

# LEFT-PERIPHERAL DELETION AND GAPPING: THE SAME, BUT DIFFERENT

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## 1 The Puzzle

The phenomena known as Left-Peripheral Deletion (LPD, Sag (1976)) and Gapping have received a fair amount of attention in the syntactic literature. The forms in (1) below give representative examples of LPD, while the forms in (2) show simple examples of Gapping (strikeout indicates “deleted” material)

- 1 a We play chess on Mondays, and ~~we play~~ bridge on Tuesdays  
b Robin gave a penny to Kim, and ~~Robin gave~~ a nickel to Pat  
c Terry painted the car red, and ~~Terry painted~~ the truck blue  
d Robin-wa Kim-ni hon-o ~~ageta~~, Robin-wa Terry-ni empitsu-o ageta  
TOP DAT book-ACC DAT pencil-ACC gave  
'Robin gave a book to Kim, and a pencil to Terry'
- 2 a Robin bought a book, and Kim ~~bought~~ a magazine  
b (?)Kim gave a penny to Pat, and Terry ~~gave~~ a nickel to Robin  
c Jack Sprat ate all the fat, and his wife ~~ate~~ all the lean  
d Robin-wa gohan-o ~~tabeta~~, Kim-wa sakana-o tabeta  
TOP rice-ACC TOP fish-ACC ate  
'Robin ate rice, and Kim fish'

The name of LPD comes from the fact that in English, the left periphery of the second clause appears to delete, as in (1a--c). In truth, given the Japanese counterpart of (1d), the name “Subject-Verb Deletion” might prove more accurate, but we shall continue to use the term LPD for convenience. In Gapping, a verb alone seems to delete.

Gapping has undergone a number of different analyses over the last 25 years. Perhaps the most widely accepted analysis, similar to that proposed for example by Neijt (1979) and van Oirsouw (1987), reads “delete a verb under identity from coordinated clauses”. Some other attempts in the literature, however, do not invoke deletion. Zoerner (1995) presents an analysis of Gapping as resulting from the coordination of like terms, for instance, and Johnson (1994) argues that Gapping results from ATB verbal movement.

On the other hand, LPD facts have long stood as motivation for retaining a deletion/conjunction reduction rule in the grammar. Without a deletion rule, the argument goes, one cannot arrive at the forms such as those in (1), since the bracketed strings below do not fit traditional views of constituency and therefore could not participate in a coordination.

- 3 We play [chess on Mondays] and [bridge on Tuesdays]

And so a standard description of LPD reads “delete under identity from the left periphery of a second conjunct clause”. Another look at (1d) of course casts doubt on that simple view. The puzzle, simply stated

how should we analyze LPD? This paper attempts to solve this puzzle. We first note the empirical similarities and differences of LPD compared to Gapping, and then go on to claim that LPD and Gapping should indeed undergo a similarly-spirited movement analysis.

2 **Some Similarities between LPD and Gapping**

We note here three similarities between LPD and Gapping, and conclude that these commonalities motivate a similar type of analysis for the two phenomena. First, both LPD and Gapping conform to Ross' (1970) "Directionality Constraints". Ross notes that left-branching terms delete forward, while right-branching terms delete forward. Another look at the relevant English and Japanese data confirm the correctness of Ross' observation.

- 4 a We play chess on Mondays, and ~~we play~~ bridge on Tuesdays
- b Robin-wa Kim-ni hon-o ~~ageta~~, ~~Robin-wa~~ Terry-ni empitsu-o ageta  
           TOP    DAT book-ACC                                    DAT pencil-ACC gave  
       'Robin gave a book to Kim, and a pencil to Terry'
  
- 5 a Robin bought a book, and Kim ~~bought~~ a magazine
- b Robin-wa gohan-o ~~tabeta~~, Kim-wa sakana-o tabeta  
           TOP rice-ACC                                    TOP fish-ACC ate  
       'Robin ate rice, and Kim fish'

Since English has left-branching subjects and verbs alike, we always find the second term(s) deleting under identity, as in (4a) and (5a). Japanese has left-branching subjects but right-branching verbs, so that although the second subject deletes in (4b), in both (4b) and (5b) the first verb deletes. Though Ross' Directionality Constraint lacks explanatory power, it still stands as a correct generalization that any analysis of LPD and Gapping must meet.

Second, Gapping, and to a lesser extent LPD, resist S-adverbs in the second conjunct in English.

- 6 a \*Robin probably bought a book, and Kim certainly ~~bought~~ a magazine (Gapping)
- b ??Robin probably gave Kim a penny, and ~~Robin~~ certainly gave Pat a nickel (LPD)

Third, to our knowledge, every language that allows Gapping also exhibits LPD. Languages showing both Gapping and LPD seem the rule rather than the exception, here we simply show grammatical examples from Spanish and American Sign Language (in (7) and (8), respectively) as evidence that these phenomena take place across varied language types.

- 7 a Robin regaló un libro a Kim, y ~~Robin regaló~~ una revista a Terry (LPD)  
           gave a book to   and                                    a magazine to  
       'Robin gave a book to Kim, and a magazine to Terry'
  
- b Robin comió la lechuga, y Kim comió la zanahoria (Gapping)  
           ate the lettuce and   ate the carrot  
       'Robin ate the lettuce, and Kim the carrot'
  
- 8 a ME READ BOOK FAST, ~~ME READ~~ MAGAZINE SLOW (LPD)  
       'I read books fast, and magazines slowly'

- b      YOU LIKE FISH, ME LIKE MEAT      (Gapping)  
       ‘You like fish, and I, meat’

That LPD and Gapping seem to go hand in hand in so many languages suggests strongly that they share an important connection. Yet we can point to three crucial differences between LPD and Gapping that cast doubt on the strength of that connection.

### 3 Some Differences between LPD and Gapping

Perhaps the most apparent difference between LPD and Gapping has to do with their naturalness. LPD constructions sound entirely natural, while Gapping constructions have a slightly marked feel to them. Richard Hudson (1982: 548) comments that LPD occurs frequently in everyday speech, but “Gapped sentences are stylistically very restricted, and (as far as I can tell from informal observation over some years) hardly ever occur in casual conversation, although they are common in prepared speech such as news broadcasts.” Any analysis of LPD and Gapping should contain an account of their comparative naturalness.

Second, some languages, such as Chinese, show LPD but lack Gapping. For example:

- 9      Wo song-le Robin yi-ben shu, Pat yi-shu bi      (LPD)  
       I give-ASP one-CL book one-CL pen  
       ‘I gave Robin a book and Pat a pen’
- 10     \*Wo kanjian-le Robin, ni Terry      (Gapping)  
       I see-ASP you  
       ‘I saw Robin, and you, Terry’

Gapping and LPD, then, cannot go entirely hand in hand, since languages do not always exhibit them together. It so happens that (to the best of our knowledge) no language exhibits Gapping but lacks LPD (the mirror image of Chinese), thus too should follow from the analysis.

A third difference between LPD and Gapping concerns what we might call “semi-coordinators” such as *as well as*. Neijt (1979: 62) observes that LPD can occur in constructions with semi-coordinators, while Gapping cannot. Consider for instance:

- 11     a      \*We play chess on Mondays, *as well as* we play bridge on Tuesdays  
       b      We play chess on Mondays, *as well as* bridge on Tuesdays      (LPD)  
       c      \*We play chess on Mondays, *as well as* our friends bridge on Tuesdays      (Gapping)

The (a) form above demonstrates the well-known fact that *as well as* cannot conjoin complete clauses. From this it comes as a surprise, perhaps, that LPD can occur with *as well as*. A complete analysis of LPD and Gapping should have an account of this distinction as well.

As noted before, some (most notably, perhaps, van Oirsouw (1987)) have tried to subsume LPD and Gapping under a single deletion rule along the lines of:

- 12            Delete under identity from coordinated clauses

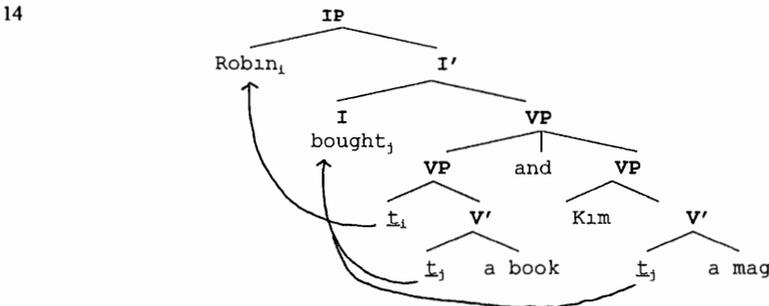
This attempt to provide a unified analysis for Gapping and LPD has well-founded motivation, given the similarities of §2. However, a unified deletion analysis does not fare well in accounting for the differences noted here. The fact that Gapping should sound less natural than LPD does not follow as a direct consequence of a deletion-based rule, nor does the fact that a given language might exhibit LPD but not Gapping (and never the other way around). Though one might account for these facts somehow, it would require extra stipulation. The *as well as* facts prove particularly damaging to a unified deletion account, since it appears that forms such as (11b) cannot derive from underlying coordinated clauses. If, in an effort to escape this problem, one tries to modify (12) to dispense with the “conjoined clauses” requirement, one opens a Pandora’s box of incorrect possibilities, such as

- 13 a \*Robin heard Max claim ~~Robin~~ heard the fairy tale  
 b \*His book is better than my book

Although a unified deletion analysis faces considerable difficulties, we shall claim that a unified analysis remains possible. More specifically, we shall claim that both Gapping and LPD result from movement rather than from deletion.

4. Gapping Johnson’s ATB Verb Movement Analysis

We will accept as a starting point Johnson’s (1994) analysis of Gapping. Under Johnson’s idea, Gapping results when verbs undergo Across-the-Board (ATB) V-to-T raising from conjoined VPs. So a somewhat simplified derivation of a canonical Gapping example such as *Robin bought a book and Kim, a magazine* would appear as



Several key points highlight this analysis. Crucially, Gapping does *not* start out from conjoined clauses, contrary to the claim of a deletion-based analysis. We find conjoined VPs here, but only a single IP. The verb from each conjunct raises to I in ATB fashion.

Note that while the underlying verbs behave in like fashion, the underlying subjects do not. The subject of the first conjunct, in this example *Robin*, raises from its original [Spec, VP] position to [Spec, IP]. This constitutes a violation of the Coordinate Structure Constraint (CSC). Johnson suggests that Case requirements (the need to check off a Case-feature within a spec-head relationship in IP) override the CSC, so that this first subject raises. On the other hand, the second subject, here *Kim*, remains in situ. It never

raises to an IP, it has no IP to raise to<sup>1</sup> Similarly, the verb of the second conjunct remains in situ

Johnson's movement-based analysis has several virtues that the deletion-based analysis cannot claim Space limitations preclude a detailed justification of Johnson's analysis, but we briefly point out three correct predictions that it makes For one thing, the aforementioned prohibition of S-adverbs on the second conjunct follows directly Since Gapping involves conjoined VPs rather than clauses, the S-adverb simply has nowhere to adjoin So whereas a single S-adverb can have scope over an entire Gapping construction, it will never have scope over only the second conjunct, since it cannot adjoin to VP

- 15 a  $[_{IP} \text{Certainly } [_{IP} \text{Robin, loves}_j \text{ } [_{VP} \text{t}_i \text{t}_j \text{Pat}] \text{ and } [_{VP} \text{Kim t}_j \text{Terry}]]]]$   
b  $*[_{IP} \text{Robin, loves}_j \text{ } [_{VP} \text{t}_i \text{t}_j \text{Pat}] \text{ and } [_{VP} \text{certainly } [_{VP} \text{Kim t}_j \text{Terry}]]]]$

Second, it so happens that the second subject of a Gapping construction (at least in English) can appear in Accusative Case For example

- 16 I cooked fish, and him/(?)he, rice

If anything, the Accusative form here sounds better than does the Nominative form This comes as a surprise to the deletion-based analysis, since we do not find entire clauses such as *\*Him cooked rice* Under Johnson's account, though, the second subject remains in [Spec, IP] and never has its Case features checked So the possibility remains open that the default Accusative Case might appear

A third virtue of the system has to do with verbal morphology Note that a Gapped verb does not always match the remaining verb entirely

- 17 The president approves the education bill, and the senators the health bill

Here, strictly speaking, we do not see "deletion under identity," since the Gapped verb *approve* lacks the 3rd person singular present tense marker *-s* of the verb of the first clause Under a traditional deletion-based analysis, one must weaken the notion of identity to allow for the grammaticality of (17) Under Johnson's analysis, however, faces no such problem, again, since the construction consists of conjoined VPs rather than IPs, no agreement need take place, and we anticipate the possibility of forms such as (17)

Johnson's movement-based analysis of Gapping, then, seems promising The subsequent analysis of LPD constructions takes Johnson's Gapping idea and modifies it slightly

## 5. LPD The New Analysis

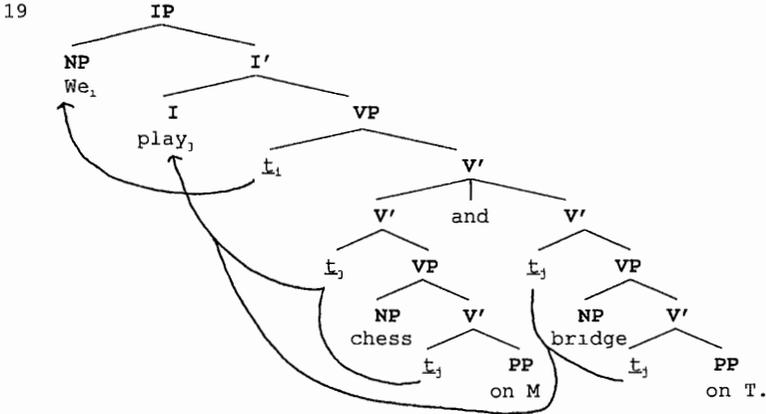
We have seen that Gapping and LPD share enough in common so that they should receive a similarly-spirited analysis Since Johnson's Gapping analysis appears to fare nicely, it follows that LPD should also have a movement-based analysis And here we have it

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<sup>1</sup>Tom Strok notes that the matter of determining which underlying subject raises to [Spec, IP] may not prove so simple, at least for a representation of coordination more articulated than the one shown here In head-final languages too, the first rather than second subject raises This apparent dependence on linear ordering poses a problem to hierarchically-based theories of coordinate structure (e.g. Munn (1992), Johannessen (1996), Zoerner (1995) and others)

18 **LPD structures result from ATB verbal movement of conjoined V' constituents**

Under this idea, the derivation of a form such as *We play chess on Mondays and bridge on Tuesdays* becomes

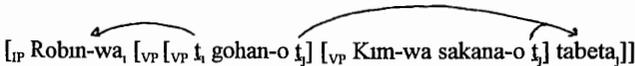


Under this analysis, LPD involves ATB verb movement from V to I, this has the consequence of the verb appearing to delete from the second clause. This much matches the Gapping analysis. However, the entire construction involves but a single VP constituent. This means that we find only one underlying subject in [Spec, VP]. This subject raises to [Spec, IP] straightforwardly, note that crucially this raising does not involve a CSC violation, because the subject simply stands external to the coordination.

6 **Accounting for the Similarities**

The similarities between LPD and Gapping have natural explanations under the present account. Consider first the Directionality effects. The direction of apparent Gaps results from the landing site of the moved material involved. In English, a verb appears to Gap forward simply because English has head-initial IPs. Japanese, with its spec-initial but head-final IPs, will appear to lack the subject of the second clause but the verb of the first.

- 20 Robin-wa gohan-o tabeta, Kim-wa sakana-o tabeta (Gapping)  
 TOP rice-ACC TOP fish-ACC ate  
 'Robin ate rice, and Kim fish'



- 21 Robin-wa Kim-ni hon-o ageta, Robin-wa Terry-ni empitsu-o ageta  
 TOP DAT book-ACC DAT pencil-ACC gave  
 'Robin gave a book to Kim, and a pencil to Terry'

[<sub>IP</sub> Robin-wa, [<sub>VP</sub> t<sub>i</sub> [[<sub>VP</sub> Kim-mi hon-o t<sub>j</sub>] [<sub>V</sub> Terry-ni empitsu-o t<sub>i</sub>]] ageta,]]

Second, recall that LPD as well as Gapping resists S-adverbs on the second conjunct. This follows directly, since LPD like Gapping involves coordinations of constituents smaller than clauses. The following form, for instance, fails because the S-adverb *certainly* attempts to adjoin to V<sup>7</sup>

22 ??<sub>[IP</sub> Robin probably gave [<sub>VP</sub> t<sub>i</sub> [[<sub>V</sub> Kim a penny] and [<sub>V</sub> certainly [<sub>V</sub> Pat a nickel]]]]

Third, the fact that many languages exhibit both LPD and Gapping comes as no surprise, since both constructions result from the same basic process: ATB verb-raising to the I position. We should note that some languages, such as Vietnamese, lack both LPD and Gapping.

23 \*Robin ăn cá và Kim cơm (Gapping)  
eat fish and rice  
'Robin eats fish, and Kim rice'

24 \*Robin đọc báo ở nhà và sách ở thư viện (LPD)  
read newspaper at home and book at library  
'Robin reads newspapers at home, and books at the library'

Under the present analysis, Vietnamese's lack of LPD and Gapping result from its inability to invoke ATB verbal movement.<sup>2</sup> So we have a simple generalization: languages that allow ATB verb movement may show LPD and Gapping, languages that do not allow ATB verb movement show neither.

## 7 Accounting for the Differences

We now have an immediate explanation for why Gapping sounds less natural than does LPD. Simply put, Gapping involves a CSC violation, while LPD does not. In Gapping, the first of two underlying subjects must raise out of the coordination to which it belongs, with [Spec, IP] as its landing site. Since LPD underlyingly has but a single subject which stands outside of the coordination, no CSC violation results from subject raising to [Spec, IP]. As noted, Johnson suggests that Case considerations override the CSC in Gapping constructions, but the CSC violation remains, and so we fully expect its relatively marked status compared to LPD, which does not contravene the CSC. On a similar note, we can state why no language shows Gapping but not LPD: it simply does not follow that a language with ATB verb-movement would allow an operation that violates the CSC (Gapping) but rule out a similar operation that does not (LPD).

A related answer follows for why some languages such as Chinese show LPD but not Gapping and why some languages show both, it has to do with how strictly the languages obey the CSC. We might generalize to two types of languages, where English would fall under Type 1 and Chinese would exemplify Type 2.

25 Type 1 Satisfy Case > Satisfy CSC Type 2 Satisfy CSC > Satisfy Case

<sup>2</sup>Brian Agbayani (p.c.) suggests the possibility that Vietnamese lacks verb-raising altogether, if so, this would prove compatible with the present analysis.

The above classification needs further investigation. It suggests, though, the possibility that all other things held equal, languages with overt Case-marking would more likely show Gapping, while languages without overt Case-marking would less likely show it. English, Japanese and Spanish, for instance, do show Case (English in limited fashion) whereas Chinese does not. ASL stands as an exception to this tendency.

Note that in any event, English not only contravenes the CSC in Gapping constructions, but arguably in other instances as well, as in the following ‘partial topicalization’ and extraposition examples. Chinese, on the other hand, seems to obey the CSC more rigidly.

- 26 a Robin, I kicked, and Kim  
 b I kicked Robin twice, and Kim
- 27 a \*Robin, wo ti-le, he Kim  
           I kick-ASP and  
       ‘Robin, I kicked, and Kim’  
 b \*Wo ti-le Robin liang-jiao, he Kim  
           I kick-ASP two-CL and  
       ‘I kicked Robin twice, and Kim’

So whether or not Case factors ultimately prove essential, it appears as though a language’s extent of obedience to the CSC determines the presence/absence of Gapping.

Finally, the present analysis offers some insight as to why a semi-coordinator such as *as well as* can work in LPD constructions but not Gapping. We know that *as well as* cannot conjoin entire clauses. Since under the VP-Internal Subject Hypothesis a VP in effect constitutes a clause, we suppose that *as well as* cannot conjoin VPs. It can, however, conjoin terms smaller than VP, such as V’. When it conjoins V’ constituents, the possibility of ATB V-to-I movement remains open (simply substitute *as well as* for *and* in the diagram in (19) to see this). The fact that LPD involving *as well as* would require ATB movement comes as no special cost, since we find it elsewhere in any event.

- 28 [Of whom] did you buy [[a drawing t<sub>i</sub>] as well as [a painting t<sub>i</sub>]]

The deletion-based analysis, which assumes underlying conjoined clauses in both LPD and Gapping, has no reasonable explanation for the LPD *as well as* data. Under the present analysis, matters fall out simply enough. *As well as* cannot participate in Gapping due to its inability to conjoin VPs, it can participate in LPD because it has the ability to conjoin V’s.

### 8 A Remaining Difficulty

One issue needs further investigation than we have suggested so far. We have noted that both LPD and Gapping resist S-adverbs on the second conjunct, and have claimed that this follows from the fact that neither construction provides a suitable adjunction site. But recall the earlier example, repeated below.

- 29 a \*Robin probably bought a book, and Kim certainly bought a magazine (Gapping)  
 b ??Robin probably gave Kim a penny, and Robin certainly gave Pat a nickel (LPD)

The LPD form sounds better than does the Gapping construction, this comes counter to the

predictions of the analysis (since if anything, VP would prove a better adjunction site for an S-adverb than a V' would) Even more potential damage to the analysis becomes clear when we consider a wider range of S-adverbs For example, adverbs of frequency sound fine on a second LPD conjunct, though they cause a Gapping construction to crash

- 30 a They usually feed monkeys at the zoo, and sometimes pigeons at the park  
b \*Robin usually prefers mysteries, and Kim sometimes westerns

Though we expect the ungrammaticality of (b) above, the acceptability of the (a) form goes against the predictions of the analysis We have no answer to this problem at the moment, perhaps an increased understanding of adverbs will shed some light on the matter, and we leave this issue open for further work

## 9. Conclusion

LPD and Gapping show the similarities that they do because they both result from ATB movement from V to I They show the differences that they do because they involve different types of coordinate structures V' conjuncts in LPD, and VP conjuncts in Gapping So LPD and Gapping stand as two closely related yet distinct phenomena the same, but different

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