yield Gapping. This is because LPE involves VP coordination, requiring V to raise out of VP, making v a high enough landing site to yield LPE. Gapping, as we have shown, involves vP coordination. V-to-v movement would not be sufficient to escape the vP coordination and therefore yield Gapping. Thus, we have posited that V moves as high as Aspect in English, outside of vP, though lower than Tense.

This analysis, in fairly straightforward fashion, offers a plausible solution for both the Non- Constituent Puzzle and the Directionality Puzzle. However, it does rely on the conceptually suspect notion of ATB movement. Since the original work on ATB movement, it has remained a mystery just why ATB movement should exist, and why it should obviate Coordinate Structure Constraint violations. Work by Nunes (2001, 2004) attempts to recast ATB movement in terms of “Sideward”/ “Parallel” Movement instead. In the next section, we modify the
above analysis by extending the Sidward/Parallel Movement analysis to LPE constructions as well. Successful application of this type of movement not only elucidates the nature of ATB movement, but also, we argue, renders directionality effects without even having to appeal to the head-parameter.

4. Parallel/Sideward Movement out of coordinate structures

4.1. The “non-constituent puzzle” revisited

We have argued that LPE involves coordination of VP constituents. We therefore need to present some preliminary assumptions regarding coordination and the notion of Spell-Out before developing our analysis of sideward movement.

Thus far we have represented coordinate structures as ‘flat’, without the usual binary branching configuration now familiar for other structures. Here we pursue a binary branching structure for coordination. We assume along with Johannessen (1998), Munn (1993) and Zoerner (1999), among others, that a coordinator (&) heads its own projection, which we will label &P (cf. Camacho 2003). Munn (1993), in particular, has made the suggestion that in coordinate structures in English the & head and its complement (which functions as the second conjunct) form an &P which is adjoined to the first conjunct. A general template for two-termed coordinate structures in English is presented here:

\[(\text{Conjunct1} \ [\text{Conjunct2}])\]

Crucially, Conjunct 2 stands as the complement of the head &; and the &P structure is adjoined to Conjunct 1.3

We assume, as a premise, the notion that derivational domains (‘cycles’) may be constructed in parallel, and that Spell-Out may apply multiple times (i.e., to each cycle, henceforth ‘Cyclic Spell-Out’; Uriagereka 1999). For the structure in (19), we propose that Cyclic Spell-Out applies to the adjunct [&P and [Conjunct 2]] prior to its merger with Conjunct 1, and that the adjunct structure crucially must be Spelled-Out before the embedding structure. The logic is similar to that offered by Nunes & Uriagereka (2000) for Parasitic Gap constructions; according to this account, an adjunct is spelled out through Cyclic Spell-Out for linearization purposes prior to its merging with the embedding (i.e., projecting or ‘main’) structure. Complex adjuncts cannot be linearized with respect to elements in the ‘main’ structure, under the simple notion that asymmetric c-command maps to linear precedence between lexical items (Kayne 1994, Chomsky 1995). This is the case under the assumption that phrasal syntactic objects are not legitimate objects at the PF level, so that the computational system should not deliver complex structures to the phonological component through Spell-out, because the linearization procedure would not be able to determine precedence relations among all of the lexical items (e.g., the precedence relations between
the lexical items in the ‘main’ structure and the lexical items within the complex adjunct. The solution to the problem is to appeal to multiple Spell-Out (Uriagereka 1999). In the case at hand, the adjunct &P is spelled out separately from [Conjunct 1] to which it adjoins, and in the phonological component its lexical items are linearized internal to the adjunct. Furthermore, we claim that Spell-Out renders an element embedded within the spelled-out domain invisible for further computation (see also Nunes & Uriagereka 2000).

With these notions in mind, let us present the proposed partial derivation of (2a) repeated below in (20a). The derivation shows the application of sideward/parallel movement of the verb. Movement is analyzed as the pair of operations Copy + Merge (with copies not in the head of a chain deleted at PF; angled brackets <...> enclose copies of material (eventually) deleted at PF, and bold text indicates spelled-out material):

(20) a. We often eat parsnips on Monday, and we often eat kale on Tuesday

b. (Partial) Numeration:
{We, often, eat, parsnips, on (2), Monday, kale, Tuesday, and, T, v, Asp}

c. Construct K, L, M in parallel:
K = [&r and [vr eat kale on Tuesday]]
L = [vr on Monday]
M = [sp parsnips]

d. Copy verb:
K = [&r and [vr <eat1> kale on Tuesday]]

Merge verb with L, M via sideward movement:
O = [vr eat' parsnips on Monday]

e. Cyclic Spell-out of K:
K = [&r and [vr <eat1> kale on Tuesday]]

f. Merge K, O:
P = [vr eat' parsnips on Monday [vr [&r and [vr <eat1> kale on Tuesday]]]]

g. Merge v; Raise verb to v; Merge subject:
Q = [vr we [v' eat1' [vr <eat1> parsnips on Monday [vr [&r and [vr <eat1> kale on Tuesday]]]]]]

(20g) shows the crucial step of the verb copied and merged external to the coordinate structure. It is this ability for the verb to “escape” the coordination of VPs that allows the LPE pattern to emerge. The subsequent and final step for the verb (which we have omitted here to conserve space) is to raise to Aspect once Aspect is merged. The adverb often is merged later. By hypothesis, the numeration provides only a single instance of the verb. The verb is initially merged in the adjunct &P (K), which must be Spelled-Out prior to its merger with the first conjunct VP.
However, the [+V] feature within Aspect needs to be checked (locality requiring movement to v first), and we have multiple NP constituents needing theta-role assignment and Case-assignment. Therefore, in (20d), the verb (after having satisfied necessary Case/theta-role requirements within K) moves in sideward fashion as a Last Resort to the newly-created O. Movement is analyzed as the pair of operations Copy + Merge (with copies not in the head of a chain deleted at PF). Within O, the moved verb can satisfy the necessary Case/theta-role requirements within that domain. Cyclic Spell-Out then applies, rendering K inaccessible to further computation. Subsequent operations (Merge and Move) render the surface order of terms. Note that if Sideward Movement of the verb does not apply (or does not apply prior to Cyclic Spell-Out) in (20d), then the verb cannot be copied in K and re-merged in domain O, since Cyclic Spell-Out would render K inaccessible to further computation (though the entire domain K itself can be merged into the larger structure, as its label information is still accessible to computation until K itself is further embedded within a spelled-out domain). As a result, the NP *parsnips* in O would not be licensed, and the [+V] feature of Aspect would remain unchecked, causing the derivation to crash. The application of Sideward Movement of the verb is thus a Last Resort.

Note that if the conjunction and the second conjunct in English form a phrasal unit that is adjoined to the first conjunct, then the verb movement that we ascribe to these constructions somehow circumvents the Condition on Extraction Domains (CED, Huang 1982), which prohibits extraction out of adjuncts and subjects (in fact, within Munn's adjunction analysis of coordination, part of Ross's 1967 Coordinate Structure Constraint—namely, the inability to extract out of a conjunct—falls partially under the CED). In Nunes & Uriagereka's (2000) sideward movement analysis of Parasitic Gap constructions, CED effects arise because syntactic domains such as adjuncts are delivered to PF via cyclic Spell-Out prior to extraction of an element from that particular domain. Once a portion of the structure is spelled-out and delivered to PF, elements within that portion of structure are no longer accessible to operations within the syntax. This provides a natural account for why elements within adjunct domains generally cannot be extracted through syntactic movement. We have argued that sideward verb movement out of the second conjunct—being constructed in parallel with the first conjunct to which the verb moves—occurs before Spell-Out as a Last Resort. The possibility of Sideward Movement prior to spelling-out of a domain is what allows the CED violation to be circumvented.

The Sideward/Parallel Movement analysis extends to the cases of discontinuous Gapping exemplified in (2c,d), repeated in (21):

(21) a. Robin eats fish Mondays, and Kim *eats* rice Mondays
   b. Max considers Terry a genius, and Dana *considers* Sandy a genius
We will analyze these cases by adapting Larson’s (1989) notion of Light Predicate Raising. First consider the case in (21a) with the adverbial Mondays. We assume that such adverbials can occupy a [v’ Complement, V] position (as suggested in Larson 1988: 345-346). Given this analysis, the underlying structure places the adverbial as the complement of V, forming a V’, with the direct object within the VP but external to the [v’ V + adverbial] structure:

(22) ... (Kim) [vp fish [v’ eat Mondays]]

If (22) is the underlying structure for such constructions, then Sideward Movement targets the [V+NP-adverbial] string, which we analyze initially as a V’. We posit that V’ in these instances is reanalyzed as a V in the sense of Larson (1989:8). His V’ Reanalysis rule is given below.6

(23) If α is a V’ and α is thematically monotransitive, then α may be reanalyzed as V.

Thus, [eat Mondays] is reanalyzed as V within the second conjunct. The reanalyzed V’ then undergoes sideward verb movement to the main VP (i.e. the first conjunct), stranding the direct object in the second conjunct. The reanalyzed string must then be “unpacked”, with the verb raising further to Aspect. This allows the following order: eats, fish [t, Mondays].

Now consider the derivation of (21b). To analyze this type of construction, we deviate from the Small Clause complement analysis of consider-type verbs. In particular, we adopt Chomsky’s (1955: 479) basic idea that obligatory complements of verbs such as consider are generated next to V, with the direct object external to the [V + complement] string. In X-bar theoretic terms, and in the same spirit as the analysis for (21a), we posit that the underlying structure for the relevant portion of (21b) would be as in (24) rather than as in (25):

(24) ... (Dana) [vp Sandy [v’ consider a genius]]
(25) ... (Dana) [vp consider [sc Sandy a genius]]

To derive the Gapping pattern in (21b), matters proceed much like the derivation for (21a). Suppose (24) is the base structure in the second conjunct. The string [consider a genius] is reanalyzed as V within the conjunct. The reanalyzed V’ then undergoes sideward verb movement to the first conjunct, which is being constructed in parallel. This sideward movement strands the direct object in the second conjunct. The reanalyzed V’ must then be “unpacked”, with the verb raising further to Aspect, allowing for considers, Terry [t, a genius].7

The analysis above recasts ATB verb movement in terms of Sideward/Parallel Movement motivated by Last Resort. The derivation involves but a single V. Apparent ATB effects result from independent properties of the computational system: operations such as Copy, Merge and PF-deletion, and the design characteristics of the system itself, such as parallel construction of cyclic domains, Cyclic Spell-Out and Last Resort. If correct, this analysis arrives at the
benefits of the Johnson-type analysis of Gapping constructions without appealing to the notion of ATB movement, and furthermore, it offers a novel solution to the “non-constituent puzzle”.

4.2 The “directionality puzzle” revisited

We now turn to the derivation of a Japanese example to show that the present analysis can likewise render Directionality Effects without appealing to linear order itself. We will assume the following basic template for coordination in Japanese (as in Johannessen 1998 and Zoerner 1999, reinterpreted via a Munn 1993-style adjunction structure for coordination):

(26) [\textit{conj1} [\textit{conj2} [\& [\textit{conjunct 1} \&] ] ] \textit{conjunct 2} ]

This contrasts with the English-type template shown in (19). Crucially, here we find \textit{conjunct 1} as the complement of \& (this may in part result from the fact that head-final languages tend to have bound morpheme \& terms, arguably enclitic elements). Thus, \textit{conjunct 1} and the \& head form the \&\textit{P} adjunct which is adjoined to \textit{conjunct 2}.

Recall our claim that Cyclic Spell-Out applies to the \&\textit{P} adjunct prior to its merger with the ‘main’ structure; this means that the apparent “gap” will appear in \textit{conjunct 1} in Japanese-type languages, rather than in \textit{conjunct 2} as in the English example in the previous section. Otherwise, matters proceed largely as before. A partial derivation of (3) repeated as (27) is shown in (28) (we simplify here by ignoring VP-shells and Aspect; also note that the example involves a phonetically null \&. Spelled-out material is indicated in bold text):

(27) Robin-wa Kim-ni hon-o Terry-ni zasshi-o ageta

‘Robin gave Kim a book, and Terry a magazine’

(28) a. Numeration: \{Robin, Kim, hon, Terri, zasshi, ageta, \&, v\}

b. \textit{Construct K, L, M in parallel:}
\begin{align*}
K &= [\& [\text{vp} Kim-ni hon-o \text{ ageta}] \&] \\
L &= [\text{sp} Terry-ni] \\
M &= [\text{sp} zasshi-o]
\end{align*}

c. \textit{Copy verb:}
\begin{align*}
K &= [\& [\text{vp} Kim-ni hon-o <\text{ageta}^1>] \&] \\
M &= [\text{vp} Terry-ni zasshi-o ageta^1]
\end{align*}

\textit{Merge verb with L, M via sideward movement:}
\begin{align*}
O &= [\text{vp} Terry-ni zasshi-o ageta^1]
\end{align*}

d. \textit{Cyclic Spell-Out applies to K:}
\begin{align*}
K &= [\& [\text{vp} Kim-ni hon-o <\text{ageta}^1>] \&] \\
M &= [\text{vp} Terry-ni zasshi-o ageta^1]
\end{align*}

c. \textit{Merge K, O:}
\begin{align*}
P &= [\text{vp} [\& [\text{vp} Kim-ni hon-o <\text{ageta}^1>] \&] ] Terry-ni zasshi-o ageta^1]
\end{align*}
f. Merge v; Raise verb to v; Merge subject:
Q = [v wa [vp [vp [vp Kim-ni hon-o <ageta> ] ] &&
Terry-ni zasshi-o <ageta> ]]] ageta]}

Again, by hypothesis the numeration provides only a single instance of the verb. Therefore, in (28c) the verb must undergo Sideward Movement to O as a Last Resort, otherwise the derivation would crash due to the failure of Case/theta satisfaction in O, as well as an unchecked [+V] feature in v/Aspect. Since the operation of Cyclic Spell-Out must apply to the [\&P [Conjunct 1] &&] structure prior to its merger with Conjunct 2 (because the lexical elements in \&P could not be linearized at PF otherwise), K becomes invisible for further computation. Thus, Sideward Movement must apply as a Last Resort from Conjunct 1 to Conjunct 2, yielding the “backward” gapping pattern (in contrast to the English case, which yields “forward” gapping). The Sideward Movement analysis, then, along with the given configuration of coordination, derives the Directionality Effect without appeal to the head parameter or directionality conditions of any kind.\textsuperscript{10} Directionality Effects are the result of language-particular properties for coordinate structure and universal operations and design characteristics of the computational system.\textsuperscript{11}

5. Verb height and the crosslinguistic incidence of LPE and Gapping

Under the present analysis, a language in which the verb does not raise out of VP will not exhibit LPE. Also, in order to exhibit Gapping effects, a language must have V movement out of vP as well. Thus, we predict an implicational universal to the effect that if a language exhibits Gapping, it also exhibits LPE. This is because if the verb raises out of a coordination of vPs in overt syntax, it will also automatically raise out of VP. Note on the same token that the presence of LPE does not imply the existence of Gapping, since the verb may raise out of VP but not high enough to “escape” vP (for example, if the verb raises to v but no higher). This predicts the existence of languages that exhibit LPE, but lack Gapping.

Tang (2001) notes that Chinese exhibits LPE phenomena but lacks Gapping. Examples of this pattern are shown in (29)-(30):

(29) Wo gei-le Robin yi-ben shu, Pat yi-shi bi (LPE)
I giveASP R. one-cl book P. one-cl pen
‘I gave Robin a book and Pat a pen’

(30) *Wo kanjian-le Robin, ni Terry (Gapping)
I seeASP R. you T.
‘I saw Robin, and you, Terry’

Recall that what distinguishes LPE from Gapping is the required landing site. LPE requires only that V movement go as high as v; Gapping requires a land-
ing site of Aspect or higher (that is, any landing site that allows for the verb to escape a coordination of VP s). Any language, then, that has V-to-v movement but not (at least) V-to-Aspect movement has the necessary property for exhibiting LPE, though not Gapping. Chinese apparently fits this pattern. Independently, Huang (1992, 1996) has claimed that Chinese has verb movement, but shows “shorter” verb movement than English. We assume that Chinese has at most V-to-v movement.

The present analysis also predicts the existence of languages that lack both LPE and Gapping, which correlates with absence of V movement. Note that if a language lacks V-to-v movement, it is predicted that such a language will exhibit neither LPE nor Gapping, as the verb would remain within VP. Vietnamese seems to be such a language, as it lacks both LPE and Gapping, as shown in (31)-(32).

(31) * Kim cho Robin một cuon sách, và Sam một tờ báo (LPE)
   K. give R. one cl book and S. one cl newspaper
   ‘Kim gave Robin a book, and Sam a newspaper’

(32) * Kim ăn cá, và Robin bò (Gapping)
   K. eat fish and R. beef
   ‘Kim eats fish, and Robin beef’

Again, under the present analysis, LPE and Gapping rely on verb movement. Should a language lack verb movement altogether (or at least lack movement of V that escapes VP), it will show none of these phenomena. We argue that Vietnamese fits such a pattern.

Now the question arises as to whether there are independent factors which would indicate a positional difference for the verb in Chinese vs. Vietnamese-type languages. Chinese and Vietnamese (both SVO) lack morphological tense/agreement marking on verbs and inversion in questions, suggesting the absence of verb movement into the higher functional domain in these languages. Both languages have a system of Aspectual marking (Li & Thompson 1981; Thompson 1987). In Chinese, Aspectual markers such as -le (Perfective) and -guo (Experiential) surface as verbal suffixes, as shown in (33):

(33) a. Wo gei-le Zhangsan yi-ben shu
   I give-ASP Z. one-cl book
   ‘I gave Zhangsan a book’

b. Wo gei-guo Zhangsan yi-ben shu
   I give-ASP Z. one-cl book
   ‘I’ve given Zhangsan a book (before)’

We maintain that V moves as high as v in Chinese. Assuming that the aspectual markers are lexically specified as suffixal and head the Aspect projection, we propose that the aspectual marker in Chinese undergoes a PF rule of lowering to the verb in the adjacent v position (as in Tense lowering accounts of English
verbal inflection (see Pollock 1989), which in our analysis would involve T lowering to the verb in the adjacent Aspect position). Lowering of Aspect to \( v \) in Chinese is shown in (34):

\[
(34) \quad \text{[Wo \[\text{ASP-}\text{p} \ e \[\text{VP \text{gei} - \text{guole} [\text{VP \text{t} \text{Zhangsan \ yi-ben shu}]]}] \text{give-ASP} \text{Z. \ one-cl book}]}
\]

To contrast, in Vietnamese, aspectual markers like Continuous \( \text{dang} \) and Perfective \( \text{dá} \) precede the verb. Unlike Chinese, the relationship between aspect marker and verb is morphologically isolating. (35) shows examples from Vietnamese:

\[
(35)\text{a. Kim \text{dang} \text{dóc \ cuon \ sách \ này \ [K. \text{ASP \ read \ cl \ book \ DEM}] 'Kim is reading that book'}
\]
\[
(35)\text{b. Kim \text{dá} \text{dóc \ cuon \ sách \ này \ [K. \text{ASP \ read \ cl \ book \ DEM}] \ 'Kim has read that book'}
\]

We assume that aspectual markers in this language remain in their merged position. We have proposed that the verb remains in VP in Vietnamese, and so does not raise to \( v \) where it would be adjacent to the Aspect head. We posit that the intervening level of structure (\( v \text{P} \)) blocks lowering of Aspect to \( V \).

\[
(36) \quad \text{[Kim [\text{ASP\text{p} \dang/dá} \[\text{VP \text{dóc \ cuon \ sách \ này}]]] \text{K. \ ASP \ read \ cl \ book \ DEM}]
\]

The \( V \) movement analysis of Gapping and LPE yields a clear and testable implicational universal: if a language exhibits Gapping, it also exhibits LPE. Of course, further research on a wider variety of languages is necessary to fully test this claim. However, the crosslinguistic observations that we have obtained from English, Chinese, and Vietnamese reveal a very suggestive and hitherto unnoticed correlation between parameters of verb height and the incidence of LPE and Gapping. We conclude that the \( V \) movement approach to LPE and Gapping finds strong confirmation from these new observations.

6. Conclusion

So-called Left Peripheral Ellipsis (LPE) constructions and discontinuous Gapping phenomena have provided a puzzle for deletion accounts, since they do not conform to the expectation that only constituents delete. This paper attempts to show that apparent non-constituent/discontinuous deletion in fact involves no deletion at all. Rather, a Sideward/Parallel Movement analysis seems to solve both the Non-constituent Puzzle and the Directionality Puzzle in fairly straightforward fashion. Furthermore, the \( V \) movement approach to these phenomena finds strong confirmation from the cross-linguistic distribution of LPE and Gapping, which we have argued is a by-product of the height/application of \( V \).
movement. Finally, the present work may extend to other putative non-constituent deletion processes such as Pseudogapping and Stripping, which show similar characteristics to Gapping and LPE.

Notes

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This raising of the first conjunct's subject to [Spec, IP] violates the Coordinate Structure Constraint, at least as commonly understood. Johnson argues, though, that the standardly accepted version of the CSC proves too strong, and suggests (1994:40-41) "...the Coordinate Structure Constraint does not prevent independent A-movement from the initial coordinate." He gives as supporting evidence the following grammatical example, in which A-movement from an initial conjunct to the left of the matrix verb particle does not render ungrammaticality:

(i) Liz made Mason out [IP [IP t to be intelligent] and [IP Sarah to be kind]]

Larson (1988) suggests the possibility of such an analysis for similar constructions within the theory of VP-shells.

Munn (1993) makes a strong argument for the adjunction analysis of coordinate structures from the need for an operator position within &P. The existence of an operator position within &P requires a spec below the left-hand conjunct. The open [Spec, &P] position is made available only if &P is adjoined to the first conjunct. In contrast, other configurational approaches to coordination (e.g., Johannessen 1998, Zorner 1999) take the left-hand conjunct to be the spec of &P. In section 4.2 we show that Munn's adjunction analysis also allows an account for directionality effects without having to stipulate directionality parameters in narrow syntax.

This follows a more radical view of Cyclic Spell-Out than suggested recently by Chomsky (2001), where Spell-Out occurs only at each phase level.

We have proposed that V movement to Aspect is motivated for checking of the [+V] feature on the Aspect head (assuming an Attract-based theory; Chomsky 1995). Furthermore, we assume NP-raising to [Spec, vP], following V raising to v, for EPP checking in association with Case licensing. We assume here that theta roles are not features on V that require checking (contra Hornstein 2001). We posit that the Theta Criterion requires the NP parsnips in (20) to receive a theta role in the domain of V (or at least to be in a local configuration with a predicative head), a property that is verified derivationally, rather than representationally at LF (as in Lebeaux's 1988 treatment of certain binding principles as "anywhere conditions"). The decision to merge V with parsnips is therefore made at the point at which parsnips is made available for computation. Note that this requires an enrichment of the principles that guide syntactic derivations, though it avoids the computational problem of Look Ahead.

According to Larson (1989:8), "V' Remanalysis says that any V' that corresponds semantically to a binary relation may be categorically construed as a head". We extend the application of the V' Remanalysis rule to the [V + complement] string, which behaves in some sense like a lexical predicate by compositionally assigning a theta-role to the direct object NP.
Adopting V' Reanalysis requires some enrichment to the theoretical machinery, but insofar as it allows for a constituent-based analysis for the facts at hand, it is a device that we maintain pending the discovery of simpler mechanisms which yield the advantages of a constituent-based analysis.

Note that \([V + \text{Complement}]\) strings of apparently unbounded length can be gapped (example from Ross 1970: 250):

(i) I want to try to begin to write a novel, and Mary \textit{wants to try to begin to write} a play. We do not see this as problematic, since the length of the \([V' V + \text{complement}]\) string has no bearing on the application of the V' Reanalysis rule. Note that the example in (i), which involves gapping of part of an infinitival complement clause, suggests that the remnant object NP has "escaped" V' Reanalysis. Moreover, Jackendoff (1971: 25) observes that with infinitival complements, there can be an NP remnant which apparently intervenes between bits of discontinuously gapped material:

(ii) Max seemed to be trying to force Ted to leave the room, and Walt \textit{seemed to be trying to force Ira to leave the room}.

We claim that in (i), the underlying structure for the VP headed by \textit{force} is \([V' V' \text{force} [to leave the room]] Ira \). We propose that the object NP in cases like (i) and (ii) raises out of its base position (either raising to a higher Agr projection, as in Lasnik's 1995 analysis of Pseudogapping constructions, or extraposing rightward, as in the analysis of Pseudogapping proposed by Jayaseelan 1990). In the case of (ii), V' Reanalysis then targets the string \([V' \text{seemed} [to be trying to force to leave the room]]\), which then undergoes sideward movement. Jackendoff (1971: 25) also observes that Gapping is degraded if the attempted remnant is a lower infinitival clause rather than the object NP:

(iii) *Max seemed to be trying to force Ted to leave the room, and Walt \textit{seemed to be trying to force Ted to stay a little longer}.

The ungrammaticality of (iii) is predicted in our account if raising of an infinitival clause is blocked, and only an object NP can raise out prior to V' Reanalysis (perhaps to check EPP with Agr under the Lasnik-style analysis). If this is the case, then the infinitival clause must remain as part of the reanalyzed V' which undergoes subsequent sideward V movement.

We should note here that these facts may also be compatible with an approach which moves a remnant VP, instead of just V, as suggested for other reasons by Kayne (1998). Such an analysis would require the object to first move out of VP, with subsequent sideward movement of the remnant VP. Such an analysis may also be compatible with these data, though space considerations preclude us from pursuing it here.

Stripping — another apparent non-constituent "deletion" phenomenon in English — shares certain surface similarities with Gapping, suggesting an extension of the present analysis to Stripping constructions. Some representative examples of the phenomenon are given in (i)-(iii).

(i) Robin plays chess, but never \textit{(Robin) plays chess} with her roommate

(ii) Kim gave presents to Pat, but not \textit{(Kim) gave presents} to Alex

(iii) Pat wants a surprise birthday party, though not \textit{Kim wants a surprise birthday party}.

Hankamer & Sag (1976: 409) define Stripping as a rule that "deletes everything in a clause under identity with corresponding parts of a preceding clause, except for one constituent (and sometimes a clause-initial adverb or negative)." Lobeck (1995; see also Chao 1987) argues that Stripping patterns closely with Gapping rather than VP Ellipsis in that, like Gapping, it may involve a gap that is not phrase-final. Furthermore, both Gapping and Stripping fail in subordinate clauses, and, like Gapping, the gapped portion under Stripping cannot precede its antecedent. Finally, Lobeck observes that both Gapping and Stripping obey the Complex NP Constraint (though this may be due to the fact that neither Gapping nor Stripping apply within a CP-level constituent). However, Stripping differs from Gap-
ping in that the former may (in fact, often) occur under connectives but and though (as in (i)-(iii)) whereas Gapping in the same environment is quite degraded:

(iv) *Robin plays chess, but/though Chris plays backgammon

It is interesting to note that Stripping seems to prefer a polarity distinction between the antecedent and “stripped” clauses, accounting for the occurrence of an initial not or negative adverb (e.g., never, seldom, hardly) before the “stripped” counterpart. In this sense, Stripping patterns most closely with Pseudogapping, which prefers a polarity distinction between clauses, and as a result often occurs with polarity-shifting but and though (Levin 1979; Agbayani & Zoerner 2004):

(v) Robin likes rutabagas, but/though she doesn’t like ice cream

See also Johannessenz’s (1998) analysis of unbalanced coordination in head-final languages, which lends further support for this treatment of coordination in Japanese.

VP Ellipsis and Sluicing do not fall within our movement analysis. We remain non-committal with respect to whether these phenomena are derived via deletion (in this light, see Merchant’s 2001 comprehensive work on Sluicing) or the presence of null pronouns (as in Lobeck 1995).

In our analysis, verb movement is a property of narrow syntax. This is contrary to the view expressed in Chomsky (2000: 149; see also Boeckx & Stjepanović 2001), who suggests that verb displacement may be a property of the post-Spell-Out derivation to PF. One problem for the analysis of head movement as a property of narrow syntax has been its status as an apparently counter-cyclic head adjunction operation. However, if head movement is a root-targeting operation like XP movement (Fukui & Takano 2000), then it is possible to overcome this particular objection to maintaining head movement in narrow syntax.

Alternatively, as we noted in fn 7, the analysis we have presented here could be recast in terms of remnant VP movement (Kayne 1998). If so, then apparent head movement would actually be a form of remnant XP movement. Such an analysis may also be compatible with these data, though we do not address this alternative analysis here, pending further research.

Addresses of the Authors:

Brian Agbayani
Department of Linguistics
California State University, Fresno
5245 N. Backer Ave. M/S PB 92
Fresno, CA 93740
USA
bagbayan@csufresno.edu

Ed Zoerner
Department of English
California State University, Dominguez Hills
1000 E. Victoria St.
Carson, CA 90747
USA
ezoerner@csudh.edu

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