# NPs versus DPs: Why Chomsky was right

Geoffrey K. Pullum
University of Edinburgh
pullum@gmail.com

Philip Miller
Université Paris Cité
philip.miller@u-paris.fr

**Abstract** The view known in the generative literature as the 'DP hypothesis' posits that the head of a phrase like *those artists* is actually the demonstrative *those*, rather than the noun *artists*. This conflicts with what has been assumed in traditional grammars, dependency grammars, and earlier generative accounts. After briefly discussing the notion of 'head' and the concept of dependency, together with the classical criteria for deciding which item is the head in a given construction, we provide a series of arguments suggesting that (as Chomsky 2020 proposes) the classical position is correct: the head of such a phrase is the noun that determines its number. We discuss a series of specific arguments and analyses that have been advanced in support of the alternative 'DP' analysis, which says the head of such a phrase is the article or other determinative. We argue that they are unconvincing. We conclude, however, by observing that the choice between NP and DP analyses may not actually be capable of being settled empirically if the evidence is limited to facts of grammaticality and we allow the highly abstract kind of syntactic representations and movement analyses currently fashionable within Chomskyan generative linguistics.

**Keywords**: English, French, DP hypothesis, head, noun phrase, determiner, determinative

# 1 Introduction

The aim of this article is to review the issue of what the head category should be in the headed constituents that were generally called noun phrases in linguistics before the 1980s, and hopefully to settle dispute on the matter. Specifically, the issue is whether the lexical head is the noun (N) that such phrases almost always contain, or whether instead the head is always a member of a lexical category D to which words like *the*, *some*, and *any* belong. The latter analysis would lead to assigning these constituents the label 'DP', so it is referred to as 'the DP Hypothesis'. This hypothesis has been widely adopted in the generative literature (see e.g. Abney 1987, Bernstein 2001, Larson 2019). [1]

To shed light on this question, it will be useful to begin with by reviewing the notions of 'head' and 'dependent' and the arguments that lead to the claim that a given item is the head of a phrase and that the other items in the phrase depend on it.

## 1.1 Terminological prerequisites

Before we can begin our discussion of the topic, we need to deal with two terminological points. First, a problem arises as to what to call the constituents at issue without appearing to have

1. The present draft, dated October 4, 2022, is a translated and significantly revised version of a paper in French that is scheduled to appear in a special issue of *CORELA*. We are grateful to Denis Bouchard, Eric Corre, Anne Jugnet, Laure Gardelle, Joan Maling, John Payne, Brett Reynolds, and Annie Zaenen for their comments on preliminary versions of the French paper; remaining faults are ours, of course. We also thank Rob Truswell for sharing his very useful notes on the DP hypothesis with us.

already made the decision. To call them 'NPs' or 'DPs' would surely give the appearance of prejudging the issue at the center of the paper, so we have to avoid these terms, except when quoting the literature or referring specifically to a given analytical choice. Stowell (1989) suggests 'common noun phrase' (CNP), but this still contains 'noun'. We propose to use the term '**substantive phrase**'.[2] So when we call a phrase like *those artists* a substantive phrase, we intend to imply nothing about whether the first word or the second is the head, but only that the phrase is of the type that this paper is concerned with.

The second terminological point on which we need to take an explicit position concerns the crucial distinction between **category** and **function**. Consider a sentence like (1):

(1) The wind broke a large branch.

Both *the wind* and *a large branch* are of the same category (they are what we will call substantive phrases), but they have distinct syntactic functions. Both traditional grammar and current linguistic theories make reference to distinct function labels for what were sometimes called 'noun-equivalents': they can be subject, direct object, indirect object, temporal adjunct, etc. Likewise adjectives (AdjPs in modern terms) can be either attributive modifiers, predicative complements, or serve in various other functions. But traditional grammars rarely had anything to say about the functions of items such as *broke* or *the*. In the case of the former, the omission can be assumed to be due to the fact that an item like the verb *broke* essentially always has the same function: it always and only functions as the principal word of a verb phrase (VP), so providing a functional label might seem redundant.[3]

It may have been traditionally assumed that an article like *the* likewise always filled the same role: as a supporting element to a noun, restricting it to definite reference. But for our discussion it will be crucial to make a distinction between (i) the category to which *the* belongs and (ii) the syntactic function it typically has. Huddleston and Pullum (2002, henceforth *CGEL*) propose calling the category '**determinative**', following some 20th-century grammars, e.g. Palmer and Blandford (1939), where the relation to the French 'adjectif déterminatif' is noted. For the function, Huddleston and Pullum use **determiner**.[4]

The term 'specifier', used frequently in the generative grammar literature, could perhaps have been chosen instead of 'determiner', but it has actually never been fully clear from that literature whether 'specifier' is being assumed to be a category (which would mean there would be items listed in the lexicon as specifiers) or a function (which under standard transformational-generative assumptions should mean it would never appear in syntactic representations). As Stowell (1991: 42) remarks, 'X-bar theory is rather vague about what a Specifier should be.' Indeed, he participates in this vagueness, writing 'SPEC' in both phrase structure rules and tree diagrams as if SPEC were a category (as several other chapters in the

2. In older literature the term 'substantive' was often used (e.g. by Otto Jespersen) to mean 'noun', and sometimes to denote the whole class of 'noun-equivalent' constituents that can serve as subjects, objects, non-finite clauses, etc.

3. Huddleston and et al. (2002) use the function term 'predicator' for the function of essentially every verb, but it really means nothing more than 'head of VP'.

4. Mnemonically, it helps somewhat that 'determinative' shares the ending '-tive' with other traditional category names like 'adjective', 'demonstrative', and 'substantive', and the agentive '-er' suffix on 'determiner' and 'modifier' suggests that they are both functions.

same collection do). Informal notations like 'Spec:VP' have also sometimes appeared in tree diagrams, as if 'specifier of a verb phrase' were a category, which does not seem to be what the theory actually allows.

'Specifier' is most often referred to informally as a phrase structure 'position', but that is not a formally recognized theoretical term. When Stowell (1989: 232) considers 'the relationship between the Subject position and the Specifier position in terms of X-bar theory' and asks 'Are these positions distinct in X-bar terms, or are Subjects simply one of a number of types of Specifiers?', it simply isn't possible to make sense of his question within the theory he assumes. Chomsky (1965, chapter 2) reduces the notion 'subject' by definition to 'NP immediately dominated by S'. 'Specifier' has never been defined at all. Stowell's question therefore has no well-defined sense.

In short, syntacticians' practice has never been sufficiently clear-cut to make 'specifier' unambiguous as a function name. Moreover, the range of constituents that have been called 'specifier' is much wider than our notion of constituents functioning as determiner. Sometimes 'specifier' seems to mean nothing more than 'sister of a phrasal constituent'. Preposed *wh*-phrases and topics have been referred to as being specifiers of clauses (or 'in SPEC position'). We therefore see no better policy than to eschew the term 'specifier' and follow *CGEL* in using 'determiner' for the grammatical function in question. Note that is strictly limited to the internal structure of substantive phrases.

The category of determinatives (abbreviated as D) contains the articles, *a(n)* and *the*; the proximal and distal demonstratives *this* and *that*; the cardinal numerals *one*, *two*, *three*, etc.; and various quantifiers like *a few*, *all*, *any*, *both*, *each*, *either*, *every*, *few*, *little*, *many*, *most*, *much*, *neither*, *no* ∼ *none*, *several*, *some*, and marginally a few others (some of which also belong to the adjective category).

The distinction between this category and the determiner function is crucial for two reasons in languages like English. First, although determinatives most commonly occur in determiner function, they can marginally function as modifiers instead: *the* is a determiner in *the artist* but (unusually) a modifier in *the quicker you get it done* or *none the wiser*; *one* is a determiner in *one mint julep* but a modifier in *the one thing you shouldn't do*. And second, more importantly, the determiner function can be assigned not only to determinatives but also (very frequently) to genitive NPs, like the underlined constituents in the following examples:

(2) a. Give me the managing director's phone number.
b. I haven't yet read your new book.
c. It's nobody else's business.

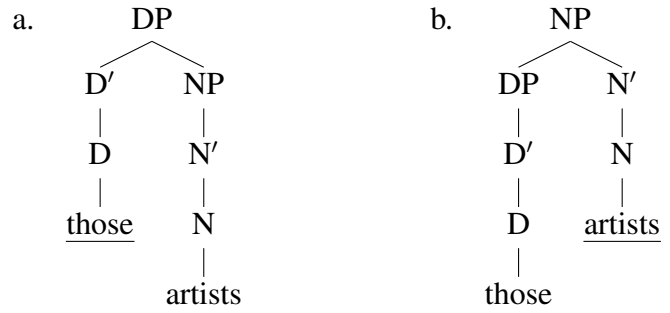
## 1.2 The DP hypothesis

The 'DP hypothesis' defended by Abney (1987) must be distinguished from the statement that there can be a phrase with a determinative as head. The latter is accepted by Jackendoff (1977) (though he divides the determinatives between a category Art (article) and Q (quantifier)) and by *CGEL*(chapter 5). It is indisputable that members of the determinative category take adverb-phrase modifiers: *so many* illustrates the degree-modifying adverb *so* modifying the determinative *many*; *very nearly all* illustrates the adverb phrase *very nearly* modifying the

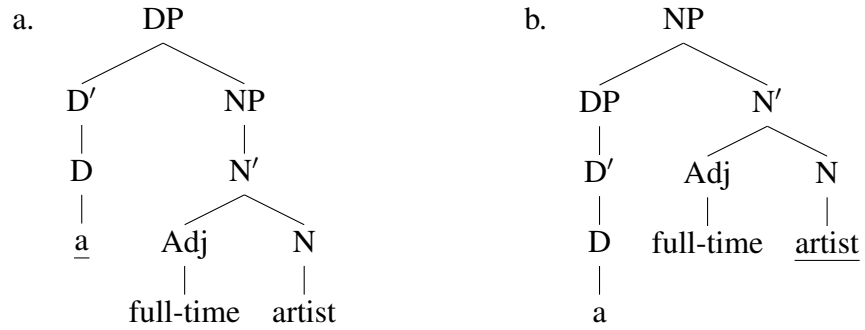
determinative *all*; *hardly any* has the adverb *hardly* serving as a degree modifier of the head determinative *any*. Thus it is eminently plausible to say that a constituent like *hardly any artists* contains a two-word phrase *hardly any* that has a determinative as its head and might reasonably be labeled 'DP'; but that is not what the DP hypothesis is about. Abney's DP hypothesis is that the whole three-word phrase *hardly any artists*, including the noun *artists*, is also a DP—and *any*, not *artists*, is its head.

He is therefore claiming that such phrases were misanalysed in all grammatical literature before the 1980s: seeing them as founded on a head noun was always a mistake. The claim is that the head of *those artists* is the demonstrative determinative *those*, with *artist* as its complement, and in *a full-time artist* the indefinite article *a* is the head with *full-time artist* its complement. The following trees illustrate the DP and NP analyses for the latter two examples (the head of the construction is underlined):

(3)




(4)




The idea that the determinative is the head of the substantive phrase emerged first in Szabolcsi (1983) for Hungarian, and was further developed by Fukui and Speas (1986) and Speas (1986). It was then more fully expounded by Steven Abney in his unpublished doctoral dissertation at MIT, Abney (1987).[5] Chomsky's publications in the years following Abney's thesis showed little sign of being influenced by the DP hypothesis, and more recently, in Chomsky (2020: 51), he made his reservations explicit:

> I'm going to assume here that nominal phrases are actually NPs. The DP hypothesis,

5. Radford (1993) puts forward a compromise between the NP and DP hypotheses: that both the determinative and the noun are heads of the NP. Such an analysis would violate one of the central principles of dependency analyses, namely that each word can only directly depend on a single head (see next section); it is convincingly rebutted in the same volume by Payne (1993).

> which is widely accepted, was very fruitful, leading to a lot of interesting work; but I've never really been convinced by it. I think these structures are fundamentally nominal phrases. [. . . ] As far as determiners are concerned, like say *that*, I suspect that they are adjuncts. So I'll be assuming that the core system is basically nominal.

The present paper argues in favor of Chomsky's position. But in order to clearly evaluate the consequences of the DP analysis and to compare it to the classical NP analysis, it will be useful to give a brief review of the notions of dependency and heads and the criteria available for arguing that a certain item is the head in a given construction. That is the task of the next section.

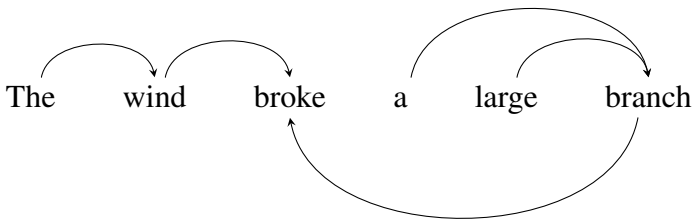
# 2 The related notions 'dependency' and 'head'

## 2.1 The dependency relation

The idea that the dependency relation is central to syntactic theory has a long history. As shown, for instance, by Dominicy (1982), dependency is the central analytical tool for many 18th-century grammarians such as Dumarsais, Beauzée and, especially, Condillac. In France today, it is well known thanks to Lucien Tesnière's the posthumously published *Eléments de syntaxe structurale* (Tesnière, 1959), which was the starting point for much of the current literature on dependency grammars (see Marneffe and Nivre 2019 for a recent summary with extensive bibliographical references). Dependency also plays a central role in the writings of U.S. structuralists such as Bloomfield (1933) and Harris (1951): so-called 'endocentric' constructions include a head, which the other items in the construction depend on.

The classical dependency relations for a simple sentence like (1) can be represented by the graph in (5). As indicated, *the* depends on *wind*, which, itself, depends on *broke*; beyond these two relations of direct dependency, *the* indirectly depends on *broke*. Similarly, *a* and *large* depend on *branch*, which also depends on *broke*, which is the head of the clause, since it does not depend on any other word. Conversely, all of the items in the construction depend, directly or indirectly, on its head.

(5)

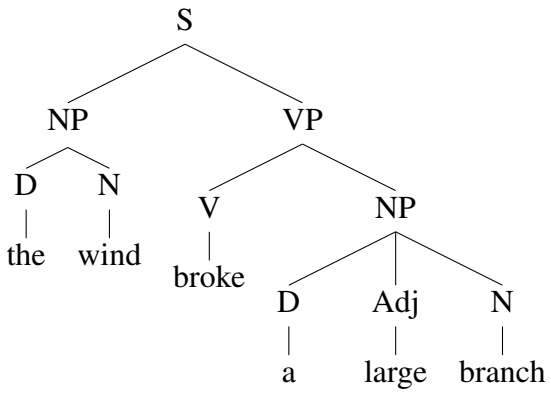



## 2.2 Constituency

Constituency is a more recent idea that was developed within the tradition of US structuralism. The idea is that a clause can be divided into immediate constituent parts which can in turn be further divided into smaller constituents, down to the level of words. Our example sentence (1) is traditionally assumed to have the constituent structure in (6). Beyond indicating how the sentence

is divided into constituents, it also indicates the grammatical category of each constituent. Each word forms a constituent, and belongs to a lexical category: *the* and *a* are Determinatives, *wind* and *branch* are Nouns, *large* is an Adjective, and *broke* is a Verb. Beyond this, the sequence *the wind* is a Noun Phrase constituent, as is *a large branch*; the sequence *broke the branch* is a VP constituent, and the whole string forms a clause (standardly notated 'S' in tree diagrams).

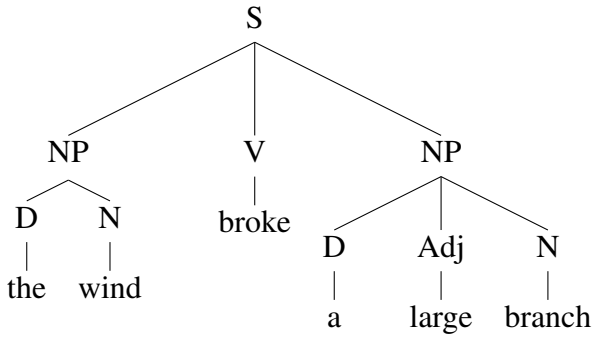
(6)




## 2.3 The compatibility of dependency and constituency

As shown by the works of Bloomfield and Harris, dependency and constituency are not incompatible notions. In fact, it can be shown that any dependency relation implicitly defines a minimal constituent structure: each word forms a constituent with all words that depend on it either directly or indirectly. Thus, the dependency relation given in (5) defines the constituent structure given in (7):

(7)

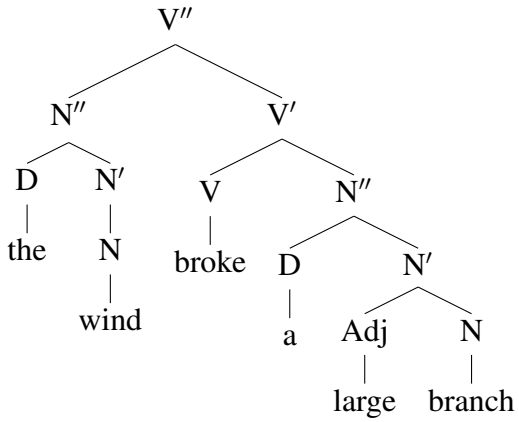



Compare (6) to (7), and note that (7) has no VP. This illustrates the fact that constituent structures can define constituents that go beyond those determined by the dependency relation. The dependency relation tells us that both NPs depend on the verb and consequently form a constituent together with it, as in (7). It cannot represent one of the two (the object NP *a large branch*) as forming a constituent with the verb under a VP label, excluding the other NP, as we see in (6).

Though dependency relations automatically define a constituent structure, the converse is not true. Consider the tree in (6). Taking the label 'NP' to be a signal that it is a phrase with N as head, and taking 'VP' to mean 'phrase with V head', might lead us to generalize by positing that for every lexical category X there will be a constituent labeled 'XP' of which it is the head, so that an N automatically has to be the head of an NP and a V automatically has to be the head of a VP. But the traditional notation for a clause, S, provides no clue as to what might be its head. Bloomfield (1933) actually considered the clause to be exocentric—a construction without a head.

Chomsky (1970), following the structuralist proposal of Harris (1951, §16), proposed the so-called 'X-bar' notation to explicitly specify dependency relations on constituent structures. Harris and Chomsky both appear to follow Tesnière in considering that the verb is the head of the clause, which is consequently analyzed as an endocentric construction. Thus, the structure in (6) can be relabeled as in (8).

(8)




In this structure, two 'projections' representing layers of phrases are distinguished for N and V. The label N″ ('N double bar') correponds to 'NP', and N′ ('N bar'), an intermediate constituent embracing N and its complements and modifiers, excluding the determinative. (The N′ is called a 'nominal' by *CGEL* and some others.) The label V″ ('V double bar') corresponds to the clause, and V′ ('V bar') corresponds to the traditional VP (the verb with its complements and modifiers, excluding the subject). [6]

In a sense, the X-bar notation makes the dependency relation visible, in virtue of a tacit principle governing the phrase structure rule system (see Kornai and Pullum 1990 on this). Any word internal to a phrase X″ depends on the head X of that phrase. So, for instance, in the N″ *a large branch*, *a* and *large* depend on the head *branch*. More generally, the tree in (8) defines the dependency relation given above in (5). [7]

6. In order to respect X-bar theory in full generality, we would need to include in (8) D′ and D″ projections above both occurrences of D (as was done in (3) and (4)), and add Adj′ and Adj″ projections above Adj.

7. This paper will not attempt to summarize the details of all the different theories mentioned. Dependency grammars have been used especially for languages where constituent order is less constrained than in English, among them the Slavic languages (see e.g. Melčuk 1988 and Marneffe and Nivre 2019 for further references). It should be kept in mind that it is possible to construct a generative grammar (in the strict sense of the term, i.e., a formal system of construction operations interpreted as defining a set of well-formed constructible objects with

## 2.4 Criteria for dependency

The central question at issue here is the head of the substantive phrase. To address it, we need criteria for deciding which word is the head in a given construction. This is not straightforward. Though it may seem obvious that the verb is the head of the clause, that intuition actually results from older theoretical discussions, where various positions were defended. [8]

Zwicky (1985, §2, pp. 2ff) provides a very useful discussion of this topic, going over a series of criteria proposed in the literature. To begin with, at the semantic level, one can propose as a criterion the idea that the head of a construction has the same semantic type as the construction itself. Applying this criterion to the clause, it is clear that both it and the verb denote either a state, or as is the case in (1), an event (of breaking). Conversely, the subject and complements are completely unconstrained as to their semantic type: they can refer to first order entities. [9] Thus, the semantic criterion suggests that the verb is the head of the clause.

Beyond the semantic criterion, two central morphosyntactic criteria seem plausible, and they give converging results (though they do not necessarily agree with the semantic criterion). The first of these, Zwicky calls the **subcategorisand** criterion: if, in a construction, one item governs the form of another, the former is the head and the latter the dependent. In languages like Latin or German, the verb governs the case of the subject and complements, making it the head of the clause. The same conclusions can be drawn for English or French, for instance, though case distinctions are only marked on pronouns.

The second morphosyntactic criterion is based on the concept of **morphosyntactic locus**, namely the item within a constituent where a property imposed by an external governor is morphosyntactically marked. It asserts that the morphosyntactic locus is the head.

These two principles can be illustrated quite simply with respect to verbs taking preposition-phrase (PP) complements. The assumption in dependency grammar is always that the PP depends on the complement-taking verb. Why? The subcategorisand criterion provides the motivation: it is the verb that determines the form of the complement. To be specific, the verb determines the specific choice of the head preposition. This is illustrated in (9), where we have deliberately chosen prepositions that are grammaticized (hence semantically bleached), and we gloss the examples in French, to make it clear that the preposition governed is not the most obvious translation of the English preposition from a strictly semantic point of view.

(9) a. Kim laughed at/*to/*of/*on/*Ø Sandy.
Kim a ri de/*à/*vers/*sur/*Ø Sandy.
b. That depends on/*at/*to/*of/*Ø Sandy.

---

internal syntactic structures) using either dependency or constituent-structure assumptions. The formal properties of dependency grammars and their relationship to phrase structure grammars are studied by Gaifman (1965) and Miller (1999). Chomsky's early work assumed only constituent structure; X-bar grammars, which incorporate a representation of the 'head' relation, represent a kind of hybrid. An X-bar theory along the lines proposed by Chomsky (1970) was systematically applied to English in Jackendoff (1977). Kornai and Pullum (1990) and Miller (1999) discuss the formal properties of X-bar theories.

8. For instance, Condillac, a major 18th-century grammarian, argued that the subject was the head of the clause; see e.g. Dominicy (1982).

9. As is the case for 'branch' in (1); one might debate the appropriate ontological classification for 'the wind'. Obviously, however, the subject could have been a first order entity, e.g., *the cat*.

Cela dépend de/*à/*vers/*sur/*Ø Sandy.

What is happening in these cases is that the verb governs a **morphosyntactic** property of the PP, not a semantic property.

Now consider why is it assumed that in a PP the preposition is the head, not the noun in the NP that follows it. In this case, it is the morphosyntactic locus principle that provides an answer: in a governed PP, what is constrained by the governing verb is the choice of preposition, as shown by the examples in (9). But verbs taking a PP complement do not govern the morphosyntactic properties of the noun inside the PP. For instance, there are no verbs that require a PP in which the head noun of the preposition's object is a count noun rather than an non-count noun, or a singular rather than a plural noun, or a proper noun rather than a common noun.

The semantic principle points to the opposite dependency relation: it is clear that the preposition in the examples in (9) does not alter the semantic type of the referent: the referent is a human being in each case. A verb *can* semantically select the type of thing its complement phrase denotes. Verbs like *seem* can take (in addition to an infinitival complement) a PP complement headed by the preposition *to*. The preposition is essentially meaningless, so the PP and the NP object inside it denote the same entity. And with *seem*-class verbs the referent is typically a human. Hence the oddity of the much-quoted sentence in (10):

(10) #Her voice seems pleasant to my toothbrush.

But no morphosyntactic constraint is being violated here. Rather, the oddness derives from our knowledge of the world (hence the judgment prefix '#' rather than '*'). To make this sentence natural we need only create a context that relaxes the usual real-world constraints:

(11) I dreamed that her voice seemed pleasant to my toothbrush.

This clearly shows that the morphosyntactic and semantic notions must be distinguished.

Note that it is crucial to distinguish government and agreement if the theory is to predict correctly. Despite their superficial similarity, the two function in radically different ways: in the case of government, a word forces another word to have a certain feature that the governing word does not have. For instance, a verb can force accusative case on its object, but the verb itself is not in the accusative. Conversely, in the case of agreement, one word forces another to share some reflection of a feature complex that it possesses itself. When a verb agrees in person and number with its subject, the features are properties of the subject, and the verb is required to reflect them in its form.

It has been known since at least Keenan (1974) that the direction of agreement is determined by semantic relations, rather than by morphosyntax: it is always the functor that agrees with its argument. In the case of the subject and verb, this predicts that it is the verb (semantically acting as functor) that agrees with the subject (semantically, argument). There are in fact languages where the verb agrees with more than one of its arguments (Basque and Swahili, for example), which would lead to a contradiction if the agreement relation was considered to define a dependency relation: the verb, in such languages, would depend both on the subject and on one or more objects, which is impossible in a well formed dependency relation. It is thus clear that the directionality of agreement is independent of the morphosyntactic dependency relation. In

other constructions, it is the the morphosyntactic dependent that agrees—as is the case for attributive adjectives in French or Portuguese, for instance, because they are functors semantically but are dependents morphosyntactically.

This crucial distinction between government and agreement makes it possible to understand the source of the debate as to the head of the clause (whether it is the subject or the verb—see footnote 8) and to motivate the present-day position.

There are bidirectional morphosyntactic constraints between the subject and the verb: in many languages the verb imposes case on the subject, and in many languages the subject imposes person and number on the verb. But the relevant processes are not the same. The first is government, the second is agreement. It is beyond the scope of this paper to completely develop the analysis proposed in Zwicky (1985), to which we refer the reader for further details and bibliographical references. [10]

# 3 The DP analysis

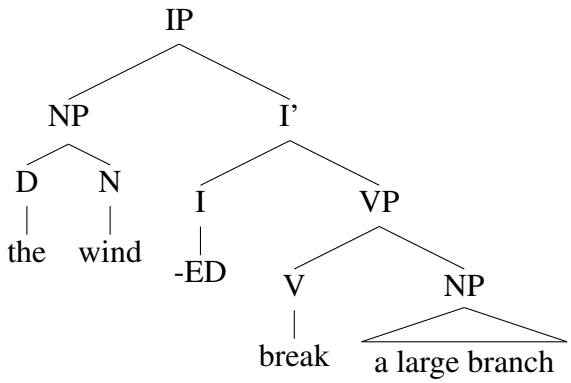
Having reviewed the general idea of dependency in syntax, we now turn to the central question of this paper: What should be understood to be the head of a substantive phrase containing a noun and a determinative? Is it the noun, as traditionally assumed, or is it the determinative as proposed by many generative linguists in the 1980s and subsequently?

On might imagine that proponents of the DP analysis would have a significant number of strong empirical arguments in favor of the DP analysis to motivate such a radical reanalysis of tradition. However, as we will see in detail below, this does not appear to be the case. It is reasonable to ask what led Abney and numerous generativists after him to adopt the analysis.

The central motivation seems to spring solely from considerations of theoretical elegance, as seen in the light of internal developments within Chomskyan generative grammar. In the late 1970s and early 1980s, Chomsky (see e.g. Chomsky 1981 and 1986) began to endorse the idea of functional heads, which could be filled either by inflectional affixes or by grammatical morphemes. This development led to identifying the head of the clause not as the verb, as traditionally assumed, but as inflection ('Infl' or 'I'), the idea being that the verbal base under V is raised to I, resulting in *broke* on the surface in our example, the structure of which is now as in (12):

10. We note two relevant cases that provide further illustration. In an example like the Latin *Video canem grandem*, ('[I] see [a] big dog') the verb *video* ('see') governs accusative case on *canem grandem*, which consequently depends on it. Within this phrase, case is realized on the head, the morphosyntactic locus, namely the noun *canem*. As for the adjective *grandem*, it is in the accusative by agreement with the noun, since it is the functor within the phrase (see previous footnote). If one considers the German translation of this sentence, *Ich sehe einen großen Hund*, where the article and adjective are inflected for accusative case (*-en*) while the noun has no apparent inflection, one is forced to say, if one assumes that the noun is indeed the head of the NP, that it is the morphosyntactic locus and is in the accusative, but that the accusative feature has no phonological correlate. Note that in a small number of German nouns, there remains a phonologically marked distinction on the noun, e.g., *Ich sehe einen Drachen* 'I see a dragon', where the nominative singular is *ein Drache*). As in Latin, it is agreement that forces the two dependents of the noun to share its case.

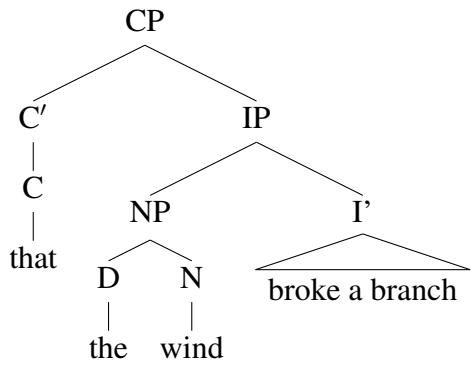
(12)



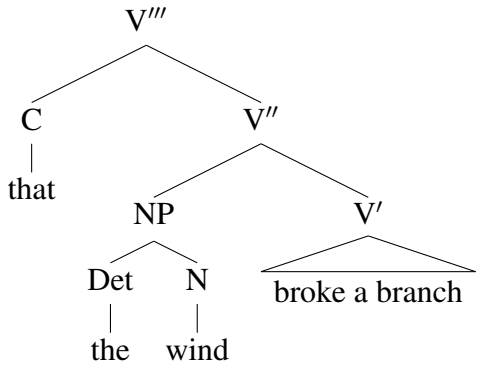

Similarly, in a subordinate clause, the Complementizer (C) is assumed to be the head with an IP complement (namely, the subordinate clause without the complementizer), the combination of the two forming a Complementizer Phrase (CP) as illustrated in (13)a, replacing the classical analysis where the whole subordinate clause is a projection of the verb, as in (13)b:

(13)

a.




b.




If one were to take it as a desideratum, or even an article of theoretical faith, that the internal structures of phrases with different categories of head are extremely similar in internal geometry (which was a prevalent view at the time), one might expect that the substantive phrase should also include a functional head. [11] The DP hypothesis emerges as a way to implement this idea: D is to noun phrases as Infl is to verb phrases and C is to clauses. It seems likely that this idea of a structural parallelism between the clause and the substantive phrase was actually the central motivation for the DP hypothesis. Bruening (2009: 27) appears to believe this, and Abney (1987: 75) explicitly presents a claimed parallelism between clauses and substantive phrases as an argument for the DP hypothesis. Note Stowell's remark that 'the chief motivation for the DP hypothesis is structurally based': its proponents 'seek to treat all X (X-zero) categories as heads of their own projections, and to unify the X-bar theoretic treatment of the functional categories'

11. Or several such heads. Recent developments in the framework of so-called 'cartographic' theory multiply the number of such functional heads within the DP; see e.g. Cinque (1994) and Scott (2002). Cinque proposes that when there are several attributive adjectives in the NP, each appears in the specifier position of a distinct functional head. This idea is developed by Scott, who proposes (see his (19), p.102), that there are at least 13 functional heads between D and N.

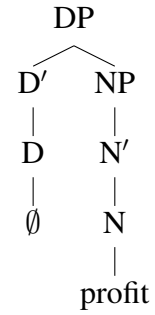
(Stowell 1989: 236). This line of argument is linked to a notion of 'simplicity' that Chomsky has always advocated: a structural generalization of this kind would 'simplify' the grammar in his view, and that would be desirable.

Benjamin Bruening rejects this line of argument (see Bruening 2009, Bruening et al. 2018, and Bruening 2020), claiming that that the alleged parallelism is deceptive and that the simplifications are purely superficial, hiding numerous complexities that are not taken into account. Several of his arguments will be recapitulated in subsections 4.1 and 4.2, where we will systematically apply the morphosyntactic locus criterion to the case of the substantive phrase. But before developing these detailed arguments, we have some briefer prefatory remarks about the implicit claim that every substantive phrase has a D in it.

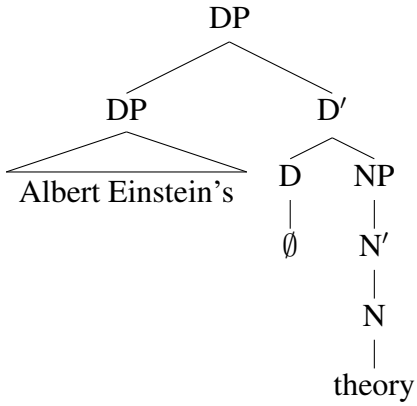
Since the 'D' of the DP analysis is a lexical category (a category to which a substantial number of words in the lexicon belong, rather than a functional category like I in (12) above to which no words belong), we are immediately faced with the question of how to analyse substantive phrases that contain no D item to serve as head: examples like *profit*; *care and concern for others*; *plan B*; *nitrogen*; *pencil and paper*; *word of mouth*; *London*; *Albert Einstein's theory*; *Britain's largest ever arts funding initiative*; and indefinitely many more. In all such phrases, Abney and other proponents of the DP analysis are forced to propose structures with a D head that has no phonetic, phonological, morphological, syntactic or semantic content, as in the following trees:

(14)

a.




b.




For cases of the type illustrated in (14)a, postulating a phonologically empty D position may seem to have a certain degree of plausibility, since it is possible to alternate with a full D, e.g., *the* in *the profit*.[12] For cases of the second type, as in (14)b, it is much more difficult to argue in favor of the existence of a D position between the genitive determiner and the noun.

Abney (1987) observes that Hungarian has substantive phrases where there are non zero D-type items in similar phrases. He also notes (p. 272) the existence of phrases like (15) in English.

(15) the duke's every wish

12. For a discussion of the conditions under which it is possible to provide strong arguments for zero morphemes, see, e.g., Miller (1997).

He explicitly concedes that *every* is the only determinative in English that allows this construction, but this understates things. *X's every N* is actually a frozen archaic construction inherited from a previous stage of the language where *every* could be used as an attributive modifier, as is possible in Present-Day English for several determinatives, including *several*, *many*, and *few*. These can readily appear in attributive modifier position following a definite article, as in *the few/many/several wishes that the duke made*; compare **the every wish that the duke made*. The construction in (15) has zero productivity: no other determinative (except those that can independently function as attributive modifiers, as illustrated) can enter into it:

(16) a. *your each bicycle
b. *the architect's any mistake
c. *those workmen's the tools
d. *my both feet

These would be perfectly intelligible with readings parallel to those of (15), if they were syntactically admissible, so it is clear that the problem is not semantic, but strictly syntactic.

Even with *every* the construction shows no productivity. If you had eaten all of someone's apples, you would never admit it by telling them*??I have eaten your every apple*. The construction with *every* in (15) cannot possibly be taken to be a serious argument in favor of a zero determinative head in phrases like *Albert Einstein's theory* (the analysis shown in (14)b above).

Proponents of the DP analysis might point out that there are also substantive phrases without an overt noun as head, and indeed there are (see *CGEL*: 410ff on fused-head and elliptical substantive phrases). In particular (setting aside anaphoric omission of repeated nouns), we find substantive phrases like *this* or *some* which consist of a determinative and nothing else. But note five points about these.

[i] Almost every noun can serve as a substantive phrase on its own, but the most central and stereotypical determinatives, namely the articles *a*∼*an* and *the*, never can.

[ii] Well over half of the substantive phrases in typical running text lack a determinative, whereas under 5 percent lack a head noun.

[iii] The one-word substantive phrases consisting of just a determinative would under traditional analyses be claimed to exhibit determinatives that have homonymous pronouns.

[iv] English has a well-established special register, that of newspaper headlines, in which determinatives are dropped as if optional and redundant (*Child finds father's gun, shoots mother*).

[v] In most cases of nounless NPs one can insert a head noun without causing ungrammaticality. Thus alongside *This worries me* we have *This situation worries me*; paralleling *Some say he's a crook* we find *Some people say he's a crook*; beside *The good die young* we get *The good people die young*; and so on. Nothing of the sort applies to inserting determinatives into the posited empty D position in examples like *your house*).

There is another undesirable feature of the DP hypothesis which goes beyond the facts of English. From a typological point of view, any analysis positing the determinative as head of the substantive phrase raises a major problem—or at the very least, forces linguistic theory to recognize a major syntactic-typological distinction between languages. It is well known that

numerous languages (most Slavic languages, Chinese, Japanese, Latin, etc.) do not have articles. In these languages, the great majority of substantive phrases have no determinative of any kind. The DP analysis consequently leads one to assume that in these languages the great majority of occurrences of substantive phrases have an empty determinative as head, which seems unparsimonious to say the least. [13]

# 4 Criteria for determining head status

In this section we apply two criteria for determining which element is the syntactic head: in 4.1 we apply the morphosyntactic locus criterion (largely following Payne (1993) and Bruening (2009)), and in 4.2 we consider the application of the subcategorisand criterion.

## 4.1 Applying the morphosyntactic locus criterion

Applying the morphosyntactic locus principle to the case of the substantive phrase, in comparison with the clause, provides us with a first set of arguments showing that the alleged parallelism between the substantive phrase and the clause, central to the original motivation for the DP hypothesis, is not well founded.

As shown by Bruening (2009: 27–29), complement clauses and NP direct objects are not at all parallel with respect to their morphosyntactic locus. [14] When a verb governs a complement clause, it imposes constraints on its formal properties. In particular, there may be differences in what are often called complementizers—grammatically significant but meaningless words like *that* and *whether*, which in *CGEL* are called subordinators. Some verbs govern declarative complement clauses, while others govern interrogative or exclamative complement clauses; some verbs govern finite complement clauses and others govern infinitival complement clauses. These distinctions are morphosyntactically marked by the choice of the complementizer, which could be considered to be the morphosyntactic locus. This could be taken to argue for the complementizer being the head of the complement clause. The following English and French examples illustrate:

(17) Declarative vs. interrogative complement clauses

a. We believe that the DP hypothesis is wrong.
   Nous croyons que l'hypothèse DP est fausse.

b. *We believe whether the DP hypothesis is wrong.
   *Nous croyons si l'hypothèse DP est fausse.

c. We wonder if the DP hypothesis is actually a hypothesis.
   Nous nous demandons si l'hypothèse DP est vraiment une hypothèse.

13. Some generative grammarians have defended a DP analysis that is not universal. Chierchia (1998), for instance, argues on semantic grounds that some languages (like English and French) have an NP that, for semantic reasons, requires an item having the determiner function to be able to refer. In these languages, NPs must be complements of D forming a DP. Conversely, other languages, like Chinese, have NPs that have a semantic type that allows them to refer directly, making items with the determiner function superfluous. Such languages require neither determinatives nor DPs.

14. Bruening himself does not use these terms, borrowed from Zwicky, and does not explicitly lay out the criteria, but his arguments and ours are entirely compatible and mutually supportive.

d. *We wonder that the DP hypothesis is actually a hypothesis. [15]
*Nous nous demandons que l'hypothèse DP est vraiment une hypothèse.

(18) Finite vs. infinitival complement clauses

a. We attempted to refute the DP hypothesis.
Nous avons tenté de réfuter l'hypothèse DP.

b. *They attempted that we refute the DP hypothesis.
*Ils ont tenté que nous réfutions l'hypothèse DP.

All of this could be taken to provide support for the idea that the complementizer is the morphosyntactic locus of the complement clause, corroborating the hypothesis that it is the head: selecting a declarative complementizer (*that* or *que*) or an interrogative complementizer (*whether* or *si*) will lead to the correct choice of a declarative or interrogative complement clause, depending on the governing verb. Similarly, the choice of a complementizer introducing a finite declarative (*that* or *que*) or a non finite declarative complement clause (*to* or *de*) will ensure that the correct complement is selected. [16]

But consider the contrast with direct objects. If the determinative were the head of a direct object substantive phrase, the morphosyntactic locus criterion would suggest that the governing verb should be able to select that determinative morphosyntactically, in parallel to what we have

15. Occasional examples may be found of declarative complements to *wonder*, but they do not affect our point; they are marginal in modern English, and represent survivals of an earlier sense of the verb. Thus the sentence *I wonder that men are so patient with society as they are* is attested, but in the early 19th century, and *wonder that* S means 'marvel at the fact that S'.

16. The analysis just sketched is not actually the one we favor. What we are doing in the text is not advocating it, but merely commenting that it does at least seem to comport with general principles of syntax and morphosyntax. Our own assumption would be (following *CGEL*, chapter 11) that the lexical head of a complement clause is not its complementizer but its main verb. While we will show below that the case for making the noun the head of the substantive phrase is very strong, that is not true for the two analyses of complement clauses: both analyses seem compatible with general principles. They differ not in what determines what, but in directness of determination. Either [i] the governing verb directly selects the complementizer (and thus indirectly determines the verb form needed in its clause complement), or [ii] the governing verb directly selects the form of the head verb in the subordinate clause (and thus indirectly determines what complementizer is required). The facts of English or French do not differentiate these, though analysis [ii] seems closer to traditional grammar, and we believe it is theoretically superior. One argument comes from subjunctives, which in formal-style English, and also in French, take the same complementizers as indicatives:

(i) Indicative vs. subjunctive complement clauses

a. I believe that the hypothesis is/*be false.
Je crois que l'hypothèse est/*soit fausse.

b. I ask that the hypothesis be/*is reevaluated.
Je demand que l'hypothèse soit/*est réévaluée.

If the verb in the complement clause is the head, we have no problem: indicative and subjunctive verb forms happen to select the same subordination-marking dependent in their containing clause. But if the complementizer is the head, we have to posit two *that* lexemes in English (say, $that_{\text{indic}}$ and $that_{\text{sbjunc}}$), and two *que* lexemes in French ($que_{\text{indic}}$ and $que_{\text{sbjunc}}$), and have verbs governing subjunctive complements only indirectly. The matrix verb will govern the choice of $that_{\text{sbjunc}}$ rather than the homonymous $that_{\text{indic}}$), and the complementizer in turn governs the head of its complement—the inflection element *I* under the Chomskyan analysis in (12)—which carries the information about the form of the verb required. If relative *that* and relative *que* are subordinators rather than relative pronouns (which we think they are), there is further inelegance: we need a third kind *that* and a third kind of *que*.

just seen for the complementizer for complement clauses and the preposition for PP indirect objects. But this is not the case. Transitive verbs are indifferent to the choice of determinative on their direct object. There are no verbs in English or French that require a direct object having a demonstrative or a definite article as determinative, for instance. [17]

In fact, it is the noun that constrains the choice of the determinative. On the other hand, the governing verb does impose a morphosyntactic constraint on its direct object, namely that it must have a noun as its head, rather than some other category (compare *We devoured much meat* with **We devoured very meaty*).

## 4.2 Applying the subcategorisand criterion

We now turn to the conclusions that can be drawn from the subcategorisand criterion as to the head of substantive phrases and complement clauses.

In the case of the substantive phrase, it is immediately obvious that it is the choice of the head noun that governs the form of the determinative, and not the contrary. As shown in (19), the count or non-count status of the head noun constrains the types of determinatives with which it can combine.

(19) a. some/not much/*a sodium
du/peu de/*un sodium
b. a/*some/*not much table
une/*de la/*peu de table

Similarly, in English, the properties of the noun determine whether it can appear without a determinative: singular count nouns require a determinative whereas plural count and non-count do not, as shown in(20).

(20)
| | | | | | |
|---|---|---|---|---|---|
| i. | a. | I want a sandwich. | b. | *I want sandwich. |
| ii. | b. | I want some sandwiches. | b. | I want sandwiches. |
| iii. | c. | I want some beer. | b. | I want beer. |

Similarly, the presence and choice of a determinative is governed by the common vs. proper status of the head noun, and in the case of proper nouns, by the specific subclass.

(21) a. I see the/*Ø man.
Je vois l'/*Ø homme.
b. I see *the/Ø Kim.

17. As shown by Bruening (2009: 29), a verb can select the number of its direct object: *The dean gathered the students* vs. */#*The dean gathered the student*. Is this a case of morphosyntactic selection (in which case the second clause would be ungrammatical), or semantic selection (in which case the second sentence is just semantically ill-formed)? Clearly, semantic. Nouns that are morphosyntactically singular but refer to a plurality of individuals are perfectly acceptable (*The dean gathered a crowd*), whereas a noun that is morphosyntactically plural but refers to a single individual is impossible: *#The dean gathered the scissors* cannot refer to a situation where there is just a single pair of scissors. See Gardelle (2019) for a more general discussion of the relations between semantic and syntactic plurality.

Je vois *le/Ø Kim.

c. I like *the/Ø France.
   J'aime la/*Ø France.
d. The/*Ø Thames is lovely.
   La/*Ø Tamise est belle.

Conversely, in the clause, closed class items determine the form of the lexical head. In English, the choice of auxiliary determines the form of the following VP (and, consequently, of its head). Modal auxiliaries require the following verb to be in the base form; the progressive auxiliary *be* requires the following verb to be a present participle, and the perfect auxiliary *have* requires the following verb to be in the past participle:

(22) a. Kim can leave/*leaving/*left.
b. Kim is leaving/*leave/*left.
c. Kim has left/*leave/*leaving.

The form of the lexical verb does not in any sense select that of the auxiliary. And the situation is the same in French:

(23) a. Kim est parti/*partir.
b. Kim va *parti/partir.

These cases are importantly different from what we just saw with respect to the substantive phrase. In the present context, lexical verbs systematically have all the necessary forms to be able to adapt to the constraints imposed by the auxiliary. [18]

It is clear that the choice of the form—infinitive, present participle, past participle—is not an intrinsic property of the verb and is in no way linked to its lexical semantics. Conversely, in the substantive phrase, it is difficult to say that the determinative imposes extrinsic constraints on the noun. The subcategory to which a noun belongs (count, non-count, proper, or whatever) is an intrinsic property of the noun and is linked to its lexical semantics (it is not entirely predictable from the semantics, but there are strong generalizations). Moreover, contrary to verbs, nouns do not have a variety of forms allowing them to adapt to the choice of a given determiner, so that most nouns would be classified as 'defective' from this perspective. This is implausible. [19]

To conclude, then, the structures of clauses and substantive phrases are not parallel. In the

18. In the special case of defective verbs, which lack inflectional forms in the normal verb paradigm, the morphosyntactic requirement of a governing auxiliary may be impossible to meet. The modal auxiliaries in English, for example, do not have tensed forms. Modal *can* is never able to appear as a complement of *would*, because it doesn't have the base form that would make it possible: **I would not can pay that*. But this is an exceptional case—defective verbs are very rare—and does not seem to be linked to the lexical semantics of the verb. The cognate modal verbs in Germanic languages like German and Dutch have similar meanings to those of English but are not defective. In the Dutch sentence *Ik zou dat niet kunnen betalen* (literally 'I would that not can pay', translation 'I would not be able to pay that'), *kunnen* ('can') is in the infinitive, because it is the complement of the modal *zou* ('would'). If the problems with the corresponding English sentence were due to semantics, the same problems should arise in the Dutch counterpart.

19. The closest phenomenon for nouns is the case of pairs like *job* / *work*, *trip* / *travel*, where the first is count and the second non-count. But these cannot plausibly be taken to be different inflectional forms of the same noun.

substantive phrase, the noun imposes its intrinsic morphosyntactic properties on the elements that surround it, suggesting that it is indeed the noun that is the head of the construction, so it is an NP rather than a DP. Conversely, in the clause, the choice of the complementizer and the form of the head verb are governed by mutual constraints, allowing the widely accepted analysis where the complementizer is the morphosyntactic head (though we ourselves do not advocate this analysis; see footnote 16 above).

# 5 Assessing the DP analysis

This section examines several examples of empirical arguments that have been claimed to support the DP analysis, and point out their weaknesses. It also points out various problems raised by the DP analysis.

Our search for empirical arguments in favor of the DP analysis will rely heavily on the foundational (though never published) work of Abney (1987), and on Bernstein (2001), an overview paper on the 'DP hypothesis' published in the *Handbook of Contemporary Syntactic Theory*. It seems to us that the empirical arguments that have been brought to bear are very weak and inconclusive. In many cases, the authors examine a small set of data coming from a limited number of langages and conclude that all languages must share similar properties. If these properties are not visible on the surface, it is assumed that they are hidden in abstract syntactic structure. This strategy is typical in the Chomskyan generative tradition since the 1980s, the idea being that the apparent variety of languages hides strong universal properties. The cases we examine below suggest that there are reasons to be skeptical about such conclusions.

Stowell (1989) provides a good illustration. He asserts that 'The occurrence of PRO in NP provides the basis of an argument for the DP hypothesis' (p. 236), but what follows is more than two dozen pages of conjectures, provisos, assumptions, riders, speculations, and semantic claims, all couched in terms of 1980s government-binding theory no longer defended by any generativists, and no clearly statable argument seems to emerge. Among other problems, Stowell asserts that any substantive phrase that 'functions referentially' must contain a D constituent; but since a null and meaningless D node can always be posited to serve as the required D, his claim has no real substance.

One central empirical argument that has been said to favor the DP hypothesis is that there are languages where the morphological marking of Genitive + Head Noun substantive phrases is very similar to the marking of Subject + Predicate clauses (Yup'ik, Hungarian, Turkish, and the Mayan languages are cited; see Bernstein 2001: 538–539 for examples and Abney 1987: 37–53 for details). Even if these analyses are convincing for the languages in question, it is not at all clear that one should draw any conclusions from them for the numerous languages which exhibit few if any such parallels, such as English and French.

Bernstein (2001: 546–547) gives another argument based on a paradigm of Italian examples from Longobardi (1994: 623), with the following contrasts:

(24) a. Il mio Gianni ha finalmente telefonato.
the my Gianni has finally phoned
b. *Mio Gianni ha finalmente telefonato.

my Gianni has finally phoned

c. Gianni mio ha finalmente telefonato.
Gianni my has finally phoned

Longobardi's analysis of these data is based on the DP analysis. He suggests that the basic position of the noun is after *il* and *mio*, but that the noun can raise to the D position, substituting for the article, as shown in (25), where '$t_i$' is the position left empty (the 'trace') by the movement of the noun to the left:

(25) $[_{DP}\ [_{D}$ il$]\ [_{NP}\ [_{Adj}$ mio$]\ [_{N}$ Gianni$]]]$
$\Rightarrow [_{DP}\ [_{D}$ Gianni$_i]\ [_{NP}\ [_{Adj}$ mio$]\ [_{N}$ t$_i]]]$

The idea that proper nouns raise to D is often proposed within the DP analysis (see Bernstein 2001: 544 and 546). It is supposed to explain why the article is absent with proper nouns. Even for Italian, it seems rather clear that the proposed analysis is not the only one imaginable. It also seems to lack any generality: as Longobardi himself concedes, raising of the proper noun to D in front of an adjective is only possible with a small subset of italian adjectives (*il grande Gianni*, 'the big Gianni', cannot be realized as **Gianni grande* as would be predicted by generalizing the type of movement suggested: see Longobardi 1994: 624, note 18).

This kind of hypothesis raises further problems. First, as shown by the well known examples in (21) above, different kinds of proper nouns appear with or without the definite article, with variation from one language to another. One cannot then provide a simple explanation for the absence of the article with proper nouns by invoking an analysis that causes them to raise into the determiner position. Any serious analysis need to make the relevant distinctions between languages and subclasses of proper nouns. One would have to say, for instance, that proper names of countries raise to D in English, but not in French, cf. (21-c), which seems unmotivated. No simple generalization is available.

Now consider the case of proper nouns modified by an adjective in English. They can appear with or without an article, with minor shifts in meaning:

(26) a. Paris is beautiful. $[_{DP}\ [_{D}$ Paris$_i]\ [_{NP}\ [_{N}$ t$_i]]]$
b. The old Paris is beautiful.
c. Old Paris is beautiful.

If one proposes that the absence of the article in (26-a) is due to the fact that the proper noun has raised to the D position, as sketched, one might suggest that in (26-b) the presence of the article is due to the fact that exceptionally the proper noun has not raised to D (since the article is still there). But then (26-c) raises a problem: the adjective is before the noun, suggesting that it hasn't raised to D (if it had, it should be before the adjective, which is impossible in English, since a universal order Det-Adj-Nom is assumed in the NP under these assumptions, see (25) above). It is then necessary to find a separate explanation for the absence of the article in (26-c). One might suggest, for instance, that the adjective itself has raised to a position before the proper noun, after the latter has raised to D. But the problem with this kind of explanation is immediately apparent: multiplying empty positions and possible movements with no overt correlate in the linear order of the string allows one to 'explain' just about anything. This combines with the fact that in general

studies that develop these kinds of analyses only provide very informal sketches as to how they are exactly supposed to work, making predictions even less reliable. [20]

To conclude, beyond the fact that the specific analyses that we have just discussed can be called into question, it is even more questionable to draw universal conclusions about the structure of the substantive phrases from such micro-analyses of phenomena in one language or another, be it Yup'ik, Turkish, Hungarian, Italian, or English. But this is exactly what one finds over and over again in the discussions of Bernstein and Abney and other proponents of the DP analysis.

A clear case of paying inadequate attention to the data is found when Abney (1987: 282) suggests that personal pronouns are really determinatives. This is of course a classical analysis, often justified in historical terms, since in many languages, among which the Romance languages, third person pronouns are historically derived from determinatives. Abney argues for it on the basis that, contrary to proper nouns, personal pronouns cannot appear in normal N positions; specifically, they cannot follow an article. He cites **the she* as impossible. But a closer look at the data makes it impossible to draw such conclusions without numerous auxiliary hypotheses. It is easy to find attested examples of the personal pronouns with articles in English, as shown by the following cases from the COCA corpus: [21]

(27) a. He loves the me I am now. Not the me I once was. (COCA)
b. Thus, when asked to make a decision, who is the me who is actually making that decision? (COCA)
c. Other times, it's as if she's separate from herself in those moments and that there is a real split in herself and that the her who needs sex is there to destroy the her who needs tenderness, the one who needs to be shielded, hugged, cared for. (COCA)
d. Cause she's not the her we thought she'd be, right? (COCA)

These examples are not sufficient to prove that Abney is wrong, of course. One could treat them as exceptional uses of the pronouns, recategorized as common nouns. But it would then be necessary to motivate the idea that proper nouns with articles (cf. (26) above) are not recategorized as common nouns as well.

A key instance of invoking the morphosyntactic locus criterion involves the failure of verbs (and other lexical heads) to impose constraints of a morphosyntactic nature on determinatives. Abney (1987) is well acquainted with the sort of case in question. He says, in fact (chapter 2, pp. 85–86):

> An obvious objection to the DP-analysis is that unlike C and I, D does not appear to be selected by a matrix head; but as is well-known, selectional restrictions *are* imposed on N. This would argue against D as the head of the noun phrase.

What strategy does Abney develop to counter the anti-DP argument he has just sketched? He

20. The Longobardi article cited is typical in this respect. It has no specific analyses with trees or labeled bracketings for the data in (24). The analysis sketched in (25) is in fact just our interpretation of what is suggested by the author.

21. Brett Reynolds, to whom we are grateful, points out that COCA (see Davies 2008–) has 27 occurrences of *the me that* out of 2,638,483 occurrences of *me*, so about 10 per million, and 7 occurrences of *the John that* out of 257,299 occurrences of *John*, so about 27 per million (data from May 2021). The orders of magnitude do not seem to be very different, at a glance, suggesting that the data are indeed comparable.

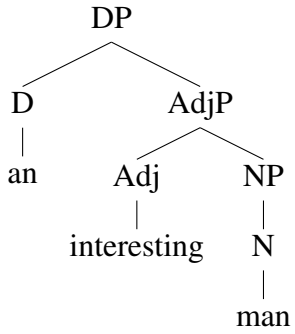
reviews some Navaho data that show that, in that language, a small class of verbs select semantic categories typical of determinatives. He concedes, however (pp. 87–88) that this is only a curiosity, since the semantic categories in question are not morphosyntactically marked on determinatives in Navaho. This does not prevent him from concluding his appendix by saying:

> Despite this, though, I think that the Navaho paradigm does show that selection of determiner is not a possibility excluded by Universal Grammar.

Two remarks are in order. On the one hand, since as Abney himself admits the Navaho example is not a case of morphosyntactic selection of the determinative, but of selection of semantic properties typical of determinatives, no conclusions about the morphosyntax of Universal Grammar can be drawn from them. On the other hand, even if there were languages where verbs do govern the choice of the determinative on their complements or subjects, this would not allow us to conclude anything about the syntax of substantive phrases in languages in general.

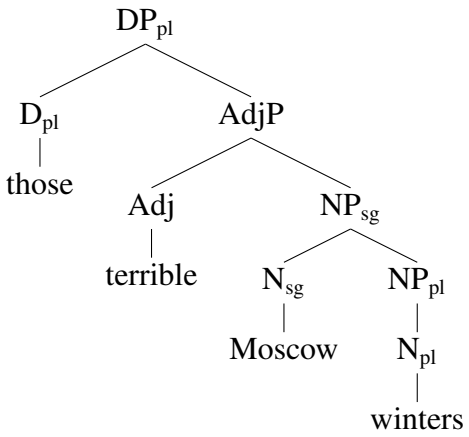
A different problem raised by Abney's analysis concerns attributive adjectives, for which Abney (1987: 327) proposes the following structure:

(28)




This structure is highly problematic. It makes it completely unclear how one can express the well known constraints linking the determinative and the noun with respect to count/uncount status and number. Attributive adjectives in English are not marked for number and are indifferent to the count/non-count status of the head noun. There is then no reason to expect that such features should be present on the Adj and AdjP nodes in (28). But in the theory within which these hypotheses are couched, (28) tells us that D selects AdjP and that Adj selects NP. If Adj has no features for number and count status, how can it select the following noun? How can one avoid producing things like **an interesting information* or **an interesting men*? The situation is made worse by the fact that one can stack such attributive modifiers, some of which can be nouns themselves. Consider the following case:

(29)




The number properties of the plural determinative *those* are selected by the noun *winters*. But between the NP that immediately dominates *winters* (and which must have the feature plural) and the DP, there is a singular NP that dominates *Moscow winters*. How then can one ensure that the determinative will agree with the right noun? Such questions are not necessarily insoluble; some strategies have been suggested. [22] Nevertheless, it is clear that the DP analysis leads its proponents to invoke numerous weakly motivated auxiliary hypotheses in order to solve the analytical difficulties it raises.

More generally, when one examines the arguments presented in Bernstein's survey paper, it appears clearly that they do not really provide direct arguments in favor of the idea that D, rather than N, is the head of the substantive phrase. Rather, they aim to show how transformational movement, combined with a series of empty syntactic positions, allows one to defend the DP analysis against objections.

Readers familiar with Abney's dissertation will perhaps be surprised that our discussion at this point does not examine the syntax of constructions like *his having won the election*. It is the topic of his third chapter, which he clearly believes is one of the strong points in his defense of the DP analysis. We decided not to discuss this topic at length because the issue is highly complex and would have required a very substantial amount of additional space laying out multiple assumptions of late-1980s GB theory. But in brief, we do not believe that Abney's DP-based analysis, which crucially relies on a null D with no properties other than that of requiring a gerund-participial complement, makes any progress with respect to previous analyses such as Schachter (1976) or Jackendoff (1977), which are Abney's points of departure. Pullum (1991) offers a thorough discussion comparing Abney's account with an alternative NP-based syntax in which the relevant constructions are NPs with (exceptionally) VP heads. *CGEL*(chapter 14) takes a different view, under which the issue is merely a superficial matter of accusative or genitive case-marking on the subjects of clauses with gerund-participial verbs (ACC-*ing* and POSS-*ing* in older transformational work): compare *I appreciated them visiting me* with *I appreciated their visiting me*. Much remains to be said about the proper analysis of such constructions (among other things, the facts themselves are a topic of dispute, with some conservative usage advisers claiming that the version with the accusative subject is just a grammatical error), but what is fairly clear is that too many issues are unresolved: we are not going to be able to extract from the

22. For the present case, see for instance Riemsdijk (1998). His hypotheses allow him to ultimately make the DP hypothesis almost indistinguishable from a classical NP analysis.

array of currently available analyses a decisive syntactic resolution of the NP/DP dispute.

One argument of a semantic nature that Bernstein presents as favoring the DP analysis is that the relation between IP and CP is parallel to that between NP and DP:

(30)

| Syntactic category | Semantic correlate |
|---|---|
| IP | proposition |
| CP | propositional argument |
| NP | nominal predicate |
| DP | nominal argument |

But vague analogies of this sort cannot count as serious arguments for the idea that *the*, rather than *children*, is the head in a phrase like *the children*. Note that *CGEL*, which does not accept the DP analysis, makes exactly parallel distinctions, except that instead of the labels IP, CP, NP, and DP, they use 'bare clause', 'expanded clause' (where 'expanded' means marked by a complementizer), 'Nominal', and 'NP'. This does not motivate any conclusions as to what should be assumed to be the head of the substantive phrase.

The validity of the parallelisms suggested by the table above is also questionable. It is not at all clear that the determinative's role is to turn an NP denoting a predicate into a nominal argument (see Bruening 2009: 32). In English, when substantive phrases are predicative complements they have an indefinite article under the same conditions as when they are arguments (as in the b and c cases of the following examples):

(31) a. Kim is a/*Ø nurse.
b. Kim saw a/*Ø nurse.
c. A/*Ø nurse walked in.

(32) a. They are Ø/*a nurses.
b. Kim saw Ø/*a nurses.
c. Ø Nurses/*A nurses walked in.

(33) a. This is Ø/*a water.
b. Kim saw Ø/*a water.
c. Ø Water/*A water dripped from the ceiling.

In fact, there is a broad range of variation between languages as to the way substantive phrases are marked when they are predicative complements (see, for instance, Van Peteghem 1993 for a detailed survey of variation in Romance languages). Universal syntactic conclusions are not to be drawn from this kind of hasty semantic generalization (see Chierchia (1998), cited in footnote 13 above, for a more serious discussion).

# 6 Conclusion

The motivations that have led so many generative linguists to embrace the DP analysis are remarkably unclear. Without any compelling reason, DP has systematically replaced NP in articles in *Linguistic Inquiry* over the past 20 to 30 years, even in articles where the internal structure of the substantive phrase is of no consequence. Overall, data and theory suggest that the head of the substantive phrase is N and not D, at least in languages like English and French.

This is not one of the many instances of a novel idea gaining traction through the prestige of a Chomskyan endorsement: Chomsky did not endorse the ideas of Szabolcsi, or of Fukui and Speas, in the mid 1980s; and he did not supervise Abney's dissertation (its title page is signed by Richard Larson and Wayne O'Neil). Chomsky's publications in the years immediately following Abney's dissertation do not switch to using DP labels for substantive phrases. Chomsky has shown little or no interest in the internal structure of substantive phrases in recent decades, and his clause representations in post-1987 publications continued to use the label 'NP'. Chomsky (1991) uses NP throughout. The chapters in Chomsky (1995) (one of them a joint paper with Lasnik) alternate between NP and DP when referring to substantive phrases, but do not discuss why. And in Chomsky (2020), as noted earlier, he finally made his skepticism about the hypothesis explicit, rejecting it.

We believe the arguments against the 'DP hypothesis' provided by Payne (1993), Bruening (2009), Bruening et al. (2018), and Bruening (2020) are compelling. Larson responds to Bruening in 2019, but his counterarguments are in some cases based on quite murky data about meaning, idioms, and fixed phrases (unpromising ground for support of a syntactic hypothesis so basic and fundamental) and in others highly intratheoretical.

One example of what we mean by intratheoretical argumentation is when Larson claims that 'DP hypothesis' structures were motivated by the fact that determinatives did not fit in with the notion of 'specifier' (itself obscure, as Stowell 1991 points out). Most specifiers were either full phrases like genitive determiner phrases (*my uncle's*), or subjects in some analyses, or moved phrases such as topics and *wh* phrases in others; yet the lexical items of the determinative class 'were neither moved items nor apparent arguments' and so 'simply did not align with the broader, developing picture' (Larson 2019: 5). He says that 'compelling logic for D as the head of the nominal derives from the formal semantics of determiners' (2019:8), but the subsequent discussion (§1.3, 8–13) yields nothing more than a suggestion that 'given the sharp semantic differences between C and D, expectations about parallel syntactic behavior in CP and DP must be adjusted accordingly', so that a parallelism argument against DP analyses is neutralized.

On balance, it seems to us that Chomsky is right to opt for the noun-headed view of substantive phrases agreeing with *CGEL*, pre-1980s transformational-generative grammar, and all traditional and structuralist works that have assumed the reality of phrase structure and dependency. And as we have indicated, we are distinctly skeptical about the strength of the defensive pro-DP arguments.

However, we cannot claim that either hypothesis could ever be declared decisively refuted. Given such devices as transformational movement from N to D, and above all the positing of null D nodes that have no semantic, morphological, or phonological properties, it seems to us that protecting the DP hypothesis from falsification within transformational theories of syntax will always be possible. In fact this may be one of the most interesting things about the present

dispute: it may represent a fairly intricate and convincing case of a situation that the philosopher W. V. O. Quine (1972) warned syntacticians about half a century ago.

Quine regarded it as obvious that a human language could have two distinct generative grammars, each generating exactly the right set of strings but differing in their claims about the syntactic structure of at least some of those strings. In such a case, he believed, there would be no fact of the matter about which was 'correct'. We have laid out our case for the more traditional NP analysis. But as far as we can see, given the fairly rich descriptive resources of current generative grammar, it is quite possible that either hypothesis might be developed to the point of being completely compatible with all evidence about grammaticality, while each continued to contradict the other in claims about matters like labeling, constituency, headedness, and null nodes.

Such a situation would be problematic (as Quine noted) for the psychological interpretation of generative grammars. It would mean that there could be two populations of English speakers, the NP subpopulation and the DP subpopulation, whose members had different mental representations of structure for substantive phrases yet never differed on questions of the grammaticality or meaning of any sentence. It would be impossible even in principle to evaluate one analysis as preferable to the other, or to tell speakers of one subgroup apart from the other, by reference to the kinds of evidence that generative grammar has always employed—facts about grammaticality and ungrammaticality. Quine merely reflected on this possibility in the abstract, but the dispute over the DP hypothesis might well be intricate but concrete instance of it in modern syntactic analysis.

Any continued claim that the DP hypothesis or its NP alternative was the correct account of the grammar of English would need to be backed up by other kinds of evidence. Experimental psycholinguistic evidence would be the most obvious candidate (though at present we see no prospect of an experiment that might bear on the problem at hand). Theoretical syntax would then have to get serious not just about its long-adumbrated claims of relevance to psychology (or neurophysiology or genetics, or whatever), but about accepting that evidence from those disciplines could be called on to settle issues about the content of the grammar itself.

# References


Abney, Stephen. 1987. *The English Noun Phrase in its Sentential Aspect*. Ph.D. thesis, Massachusetts Institute of Technology, Cambridge, MA.

Bernstein, Judy B. 2001. The DP hypothesis: Identifying clausal properties in the nominal domain. In Mark Baltin and Chris Collins, eds., *The Handbook of Contemporary Syntactic Theory*, 143–160. Oxford: Blackwell.

Bloomfield, Leonard. 1933. *Language*. London: George Allen and Unwin.

Bruening, Benjamin. 2009. Selectional asymmetries between CP and DP suggest that the DP hypothesis is wrong. In *Proceedings of the 32nd Annual Penn Linguistics Colloquium*, Volume 15 of *University of Pennsylvania Working Papers in Linguistics*, 26–35. Berkeley, CA. URL http://repository.upenn.edu/pwpl/vol15/iss1/.

Bruening, Benjamin. 2020. The head of the nominal is N, not D: N-to-D movement, hybrid agreement, and conventionalized expressions. *Glossa* 5(1).

Bruening, Benjamin, Xuyen Dinh, and Lan Kim. 2018. Selection, idioms, and the structure of nominal phrases with and without classifiers. *Glossa* 3(1):1–46.

Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6:339–405.

Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.

Chomsky, Noam. 1970. Remarks on nominalization. In Roderick A. Jacobs and Peter S. Rosenbaum, eds., *Readings in English Transformational Grammar*, 184–221. Waltham, MA: Ginn.

Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.

Chomsky, Noam. 1986. *Barriers*. Cambridge, MA: MIT Press.

Chomsky, Noam. 1991. Some notes on the economy of derivation and representation. In Robert Freidin, ed., *Principles and Parameters in Comparative Grammar*, 417–454. Cambridge, MA: MIT Press.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Chomsky, Noam. 2020. The UCLA lectures (April 29 – May 2, 2019). Online at https://lingbuzz.net/lingbuzz/005485.

Cinque, Guglielmo. 1994. On the evidence for partial N movement in the Romance DP. In Guiliglemo Cinque, Jan Koster, Jean-Yves Pollock, Luigi Rizzi, and Rafaela Zanuttini, eds., *Paths towards Universal Grammar*, 85–110. Washington, DC: Georgetown University Press.

Davies, Mark. 2008–. The Corpus of Contemporary American English (COCA). https://www.english-corpora.org/coca/.

Dominicy, Marc. 1982. Condillac et les grammaires de dépendance. In Jean Sgard, ed., *Condillac et les problèmes du langage*, 313–343. Genève: Slatkine.

Fukui, Naoko and Margaret Speas. 1986. Specifiers and projection. In Naoko Fukui, T. R. Rapoport, and Elizabeth Sagey, eds., *Papers in Theoretical Linguistics*, number 8 in MIT Working Papers in Linguistics, 128–172. Cambridge MA: Massachusetts Institute of Technology.

Gaifman, Chaïm. 1965. Dependency systems and phrase structure systems. *Information and Control* 8:304–337.

Gardelle, Laure. 2019. *Semantic Plurality. English Collective Nouns and Other Ways of Denoting Pluralities of Entities*. Amsterdam: Benjamins.

Harris, Zellig S. 1951. *Structural Linguistics*. Chicago: University of Chicago Press.

Huddleston, Rodney and Geoffrey K. Pullum et al. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.

Jackendoff, Ray S. 1977. *X-bar Syntax. A Study of Phrase Structure*. Cambridge, MA: MIT Press.

Keenan, Edward. 1974. The functional principle: Generalizing the notion 'subject of'. In *Papers from the Tenth Regional Meeting of the Chicago Linguistic Society*, 298–309. Chicago, IL.

Kornai, András and Geoffrey K. Pullum. 1990. The X-bar theory of phrase structure. *Language* 66:24–50.

Larson, Richard. 2019. The DP hypothesis and (a)symmetries between DP and CP. *Linguistic Analysis* 42(3&4):1–42.

Longobardi, Giuseppe. 1994. Reference and proper names: A theory of N-movement in syntax

and logical form. *Linguistic Inquiry* 25:609–665.

Marneffe, Marie-Catherine de and Joakim Nivre. 2019. Dependency grammar. *Annual Review of Linguistics* 5(1):197–218.

Melčuk, Igor. 1988. *Dependency Syntax: Theory and Practice*. Albany, NY: SUNY Press.

Miller, Philip. 1997. Les morphèmes zéro à l'épreuve du rasoir d'Occam. In Jean Chuquet and Marc Fryd, eds., *Travaux Linguistiques du Cerlico*, Volume 10, 13–42. Rennes: Presses Universitaires de Rennes.

Miller, Philip. 1999. *Strong Generative Capacity: The Semantics of Linguistic Formalism*. Stanford: CSLI Publications.

Palmer, Harold E. and F. G. Blandford. 1939. *A Grammar of Spoken English on a Strictly Phonetic Basis*. Cambridge: W. Heffer & Sons.

Payne, John. 1993. The headedness of noun phrases: Slaying the nominal hydra. In G. G. Corbett, N. M. Fraser, and S. McGlahshan, eds., *Heads in Grammatical Theory*, 114–139. Cambridge: Cambridge University Press.

Pullum, Geoffrey K. 1991. English nominal gerund phrases as noun phrases with verb phrase heads. *Linguistics* 29:763–799.

Quine, Willard V. O. 1972. Methodological reflections on current linguistic theory. In Donald Davidson and Gilbert Harman, eds., *Semantics of Natural Language*, 442–454. Dordrecht: Reidel.

Radford, Andrew. 1993. Head-hunting: on the trail of the nominal Janus. In G. G. Corbett, N. M. Fraser, and S. McGlahshan, eds., *Heads in Grammatical Theory*, 73–113. Cambridge: Cambridge University Press.

Riemsdijk, Henk van. 1998. Categorial feature magnetism: The endocentricity and distribution of projections. *Journal of Comparative Germanic Linguistics* 2:1–48.

Schachter, Paul. 1976. A nontransformational analysis of gerundive nominals in English. *Linguistic Inquiry* 7:205–241.

Scott, Gary-John. 2002. Stacked adjectival modification and the structure of nominal phrases. In Guglielmo Cinque, ed., *The Cartography of Syntactic Structure, Vol. 1: Functional Structures in DP and IP*, 91–122. New York: Oxford University Press.

Speas, Margaret. 1986. *Adjunction and Projection in Syntax*. Ph.D. thesis, MIT, Cambridge, MA.

Stowell, Tim. 1989. Subjects, specifiers, and X-Bar theory. In Mark R. Baltin and Anthony S. Kroch, eds., *Alternative Conceptions of Phrase Structure*, 232–262. Chicago, IL: University of Chicago Press.

Stowell, Tim. 1991. Determiners in NP and DP. In Katherine Leffel and Denis Bouchard, eds., *Views on Phrase Structure*, 37–56. Dordrecht: Kluwer.

Szabolcsi, Anna. 1983. The possessor that ran away from home. *The Linguistic Review* 3:89–102.

Tesnière, Lucien. 1959. *Eléments de syntaxe structurale*. Paris: Klincksieck.

Van Peteghem, Marleen. 1993. *La détermination de l'attribut nominal: étude comparative de quatres langues romanes (français, espagnol, italien, roumain)*. Turnhout: Brepols.

Zwicky, Arnold M. 1985. Heads. *Journal of Linguistics* 21:1–29.