

“Gapping” in DP?

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1. Introduction

Since Ross (1967, 1970), there has been extensive research on Verbal Gapping (VG):

- (1) a. Max ate the apple and Sally the hamburgers.
- b. Max ate the apple and Sally ate the hamburgers.

In (1a), the verb in the second conjunct *ate* is deleted but this sentence has the same interpretation as (1b), where *ate* is present.

Jackendoff (1971) noticed a gapping-like construction that exists in nominal phrases:

- (2) a. Bill’s story about Sue and Max’s about Kathy both amazed me. (Jackendoff, 1971:27)
- b. Bill’s story about Sue and Max’s story about Kathy both amazed me.

In (2a), the noun in the second conjunct *story* is absent but the sentence has the same interpretation as (2b), where *story* is not absent. We call the construction in (2a) Nominal Gapping (NG).

For the sake of exposition, we use the following terminology in describing VG and NG. Take (1a) as an example. We call the first conjunct the antecedent constituent and the second conjunct the gapped constituent. Within the gapped constituent, the elements that remain intact (*Sally* and *the hamburgers*) are called remnants. Within the antecedent constituent, the elements that correspond to the remnants (*Mary* and *the apple*) are called correlates. The same set of terms also applies to NG (2a).

VG and NG exhibit three similarities. First, in both VG and NG, remnants carry contrastive focus (we use small capitals to indicate focus).

- (3) a. Alan played poker and BETSY CANASTA. (Sag, 1980: 192)
- b. John read Bill’s book of poems and MARY’S ~~book~~ of MUSIC¹.

Second, both of them allow at most two remnants (Jackendoff, 1971; Johnson, 1996/2004; Sag, 1980).

- (4) a. *Alan gave Sandy a book and Peter ~~gave~~ Betsy a magazine. (Sag, 1980: 196)
- b. *Mary was surprised by John’s present of towels to Susan and Bill’s ~~present~~ of flowers to Diana.

Finally, in both VG and NG, “gapping” does not take place in the first conjunct (Sag, 1980).

- (5) a. *Peter ~~played~~ first base and Alan played left field. (Sag, 1980:191)
- b. *John read Bill’s ~~book~~ of Music and Mary’s book of poems.

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¹ In this paper, we use the strikethrough to indicate the deleted word.

These similarities have supported the position that VG and NG have the same type of derivation (for example, Jackendoff (1971) and Yoshida (2005)). Despite these similarities, however, this paper argues that, VG and NG have different derivations. Regarding VG, we assume Johnson's (1994, 1996/2004, 2000, 2009) Across-the-Board (ATB) movement analysis, which has been shown to successfully capture many peculiar properties of VG. We show, on the other hand, that NG displays characteristics distinct from VG, and that the ATB movement cannot derive the properties of NG.

2. The ATB movement analysis of VG

Before discussing NG, let us first review the prominent properties of VG, and how Johnson's (1994, 1994/2004, 2000, 2009) analysis can capture these properties.

First, VG is acceptable when the antecedent constituent and the gapped constituent are connected by coordinators like *and* or *or*, but unacceptable when they are connected by subordinators such as *that*, *because*, *though*, *while* (Jackendoff, 1971; Johnson, 1996/2004; Neijt, 1978, 1979; Ross, 1967 among others).

- (6) a. Some ate nattoo today, and others ~~ate~~ natto yesterday.
 b. *Some ate nattoo today, because others ~~ate~~ natto yesterday. (Johnson, 1996/2004: 24)

Second, neither the antecedent constituent nor the gapped constituent may be embedded within finite clauses (Johnson 1994, 1996/2004, 2009; Neijt, 1979).

- (7) *Some had eaten mussels and she claims that others ~~had eaten~~ shrimp. (Johnson, 2009: 293)

Third, negation and modals that appear in the antecedent constituent in VG scope over the gapped constituent, as well (Johnson, 1996/2004; Lin, 2000; McCawley, 1993; Oehrle, 1987). For example, the modal in (8b), which appears in the left conjunct, can be interpreted as scoping over the second conjunct. The negation in (9a), which appears in the first conjunct, can scope over the entire coordinate structure, as (9a) can be interpreted as (9b).

- (8) a. One man must get the majority of votes and the other ~~must~~ win the election.
 b. It both must be the case that one gets the majority of votes and the other wins the election. (Johnson, 1996/2004: 25)
- (9) a. Kim didn't play bingo and Sandy ~~didn't~~ sit at home all evening.
 b. It's not the case that [Kim played bingo and Sandy sat all evening] (Johnson, 1996/2004: 25)

Fourth, VG exhibits the so-called cross conjunct binding, that is, the subject of the first conjunct can bind the pronoun in the second conjunct. Meanwhile, this binding relation is not available if the verb is not gapped in the second conjunct.

- (10) a. No₁ woman can join the army and her₁ girlfriend ~~can join~~ the navy. (Johnson, 2009: 297)
 b. *No₁ woman can join the army and her₁ girlfriend can join the navy.

The properties of VG that we discussed above are nicely captured by Johnson (1994, 1996/2004, 2000, 2009) Across-the-Board (ATB) movement analysis, which is, by far the most successful analysis. Under the ATB analysis, the structure of VG is as illustrated in (11b).

3. NG is different from VG

This section shows that NG exhibits differences from VG. Specifically, we show that the prominent properties of VG discussed are not all shared by NG. These differences lead us to the conclusion that the ATB movement analysis cannot apply to NG.

First, although the VG is not acceptable when the two conjuncts are connected by subordinators, NG is acceptable in both coordination and subordination.

- (13) a. I like John's books of poems and/or Bill's ~~books~~ of painting.
 b. John's books of poems are very popular although Bill's ~~books~~ of painting are not.

This poses a problem for Johnson's ATB movement analysis since ATB movement only can take place in coordination instead of subordination.

Second, in contrast to VG, NG can be freely embedded. As illustrated in the following examples, NG can be embedded in the complement clause of a verb (14a), in a relative clause (14b) and in another DP (14c).

- (14) a. [John read Mary's story about Rome] and [he says [_{CP} that Susan likes Bill's ~~story~~ about Greece]].
 b. [John talked to [a boy [who read Bill's books of history]]] and [Sally talked to [a girl [_{CP} who read Mary's ~~books~~ of philosophy]]].
 c. [I have read [Mary's draft about [Sue's proof of this theorem]]] and [Sally has read [_{DP} Bill's draft about [David's ~~proof~~ of that theorem]]].

This non-locality property of NG raises a serious problem with ATB analysis. Under Johnson's ATB movement analysis of the NG example like (14b), the movement of *books* must cross a relative clause island (Ross 1967). Similarly, in an example like (14c), the movement of *proof* must cross a specific DP, which is also an island in English (Fiengo and Higginbotham, 1981; Davies and Dubinsky 2003 among many others). Additionally the extraction of the NP (*painting*) out of the DP (*Mary's painting of the mountain* or *Tom's painting of the river*) is not allowed in English, as illustrated below:

- (15) a. I read Jim's books of dancing.
 b. *It was books_i that I read Jim's t_i of dancing.

Third, NG is different from VG in terms of the way that functional elements in the antecedent constituent interact with the gapped constituent. Although it is impossible to find modals and negation in coordinated DPs we can assume that numerals are in a functional category generated above the core NP projection in the same way that modals and negation are generated above the core VP projection (Lobeck, 1995; Ritter, 1991). Thus we can make use of the interpretation of numerals in DP to test the prediction of the ATB analysis. In contrast to (8) and (9), where modals and negation in the antecedent constituent of VG can scope over the gapped constituent, the numeral in NG applies to each conjunct separately. For example, the sentence in (16a), where *three* in the second conjunct is deleted, has the same interpretation as (16b), where the numeral is not deleted.

- (16) a. John read David's three books of music and Mary's ~~three books~~ of Poems.
 b. John read David's three books of music and Mary's three books of poems.

Fourth, while VG exhibits the so-called cross-conjunct binding and this binding relation depends on gapping of the verb in the second conjunct. NG is different from VG in that a quantifier in the first conjunct scopes over a pronoun in the second conjunct, whether the noun in the second conjunct is deleted.

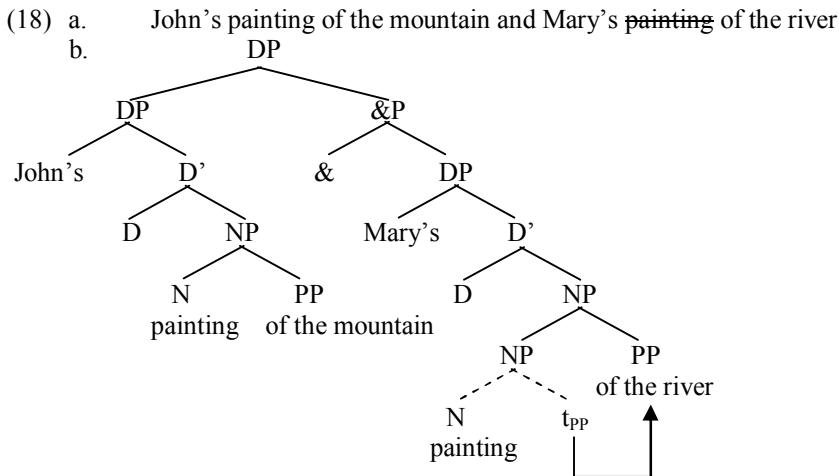
- (17) a. Not every doctor₁'s knowledge of tax law or his₁ accountant's of medicine is reliable.
 b. Not every doctor₁'s knowledge of tax law or his₁ accountant's knowledge of medicine is reliable.

These binding facts are not predicted from the ATB analysis. Instead, these binding facts can be explained by the so-called specifier binding effect (Hornstein, 1995; Reinhart, 1976): quantifiers that appear in the specifier position of a determiner phrase can bind a pronoun outside of the determiner phrase, even though the quantifier does not c-command the pronoun.

This section shows that NG is different from VG in terms of four properties. In contrast to VG, NG is acceptable across subordinations, and it can be embedded. Additionally, functional elements in the first conjunct of NG do not scope over the second conjunct and the so-called cross conjunct binding is available regardless of whether the noun in the second conjunct is deleted. All these properties of NG prevents from applying Johnson's ATB movement analysis to NG.

4. The ellipsis analysis of NG

Since the previous section argues that NG cannot be derived through ATB movement, we suggest that NG can be derived through ellipsis. Specifically, the remnant moves rightward and adjoins to NP, NumP or other functional projections. Then the ellipsis process deletes a segment of the category to which the moved constituent adjoins (Chomsky, 1986; May, 1985). The ellipsis analysis has been applied to VG in previous studies (Jayaseelan, 1990; Lasnik and Saito, 1991). The following is an illustration of the ellipsis analysis of NG:



Under this analysis, NG and another ellipsis process, Noun Phrase Ellipsis (NPE), are predicted to have a similar distribution. This prediction is confirmed as the licensing environments of these two processes overlap. First, when NPE is legitimate, NG is also legitimate.

- (19) a. *All*
 The books are new, and all ~~books~~ (of poems) are on sale.
 b. Demonstratives
 John read these books of painting, but I like those ~~books~~ (of music).
 c. Numerals
 John bought two books of painting and I bought five ~~books~~ (of painting).
 d. Genitives
 He has read Susan's book of painting, and Bill's ~~book~~ (of music) as well.

Moreover, superlative adjectives that license NPE (Panagiotidis, 2003) also license NG:

- (20) a. John read Mary's longest book of poems and Bill's shortest ~~book~~ (of music).
 b. I like reading Mary's most interesting book of poems and Bill's most boring ~~book~~ (of music).

Second, where NPE is not licensed, NG is not licensed, either.

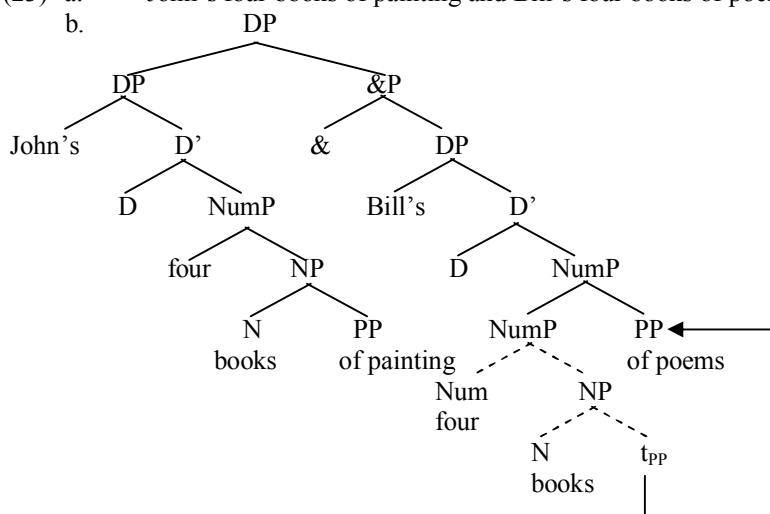
- (21) a. Determiners
 *John found a/the/every book of painting and Mary found a/the/every ~~book~~ (of music).
 b. Adjectives
 *John likes Susan's long book of poems and Mary's short ~~book~~ (of music).

Third, both NPE and NG can target functional elements like numerals in nominal phrases.

- (22) John read David's three books of music and Mary's (three) ~~books~~ of poems.

We assume that numerals head a projection Number Phrase within nominal phrases. To explain the derivation of the (22), the remnant PP moves rightward and adjoins to NumP and the lower segment of NumP is deleted. This derivation process is illustrated in (23) below.

- (23) a. John's four books of painting and Bill's ~~four books~~ of poems
 b.



Further support for the ellipsis of NumP comes from the interpretation of the numerals in (23), where the numeral *four* is interpreted within each constituent.

Given the overlapping licensing environments of NPE and NG, this section concludes that NG and NPE are derived through the same mechanism, that is, ellipsis followed by the rightward movement of the remnant.

5. Revisiting the similarities between VG and NG

Finally, let us revisit the similarities between VG and NG. So far we have argued that unlike VG, NG involves ellipsis. However, this raises a question of how to account for the similarities between VG and NG mentioned in Section 1. There are at least two similarities to be explained. First, at most two remnants are allowed in the gapped constituent. This similarity arises from a general tendency in English that multiple foci are not preferred in environments that involve deletion. For example, in the sluicing environment (24a), two *wh*-phrases are allowed but three *wh*-phrases will degrade the sluicing construction considerably (capital letters indicate focus).

- (24) a. I know that in each instance one of the girls bought something for one of the boys.
But [WHICH] [FOR WHICH]? (Bolinger, 1978: 109)
- b. ?*I know that in each instance one of the girls bought something for one of the boys
at a one of the gift shops. But [WHICH] [FOR WHICH] [WHERE]?

Second, in both VG and NG, gapping cannot take place in the first conjunct, in other words, backward ellipsis is prohibited. We suggest that this similarity can be captured by the so-called Backward Anaphora Constraint (BAC). (Langacker, 1969; Ross, 1967, 1969). This constraint dictates that anaphoric elements (including deleted elements) may not simultaneously command and linearly precede their antecedents. This constraint is illustrated by the contrast between the following two sentences:

- (25) a. Penelope is intelligent, and Algernon too.
- b. *Penelope too, and Algernon is intelligent. (Langacker 1969: 170-171)

Assuming that BAC is correct, both backward NPE and backward NG should be possible as long as BAC is satisfied. This is confirmed by the following examples:

- (26) a. John's book of music was successful while Mary's ~~book~~ (of poems) was not.
- b. *John's ~~book~~ (of music) was successful while Mary's book of poems was not.
- c. While John's book of music was successful, Mary's ~~book~~ (of poems) was not.
- d. While John's ~~book~~ (of music) was successful, Mary's book of poems was not.

In case of VG, since VG cannot be embedded and cannot be applied across subordination, backward VG is always unacceptable.

6. Conclusion

This paper demonstrates that NG does not exhibit any of those properties that motivate the ATB movement analysis of VG. Based on this contrast, we argue that NG is derived through ellipsis, instead of the ATB movement. This means that the kind of gapping which is derived through the ATB movement as in VG does not take place in Determiner Phrases. One question raised by this paper is why ATB movement is not available in nominal phrases in English but available in verb phrases. One potential explanation is that in English, verbs can move (Johnson, 1991; Koopman and Szabolcsi, 2000) but nouns cannot (Larson and Marusic, 2004). Therefore, although VG can be derived through the ATB verb movement, it is impossible to apply the ATB noun movement to NG.

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