

Construction after Construction

Abstract

D136a

The NPN construction, exemplified by *construction after construction*, *day by day*, *point for point*, *face to face*, and *book upon book*, presents a complex mixture of idiomaticity and productivity. The basic issue is how its properties are represented in the lexicon and the grammar. A detailed consideration of these properties leads to the conclusion that this construction can be accounted for only in a theory of grammar that (a) takes the "periphery" of language as seriously as that of the "core"; (b) recognizes constructions as theoretical entities; (c) does not make a strict separation between the grammar and the lexicon, but rather recognizes a continuum of regularity between words and rules; and (d) recognizes the autonomy of syntax from semantics and vice versa.

1. Introduction

When investigating the character of the language faculty, it is useful to explore not only the most robust grammatical phenomena, but also the quirky corners of the grammar, where strange little beasties lurk. The present paper is a brief exploration of a very minor piece of English syntax, a “syntactic nut” in the sense of Culicover 1999: the NPN construction, exemplified in (1).

- (1) construction after construction
day by day
point for point
face to face
book upon book

Aspects of this construction have been commented on before (Williams 1994; Pi 1995; Postma 1995; Oehrle 1998; Jackendoff 1997, 2002; Huddleston and Pullum 2002; Matsuyama 2004). A somewhat fuller exposition proves worth undertaking for the light it sheds on issues of greater interest. These issues include:

- The relation between the lexicon and rules of grammar. Mainstream generative grammar (e.g. Chomsky 1981, 1995), treats the lexicon as distinct from the grammar, following the lead of Bloomfield (1933, p. 274): “The lexicon is really an appendix of the grammar, a list of basic irregularities.” Alternative traditions such as HPSG (Pollard and Sag 1994), Construction Grammar (Fillmore, Kay, and O’Connor 1988; Goldberg 1995), “Usage-Based Grammar” (Tomasello 2003) and “concrete minimalism” (Culicover 1999, Jackendoff 2002, Culicover and Jackendoff forthcoming) view the distinction between words and rules as far more flexible, in fact constituting a continuum (Williams 1994 mentions the NPN construction in the course of an argument to this effect). The facts of the NPN construction will support the latter view.
- The nature of “constructions”. Mainstream generative grammar claims that constructions such as the passive and subject-auxiliary inversion have no special status in the grammar, but rather are fortuitous outcomes from the interaction of very general processes. The alternative construction-based traditions claim that not all the constructions of language can be captured in this fashion, and at least some must be in large part stipulated. (In turn, these traditions differ in whether they think *all* language is built up out of constructions.) The facts of NPN will support the latter view.
- The autonomy of syntax from semantics and vice-versa. Mainstream generative grammar claims that semantic structure is derived compositionally on the basis of the meanings of words, via some level of syntactic structure such as Logical Form which canonically encodes meaning uniformly and invariantly across languages. Conversely, some versions of Cognitive Grammar (Langacker 1987) and Construction Grammar claim that essentially all syntactic structure is predictable on the basis of meaning relations. The NPN construction will be used to show that both these views are mistaken (at least if they are

making any sort of empirical claim rather than asserting a dogma). Instead, the syntax provides grammatical frames, each of which can be used to express various patterns of meaning; conversely, the same pattern of meaning can often be expressed in terms of unrelated syntactic frames.

This is a lot of weight to put on a little construction. Let's see how it goes. First we have to look at the data. This section will offer a brief overview, and section 2 will plunge us into far greater detail.

On the face of it, the examples in (1) have totally nonstandard syntax; later on, we will argue that appearances are not deceiving. Yet, as observed by Williams 1994, the NPN construction is not just a collection of idioms with nonstandard syntax, along the lines of the examples in (2).

- (2) by and large
for the most part
all at once
all of a sudden
far be it from NP to VP

Rather, one can create new examples on the spot such as *construction after construction*, *century to century*, and so forth. That is, the construction has some of the traditional symptoms of grammatical productivity. Thus classical generative grammar would want to consider the examples in (1) as being generated by a rule that captures their common form.

Here are some of the facts that such a rule would have to capture.

- The overwhelming majority of these examples have two identical nouns: **man for boy*, **day after week*, **inch by foot*. However, a few idiomatic cases, which have to be listed in the lexicon, do have non-identical nouns, for instance

- (3) cheek by jowl
hand over fist
head over heels
hand in glove
tongue in cheek
hand to mouth²

²Coinages with non-identical nouns are possible if they have clear intended analogues: I recall a science fiction story in which a human and an alien, romantically involved, walk off at the end *hand in pseudopod*, the phrase clearly intended as a joke. A reader has reminded me of the famous e.e. cummings poem "anyone lived in a pretty how town", which contains coinages such as *when by now*, *tree by leaf*, *bird by snow*, and *if by yes*. See section 3 for more discussion.

We will also see below some variants of the construction that permit non-identical nouns.

- The nouns cannot be mass nouns (4) (with certain exceptions – see section 2.4.4); they are not allowed to have determiners (5), plurals (6) (again with exceptions), or postnominal modifiers (7) (with one exceptional case shown in (8), to which we will return in section 2.3).

- (4) *water after water
*dust for dust
- (5) *the man for the man
*a day after a day
*some inch by some inch
- (6) *men for men
*books after books
*weeks by weeks
- (7) *father of a soldier for father of a soldier
*day of rain after day of rain
*inch of steel pipe by inch of steel pipe
- (8) day after day of rain
[*but* *inch by inch of steel pipe]

- Many prepositions are totally impossible in the construction:

- (9) *house between house
*teacher above teacher
*foot under foot
*book with book

And some such as *from*, *over*, and *in* occur only in isolated idioms.³

- (10) a. (tear NP) limb from limb
but *leg from leg
- b. hand over hand; hand over fist
but *foot over foot; *fist over fist; *finger over finger
- c. hand in hand; arm in arm; hand in glove; tongue in cheek
but *tentacle in tentacle; *hook in hook; *piece in piece (*as in a puzzle*)

Only five or six prepositions yield relatively productive classes of expressions in which the choice of N is fairly free: *to*, *by*, *for*, *after*, and (*up*)*on*.

³It is possible to “stretch” to some of the starred examples, and indeed many of them can be found with a Google search. I will comment on this in section 3.2.

- The construction appears in adjunct positions in the clause: presententially (11a), after the subject (11b), and in VP after the complements (11c). It can also appear in an NP, in the position normally occupied by a prenominal adjective (11d). *N after N* and *N (up)on N* furthermore can appear in positions characteristic of NPs (11e-g).

- (11)
- Page for page, this is the best-looking book I've ever bought.
 - John and Bill, arm in arm, strolled through the park.
 - We went through the garden inch by inch.
 - Your day-to-day progress is astounding.
 - Student after/upon/*by student flunked. [subject]
 - We filled crack after/*by crack. [object]
 - We looked for dog after/*by dog. [object of PP]

- Prenominal adjectives are only minimally possible. When they are possible, they can occur before the second noun alone or before both nouns (12a,b); in the latter case the two adjectives must be identical (12c). A prenominal adjective cannot occur before the first noun alone (12d). However, prenominal adjectives are not possible at all when the whole construction is used prenominally.

- (12)
- (miserable) day after miserable day
 - (painful) inch by painful inch
 - *miserable day after awful day
 - *painful inch by inch
 - *her inch-by-painful-inch progress

These are the overall regularities of the construction.⁴ However, within these constraints, the construction fractionates into limited pockets of productivity, mixed inextricably with relatively idiomatic cases (Williams refers to these pockets as “subfamilies” of the construction). As noted above, many of the general conditions on the construction have exceptions here and there among the subfamilies. Moreover, it will be seen that certain subfamilies show relationships to still other idiomatic constructions; for example *N after N* is semantically very close to *one N after another*, which proves to have distinct syntactic properties (section 2.3). Thus the overall texture of the construction is that of a “family resemblance” à la Wittgenstein. This is not unprecedented: Goldberg and Jackendoff 2004 argue that the resultative construction in English

⁴Just for fun, we can embed one NPN construction as a prenominal modifier inside the other:

- Coast-to-coast scandal by coast-to-coast scandal, we eagerly watched the demise of the government's credibility.

And in a related grammatical tour de force, a billboard on Boston's Southeast Expressway in summer 2002 proclaimed:

- Go from bumper to bumper to face to face!

similarly fractionates into subconstructions.

To establish this texture, we must enumerate a fairly exhaustive list of the possibilities. We will go through the productive and semi-productive subfamilies one by one [*sic*], with attention to the syntactic and semantic possibilities for each.

2. Details of the constructions, preposition by preposition

2.1. N by N. Consider first *N by N*. It appears to have three senses. The first is represented by the single idiom *side by side*, which denotes juxtaposition of two entities in a particular orientation. Semantically it fits into a paradigm with the NPN expressions *face to face*, *back to back*, and so on, which we treat in section 2.4.3.

The other two senses are regular and productive. The first expresses some sort of succession:

- (13) piece by piece
bit by bit
day by day
layer by layer
house by house

We can get a sense of the productivity of this frame by inventing perfectly good novel examples such as (14).

- (14) We went through the reptile house snake by snake.
We examined the moon crater by crater.

This subconstruction has the pronominal form *one by one*, which denotes succession in the usual way (15a); other numerals can be used pronominally as well (15b).

- (15) a. We looked at the houses in New Orleans one by one.
b. The animals came in two by two.

Thus, “succession” *N by N* is quite productive and regular in meaning.⁵ A semantically related construction is *one N at a time*, which we will mention in section 2.3.

The other sense of *N by N* is definitely a syntactic and semantic outlier. It is used for measure expressions, where each noun is a numeral or a numeral plus noun. Unlike more typical

⁵We might also mention the idiomatic *little by little*, which has the characteristic succession sense but conjoins two quantifiers. Note that instead of the parallel **more by more*, we have *more and more*.

NPN constructions, the nouns may be plural and need not be identical. Moreover, dimensional adjectives can get into the act (16c,d), and three elements can be connected by two *bys* (16c). (16d) shows that in prenominal position, plural is excluded.

- (16) a. a two hundred by four hundred (entry/pixel) matrix
- b. The room is/measures three (feet) by four (feet).
- c. three feet long by ten inches wide (by half an inch thick)
- d. a two-inch(*es) (high) by four-inch(*es) (wide) hole

2.2. N for N. The principal meaning of this subconstruction appears to invoke two or more sets whose members are being aligned. This alignment in turn is used as a basis for comparison of the sets as a whole. It seems totally productive, given appropriate pragmatics.

- (17) a. Snake for snake, this is the best reptile house in the world.
- b. Dollar for dollar, you get your best value at Shmendrick's Department Store.
- c. This article, line for line, has more mistakes in it than the one I published last year.
- d. the font-for-font superiority of the graphics in the old version of WordPerfect

Pragmatics gets you only so far, though. Suppose the Wellesley debating team is all women and the Harvard debating team is all men. It's still impossible to say the pragmatically plausible (18a), and we are forced into reducing all participants to a common category (18b). That is, *N by N* in this reading requires identical nouns.

- (18) a. *Woman for man, Wellesley's got the better debating team.
- b. Member for member/Student for student, Wellesley's got the better debating team.

The other productive use of *N for N* is related to the *for* of exchange, illustrated in (19) (Jackendoff 1990).

- (19) sell/buy/rent/obtain the car for \$5000
- pay \$5000 for the car
- punish Bill for his insolence
- reward Bill for his good deeds

This use of *N for N* pertains specifically to the exchanges of sets of objects that have been put in equivalence in the same way as in comparison *N for N*.

- (20) a. Gandia and Qumar exchanged prisoners man for man.
- b. a line-for-line/point-for-point rebuttal of the argument
- c. The opponents matched each other insult for insult.
- d. We substituted a new version of the text line for line.
- e. a syllable-for-syllable replacement that improved comprehensibility

In the special case of *numeral-for-numeral*, the two numerals can be unequal:

- (21) a three-for-two swap of prisoners

Finally there is the special case of *word for word*, which expresses an exact matching in the reproduction of a text, as in (22).

- (22) I bet you can't learn/recite *Syntactic Structures* word for word.
a word-for-word translation

Here the notions of comparison and exchange are lacking, and only the matching of sets remains. This use does not extend comfortably to other plausible cases such as **I learned the speech paragraph for paragraph* or **a syllable-for-syllable imitation*. The closest approximation to the desired meaning uses *by*: *I learned the speech paragraph by paragraph; a syllable-by-syllable imitation*. Thus *word for word*, unlike the other cases of *N-for-N*, appears to be idiomatic.⁶

2.3. N after N; N (up)on N

N after N poses fewer problems of semantic fractionation: it always denotes a succession of *Ns*, either temporal (23a) or spatial (23b). Although *volume* is not a time period, (23c) suggests a temporal progression through the series.

- (23) a. Day after day, alone on a hill, the man with the foolish grin is keeping perfectly still.
b. Telephone pole after telephone pole stretched along the road toward the horizon.
c. This series of books on Imperialist Grammar is totally boring, volume after volume.

As seen in (23b), the spatial succession with *after* is characteristically in a horizontal direction,

⁶The above statement pertains to my own speech, but there are evidently individual differences. A Google search yields a few examples like these:

- (i) I can recite their liturgy syllable for syllable to this day.
(ii) ...take an Ella Fitzgerald solo and learn it syllable for syllable
(iii) They know the Qur'an word by word, syllable for syllable
(iv) I do wonder exactly how this work would read if read backwards, paragraph for paragraph.
(v) All you can do is read out word for word, sentence for sentence and paragraph for paragraph someone else's ideas.

Notice that in (iii) and (v) the usage is clearly motivated by a desire to extend *word for word* (although, perversely, (iii) uses *word by word*). My own strong preference would be to use *by* in these examples, in contrast with (20e), in which *for* is perfect; I have not undertaken a survey of speakers. See discussion in section 3.2.

away from the speaker's point of view.

N (up)on N also expresses spatial succession, but vertically and upward (24a,b). Note that this sense is also preserved metaphorically: compare (24c) to (24d) with *after*.

- (24) a. Layer (up)on layer of mud lay on the seabed.
b. We threw brick upon brick onto the pile.
c. She scornfully piled up argument (up)on argument against my position.
d. She scornfully produced/??piled up argument after argument against my position.

These differences no doubt arise from the ordinary meanings of *after* and *on*, which stereotypically denote horizontal and vertical alignment respectively.

In addition to this "succession" reading of *N (up)on N*, shared with *N after N*, there are two other uses. Pi 1995 points out a special use of *N (up)on N* that permits unlike plural nouns, and with the meaning of unexpected large quantity, though not necessarily in succession. The best cases are with numbers (25a), but other possibilities occur (25b), where the nouns are understood as measuring or quantificational. The second noun, if different, must be in some sense more excessive than the first (25c,d):

- (25) a. Hundreds upon thousands of demonstrators converged on the Capitol.
b. Rachel spilled cups upon buckets of paint in her studio.
c. *thousands upon hundreds of demonstrators
d. *buckets upon cups of paint

This particular use of *upon* finds a close parallel in the use of *Ns and Ns* to mean 'lots of Ns':

- (26) a. Hundreds and hundreds/thousands of demonstrators converged on the Capitol.
b. Rachel spilled buckets and buckets of paint in her studio.

The other special case is the idiomatic *one on one*, denoting juxtaposition of opposing players or interlocutors. Aside from these two cases, no special idiomatic examples have come to my attention. "Succession" *N after N* is by far the more robust sense of this subconstruction, and I will concentrate on it in the rest of this section.

As mentioned in section 1, what differentiates these two from all the other cases of NPN is their syntax. All the other cases appear in positions characteristic of adjuncts: presententially, after the subject, after the arguments in VP, and prenominal. However, as can be seen in (11e-g), (23b), and (24), *N after/upon N* can occur as subject or object, in the position normally occupied by NP. (27) gives a more systematic comparison between *N after N* and analogous

cases of “succession” *N by N*.⁷

- (27) a. a day-after day horror
 a day-by-day horror
 b. We crawled on, mile after mile.
 We crawled on, mile by mile.
 c. Day after day, we suffered.
 Day by day, we suffered (more). [subtle meaning difference here?]
 d. Mouse after mouse emerged from the hole. [subject]
 * Mouse by mouse emerged from the hole.
 Mouse by mouse, the little monsters emerged from the hole.
 e. We filled crack after crack. [object]
 * We filled crack by crack.
 We patched the wall crack by crack.
 f. We looked for dog after dog. [object of preposition]
 *We looked for dog by dog.
 We looked for the dogs one by one.
 g. ?Artist after artist’s worst work was praised in the Times. [possessive NP]
 *Artist by artist’s worst work was praised in the Times.
 Artist by artist, the impressionists’ worst work was praised in the Times.

Another syntactic difference from *N by/for N* is that *N after N* can be freely iterated:

- (28) day after day after day
 page after page after page after page
 ?day by day by day
 *page for page for page

Perhaps the most striking difference, though, is that *N after N* can take postnominal complements and modifiers characteristic of NPs (this is noticed by Huddleston and Pullum 2002, 634, n. 15).

- (29) We endured day after day of rain.
 We looked at picture after picture by Renoir of his wife.
 Country after country that I had never heard of before condemned the US invasion.
 We demolished argument after argument for the war.

⁷Huddleston and Pullum 2002 (p. 633, note 15) observe this difference between *N after N* and the other cases. However, they claim that only temporal nouns can appear in the adjunct positions characteristic of the other NPN constructions: they cite *day after day* but **quarrel after quarrel*. The examples throughout this section show that this is not the case, and I find the following example perfectly acceptable: *Quarrel after quarrel, they somehow manage to remain friends*.

Page after page of tattered, fraying paper with the notations of a bean counter spill from the Archives. (Stefan Fatsis, *Word Freak*, 94)

However, this is possible only when *N after N* is used in an NP position; elsewhere it is ungrammatical (30), paralleling other cases of NPN. (I have taken care to make the examples pragmatically plausible.)

- (30) We endured the cold, day after/by day (*of rain).
Picture after/by picture (*by Renoir of his wife), we see the growth of the artist's style.
We compared the documents, page after/for page (*of the first volume).
Country after/by country (*that I had never heard of), the UN representatives condemned the US invasion.
We traveled country to country (*of Asia).
[n.b.: We traveled [country to country] in Asia]

Before going on with further properties of *N after N*, it is useful to digress a moment to discuss two closely related constructions *one N after another* and *one N at a time*. The former appears to have the very same meaning as *N after N*; the latter is very close to succession *N by N*. They both allow complements to the noun, even in adjunct position:

- (31) We endured the cold, one day of rain after another/one day of rain at a time.
One picture by Renoir after another, we see the artist's attention to detail.
We compared the documents, one page of the volume after another/at a time.
? One country that I had never heard of after another/at a time, the UN representatives condemned the US invasion.

Alternatively, the complements and modifiers can be placed at the end of the construction, with the flavor of Heavy Shift, as in (32).

- (32) ... one day after another of heavy rain/one day at a time of distressing news
... one picture after another by Renoir
... one page after another of the volume
... one country after another that I had never heard of

One N after another and *one N at a time* both allow a full NP before the preposition, but the former prohibits a head noun or any modification on *another*:

- (33) one very happy child from Siberia after another/at a time
*one happy kid after another kid
*one day after another miserable one [cf. day after miserable day]

After another and *at a time* can sometimes be extraposed as if they were complements or adjuncts of *one N*; this is clearly impossible for *N after N*.

- (34) a. One unhappy kid came in sick after another/at a time.
 b. *Child came in sick after child.

These constructions have the pronominal form *one after another* and *one at a time* (note also *two/three at a time*, paralleling *two by two*); the *N after N* construction has no pronominal form **one after one* that might parallel *one by one*.

Oehrle 1998, Pi 1995, Postma 1995, and Matsuyama 2004 (who all discuss primarily or exclusively *N after N*, not the rest of the NPN constructions) notice that *N after N* in NP positions has the force of a quantified NP, rather like *every N*, except that it denotes universal quantification over a set of indefinite or unbounded size. Here are some of Oehrle's examples. For completeness, I have added examples using *one N after another*, and where possible *one N at a time*, to show that they have similar force.

- (35) a. [Student after student]_i talked about his_i attitudes.
 Every student_i talked about his_i attitudes.
 [One student after another]_i talked about his_i attitudes.
 [One student at a time]_i talked about his_i attitudes.
 b. [Student after student registered for [a course in physics]_i] complained about it_i.
 Every student registered for [a course in physics]_i complained about it_i.
 [One student after another registered for [a course in physics]_i] complained about it_i.
 c. Student after student turned in paper after paper.
 One student after another turned in one paper after another.

Oehrle reads (35c) as having a branching quantifier: there is a succession of student-paper pairs. But there is also another reading, in which one student after another turns in a succession of papers; here the quantification in the subject has scope over that in the object. I find the latter the *only* reading possible in *One student after another turned in paper after paper*.

Like *Q-N*, *N after N* and *one N after another/at a time* can quantify out of a complement of an NP (36a), but not out of an adjunct of an NP (36b).

- (36) a. Teachers of student after student of ours came in with a complaint.
 Teachers of one student of ours after another/at a time came in with a complaint.
 [can be read: for each student, one teacher came in, each with a different complaint]
 Teachers of many of our students came in with a complaint.
 [same reading possible]
 b. *Teachers with student after student of ours came in with a complaint.
 *Teachers with one student of ours after another/at a time came in with a complaint.
 *Teachers with many of our students came in with a complaint.

When *N after N* is an adjunct, it cannot quantify over a singular indefinite. (37-39a,b,c)

are matched as closely as possible, configuration for configuration. Notice that the only syntactic difference is that in (37-39a), *N after N* is the complement of a preposition (hence functioning as an NP), while in (37-39b), *N after N* is a stand-alone adjunct.

- (37) a. Looking at the document even casually, we could see that there was a serious error on page after page/one page after another. [where it's a different error on each page]
 b. * Looking at the document even casually, we could see that there was a serious error, page after page/one page after another. [where it's a different error on each page]
 c. Looking at the document even casually, we could see that there were serious errors, page after page.
- (38) a. From student after student, we've received a serious complaint. [where it's a different complaint for each student]
 b. Student after student, we've been hearing a serious complaint. [only good if it's the same complaint each time]
 c. Student after student, we've been hearing serious complaints.
- (39) a. I was alarmed by his discovery of an error in page after page of the document. [??different error in each page?]
 b. *I was alarmed by his page-after-page discovery of an error in the document.
 c. ?I was alarmed by his page-after-page discovery of errors in the document.

Matsuyama 2004 observes that *N after N* behaves more like a bare plural than like *every N* with respect to aspectuality (and so do *one N after another* and *one N at a time*):

- (40) a. For hours/*In an hour, student after student walked into my office.
 b. For hours/*In an hour, one student after another/at a time walked into my office.
 c. For hours/*In an hour, students walked into my office.
 c. In an hour/*For hours, every student walked into my office.
 [in reading where each student walked into my office once]

Yet, as noted by Pi 1995 and Oehrle 1998 as well as Matsuyama, *N after N* in subject position takes singular agreement, like *every/each N*; so do *one N after another* and *one N at a time*:

- (41) a. Page after page is/*are sprinkled with errors.
 b. One page after another is/*are sprinkled with errors.⁸
 c. One student at a time is/*are bugging me.

Hence there are puzzling mismatches between the surface syntax and the semantics: How does *N after N* acquire quantificational force without an overt quantifier? How does it come to behave semantically like a bare plural and syntactically like a singular NP?

⁸I am told (Moirá Yip, p.c.) that in British dialects where words like *team* can take plural agreement, *N after N* does too: *Team after team are/*is drinking beer*.

2.4. N to N. This is the most tangled of the cases of NPN, and must be picked apart in even more detail.

2.4.1. *Transition N to N*. Let's begin with a case where the two nouns need not be identical, which I will call "transition" *N to N*. This occurs in prenominal position, but in most cases is supplanted by *from...to* in other positions. It denotes a transition over time or space from N_1 to N_2 .

- (42) a. a boy-to-man transition
a rags-to-riches story
the Boston-to-New York commute
cradle-to-grave health care
the syntax-to-semantic mapping
a one-to-many mapping
the Christmas-to-New Year's break
- b. He changed *(from) boy to man in less than six months.
His life altered *(from) rags to riches.
The break lasted *(from) Christmas to New Year's.
*(From) Boston to New York, it took us over eight hours.
*(From) syntax to semantics, not all information is preserved.

A few idiomatic cases allow omission of *from* in postverbal position as well (43a), and *one to one* cannot use *from* at all (43b).

- (43) a. We lived (from) hand to mouth.
b. This function maps syntax to semantics (*(from) one to one.
[but *This function maps syntax to semantics (from) one to many.]
c. This plan protects you (from) cradle to grave.
d. We traveled (from) coast to coast.

2.4.2. *Succession N to N*. The transitions in (42)-(43) are single transitions. Another sense of *N to N* involves iterated transitions or successions. Here the nouns must be identical. This sense is productive with nouns denoting time periods:

- (44) minute to minute; day to day; week to week; millisecond to millisecond; year to year;
century to century

The meaning is paraphrasable roughly by 'successively, from one N to the next.' It can be prefixed with *from* with no change in meaning (except in prenominal position, of course): *from minute to minute; from millisecond to millisecond*, etc.

A related use of *N to N* is in the idiom (*from*) *case to case*, which occurs in all the usual positions, denoting a succession of cases. This idiom can also be calqued with nouns that denote

what it is a case *of*, yielding expressions like (45).

- (45) a. We have to make up our minds on a sentence-to-sentence basis.
b. Adult coloration is highly variable (from) snake to snake. [from Google]
c. (From) situation to situation, conditions change.
d. item-to-item differences/similarities/variation

Another related subcase of the “succession” sense is shown in (46).

- (46) search (from) house to house (= ‘successively from one house to the next’)
travel (from) country to country (= ‘successively from one country to the next’)
sell books (from) door to door (= ‘going successively from one door to the next’)

This succession reading of *N to N* is close in meaning to succession *N by N*. However, an example-by-example comparison (47) reveals semantic constraints that are hard to pin down.

- (47) a. We went through the reptile house snake by/??to snake.
We examined the moon crater by/*to crater.
We took out the garbage bag by/*to bag.
b. We traveled country to/??by country.
Adult coloration is highly variable snake to/*by snake.
c. We searched house to/by house throughout the neighborhood.
His condition keeps improving day to/by day.
We have to make up our minds on a sentence-to/by-sentence basis.

In general, *N by N* appears far more productive. The sense shown in (46) seems happiest in contexts where the nouns denote locations in which something is being sought, and not even then is it happy with all nouns (48c).

- (48) a. We looked house by/*to house at the unusual architecture in New Orleans.
b. We looked house by/to house for traces of the criminals.
c. We looked article by/*to article for examples of the NPN construction.

The upshot seems to be that succession *N-to-N* splits into a number of distinct cases with subtly distinct semantic import. In comparison, succession *N by N* is quite productive and regular in meaning.

On the grounds of examples like these, where *from* is optional, Williams 1994 guesses that the syntax of NPN parallels the compound preposition *from...to*, except that it omits the *from*. In particular, he takes the paraphrase of *day to day* with *from one day to the next* as a significant syntactic relation. However, such a proposal has three problems. First, it does not account for the required identity between the two nouns in most cases of NPN, including succession *N-to-N*, nor for the absence of determiners and plurals. Second, although this paraphrase works for

transition and succession *N-to-N*, it does not work for other cases of *N-to-N*, let alone other *NPN* combinations:

- (49) (fighting) hand to hand ≠
 ‘*(fighting) from hand to hand’; ‘(fighting) from one hand to the next’
(dancing) cheek to cheek ≠
 ‘(dancing) from cheek to cheek’; ‘(dancing) from one cheek to the next’
student after student ≠ ‘from student to student’; ‘from one student to the next’
dollar for dollar ≠ ‘*from dollar to dollar’; ‘*from one dollar to the next’

Third, *N-to-N* occurs in a broader range of syntactic contexts than *from ... to*, in particular in the position of prenominal adjectives (50).

- (50) a. His day-to-day improvement is encouraging.
 b. *His from-day-to-day improvement is encouraging.
 c. *His from-one-day-to-the-next improvement is encouraging.

Thus if anything qualifies as a conditioned reduction of *from...to*, it has to be specifically transition and succession *N-to-N*: it may make sense to think of *from* as obligatorily omitted in prenominal position and present otherwise. But this is not a general solution to *NPN*.

2.4.3. *Juxtaposition N to N*. Another meaning of *N to N* has to do with close contact or juxtaposition of similar parts of similar objects, particularly body parts:

- (51) hand to hand
 cheek to cheek
 face to face
 eye to eye
 toe to toe
 shoulder to shoulder
 back to back
 bumper to bumper
 base to base

Many of these are a bit idiosyncratic in usage. For instance, *hand to hand* is used largely in the context of combat, and *cheek to cheek* in the context of dancing (did the phrase even exist before the Irving Berlin song?). Near neighbors of nouns in (51) are sensed as unusual (even if some of them show up in a Google search – see section 3.2):

- (52) ?foot to foot (cf. *toe to toe*)
 ?finger to finger, *wrist to wrist (cf. *hand to hand*)
 ?arm to arm (cf. *shoulder to shoulder*) (elbow to elbow?)
 ?lip to lip (cf. *cheek to cheek*) [even in pragmatically plausible context of kissing!]

?front to front (cf. *back to back*)

When we move to pragmatically plausible cases that are not human body parts, acceptability drops off more:

- (53) ?*The two envelopes lay on the table flap to flap.
?*The cars sat in the parking lot trunk to trunk.
?*The houses are facing each other, porch to porch.

The juxtaposition reading is further fragmented by irregularities. For example, alongside *back to back* and *shoulder to shoulder*, one might expect *side to side* to denote juxtaposition of two objects with their sides adjacent. The form *side to side* does exist and may be used that way, but its more prominent reading denotes instead oscillatory motion in the transverse plane. Semantically, this reading fits into a paradigm otherwise expressed by *P-and-P*: *up and down*, *back and forth*, *to and fro*, and *round and round*. The sense of juxtaposition expected for *side to side* is more usually expressed as *side by side*, which is itself exceptional in the *N-by-N* class (see section 2.1).

Similarly, as mentioned, *hand to hand* is used primarily in the context of combat. A different juxtaposition of hands appears in *hand in hand*, whose preposition occurs in this construction only in a few other idioms such as *arm in arm*, *hand in glove*, *tongue in cheek*.

2.4.4. *Comparison and contact N to N*. Still another sense of *N-to-N* has to do with comparisons. It allows nonidentical nouns. Unlike all other cases, the nouns can be mass nouns (54c). Rather like transition *N to N*, this occurs *only* in prenominal position (55).

- (54) a. a boy-to-girl comparison
b. a student-to-professor matchup
c. the sulfur-to-kryptonite ratio
d. finger-to-hand proportions
- (55) a. *We compared boy to girl.
We compared boys to girls. [n.b.: *boys to girls* is not a constituent!]
*a comparison of boy to girl
a comparison of boys to girls
- b. We matched student(s) up to/with professor(s)
[*student to professor* is not a constituent]
a matchup of student(s) to/with professor(s)
- c. the ratio of sulfur to kryptonite
[no verbal counterpart]
- d. the proportion of ?(a/the) finger to ?(a/the) hand
[no verbal counterpart]

This reading seems to appear only with a few nouns like those in (54) having to do with

comparison; even close semantic neighbors like *similarity* do not allow it.

- (56) the ratio/similarity of sulfur to kryptonite
the sulfur-to-kryptonite ratio/*similarity

This case, unlike the others, allows *to* to be omitted:

- (57) a boy-girl comparison, a student-professor matchup; the sulfur-kryptonite ratio
*a hand-mouth existence, *a house-house search, *a face-face encounter

Thus “comparison” *N-to-N* presents yet another pattern of syntactic distribution, connected to yet another meaning.

A related case appears with nouns such as *contact*:

- (58) a. blood-to-blood contact; saliva-to-skin contact
b. ??They made contact blood to blood/saliva to skin.
c. the contact of saliva to/with skin; contact between saliva and skin
d. blood-blood contact; saliva-skin contact

Thus comparison and contact *N to N* are productive but their syntactic properties are somewhat different than other NPN constructions.

I think that’s about it for the data. Now we have to ask what to make of it.

3. What’s in the lexicon? What’s in the rules?

It is clear from the fractionated nature of the NPN construction that the grammar cannot just contain a rule that freely generates NPN phrases: there are too many special constraints and special interpretations. Rather, a great deal of idiosyncratic information must be listed in either the lexicon or the grammar. What could this information be, and how is it listed?

3.1. Theoretical options. Under the mainstream Principles and Parameters/Minimalist view of grammar, the “core” rules of grammar are maximally simple and universal, and their variation from language to language is regulated by the settings of a finite number of innate parameters. One can imagine a parameter that regulates whether a language contains an NPN construction at all. Informal inquiry suggests that NPN constructions are found in many languages, for example Dutch (Postma 1995), Japanese (Matsuyama 2004), German, Polish, Russian, and French.⁹ But, pending an amazing coincidence to be revealed by future detailed crosslinguistic research on NPN

⁹Thanks to Heike Wiese (German), Barbara Citko (Polish), Vera Gribanov (Russian), and an NLLT reader (French) for examples.

constructions, along the lines of section 2, it is really hard to believe that the fine details of the English NPN construction, in particular its patterns of productivity and semiproductivity and its syntactic case-to-case variation, are the outcome of setting innate parameters. Thus it is at least highly unlikely that the special information for NPN is listed in terms of innate parameters in core grammar.

Could this information be listed in the lexicon? Under Chomsky's (1965; 1995) view, following Bloomfield 1933 ("the lexicon is really an appendix of the grammar"), the lexicon is a nonredundant list of irregularities, from which all regularities have been extracted as rules of grammar. It is difficult to see how to account for the NPN construction in these terms. The problem is: exactly what does the lexicon list? An idiomatic case such as *hand to hand* is redundant in that (a) it reduplicates the noun, and (b) the meaning is partly predictable from *hand* and the juxtaposition use of *to* in a number of other idioms. But the particulars (e.g. that *hand to hand* is most appropriately used in the context of combat) are not redundant. And the way the particulars are connected to the meaning makes it impossible to just leave the redundant part of the meaning out. Consider: two people may take a walk *shoulder to shoulder* but not *hand to hand*; rather *hand in hand* is appropriate. And when two people fight *hand to hand*, they are presumably in opposition; but if they fight *shoulder to shoulder*, they are presumably in solidarity. How can one compute these inferences without saying they pertain to different kinds of juxtaposition, while at the same time juxtaposition itself is absent from the lexical entries of *hand to hand* and *shoulder to shoulder* on grounds of redundancy? Moreover, if juxtaposition is mentioned in the entry of *hand to hand*, then this entry is no "cheaper" than the exceptional reading of *side to side* that denotes oscillatory motion. In other words, this construction is a significant challenge to the goal of eliminating redundancy from the lexicon.¹⁰

A further aspect of Chomsky's position on the lexicon and the grammar is that the meanings of phrases are built up piecemeal from the meanings of the individual words; there is no such thing as "constructional" meaning. Now consider the productive patterns, for instance *N by N* in the sense of succession and *N for N* in the sense of comparison. Here the meanings of succession and comparison do not come from the ordinary meanings of *by* and *for* (as might be the case with *after* or *upon*), so they must be specified as special meanings of *by* and *for*. But these meanings cannot be specified without stipulating that they occur only in the larger context *NPN*, which is putatively created only by rule, and therefore should not be mentioned in the lexicon. Consider also the fact that *N by N* can only be an adjunct, but *N after N* can also function as an NP, even though they both denote succession. This distinction does not follow from anything, but it cannot be stated as part of the lexical entries of *by* and *after* without mentioning the (rule-governed, and therefore putatively nonlexical) fact that the distinction occurs only in the *NPN* construction and nowhere else.

¹⁰I am aware of no work that actually tries to formalize truly nonredundant lexical entries, despite the many years that this position has been asserted. It is not appropriate here to try to formulate such a position as a straw man.

In short, the mainstream approach cannot admit the NPN construction in either “core” grammar or the lexicon. This leaves only the option that NPN is a rule within the “periphery”. Here are two characterizations of the periphery, 12 years apart:

... each actual “language” will incorporate a periphery of borrowing, historical residues, inventions, and so on, which we can hardly expect to – and indeed would not want to – incorporate within a principled theory of UG. ... [W]hat is actually represented in the mind of the individual ... would be a core grammar with a periphery of marked elements and constructions.

[Chomsky 1981, 8]

For working purposes (and nothing more than that), we may make a rough and tentative distinction between the *core* of a language and its *periphery*, where the core consists of what we tentatively assume to be pure instantiations of UG and the periphery consists of marked exceptions (irregular verbs, etc.). Note that the periphery will also exhibit properties of UG (e.g., ablaut phenomena), though less transparently. A reasonable approach would be to focus attention on the core system, putting aside phenomena that result from historical accident, dialect mixture, personal idiosyncrasies, and the like....

The preceding remarks are largely conceptual, though not without empirical consequences. We now proceed along a particular path [i.e. investigating the core], ..., assuming further empirical risk at each point.

[Chomsky 1995, 19-20; originally in Chomsky and Lasnik 1993]

NPN is definitely “peripheral” in Chomsky’s sense. It is a “marked exception” in the grammar of English, in a sense not like irregular verbs, which also fall into families of subregularities. The present-day form of NPN is presumably a historical accident, or an “invention” – I can’t see that English would be any less “natural” if one or another of the senses of NPN were lacking, or if one of its subconstructions were more or less productive than it is, or if it had yet another sense with another preposition. And NPN “exhibits properties of UG” such as assigning quantifier scope, although “less transparently”, i.e. without an overt quantifier.

So the question is whether it is “reasonable” to focus attention on the core and put aside phenomena like NPN. I would contend that it is not. As Chomsky observes, this is not just a matter of deciding on “conceptual” grounds what to investigate: there are empirical risks in not paying attention to evidence from the periphery. For example, if NPN can act sometimes like an NP and sometimes not, this just might have some bearing on how we think about syntactic categories and the way they satisfy phrase structure constraints. And if NPN acts like a quantified NP without any evident quantifier, this just might have some bearing on how we think about the relation of syntax to semantics. However, PPT/MP gives us no guidance on how to study the periphery, because the methodological judgment has been made that the periphery is for the moment to be set aside.

A framework in which it *is* possible to study the periphery is Construction Grammar

(Fillmore 1988, Fillmore, Kay, and O'Connor 1988, Zwicky 1994, Goldberg 1995), which grows out of the observation that there are numerous offbeat bits of syntax that come with special interpretations, for example:

- (59)
- a. Off with his head! Into the house with you!
 - b. One more beer and I'm leaving. Another incident like this and you're finished.
 - c. How about some lunch? [Hair stylist:] How about a little off the back?
 - d. John drunk? Him in an accident? (I don't believe it!)
 - e. Seatbelts fastened! Everyone in the car!
 - f. The Red Sox 10, the Yankees 3.

Within Construction Grammar, these utterance frames are listed as syntactic constructions that carry with them a piece of interpretation. They all have open variables that can be filled productively: for instance the frame in (59a) stipulates a directional PP, filled productively, followed by *with*, followed by an NP. The utterance types in (59a-c) stipulate a piece of phonology (*with*, *and*, *how about* respectively), but those in (59d-f) have no characteristic phonology, only a syntactic frame and a constructional meaning.

The constructions in (59) are all full utterances and do not embed. However, other meaningful constructions have the structure of ordinary syntactic phrases, for instance the VP constructions in (60) (Goldberg 1995, Jackendoff 1997b):

- (60)
- a. She sang/knitted/cooked her head off. (V pro's head off, 'V excessively')
 - b. She sang/knitted/cooked the afternoon away.
(V NP[time] away, 'spend NP[time] V-ing')
 - c. She sang/knitted/cooked her way into obscurity.
(V pro's way PP, 'go PP, while/by V-ing')
 - d. The car squealed/rumbled/creaked down the street.
(V PP, 'go PP, making V-ing noise')

These too are listed as pieces of syntax with specified interpretations. They all have open variables – including the verb, which uncharacteristically does not determine the argument structure of the VP. (60a-c) stipulate part of the phonology (*head off*, *away*, and *way* respectively); but (60d) has no characteristic phonology, only a syntactic frame and a constructional meaning.

These cases differ from those in (59) only in that their syntactic structure is not *sui generis*: it is the ordinary syntax of VPs. But this cannot be stipulated nonredundantly. For example, one could not somehow say that *away* has a special lexical entry that means 'spend time' without somehow mentioning that this occurs only in the frame (60b) – that is, stipulating the frame that is supposedly not to be mentioned because it is generated by rule. This is precisely the difficulty observed above with the NPN construction.

The solution adopted within Construction Grammar (along with the closely related framework HPSG) is to embrace redundancy in the listing of words and constructions. In order to adopt this position, we must ask for what reasons the lexicon has been thought to be *nonredundant*. One reason is simply custom, stemming from the practice of traditional grammar; but there is no reason for holding customs sacred. More substantial is the argument from learning: the competence grammar should reflect the fact that generalizations are predictable and need not be learned over and over again. One way to instantiate this intuition in the theory is to say, with Chomsky, that the generalizations are listed only once. An alternative approach is to say that learning redundant information is easier – that in some sense it “costs less” to learn it and to store it.

Such an approach is instantiated in HPSG (Pollard and Sag 1994, Ginzburg and Sag 2000) and Construction Grammar (Fillmore and Kay 1993, Goldberg 1995, Michaelis and Lambrecht 1996) in terms of *inheritance hierarchies*: words and rules are organized into taxonomies. A lower element in such a taxonomy by default “inherits” all information from elements above it in the taxonomy. However, it also adds information not present in higher elements and may, exceptionally, contradict or override information present in higher elements. The inherited information is not *left out* of the lower elements – it just can be assumed in learning the lower item unless there is information to the contrary. Alternatively, the higher elements in the taxonomy can be viewed as generalizations from previously learned instances in the lower levels. Learning a taxonomy involves successive layers of generalization over the lower elements, which are acquired more directly from experience (Culicover 1999, Tomasello 2003).

Turning back to the VP constructions in (60), these fall into an inheritance hierarchy as subcases of the syntax of VP. In this respect they are redundant, but in their particulars they are not. In particular, they all override the default treatment of VP in which the verb determines the argument structure.

This approach leads in turn to a startling conclusion (at least from the point of classical generative grammar): the phrase structure rule for the English VP is simply another construction, one with more variables and less meaning. More generally, the inheritance hierarchy for English syntax contains a smooth cline from individual words, through idioms, through specific meaningful constructions, through the most general phrase structure rules. That is, *there is no sharp division between lexical items and rules of grammar*. This is a major departure not only from classical generative grammar (up to and including the Minimalist Program), but also from traditional grammar. This conclusion has been arrived at independently by numerous researchers (e.g. Williams 1994, Culicover 1999, and Jackendoff 2002 as well as HPSG and Construction Grammar). (For the question of how this approach relates to “core” grammar and UG, see Jackendoff 2002, section 6.10; Culicover and Jackendoff forthcoming, sections 1.5-1.6.)

Whether or not one buys into the extension of Construction Grammar to “core grammar” (as argued by its proponents), Construction Grammar offers an attractive approach to a peripheral construction such as NPN, with its *sui generis* syntax. First, we can list all the subfamilies

separately and do not have to worry about squeezing out redundancy. Rather, the appropriate way to deal with their similarities is in terms of an inheritance hierarchy. Second, we do not have to worry whether the principles of NPN belong in the lexicon or in the grammar: there is no sharp distinction, and the members of this construction fall right in the gray area. To be sure, NPN is phrasal, but so are idioms, which have to be listed in the lexicon, and so are all the constructions in (59)-(60). And to be sure, some cases of NPN are productive, depending on the choice of preposition, but so are idioms like *take NP to task* and all the constructions in (59)-(60). In this framework, what it means for a lexical item to be productive is simply that it has a variable in its entry.

3.2. Productive vs. semiproductive generalizations. In order to tackle NPN, there remains an important distinction that forms the centerpiece of Pinker 1999 (see also Jackendoff 2002, chapter 6). Variables within lexical items/constructions can be freely filled, within the bounds of contextual restrictions, yielding *productive* constructions. Speakers freely accept novel cases and know what they mean. This is the situation in the constructions in (59)-(60).

In other situations there is a generalization among individual cases, but one has to learn one by one which instances of the generalization actually exist. In these *semi-productive* constructions, acceptable instances tend to cluster around central cases in family resemblance patterns, and speakers may vary in which particular cases they find acceptable. In addition, speakers may be able to “stretch” to related cases, though often not entirely comfortably. Pinker illustrates this kind of generalization with the numerous patterns of irregular past tense verbs in English. For instance, a substantial number of verbs form past tense by undergoing ablaut, but exactly which ones go with which pattern of ablaut must be learned one example at a time, with hints from phonologically similar examples.

Another such generalization is the family of denominal verbs such as *butter (the bread)*, *shelve (the books)*, *pocket (the money)*, and so on. These are all causative verbs in which the noun is understood as part of a manner, location, or theme expression. But speakers must learn which nouns form denominal verbs (e.g. *butter* does but *mustard* and *mayonnaise* do not), and what meaning(s) a particular denominal verb has (e.g. *dust* can mean ‘put on a dustlike substance such as flour’ and also ‘remove dust from a surface’). At the same time, speakers can “stretch” to new cases they have not heard before, with appropriate contextual support. For instance, in the context of recipes, one can find on Google instances of the phrases *mayonnaise the bread* and *mayo and mustard the bread*. But their numbers are minuscule compared to *butter the bread* (one each versus about a thousand). This situation finds a parallel in semi-productive patterns within NPN: for example Google searches for *hand to hand*, *eye to eye*, *shoulder to shoulder*, and *back to back* yield citations in the hundreds of thousands, whereas *front to front* and *lip to lip* have about 5000 each, and *wrist to wrist* has less than 1000. In other words, in both denominal verbs and juxtaposition *N-to-N*, the ratio of citations for idiomatic vs. “productive” cases is two to three orders of magnitude.

A similar situation appears to exist with the idiomatic isolates within NPN. For instance,

alongside *hand over hand*, one can find *foot over foot* in a Google search. But again the numbers are telling: there are about 28,000 citations of *hand over hand*, and (on the day I did the search) 312 for *foot over foot*. Of the first 50 of these, 12 had to do with stair-climbing, an activity where *foot over foot* makes sense; and another 13 of the 50 occurred in conjunction with *hand over hand*, suggesting a direct analogical extension. Similarly, there were 51 citations of *finger over finger*, and 183 citations of *fist over fist*. Many of the latter were used in the context of making money,¹¹ where I would have said *hand over fist*, of which there were 24,000 citations.¹² The upshot is that we can view both denominal verbs and NPN as moderately productive constructions overlaid with a number of relatively high-frequency idioms, or else as specifically semiproductive constructions.

Pinker suggests that instances of productive generalizations may or may not be listed (for example, psycholinguistic research suggests that high-frequency regular plural nouns in English are listed), but the generalization among them is also present as an explicit rule. In the context of Construction Grammar, the rule is stated as a lexical item with a variable in it. By contrast, Pinker claims that the instances of semiproductive generalizations are simply listed, and the generalizations among them are implicit in memory without being explicitly extracted as “lexical rules.” Jackendoff 2002 adopts a similar position. An alternative possibility for the semi-productive generalizations is that there *are* explicit rules, but they have a different sort of variable in them, say with a feature [semi-productive]. Such a variable can be satisfied only by listed instances and occasional neologisms. In other words, its primary role is as a node in the inheritance hierarchy, but it can under contextual pressure be satisfied by a new item. I am not sure which of these positions is correct, nor whether, perhaps when the appropriate brain science emerges, there will be some different solution altogether. However, for convenience here I will adopt the latter alternative: some variables are marked [productive] and others [semiproductive].

In the context of the NPN construction, we can see that there is a complex interplay of productivity and semi-productivity. The construction as a whole is semi-productive, as one has to learn one by one which prepositions are acceptable. With some prepositions such as *over* and *in*, one further has to learn which nouns are acceptable with them – that is, this region of the construction consists essentially of a collection of idioms. On the other hand, if the preposition is *by*, *for*, *after*, or *upon*, the choice of noun is productive. Still, for each of these prepositions, one

¹¹And quite a few were in the context of an activity that cannot be mentioned in a family publication such as *NLLT*.

¹²Just for a control: there were 79.8 million citations of *hand* alone, 57.7 million of *foot*, and 3.6 million of *fist*. Thus the ratio of *hand over hand* to *hand* was nearly an order of magnitude larger than that of *fist over fist* to *fist*, and nearly two orders of magnitude larger than that of *foot over foot* to *foot*. There are, to be sure, many duplications and spurious cases among the citations of phrases, and I have made no effort to sort these out. I am assuming, perhaps unjustly, that the proportion of this sort of noise in the data is comparable across all cases and can therefore be safely ignored.

has to learn what the construction can mean and the syntactic peculiarities of each meaning. If the preposition is *to*, some of the meanings are productive: transition, succession (with three subtypes), comparison, and contact, which still display syntactic differences from each other and from other NPN subconstructions. However, the juxtaposition reading of *N to N* appears to be semiproductive, a somewhat expandable list of particular known idiomatic instances with idiomatic contexts (e.g. *hand-to-hand* with combat, *cheek-to-cheek* with dancing).

Figure 1 is an attempt at a taxonomy of all the cases discussed in section 2. It is sorted by choice of preposition and within that by meaning. At the bottom of each branch of the taxonomy is a list of the possibilities within that branch. Some possibilities, such as *arm in arm* and *face to face*, are fully listed idioms; some, such as succession *N by N* and transition *N₁ to N₂*, are productive patterns containing variables. Within the inheritance hierarchy, the variables in italics are semi-productive nodes; those in roman are productive.

[Figure 1 about here]

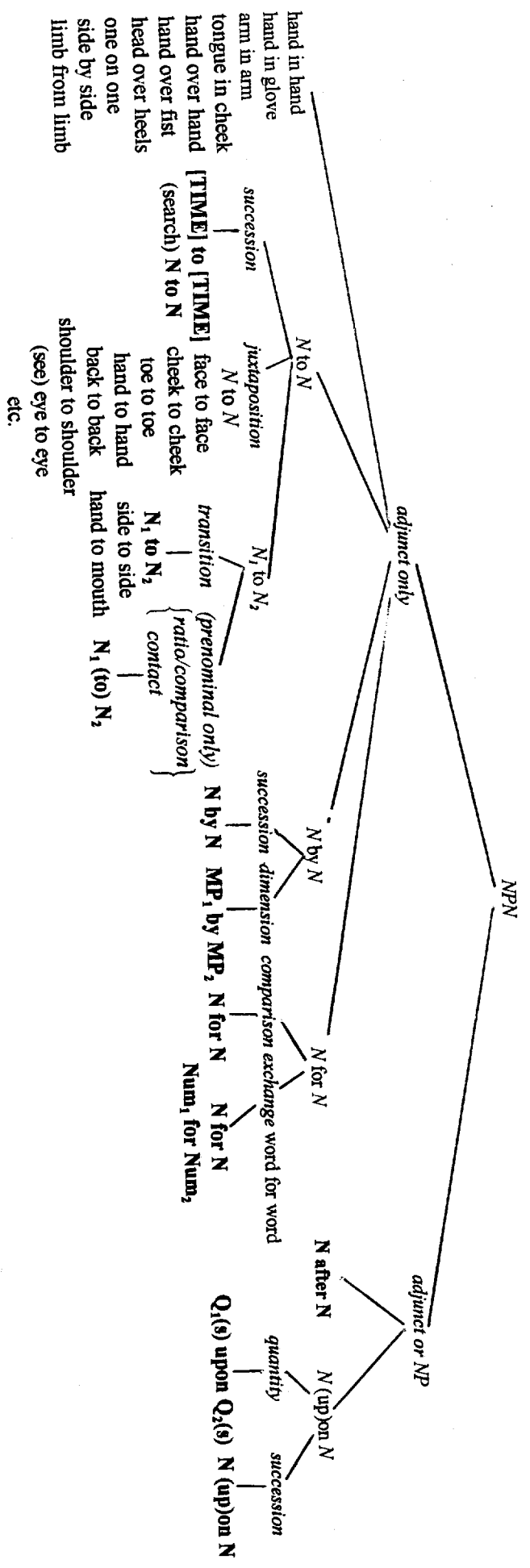


Figure 1. Taxonomy of NPN constructions. Terms in italics are semi-productive patterns; terms in bold are productive patterns, terms in normal type are idioms. Nouns have to be identical except where specified by different subscripts.

The semi-chaotic nature of this taxonomy makes a great deal more sense if we think of it as an inheritance hierarchy rather than as a collection of separate rules from which all generalization has to be extracted. It allows us to account at least descriptively for the distribution of the NPN pattern, with everything from isolates such as *limb from limb*, through semi-productive families like juxtaposition *to*, where one has to memorize the actual cases despite their patent relation, to totally productive little patterns like succession *N by N*.

In short, the claim is that the lexicon (or, if you insist, “peripheral grammar”) has to contain all of the terminal elements in the hierarchies of Figure 1: these are the minimal units that have to be learned. They are related in terms of the inheritance hierarchies in Figure 1, properly fleshed out with syntactic and semantic details. It is hard to see how one could make do with less in characterizing a speaker’s knowledge of the construction. In turn, such a conclusion has a bearing on the theoretical status of the lexicon/grammar distinction: a lexicon like this is far more comfortable in a theory that regards the lexicon not as Chomsky’s nonredundant “appendix of the grammar”, but rather as formally continuous with the grammar.

3.3. Correlation of syntax with meaning

Suppose we sort the family of NPN constructions along semantic lines, as in Fig. 2.

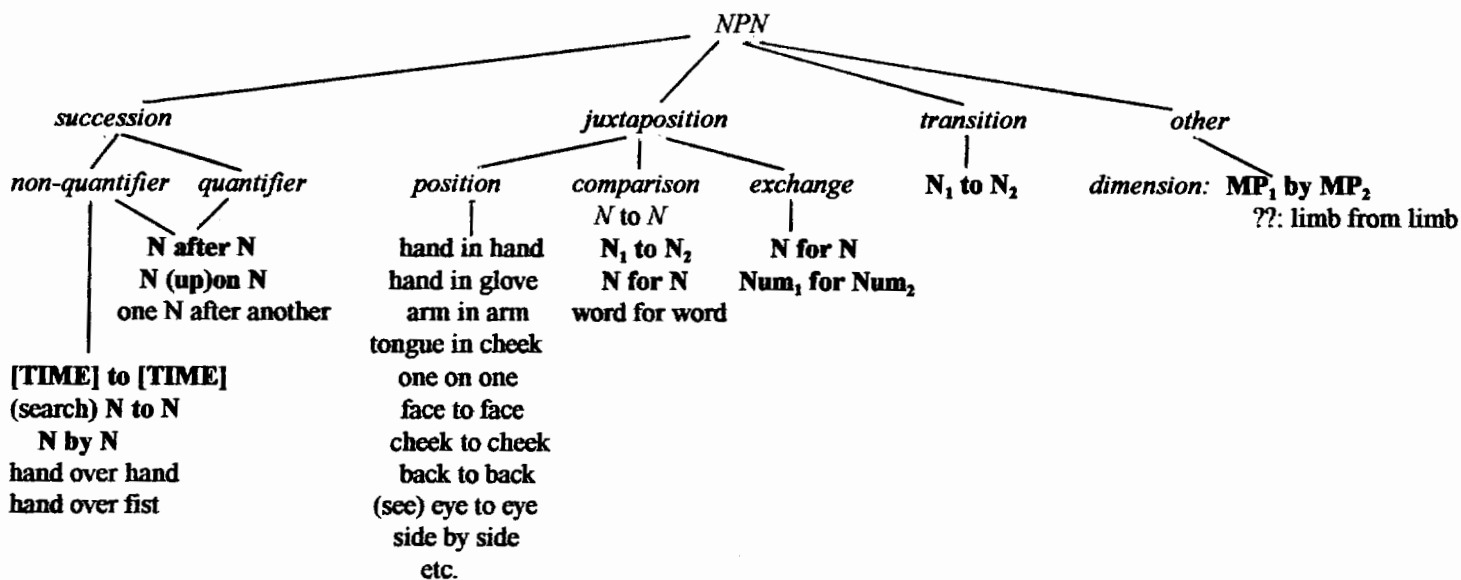


Figure 2. Taxonomy of NPN, sorted by semantics

Viewed at a distance, the meanings associated with the NPN construction are vaguely iconic, in that they mostly deal with pairing or succession of some sort. This observation at first glance is grist for the mill of Cognitive Grammar in the sense of Langacker 1987 or Construction Grammar in the sense of Goldberg 1995, in which every syntactic configuration is taken to bear meaning. On the other hand, the variety of precise meanings associated with the construction –

succession, spatial juxtaposition, transition, comparison, exchange, ratio, and dimension – is not predictable. Although one could respond by saying the NPN construction is inherently meaningful but multiply ambiguous, such a position has no empirical content. If another meaning were to crop up, it would just be added to the inherent readings of the construction. In other words, no empirical discovery could falsify the position.

A different focus arises by considering not just all the meanings associated with this construction, but also all the structures or constructions that the language has for expressing the same meaning. In general, the syntax-semantics correspondence is a many-to-many mapping: each configuration of meaning can be expressed in multiple ways in syntax, and each syntactic structure expresses multiple semantic configurations (Jackendoff 1990, 2002). In the present case, many of the meanings associated with NPN have alternative syntactic realizations that are not directly related to NPN. For instance, *N after N* has a semantically indistinguishable but syntactically distinct variant *one N after another*, the quantificational reading of *N(s) upon N(s)* also shows up as *N(s) and N(s)*, and some variants of succession *N to N* can be paraphrased by *from one N to the next*.

This leads to the position that the syntax of English happens to have this offbeat frame NPN – a bit of autonomous noncanonical syntax – which perhaps comes with a vague meaning that involves pairing. But the varieties of precise meaning associated with this frame, either idiomatically or in subconstructions, are not entirely predictable; nor is the fact that some of the meanings are productive and others are not. In other words, the syntax of the construction is to some degree autonomous of semantics, and the various meanings associated with the construction are to some degree autonomous of syntax. Learning the construction as a whole, then, requires learning (a) the syntactic frame and (b) the particular matchings of meanings to this frame. On closer examination, then, NPN provides the usual sort of evidence for the semi-autonomy of syntax and semantics from each other – in particular for an autonomous syntactic component whose properties are not predictable from meaning alone.

As observed in section 3.1, NPN also provides evidence that individual word meanings plus syntax cannot determine meaning. At the very least, the prepositions in the productive cases must be furnished with lexical entries that essentially specify the entire syntax and semantics of the construction, a conclusion that is a notational variant of the constructional view.

But there is a further problem as well. Consider the fact that *N after N* behaves semantically like a quantified NP, as was shown in section 2.3. On the standard approach to quantification in GB/MP, quantifiers are assigned their scope by virtue of being syntactically raised in the course of deriving LF, such that LF has syntactic quantifiers in positions that correspond isomorphically to their scope in semantics. Thus the obvious question arises: What constituent of *N after N* can possibly be a quantifier that raises? The only overt candidate is the preposition, which bears no resemblance to any known *quantifiers*. One could of course propose a special phonologically null quantifier that raises (Postma 1995 suggests an analysis along these lines), but, again, such a proposal has no empirical content – it is just a stratagem to preserve a

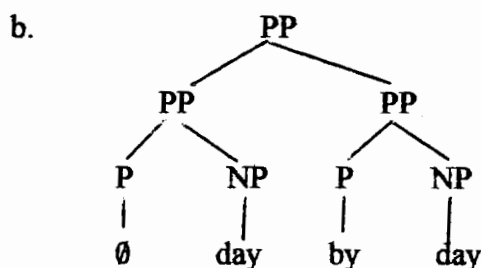
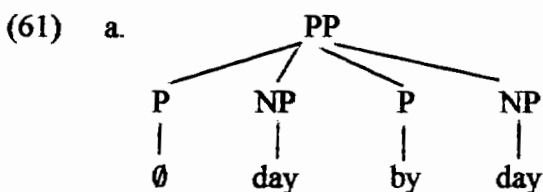
dogma. Moreover, consider how the possibility of such a null quantifier would have to be licensed: it must somehow be associated with the use of *after* and (*up*)*on*, specifically in the context of NPN. In other words, the preposition must specify not only the superficial syntax of the construction, but also the presence of this null quantifier – a kind of syntactic stipulation otherwise unknown (at least to me).

All this therefore ends up being a more elaborate notational variant of the constructional approach, in which *N after N* is listed in the lexicon with both its syntactic and its semantic properties. Among its semantic properties is that it is interpreted quantificationally, not unlike an NP whose specifier is *every*. However, if quantification is a purely semantic property of the construction, there is no need for quantifier raising in syntax. Rather, the general principles governing scope of quantification apply to semantic structure, where *N after N* and *every N* have parallel structure. In other words, NPN, like various other constructions studied by Culicover and Jackendoff (1995, 1997), provides evidence against a syntactic level of LF that explicitly represents quantifier scope.

4. What's the syntactic structure?

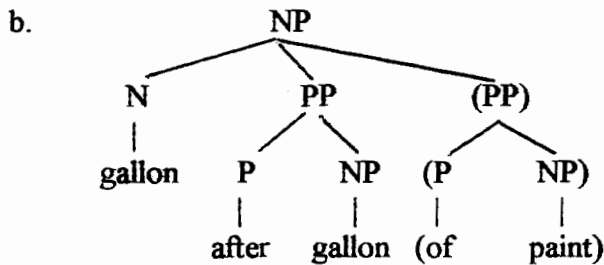
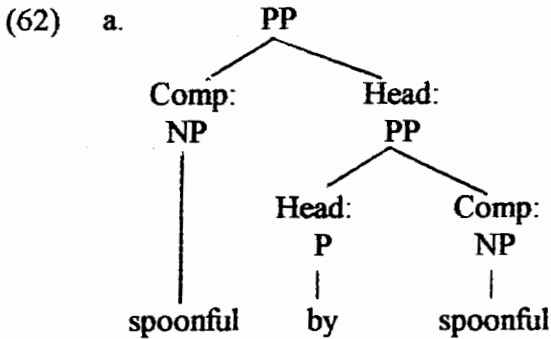
4.1. Proposals with too much structure. Is it possible to account for the syntactic form of the NPN construction in terms of a more canonical form? The goal of this section is to show that the peculiarities of NPN admit of no general solution.

Section 2.4 mentioned Williams's (1994) proposal that NPN is at bottom a compound prepositional phrase like *from X to Y*. That would give a structure with the constituency of (61a) or (61b) (at least).



Huddleston and Pullum 2002 (632) offer the structure (62a), in which the preposition is head, the first noun is a specifier (or a prehead complement) and the second is a complement. For the cases with *after* that function as NPs, they propose (62b), in which the first noun is head and the PP is a dependent; a complement of the noun is a further dependent. (Pi 1995, Postma 1995, and Matsuyama 2004 also endorse something like on (62b) for *N after N*. Matsuyama explicitly

argues that *N after N* is a constructional idiom along lines proposed here.¹³⁾



The difficulty with all of these is that they grace the construction with more structure than is empirically warranted. For one thing, there is no evidence that *P-N* on its own forms a constituent: it never moves anywhere, the noun cannot be extracted from it, and no characteristic prepositional specifiers can be inserted in front of the preposition (e.g. **shoulder right to shoulder*, **day right after day*, **brick right upon brick*, which are pragmatically plausible – note

¹³Pi derives this structure from an unusual underlying structure in which the preposition is marked “iterative”, and the two nouns both originate as its complements, projected from the same position but differentiated in the third dimension. Pi’s focus is generalizing the quantifier version of *upon* with things like *boxes and boxes of cookies*; but all the differences between this and the other NPN constructions are basically matters of stipulation. Note also that juxtaposition, transition, and contact *N to N* are not fundamentally quantificational, so such an approach leaves them out.

Postma derives a structure along the lines of (62b) from an underlying (i), in which PRO_k moves to the specifier of DP. This is supposed to be analogous to an alleged derivation of *each man* from an altogether parallel structure with a null preposition, thus accounting for the quantificational force of NPN through the parallelism of two individually implausible structures, and ignoring the nonquantificational cases of NPN altogether.

(i) $[_{DP} [_{D'} D^0 [_{PP} [_{NP} PRO_i \text{ hand}] \text{ in } [_{NP} PRO_k \text{ hand}]]]]$

one day right after another). For another, in most cases there is no evidence that the nouns are constituents of NPs, given the enforced absence of determiners, the meager opportunities for nominal complementation and modification, and the impossibility of moving them anywhere. Again, compare to *one N after another* and *one N at a time*, where *after another* and *at a time* can be extraposed, as seen in (34): *One unhappy kid came in sick after another/at a time.*¹⁴ (Sections 4.3 and 4.4 deal with the cases where the noun is modified.) The predominant rigidity of NPN rivals that of the conjoined prepositional idioms *up and down*, *to and fro*, *back and forth*, and *round and round*, with which it shares many privileges of occurrence (and, in the case of *side to side*, semantics).

In addition, such structure does nothing to explain why only certain prepositions are productive in the construction, and why under most interpretations of the prepositions, the two nouns have to be identical. One might propose that these restrictions are listed in the lexical entries for the prepositions in question. For example, one might say that *for* allows an NP as its specifier just in case both the specifier and the complement of *for* are bare nouns and they happen to be identical – in which case *for* means either comparison or exchange of sets. However, such lexical information is formally equivalent to actually listing the frame *N for N* and its interpretation in the lexicon, as proposed in section 3. But if the frame is stipulated in the lexicon, there is no reason for it to have any sort of canonical syntactic structure – it might as well be like *by and large*, *let alone XP*, or *the more, the merrier*. Moreover, totally idiomatic cases like *hand in glove* have to be listed in their entirety anyway: it would be silly to stipulate that there is a special lexical entry for *in* that idiomatically selects for *hand* and *glove*.

Such a solution is at least conceivable if the preposition is taken to be the syntactic head of the construction. If instead the first noun is taken as head, as in (62b), the situation is incomparably worse. The only way the characteristics of the construction can be built into the lexical entry of a word is in the entry for *after*. This entry has to say that it can occur as a nominal modifier denoting succession, just in case its complement and the noun that it modifies are bare nouns and are identical. This is outrageously distant from the restrictions ordinarily attributed to prepositional modifiers. In fact, I suspect that the only reason Huddleston and Pullum want a structure like (62b) is that *N after N* has to behave like an NP with respect to the outside world in

¹⁴The Polish NPN construction does provide some evidence for the constituency [N [PN], in that the second noun receives the case governed by the preposition, but the first noun receives the case governed by the larger environment. (Thanks to Barbara Citko for data.)

- (i) Prof. Kowalski oblewa studenta za studentem.
 Prof. K flunks student-ACC behind student-INSTR ('student after student')
- (ii) Miasto za miastem głosowało przeciw tej ustawie
 town-NOM behind town-INSTR voted against this measure ('town after town')

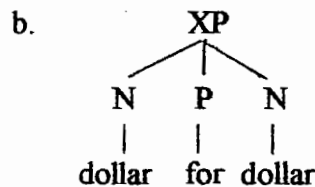
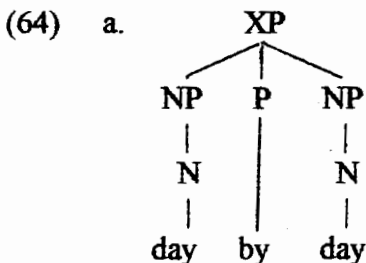
which it is embedded.¹⁵

I can imagine that some practitioners of the Minimalist Program will see in the identity of the two nouns an opportunity to demonstrate that Move is actually Copy. A derivation might go like this:

- (63) Merge: after + day \Rightarrow after day
 Copy: day_i after day_i
 both copies survive at Spell-Out

The difficulty is in how the grammar says that Copy without PF deletion is possible just in *these* cases, with *these* particular prepositions. Again, one might claim that these possibilities are stipulated in the lexical entries for *after*, *for*, etc. But how does a preposition stipulate possibilities for copying of its complements (and why don't verbs do it too)? Why can't the copied constituent move further, say by Topicalization, like other copied constituents can? Why do some meanings of prepositions yield *NPN* by Copy, and others, such as transition *N₁-to-N₂*, by Merge? In order to spell out these stipulations, it again is essentially necessary to encode the exact form of the surface frame in the lexical entry for the preposition. In the end, one is forced to admit that there is something irretrievably special about the syntax of the construction; the general processes of Merge and Copy and the general constraints on movement in no way predict that this construction will fall out of the grammar of English. Thus ultimately, I think, this approach turns out to be a rather clumsy notational variant of the constructional approach proposed in section 3.

A less highly articulated structure for the construction would be (64a) or even (64b).



The issues that would still remain with such structures are the following:

- How is the category of XP assigned so as to account for where the structure can occur?

¹⁵One possibility worth pursuing is that the structure is as in (62b), but the preposition plays the semantic role of a quantifier. It would thus semantically block the use of a determiner in the head noun (parallel to the way use of postnominal *galore* blocks other quantifiers). Still, this analysis fails to explain the absence of a determiner in the second noun, the transitional and contact uses of *N to N*, and the impossibility in many cases of any adjectival modification.

- How is the structure augmented when the nouns have apparent modification (*inch by miserable inch, day after day of rain*)?

Let's take these up in turn.

4.2. The syntactic category of *NPN*. For the non-NP cases, it seems reasonable to follow Williams and Huddleston/Pullum in calling these PPs. Adjunct PPs, like *NPN*, appear presententially, after the subject, and at the end of VP. The only possible question would be the position of prenominal modifier. Although this position is not open freely to PPs (65), various idiomatic PPs can occur there (66), including the idiomatic conjoined prepositions that have already cropped up in our discussion.

- (65) *an in-the-car boy
 *the about-syntax book
 *a to-the-store trip
- (66) an in-your-face insult
 an out-of-work engineer
 this out-of-the-way location
 an inside-out sweater
 that up-and-down oscillation
 some back-and-forth dialogue
 an after-the-fact conclusion

It is certainly not clear how the grammar licenses the PPs in (66) while excluding those in (65). But however this is accomplished, nothing stands in the way of also admitting PPs of the type *NPN* into the relevant class.¹⁶

Turning to the cases of *N after/upon N* that appear in NP position, the category of the overall construction obviously has to be NP. This raises the issue of what the head is. As noted

¹⁶Note that *one N after another* is *not* admitted prenominally: **a one-page-after-another disaster*. This demonstrates again its syntactic distinctness from *N after N*, despite their near synonymy.

Recall that many cases of transition *N-to-N* occur *only* in prenominal position, being supplanted by *from X to Y* elsewhere. We might see these cases of *N-to-N* along the lines of Williams's proposal: they are an accommodation of *from X to Y* to the frame *NPN* in order to be able to locate them in prenominal position. Again, how the grammar accomplishes such an end is an open question; it has a little of the flavor of Optimality-Theoretic constraint interaction. A similar case might be the coercion of an obligatorily plural noun such as *groceries* into singular form, in a context where inflection is disallowed, such as the first noun of compounds, as in *grocery store*.

above, Huddleston and Pullum take the first noun to be the head, as in (62b). And as noted above, the only thing that recommends this structure is its adherence to the principle that NPs are headed by nouns.

However, there is no need to maintain this principle, given that in any event NPs are not always headed by nouns. A major well-known exception is gerundive phrases. They occur in most NP positions (67); but internally they behave like they are headed by a verb, since they take objects, indirect objects, and adverbial and aspectual modification (68):

- | | | | |
|------|----|---|----------------------------|
| (67) | a. | Watering the petunias is no fun. | [subject] |
| | b. | I hate watering the petunias. | [object] |
| | c. | Everyone complains about watering the petunias. | [object of preposition] |
| | d. | The advantage of watering the petunias is ... | [complement of N] |
| | e. | *Watering the petunias' advantage is... | [*possessive NP] |
| (68) | a. | watering the petunias | [direct object] |
| | b. | giving Bill a hard time | [ditransitive] |
| | c. | Quietly stomping on the petunias would be a pleasure. | [adverb modifier] |
| | d. | Having been arrested is no guarantee of virtue. | [aspect and passive auxes] |

So somewhere in the chain of nodes from the NP down to the verb, the category must shift. Perhaps the *-ing* affix can be regarded as the syntactic head; we might categorize it as a noun that takes a VP complement. But such a solution simply conceals a raw stipulation within the lexical entry of *-ing*: what other nouns do we know of that are syntactic affixes? When we spell out the details, including the selectional properties of the affix, we arrive at a lexical entry like (69a), which is a notational variant of a constructional account like (69b):

- | | | | | |
|------|----|--------------------------------|----|---------|
| (69) | a. | -ing [phonologically an affix] | b. | NP |
| | | N | | |
| | | + [___ VP] | | -ing VP |

Alternatively, gerundive NPs might be regarded as headless, or gerundive verbs might be treated as unspecified between the categories N and V (Malouf 2000). No matter how we do it, there has to be something exceptional going on in gerundive phrases. Once we accept that, it is not so hard to accept as well a rule in which NP dominates NPN, with no particular syntactic head.

We conclude that NPN can be either a PP or an NP. However, since the latter possibility is restricted to *after* and *(up)on*, we must list this somewhere in the rules and/or lexicon. Again, the constructional account is most direct in how it allows us to do this: it is not a property of the words *after* and *(up)on* on their own, but rather a property of *N after/(up)on N*, i.e. the particular subconstruction.

4.3. Prenominal adjectives in NPN. We now turn to the two cases in which NPN contains more than just the nouns and the preposition. The first case is the addition of prenominal

adjectives, which we take up in this section; the second is the additional of all manner of postnominal complements and adjuncts in the NP cases of NPN, which we take up in section 4.4.

(12a-d), repeated here as (70), shows the basic facts of prenominal modification. The second noun can optionally be modified, and if so, then the first noun can optionally be modified by an identical adjective. The adjectives cannot be different (70c), nor can the first noun alone be modified (70d).

- (70) a. (miserable) day after miserable day
 b. (painful) inch by painful inch
 c. *miserable day after awful day
 d. *painful inch by inch

Just to make matters a little more elaborate, consider the possibilities when *N after N* is augmented to triplication. In this case, the adjective may appear either on the final noun (71a) or on all three nouns (71b); no other combinations are possible (this fact noted by Pi 1995).

- (71) a. day after day after lousy day
 b. lousy day after lousy day after lousy day
 c. *day after lousy day after lousy day
 d. *lousy day after lousy day after day

The possibility of prenominal adjectives seems to motivate the more elaborate structure (64a) over (64b), as the NP nodes are necessary to hosts for the modifiers. But it's worth looking a bit more closely, if only to ask the extent to which this assumption is empirically driven. For one thing, (64a) would have to be artificially restricted so as to exclude determiners. In addition, there are several interesting constraints on the use of prenominal adjectives that lead to questions about the structure.

First, the possibility for prenominal modification appears to exist only with *N after/(up)on N* and the succession sense of *N by N*. Not even the succession sense of *N to N* is comfortable with adjectives, as seen in (72a).

- (72) a. The situation is getting worse week to (*miserable/*long) week.
 [note *by, after* ok with adjective]
 b. They walked along hand in (*strong/*greasy) hand.
 c. They walked along arm in (*muscled) arm.
 d. They stood side by (*firm/*resolute) side.
 e. They stood face to (*ugly) face.
 f. We lived hand to (*hungry) mouth.
 g. Man for (*brilliant/*wonderful) man, you've got the best team.
 h. The opponents matched each other insult for (??vile) insult.

One might respond by proposing that only *after*, (*up*)*on*, and the relevant sense of *by* occur in structure (64a) and the rest occur in the more minimal structure (64b). Alternatively, the other NPN subconstructions have to completely inhibit any expansion of NP in (64a). In any event, when there are AP modifiers, the construction still has to control the codependencies between them as illustrated in (70c,d) and (71).

There are constraints on interpretation as well. The adjective preceding the second noun is taken to apply not just to the second noun: in *page after lousy page*, it's not that a lousy page is followed by another page. Rather, *all* the pages are lousy. Thus the adjective modifies the construction as a whole, not just the noun it is adjoined to. This becomes still clearer in cases like *inch by painful inch*. Here the pain is associated not with the inches, but rather with one's progress through the successive inches, parallel to, say, *every painful inch of the way*.

A subtler constraint has to do with the choice of possible adjectives. It's my impression that the prenominal adjective has to convey some sort of emotional effect on the perceiver (the speaker or person whose point of view is being presented), for example *miserable*, *awful*, and *painful* in (70). (73) presents some further examples.

- (73) a. Movie star after (fabulous/repulsive/*tall/*old/*British) movie star walked by.
b. We discussed poem after (wonderful/boring/*long/*modern/*French) poem.¹⁷

For a further case, compare (74a,b). In (74a), *rich* and *blonde* don't express any particular evaluation of the movie stars. But in the NPN construction (74b), the speaker seems to be taking *rich* and *blonde* to be enviable (emotionally positive) or alienating (emotionally negative) properties of the individuals in question.

- (74) a. Lots of rich blonde movie stars walked by (, one after another).
b. Movie star after rich blonde movie star walked by.

Thus even when the adjective on its own does not express emotional effect, the perceiver is inferred to have some sort of attitude toward the property expressed by the adjective. This aspect of interpretation appears to be an semantic characteristic of the construction as a whole. It makes little sense to list it as part of the lexical entries of the words *after* and *by*. Rather, again the most plausible account is in terms of listing the construction in the lexicon as a pattern.

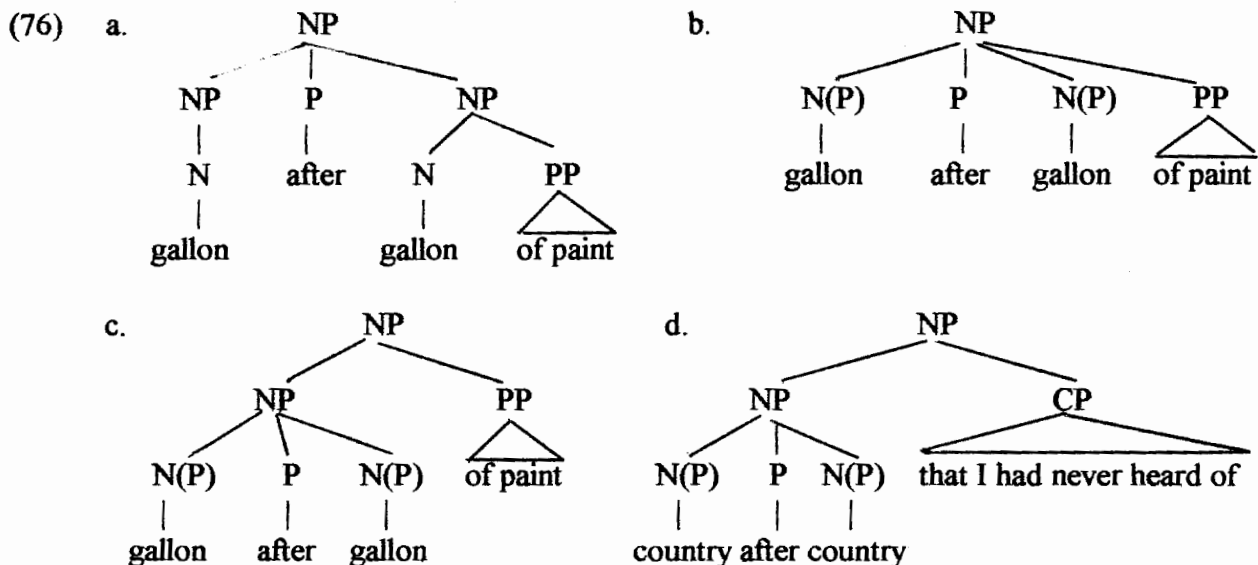
The upshot seems to be this: The lexical specification of *N after N* cannot be just (75a), with a free choice of APs within the NP. Rather it has to be the more elaborate (75b), which spells out the syntactic possibilities explicitly. (I leave a formalization of the semantic interpretation aside, as well as a treatment of the multiple-N forms like (71).)

¹⁷This emotional overtone seems to be absent when there are two adjectives: *Tall building after tall building was knocked down by the earthquakes*, versus ??*Building after tall building was knocked down by the earthquakes*.

- (75) a. $[_{NP/PP} NP \text{ after } NP]$
 b. $[_{NP/PP} [_{NP} (AP_x) N_z] \text{ after } [_{NP} (AP_y) N_w]]$
 conditions: AP_x only if AP_y ; $AP_x = AP_y$; $N_x = N_w$

Again, it is hard to see how to get any of this out of more general conditions.

4.4. NP complements and adjuncts with *N after N*. The issues here are similar to those with prenominal adjectives. Is the structure (76a), where the postnominal material forms an NP with the second noun, or is it (76b), where the material is attached to the construction as a whole, or is it (76c,d), where it is adjoined to the construction?



The main issue to be addressed here is whether the postnominal material is a sister of the second noun, as in (76a), or not, as in (76b,c,d). A bit of evidence in favor of (76a) is the fact that, if short enough, the complement can be reduplicated fairly comfortably after the first noun. However, as with the prenominal adjectives, the first noun can have a complement only if the second noun does.

- (77) a. gallon of paint after gallon of paint
 b. picture of Bill after picture of Bill
 c. gallon (??of green paint) after gallon of green paint
 d. picture (*of his sister-in-law) after picture of his sister-in-law
 e. *gallon of paint after gallon
 f. *picture of Bill after picture

The variant with multiple nouns also follows the same pattern as prenominal adjectives: compare (78) to (71).

- (78) a. gallon of paint after gallon of paint after gallon of paint
 b. gallon after gallon after gallon of paint
 c. *gallon after gallon of paint after gallon of paint
 d. *gallon of paint after gallon of paint after gallon

These parallels suggest that if prenominal adjectives form an NP with the nouns, then postnominal complements do as well.

Before getting too enthusiastic about the parallel, we note that prenominal adjectives occur with both NPN=NP (*N after N*) and NPN=PP (*N after N* and *N by N*). By contrast, as observed in section 2.3, nominal complements occur only in NPN=NP. So, despite the similarities between the two cases, there is no automatic generalization that encompasses them both.

Just as with prenominal adjectives, if there is only a single complement, it still is taken to apply to both nouns: *picture after picture of Bill* does not mean a picture of something followed by a picture of Bill – everything in the succession is a picture specifically of Bill. Thus, semantically, the complement is a complement of the construction as a whole, not of the second noun alone. (Though this time there is no special emotional overtone.)

This conclusion is reinforced by (79a,b), where the complement is indefinite.

- (79) a. picture after picture of a dead president [same dead president in each]
 b. picture after picture of dead presidents [can be read as different single president in each]
 c. pictures of a dead president [same dead president in each]
 d. pictures of dead presidents [same readings as (71b)]
 e. a picture of dead presidents [multiple presidents in the picture]

Here, the semantic pattern of *N after N* is exactly like that of an indefinite plural (79c,d), not like an indefinite singular (79e). The level at which *N after N* is plural has to be semantic: as pointed out in section 2.3, *N after N* governs singular verb agreement:

- (80) Picture after picture is/*are displayed in the gallery.

In other words, no matter what syntactic structure we choose for postnominal complements here, a mismatch between syntactic and semantic behavior is inevitable (Matsuyama 2004 arrives at a similar conclusion).

The possibility of reduplication does not seem to extend to postnominal adjuncts, no matter how short:

- (81) a. meeting (*yesterday) after meeting yesterday
 b. student (*in Bonn) after student in Bonn

- c. girl (*with Phil) after girl with Phil

This seems to suggest that postnominal adjuncts are attached to the NPN structure as a whole, as in structure (76b,c,d) or some variant thereof. Note however that such a conclusion points up another syntax-semantics mismatch: prenominal adjectives pattern semantically with postnominal adjuncts but syntactically with postnominal complements.

If postnominal adjuncts are attached to the construction as a whole rather than to an interior NP, what licenses them? There is no head noun in the construction that can license them (as required in HPSG, for instance). Rather, what appears to license them is simply the semantics of the construction as a whole: *N after N* has a semantic structure parallel to *lots of Ns* or *every N in succession* or *Ns in succession*, and the adjuncts are interpreted as modifiers of this meaning.

A final observation (Matsuyama 2004) is that long postnominal complements and adjuncts can be extraposed as though from an ordinary NP:

- (82) a. Bottle after bottle went bad of the expensive wine we brought back from Romania.
b. Picture after picture hung on the wall of Walt's estranged wife.
c. Rumor after rumor surfaced about the deceits practiced by the administration.
d. Country after country appeared in the news that I had never heard of before.

It is hard to decide what counts as an analogous syntactic situation. But if complements such as *of wine* in *bottle after bottle of wine* are situated inside the second NP, as in structure (68a), they probably shouldn't be able to extrapose. Yet in (82a), *of the expensive wine* extraposes quite comfortably, as though it is attached to the construction as a whole.

At this point it is probably time to stop. If there is an overall point to the discussion of prenominal adjectives and of postnominal complements and adjuncts, it is that the evidence for the internal syntactic structure of NPN is thoroughly equivocal. At best, if the strongest evidence for syntactic structure is taken at face value, then there are multiple points of mismatch between syntactic and semantic structure.

5. Concluding remarks

I don't pretend to have "solved" the NPN construction in this paper. The best I have been able to do is expose some of its unexpected complexity, and reflect on the consequences for theoretical alternatives. I leave it to future research to determine if any of the apparently ad hoc aspects of the construction will submit to more general explanation.

There are segments of the community who will find this account "uninteresting", on the grounds that it is merely descriptive and not "explanatory" (see remarks about such attitudes in Culicover 2004). Of course, interest is a subjective matter – one is free to work on whatever one

likes. But if the overall goal is an understanding of how human language works, well, NPN is a part of human language too and must somehow fit into the account. One must describe linguistic phenomena with care before accommodating them too hastily to principles generally accepted as explanatory. Here I have explored the NPN construction deeply enough to be able to point out some places where such care is warranted, and where in fact NPN raises challenges to such generally accepted principles.

A possible response would be that it is not just the account offered here but the phenomenon itself that is “uninteresting”, on the grounds that it is “peripheral”, in the sense discussed in section 3.1.¹⁸ The theoretical point of the present paper is that the “periphery” warrants careful study. In particular, NPN offers challenges to a number of major tenets of mainstream generative grammar. Among these are the strict distinction between the grammar and the lexicon, and the “conceptually simplest” way of building syntactic structure through a binary Merge grounded in individual words. Instead, the details of NPN support an approach more along constructional lines, in which words and general rules are at the ends of a continuum of generality in linguistic knowledge, with all sorts of semiproductive syntactic and semantic frames in between, and in which larger listed syntactic frames can be loci of combinatoriality.

The fundamental issue at the heart of mainstream generative grammar is how the child manages to acquire language, given the nature of the input. The fundamental goal is an account of UG, the child’s initial state that makes language acquisition possible. As Culicover 1999 points out with respect to host of other “syntactic nuts” of English, NPN – in all its idiosyncratic glory – is learned along with everything else. So why wouldn’t we want to “incorporate [it] within a principled theory of UG”? Does its acquisition require instead some other cognitive faculty, and if so, what is it? And, as Culicover further asks, if we develop a theory for the acquisition of the “periphery”, how much of the “core” will this take care of as well? With respect to accepted canons of scientific interest, I submit that this question is far from “uninteresting” – and it is beginning to be investigated within the constructional and usage-based approaches cited above.

¹⁸I disregard the possible but scientifically irresponsible interpretation in which “uninteresting” and “peripheral” are euphemisms for “doesn’t fit my theory.”

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