Remarks on “Gapping” in DP

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Abstract
This paper argues that the gapping-like constructions in the nominal domain (Nominal Gapping: NG) and regular gapping constructions seen in clauses (Verbal Gapping: VG) show quite different properties. First, VG obeys the Coordination Constraint but NG does not. Second, in terms of locality, NG allows free embedding but VG does not. Third, the scope properties exhibited in VG are not seen in NG. Forth, so-called cross-conjunct binding, which is sometimes taken as a strong piece of evidence for the Across-the-Board movement analysis of VG, is not seen in NG in the same way as in VG, even in the environments where locality requirements for Across-the-Board movement are met. We argue that the derivation of NG does not involve Across-the-Board movement. Instead, NG is best analyzed as involving ellipsis.

Keywords
Gapping, Verbal Gapping, Nominal Gapping, NP-Ellipsis, Across-the-Board movement
1. Introduction

In the literature, it has been observed that there are gapping-like constructions in the Determiner Phrase (Abney 1987) in which the head noun is omitted (Chaves 2005, Jackendoff 1971, Johnson 1994, 2006, Lobeck 2007, Neijt 1979, Nerbonne, Iida and Ladusaw 1989, Nerbonne and Mullen 1998, Postal 2004, Yoshida 2005). One of these cases is exemplified by (1a). In the second conjunct of (1a), the head of the noun phrase, book, is omitted, while two other constituents in the DP are left intact, with these two constituents contrastively focused. Despite the missing head noun in (1a), the basic interpretation of this sentence is the same as in (1b), where all the elements in the DP of the second conjunct are present:

(1) a. John read [\([\text{DP Bill’s book of poems}]\) and [\([\text{DP Mary’s of music}]\).]


This type of construction in (1a) shows a surface resemblance to the so-called Gapping construction in the clausal domain (first discussed in Ross 1967). Exemplified in (2), gapping constructions omit the head of the VP in the second conjunct, while leaving the two arguments intact.

(2) a. John wrote this book and Mary, that book.

b. John wrote this book and Mary wrote that book.

Let us call the construction in (1a) Nominal Gapping (NG), i.e. Gapping in nominal phrases (Chaves 2005, Postal 2004, Yoshida 2005). The construction in (2), traditionally called Gapping, we refer to as Verbal Gapping (VG), i.e. Gapping in verbal phrases. For the sake of exposition, we call the second conjunct of (1a) or (2a), where the noun book
or the verb wrote is gapped, the gapped constituent and the first conjunct, which is serving as the antecedent of the gapped constituent, the antecedent constituent. In addition, the elements left in the gapped constituent, which are called the remnants, contrast with the corresponding constituents (typically marked by emphatic stress) in the antecedent constituent, which are called the correlates.

Following Jackendoff (1971), NG is standardly analyzed as a variant of “Gapping” (Culicover and Jackendoff 2005, Jackendoff 1971, Lobeck 2007). This raises the possibility that both NG and VG are derived through Across-the-Board (ATB) movement, as proposed for VG by Johnson (1994, 1996/2004, 2000, 2006, 2009). The plausibility of ATB movement analysis of NG is supported by several similarities between the two constructions, as reported by Jackendoff (see section 4 for a detailed discussion). Furthermore, the ATB analysis of VG predicts that Gapping should be possible in environments where ATB movement is licit. The coordination of NPs within the DP is one such environment, suggesting that an ATB analysis might be warranted.

The central goal of this study is to demonstrate that, in contrast to any superficial similarity, the basic properties of NG differ substantially from those of VG. An investigation into the characteristics of NG leads us to claim that NG must be distinguished from VG and that it cannot result from any sort of typical ATB-movement. Instead, we claim that NG is derived through the ellipsis of Noun Phrase (NP) or Number Phrase (NumP), following movement of the remnant.\(^2\,3\)

1. Differences Between VG and NG

1.1 The Across-the-Board Movement Analysis of VG
VG is distinguished from other elliptical constructions by a number of characteristics. Here, we will focus on four prominent characteristics by comparing it with Verb Phrase Ellipsis (VPE). We contrast VG with VPE instead of other similarly comparable constructions because the properties of VPE make it an informative foil to VG. The first distinguishing characteristic of VG is that it is applied across a restricted class of sentential connectives. While VG is most acceptable with coordinators like *and* or *or*, it is less acceptable when appearing with subordinators such as *that, because, though,* and *while* (Jackendoff 1971, Johnson 1996/2004, Neijt 1978, 1979, Ross 1967). This restriction is sometimes called the *Coordination Constraint* (Kennedy 2001). The following examples illustrate this point (throughout this paper, we use the strikethrough to indicate the gapped elements):

(3)  
   a. John ate pizza and/or Mary ate pasta.  
   b. *John ate pizza because/while/if Mary ate pasta.*

In contrast, VPE freely occurs both in coordinate constructions, as in (4), and in subordinate constructions, as in (5).

(4)  
   a. John ate pizza and/or Mary did too.  
   b. John ate pizza but Mary didn’t.

(5)  
   a. John ate pizza before/while/if Mary did.  
   b. Some will eat nattoo today, because others had yesterday.

Second, neither the gap nor the antecedent constituents may be embedded within finite clauses within their conjuncts, as in (6a) and (6b) (Johnson 1994, 2006, 2009, Neijt 1979). However, as long as the antecedent and the gapped constituents are not separated
by a finite clause boundary, they may be freely embedded, as in (7). We call this constraint the *non-embedding constraint.*

(6) a. *John read those books and she claims that others read these magazines.*
   b. *John said Peter read those books, and Sally read these books.*

(7) a. John is sure that Mary eats beans and Peter meat.
   b. John wants Bill to give Pat flowers and James wants Bill to give Sam flowers.

In contrast, VPE is not subject to this constraint. The examples in (8) demonstrate that either the antecedent or the elided VP can be inside an embedded clause:

(8) a. Mittie ate nattoo, and I thought that Sam did eat nattoo too.
   b. Chuck thought that either Mittie had eaten natto or Liz had eaten natto.

Third, negation and modals that appear in the antecedent constituent in VG scope over the gapped constituent (Lin 2000, McCawley 1993, Oehrle 1987, Siegel 1984, 1987). For example, modals in VG can scope over the entire coordinate structure: (9a) may be interpreted as (9b). Similarly, (10a), where the negation and the verb are gapped, is interpreted as in (10b), where the negation takes wide scope over both conjuncts.

(9) a. James must finish his paper and Sally must finish her book.
   b. It both must be the case that James finishes his paper and Sally finishes her book.
   c. James must finish his paper and Sally must finish her paper too.

(10) a. Ward can’t eat caviar and Sue can’t eat beans.
   b. It’s not the case that [Ward can eat caviar and Sue can eat beans].
c. Ward can’t eat caviar and Sue can’t eat caviar either.

The wide scope of negation in the VG context can be further supported by the interaction of negation and the interpretation of *or*. As has been reported in the literature, when the negation and the verb are gapped in the gapped constituent and coordinated by the connective *or*, the negation scopes over *or*. As a result, *or* is interpreted conjunctively in the VG context (Johnson 1994, 2009, Van Oirsouw 1987, Schwarz 1999). Thus, (11a) is interpreted conjunctively, and the disjunctive interpretation is degraded.

(11)  
   a. John hasn’t seen Harry or Bill Sue.  
   b. John has not seen Harry *and/or* Bill has not seen Sue.

(Schwarz 1999: 362)

However, in the non-gapped counterparts of (9a), (10a) and (11a) as well as the VPE examples in (9c) and (10c), such wide-scope negation/modal interpretations are not seen, as these operators take scope within each conjunct.

Finally, VG allows the so-called cross-conjunct binding (Johnson 1996/2004, Kennedy 2001, Lin 2000): the subject in the antecedent constituent can bind (and thus c-command) the subject in the gapped constituent but not the subject of a non-gapped conjunct.

(12)  
   a. Not every girl\textsubscript{1} ate a green banana, and her\textsubscript{1} mother (*ate) a ripe one.  
   b. *Not every girl\textsubscript{1} ate a green banana, and her\textsubscript{1} mother did too.

These properties have motivated the Across-the-Board (ATB) movement analysis initially proposed by Johnson (1996/2004). The contrasts between VPE and VG strongly suggest that VG is not a variant of VPE; if VG had the derivation of VPE, we would not
expect these differences between VG and VPE that we have seen so far. These properties of VG do not follow from a clausal ellipsis analysis, either. It is well known that the clausal ellipsis (e.g. in sluicing) and its antecedent can be separated by a clause boundary (Ross 1969). As Coppock (2001) and Kennedy (2001) argue, it is possible to assume that the size of conjunct is restricted to VP or vP in the case of VG, as VP/vP cannot be embedded and can presumably be connected only by coordinating connectives. However, it is not clear whether such a construction-specific stipulation should be granted or not. So far, the most successful analysis that can capture all these properties of VG is the ATB movement analysis proposed by Johnson (1994, 1996/2004, 2000, 2006, 2009). Thus, we adopt the ATB analysis of VG in this study.

(13b) is the derivation of VG under the ATB (VP-movement) analysis.

(13) a. No one will eat beans and his friend eat rice.

b. \[
\begin{array}{c}
\text{TP} \\
\text{DP} \\
\text{no one} \\
\text{will} \\
\text{eat} \\
\text{beans} \\
\text{and} \\
\text{his} \\
\text{friend} \\
\text{eat} \\
\text{rice} \\
\end{array}
\]

Under this analysis, VG does not involve an ellipsis process. Instead, the appearance of the gap arises from the ATB movement of the VPs out of the conjoined vPs to the specifier of a higher functional projection PredP. Prior to the ATB movement, the second remnant \textit{rice} and the second correlate \textit{beans} have raised rightward from their respective
VPs (evacuating movement in Vicente’s (2010) terms (see Jayaseelan (1990) for the related discussion)), thereby remaining in their respective conjuncts. In addition, the subject of the antecedent constituent moves to Spec TP, and the subject in the gapped constituent remains in Spec vP. As Johnson (2009) notes, this analysis is able to explain several aspects of VG. The Coordination Constraint follows because ATB movement is only possible in coordination structures (Bošković and Franks 2000, Hornstein and Nunes 2002, Munn 1993, 1999, Williams 1978). Cross-conjunct binding follows as well. The subject of the antecedent constituent moves to Spec TP, a position from which it c-commands the coordinate structure, including the remnant subject in the gapped constituent. Finally, modals and negation are predicted to be able to take wide scope, as they would c-command the entire coordinate structure as well as the ATB-moved VP, which lands in Spec PredP.

Even though the ATB-VP-movement analysis can capture many of the key properties of VG discussed so far, the non-embedding constraint does not seem to follow. VG structures are derived by the ATB movement of the VP from a position within each conjunct to a higher landing site, Spec PredP. However, as discussed by Huang (1993: 107) and Takano (1995), the movement of VP in English can be long-distance.

(14)  
a.  [VP Criticize himself], John thought Bill would not t_{VP}.  
b.  [VP Talk to friends of each other], they said we should not t_{VP}.  

Thus, the ATB VG analysis incorrectly predicts that it is possible for a VP from an embedded clause to feed ATB-VP-movement, and that VG can be applied across subordinated clauses, contrary to the fact. Note that the ATB-head-movement analysis,
which is an earlier implementation of the ATB analysis (Johnson 1994, 2000), captures the non-embedding constraint quite elegantly: head-movement is bounded to a finite clause in English due to the Head Movement Constraint (Baker 1988, Travis 1984) or Relativised Minimality (Rizzi 1990), and thus VG, which is assumed to involve head-movement, is also bounded to a finite clause. Johnson’s most recent analysis (2009) does not have a clear solution to this problem. However, because the landing site of VP-movement is PredP, we speculate that it is possible that this locality effect of Gapping follows from the distribution of PredP and the properties of remnant VP-movement.

2. NG is Different from VG

In this section, we show that NG presents characteristics markedly distinct from those four characteristics of VG discussed above.

First, in contrast to VG, NG does not respect the Coordination Constraint. NG can be applied freely across coordinators and subordinators.⁶ For example, the gapped DP is acceptable inside complement clauses and adverbial clauses:

(15)  a. John will read Bill’s book of music and/or Mary’s book of poems.

b. John’s book of music will be published because/if Mary’s book of poems is successful.

The acceptability of NG in non-coordinate constructions is problematic for an ATB analysis in that, in general, constructions purported to involve ATB movement obey the Coordination Constraint. For example, in the canonical case of ATB movement, ATB wh-fronting in non-coordinate conjunctions are unacceptable, as illustrated in (16) below.

An ATB movement analysis of NG must therefore provide an explanation for this
apparent exception to the Coordination Constraint.

(16)  a. Which car did Peter bought t_{which car} and James sell t_{which car}?
    b. *Which car did Peter buy t_{which car} because/if James sold t_{which car}?^7
    d. *Who t_{Who} buys a new car because/if t_{who} sold the old one?

Second, the types of movement that would be required in an ATB movement analysis of NG are generally illicit in English. An ATB analysis of (17a) is given in (17b).

    b. [TP John read [XP Bill’s _1 [YP [NP book]_2 [DP t_1 t_2 of poems] and [DP Mary’s t_2 of music]]]]

As shown in (17b), the NP, book, ATB-moves out of the conjoined DPs to the specifier of some functional projection above the coordinated DPs. In addition, Bill’s, which stays in the specifier of the antecedent constituent, also raises out of the coordinate structure to another functional projection above that occupied by the NP book. However, the movement required in the derivation in (17b) is problematic for two reasons. The genitive Bill’s has raised from the specifier of a DP, a type of movement known as Left Branch Extraction, which is considered illicit in English (Ross 1967). Additionally, NP movement that strands a DP specifier does not appear to be licit in English. As illustrated in (18), the NP books of poems cannot be the focus of it-clefting, nor can it be wh-moved to the exclusion of the DPSpecifier Mary’s. Thus, the types of movement required in an ATB analysis of NG are not licensed in English.

(18)  a. John read Mary’s books of poems.
    b. *It was books of poems that John read Mary’s.
c. *Books of which poems did John read Mary’s?

The same point can be made with the examples in (19).

(19) a. [John read Bill’s books of music] and

[she says [CP that Susan read Mary’s books of poems]].

b. [John met [a man [who read Bill’s books of music]]] and

[Sally met [DP a girl [CP who read Mary’s books of poems]]].

c. [John read [Mary’s books about [Sue’s proof of this theorem]]] and

[Sally read [DP Bill’s books about [David’s proof of that theorem]]].

In these NG constructions, the gap and the antecedent have been embedded in a variety of constructions: verbal complement clauses, embedded coordinated clauses, relative clauses, and DPs. In these constructions, the DP coordination analysis demonstrated in (17b) clearly is unavailable. Instead, it appears that it must be TPs that are coordinated, from which Bill’s in Spec DP and the NP books have raised out. This entails that the matrix subject and the verb in the antecedent constituent must also raise out of the TP coordinate structure to precede Bill’s and books. Just as with the examples in (17), it is not clear where the landing sites of the ATB-moved NP and other accompanying movements would be in the examples in (19). Taking (19a) as an example, the analysis of NG under ATB NP-movement must be as follows:
The NP *books* must ATB raise from the coordinate structure to some higher functional projection, and, consequently, other elements, including *Bill’s* in Spec DP, the matrix subject and the verb of the antecedent constituent must also raise from the coordinate structure. Again, as with (17a), the ATB movement of *Bill’s* requires left branch extraction of *Bill’s* and NP extraction from under the DP specifier, both disallowed movements in English.

The derivation of examples like (19b) and (19c) raises a further issue for an ATB analysis. They require that the NPs *books* and *proof* escape the relative clause and adjunct islands in the course of movement out of the coordinate structure. As we saw above, leftward movement of these NPs appears to be impossible, even in scenarios in which the movement would not violate island constraints. The point here is to simply note that the ATB analysis of NG would also require that this movement violate island constraints in
certain cases, an operation which is not possible for other types of ATB movement, e.g. ATB wh-questions, which respect islands constraints (Munn 1993, Ross 1967).

A third point that argues against the ATB analysis of NG is that the scope of quantifiers interacts with NG in a manner distinct from that in VG. As we have seen in the examples in (9) and (10), negation and modals in the antecedent constituent of VG can scope over the gapped constituent. These facts follow from the structural position that the modals and negation take within the ATB analysis: c-commanding both the antecedent constituent and the gapped constituent. It is difficult to find exactly the parallel structure in DP because in many cases the nominal domain does not involve modals or negation. However, if we assume that numerals are generated above the core NP projection (Lobeck 1995, Ritter 1991) in the same way as negation and modals in clausal projections, and if VG and NG have the same ATB-movement derivation, it is expected that numerals can be shared by the two conjuncts in NG. Constructing the right test case, however, requires some consideration of the semantics of the coordinated nominals. For instance, in an example like (21), each conjunct refers to a distinct set of individuals: the books of music and the books of poems both belong to Mary, and it is rather difficult to understand that there are three things that are simultaneously books of music and books of poems.

(21) Mary’s three books of music and books of poems.⁹

As such, it is more plausible to assume that an example like (21) involves the coordination of DPs. Interestingly, in this type of example, a salient interpretation is that the numeral three modifies only the first conjunct;¹⁰ thus, the total number of books is
four or more. Such an interpretation suggests that this type of example indeed involves DP-coordination, with the numeral trapped inside the first conjunct DP. Therefore, examples like (21) do not serve as a good testing ground for the ATB nominal gapping hypothesis, which requires small conjuncts.

On the other hand, in an example like (22), the most salient interpretation is that there is a set of three things (e.g. Mary’s son’s involvement with car theft, drug dealing and criminal gangs) that serve both as the problems that Mary has with her son and the reasons for her depression.

(22) Mary’s three problems with her son and reasons for her depression

This interpretation is most likely to be associated with the coordination of the predicates denoted by the NPs. Thus, the “gapping” counterpart of an example like (22) is just the kind of example to test the ATB nominal gapping hypothesis. To achieve a canonical gapping-like string, we need an example where the head noun is omitted and two remnants remain in the second conjunct, something like (23). In such examples, if an ATB derivation is available, it should be associated with the NP-coordination structure, and, consequently, the numeral should be able to scope over both of the conjuncts.

(23) a. Mary’s three reasons for anger and her husband’s reasons for depression.
   b. Mary’s three simplest reasons for smiling and best reasons for laughing

In (23a), the genitive phrase and the object PP are remnants, and in (23b) the superlative adjective and the object PP are remnants. In both of the examples, the “three in total” interpretation is not available (e.g., one in which there are three things that serve both as Mary’s reasons for anger and her husband’s reasons for depression, such as their debt,
their mortgage and their failing marriage), whether the head noun is gapped or not. Instead, either the “more than three reasons” interpretation or “six reasons in total” interpretations are available; the “three reasons in total” interpretation is not possible, i.e., the numeral *three* applies only to the first conjunct or applies to the both of the conjuncts separately (We consulted 13 native speakers of English and they all agreed with this judgment). While NP coordination, in general, is clearly possible, as illustrated in (22), the available interpretation of sentences like those in (23) suggests that NP coordination, the very structural configuration instrumental to an ATB analysis, is not available in the context of NG.

Fourth, although NG does exhibit cross-conjunct binding, there are reasons to suspect that this is not due to a small conjunct coordination configuration but instead due to independent reasons. It is illustrated in (12) that in VG, cross-conjunct binding is possible only when the verb in the second conjunct is gapped (Johnson 1996/2004). However, as example (24) shows, cross-conjunct binding is possible in DP regardless of whether the head noun in the second conjunct is gapped or not. Although these examples are complex, their acceptability seems to be clear.

(24) Not every doctor’s knowledge of tax law or his accountant’s (knowledge) of medicine is reliable.

Furthermore, cross-conjunct binding is available even if the head noun in the second conjunct is embedded inside another DP, as in (25), or even in non-coordination contexts, as in (26). Again, the examples are complicated, but many speakers do not report an acceptability difference between the gapped and the non-gapped examples.\(^\text{12}\)
(25)  a. Not every doctor₁’s knowledge of tax law or his₁ accountant’s comments about the doctor’s (knowledge) of tax is useful.

       b. No semanticist₁’s opinion of syntacticians’ attitudes towards morphology and his₁ students’ opinion of phonologists’ (attitudes) towards sociolinguistics were both expressed inappropriately.

(26)  [No parent]₁’s attitude toward politics should bias [DP his₁ children’s (attitude) toward religion].

If the explanation for cross-conjunct binding in NG were that a c-command relation between the binder and the bindee exists only when the head noun in the second conjunct is gapped, the cross-conjunct binding in non-gapped DP coordination would remain a mystery. Instead, the “cross-conjunct binding” facts in NG can be explained by appealing to the well-know exception to the c-command condition on binding: the so-called specifier binding effects (Hornstein, 1995, Reinhart, 1987). That is, when a quantified DP appears in the specifier of a DP, it is allowed to bind a pronoun outside the DP even though the Spec DP does not c-command the constituent outside the DP, as in (27)

(27)  a. Every boy₁’s mother thinks he₁ is a genius.  (Reinhart 1987:155)

       b. Every senator₁’s portrait is on his₁ desk.  (Hornstein 1995: 108)

The cross-conjunct binding cases in NG can be understood as one of these cases of specifier-binding phenomena. Therefore, as far as NG is concerned, cross-conjunct binding does not provide a good piece of evidence for the ATB analysis (or the size of the conjuncts), i.e., the cross-conjunct binding facts do not support the analysis that smaller constituents such as NPs are coordinated in NG.
In sum, NG contrasts with VG in terms of the Coordination Constraint, the non-embedding constraint, scope properties and cross-conjunct binding. Given that the ATB movement analysis of VG is motivated by these four properties, it is not plausible to extend the same analysis to NG. So it is most reasonable to assume that NG has a different derivation from VG.

3. Toward an Analysis of Nominal Gapping

The striking differences between NG and VG point to the conclusion that NG and VG have different derivations. We argue that NG arises from movement of the remnant followed by ellipsis. Specifically, we argue that the complement prepositional phrase (PP) undergoes movement and adjoins to NP, NumP or other functional projections in DP, and the ellipsis process targets a segment (Chomsky 1986, May 1985) of the category to which the moved phrase is adjoined. Similar analyses, utilizing ellipsis of the segment of the category, have been proposed by Hornstein (1994) and Merchant (2000) for Antecedent Contained Deletion in VPE contexts. A sample derivation is given in (28):

(28) a. John’s books of music and Mary’s books of poems

In this analysis, the PP moves rightwards and adjoins to NP. Johnson’s (2009) ATB VP-movement analysis of VG also has the similar component of moving the object out of the ATB-moved VPs (the evacuation movement in Vicente’s (2010) terms).
Evidence for rightward movement of the complement PP comes from the observation that the preposition cannot be omitted under NG:


As Jayaseelan (1990) points out in his discussion on the similar restriction on VG, the ban on preposition omission can be easily captured if the remnant in the gapped constituent undergoes rightward movement as rightward movement in general (as in examples of Heavy NP Shift (HNPS) in (30)) does not allow preposition stranding (Pesetsky 1995, Ross 1967).

(30) a. I talked t1 yesterday [pp about the man I recently met]1.
    b. *I talked about t1 yesterday [dp the man I recently met]1.
    c. [dp A student t1] came to see me yesterday [pp with long outrageous hair]1.
    d. *[dp A student with t1] came to see me yesterday [dp long outrageous hair]1.

If, on the other hand, the remnant PP in NG undergoes leftward movement, which generally allows P-stranding in English, as the examples in (31) show, it would be unclear why the omission of the preposition is not possible under NG, i.e., the PP containing the trace of the moved NP could be elided together with the larger NP.

(31) a. [dp Which man]1 did you talk about t1?
    b. [dp What branch of physics]1 are you a student of t1?

Based on these observations, we conclude that NG involves NPE following rightward movement of the PP-remnant.

The ellipsis analysis of NG predicts that NG and NPE, which both involve ellipsis of NP, would have similar distributions. Indeed these two constructions show a strong
parallelism. For example, both NG and NPE can be applied across coordinators and subordinators and can be freely embedded as we have seen in (15) and (19). Furthermore, their licensing conditions overlap perfectly. The following examples indicate that where NPE is legitimate, NG is also legitimate.

(32)  a.  *All

The books are new, and all books (of music) are on sale.

b.  Demonstratives

Mary likes those books of poems, but I like these books (of music).

c.  Numerals

Mary bought some new books of poems and I like these six books (of music) the best.

d.  Genitives

John read Mary’s book of poems, and Bill’s book (of music) as well.

On the other hand, where NPE is not licensed, NG is not licensed, either. Typical examples involve determiners and attributive adjectives.

(33)  a.  Determiners

*John read the/a/every book of music and Mary read the/a/every book (of poems).

b.  Adjectives

*John read Mary’s long book of poems and Bill’s short book (of music).

Additionally, if the attributive adjectives are in the superlative form, both NPE (Panagiotidis 2003) and NG can be licensed, as in (34).
Superlative adjectives


b. John read Mary’s most interesting book of poems and Bill’s most boring book (of music).

The third parallelism has to do with the distribution of numerals in the context of NG and NPE. That is, exactly like NPE, the ellipsis in NG can contain numerals:

(35) John read David’s three books of music and Mary’s (three) books of poems.

In such cases, we assume that the ellipsis targets functional projections such as Number Phrase (NumP) (Lobeck 1995, Ritter 1991) within DP. In the case of (35), we further assume that the remnant PP is adjoined to the NumP and the lower NumP segment is elided. The derivation is as follows:

(36) a. John’s three books of music and Mary’s three books of poems

b. Support for this NumP ellipsis derivation, as we have discussed earlier, comes from the interpretation of the numerals (see fn. 10). As we have seen, in these NumP ellipsis examples, numerals can apply to each conjunct separately. Thus, even though the numeral is elided together with NP, it is interpreted in the gapped constituent.

Given these striking parallelisms between NG and NPE, the simplest conclusion
is that NG is a type of NPE, involving NPE following the rightward movement of a remnant PP.

4. Conclusions

Based on the detailed comparisons between NG and VG on one hand, and NG and NPE on the other, we have argued that NG does not involve the Across-the-Board movement of NP (or N-head). This conclusion is supported by the sharp contrast between NG and VG in terms of the Coordination Constraint, the non-embedding constraint, scope properties and the possibility of cross-conjunct binding. The striking similarities between NG and NPE, on the other hand, indicate that NG involves ellipsis that follows the rightward movement of the complement. This conclusion immediately raises two questions. The first question is concerned with where the similarities between NG and VG come from (see Jackendoff 1971 for the similarities between NG and VG). As has been noted in the literature, both VG and NG seem to show the following properties: the gapped constituent must follow the antecedent constituent (37), and these constructions are less acceptable with more than two remnants (38).

 b. John *(read) this book and Mary ok(read) that book.

(38) a. John’s present of towels to Susan and Bill’s present of towels to Diana.
 b. *John’s present of towels to Susan and Bill’s present of flowers to Diana.
 c. John gave towels to Susan and Bill gave towels to Diana.
 d. *John gave towels to Susan and Bill gave towels to Diana.
These similarities have originally motivated the position that NG is an instance of Gapping constructions and have the same derivation as VG (Jackendoff 1971). From what we have shown so far, we do not expect such similarities. It is, however, well-known that backward ellipsis is tightly constrained in English. It is sometimes argued that backward ellipsis follows a constraint like the so-called Backward Anaphora Constraint (BAC) (Langacker 1969, Ross 1969, Sag 1976, among others). The constraint can be stated roughly as follows: the constituent that contains the ellipsis site (the ellipsis constituent) may not c-command the antecedent constituent. Thus, this constraint predicts that if the ellipsis constituent does not c-command the antecedent constituent, it may precede the antecedent constituent. This is exactly the case for NPE, as illustrated in (39).

(39)  
  a. John’s *(book) was successful while Mary’s ok(book) was not.  
  b. While John’s ok(book) was successful, Mary’s ok(book) was not.

If NG involves NPE, this predicts backward NG to be acceptable provided that the gapped constituent does not c-command the antecedent constituent, see (40):

(40)  
  a. John’s *(book) of music was successful while Mary’s ok(book) of poems was not.  
  b. While John’s ok(book) of music was successful, Mary’s ok(book) of poems was not.15

Thus, under an NPE analysis of NG, the restricted distribution of backward NG can be attributed to a general constraint on backward ellipsis. On the other hand, an ATB analysis of NG cannot accommodate this distribution, as a backwards gapped constituent must c-command the antecedent constituent in this analysis. The ban on backward VG
naturally follows from the ATB analysis as long as the Coordination Constraint and the non-embedding constraint follow from the ATB analysis.

The other similarity between NG and VG, that no more than two remnants are allowed in the gapped constituent, can be understood as a tendency in English focus and ellipsis constructions: as the number of foci increases, the examples become more difficult. This can be illustrated with multiple sluicing in English. While two focused constituents are allowed, three focused constituents are degraded.

(41)  a. John gave something to someone, but I don’t know what to whom.

b. *Someone gave something to someone, but I don’t know who, what, to whom.

It is not clear what principle lies behind this restriction (see Culicover and Jackendoff 2005 for relevant discussion); we can understand it as one of the general properties of focus constructions and not specific to Gapping. Thus, restrictions on the number of remnants do not support the position that VG and NG have the same derivation.

The other question is about the analysis of Gapping-like constructions in general: does NG (among other gapping-like constructions) have the ATB movement derivation in a coordination structure where all the locality conditions are met? If we adopt the ATB-head-movement analysis of VG, one possible explanation of the impossibility of ATB derivation of NG is as follows. Even though verbs in English move (Johnson 1991, Koizumi 1995, Koopman and Szabolcsi 2000, Runner 1995, Zwart 2001), nouns do not, and thus the N-raising derivation for NG is not possible. It has long been argued that English does not have overt N-raising, unlike Romance languages (Cinque 1995, Longobardi 1994). Although the N-raising in English is proposed for semantically light
nouns (e.g., thing or one; Kishimoto 2000), full lexical nouns still remain in their base N position. Furthermore, the properties of adjectives in light-noun constructions indicate that there is no N-movement even for light-nouns in English (Larson and Marusic 2004). Adopting this conclusion, it naturally follows that it is impossible to derive NG through the ATB movement of head nouns. If N does not move in English DP, it does not move in the coordination environment, either. Therefore, the only possible way to derive NG is ellipsis following the movement of the remnant.\(^\text{16}\) It is not clear, however, whether this reasoning can be extended to ATB-phrasal-movement, as it is not clear whether movement of NP inside DP can be independently motivated or not.
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1 There are studies on similar constructions in other languages, for example Demonte (1999), Ticio (2005) and Vicente (2007) on Spanish. However, to the best of our knowledge, there is no thorough investigation of NG in English in the literature.


3 The differences between VG and NG have also been touched on in Yoshida (2005) and Chaves (2005).

4 We have to note that the ATB analysis is not free from problems. For example, Siegel (1984, 1987) notes that examples like (12a) can have an interpretation in which the
coordination is taking the wide scope (i.e., $\neg \Box p \land \neg \Box q$). Both Lin (2000) and Repp (2009) note that for this interpretation, clausal coordination is required, and this is not expected from the ATB-analysis (see Repp (2009) for the details).

5 This violates the Coordinate Structure Constraint (CSC) (Ross 1967). However, Johnson (1996/2004) and Lin (2000) show that A-movement may violate CSC.

6 Jackendoff (1971) reports that NG is not acceptable in embedded clauses. In order to check the generality of the acceptability of embedded NGs, we consulted 15 native speakers of English, and they all accepted examples in (15) and (19). Therefore, we conclude that NG in the embedded context is generally acceptable, but this may be subject to individual or generational variability.

7 Example (16c) could be construed as an example of a parasitic gap (PG), which would then be unacceptable due to the independent constraint on PGs that tensed because-clauses or if-clauses are low in the hierarchy of the environment where parasitic gaps are licensed (see Engdahl, Elisabet. 1983. Parasitic Gaps. Linguistics and Philosophy 6:5-34.). However, examples like (16d), where a PG analysis is impossible, due to an anti-c-command condition violation (Engdahl 1983, among others), are still unacceptable. If ATB-movement were possible in these environments, examples like (16d) should still be acceptable, but not. Thus ATB movement is not possible in these environments.

8 Examples like (19b) and (19c) are particularly problematic for an ATB head-movement analysis. Johnson (1994, 2000) proposed that VG results from the ATB movement of the head verb but not of the VP. Applied to NG, this ATB head-movement analysis predicts
examples like those in (19) to be unacceptable, as the movement of the head noun in such configurations must violate the Head Movement Constraint (Baker 1988, Travis 1984) or Relativized Minimality (Rizzi 1990).

9 An anonymous LI reviewer pointed this out. We thank the reviewer for raising this important point.

10 Note that there are speakers who also have an interpretation where the numeral is interpreted within each of the conjuncts, yielding a “six in total” interpretation.

11 This example was provided by an anonymous LI reviewer.

12 We consulted 10 native speakers of English for the judgment of (25) and (26). For (25a), 7 out of 10 native speakers accepted it and 3 did not. For (25b), 8 accepted and 2 did not. For (26), 8 accepted and 2 did not.

13 If we assume that the NG involves ellipsis after the movement of the complement PP, the complement PP can move rightward and adjoin to NumP, as demonstrated in (36). It is also possible that the complement PP moves rightward and adjoins to DP, which is evidenced by the interpretation of the following phrase:

(i) John’s three books each about music and about poems

The example in (i) can mean six books, with three of them about music and another three of them about poems. This interpretation supports the following derivation:

(ii) \[\text{DP John’s } [\text{NumP three } [\text{NP books each [PP about music]}]]] \text{ and } \[\text{DP Mary’s } [\text{NumP three } [\text{NP books [t]}]] [\text{PP about poems}]].\]

14 A similar analysis incorporating the rightward movement is employed by Johnson
(2009) for the analysis of Pseudogapping. Pseudogapping, indeed, shows very similar distribution to NG (e.g., they can be embedded freely, etc.).

15 Note that this example is intended to indicate that dropping either, but not both, of the Ns is acceptable.

16 This conclusion implies that if the availability of overt N-raising is the crucial factor for the possibility of the ATB movement analysis of NG, it is expected that a language that has overt N-raising (e.g., Spanish, Italian, French and other Romance languages) may have NG derived through the ATB movement derivation.
List of figures

(13)  b.

```
TP
  /\ 
 /   /
/     /
DP    T
      \ 
      /  
    T'   
    /    
  /     
PredP
  /    
  /     
  VP   Pred'
  /     
  /     
  eat   
  /     
  /     
  t     
  /     
  /     
  Pred 
    /    
    /    
    vP   &P
    /    
    /    
    vP   &
    /    
    /    
    vP   vP
    /    
    /    
    t    v
    /    
    /    
    vP   friend
    /    
    /    
    DP   v
    /    
    /    
    VP   VP
    /    
    /    
    eat   eat
    /    
    /    
    t    t
    /    
    /    
    DP   DP
    /    
    /    
    rice   rice
```
(36) b.

```
DP
  /\  
/   \ /
DP   &P
  |   |
DP   DP
  |   |
D'   D'
  |   |
NumP &
    |   |
DP   DP
  |   |
D   D'
  |   |
NumP &
    |   |
DP   DP
  |   |
D   D'
  |   |
NumP NumP
    |   |
NP   PP
   /   |
   |   |
    N PP
   /   |
   |   |
    books of music
    /   |
    |   |
    Num three NumP
    /   |
    |   |
    NP PP of poems
    /   |
    |   |
    Num three
    /   |
    |   |
    N books
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