

Chapter 1

Revisiting the NP vs. DP debate

Martin Salzmann

Leipzig University

The DP-hypothesis as proposed in Abney (1987) is nowadays generally taken for granted in formal syntactic work. In this chapter I will show that most if not all of the arguments that have been provided in the literature are not conclusive; they either rest on purely theory-internal premises or are based on assumptions that lose their force given recent developments within syntactic theory. In practically all cases a reasonable reanalysis within the NP-hypothesis is possible. Similarly, I will show that the few arguments in favor of the NP-hypothesis that there can be found are also inconclusive. Finally, after discussing diagnostics for headedness, I will propose a new argument in favor of the DP-hypothesis based on hybrid agreement in Slavic languages. The phenomenon crucially requires determiners to be closer to agreement targets outside the noun phrase than the noun itself. This follows if DP dominates NP but not vice versa.

1 Introduction

Until the mid 1980ies there was little controversy about the head of the noun phrase as in (1). It was taken to be a projection of the noun with determiners occupying the specifier position of N as depicted in (2-a). Things changed drastically with Steven Abney's seminal dissertation (Abney 1987) in which he proposed that it is actually the determiner that heads the noun phrase, cf. (2-b):¹

- (1) The book

¹ The idea that the determiner is the head of the noun phrase can occasionally be found in literature predating Abney's dissertation, see Abney (1987: 77) for references. However, he was the first to propose a comprehensive new theory of the noun phrase under this perspective.





It is fair to say that the DP-hypothesis has been exceptionally successful. In most of the current formal syntactic literature, especially in work carried out within the Minimalist Program since Chomsky (1995), the DP-hypothesis is taken for granted.

Interestingly, though, once one browses through some of the major textbook introductions to various formal syntactic theories, one finds surprisingly little argumentation in favor of either NP or DP. For instance, in their introduction to LFG, Bresnan et al. (2016) remain agnostic as to which structure is preferable. Within HPSG one can find the view that the noun phrase is a DP (cf. Sag et al. 2003), while Müller (2007: 84ff.)/presentation on May 11, 2017, argues in favor of the NP structure (I return to his argument in section 3.4 below). In the introduction to TAG by Frank (2002) the DP-hypothesis is taken for granted but not argued for. In his introduction to Minimalist syntax, Adger (2003) does argue in favor of the DP-structure by means of arguments we will evaluate below. In many cases, the use of terminology tends to suggest a certain amount of uncertainty. For instance, in his overview of (formal) German syntax (Haider 2010), Hubert Haider uses both DP and NP apparently interchangeably, although DP is used more frequently (239 hits vs. 86 hits; note that in Haider 1992 article, he does argue in favor of the DP-hypothesis w.r.t. German, with arguments I return to below). Such uses of terminology are frequently to be found; this, together with the surprisingly little amount of argumentation in favor of either NP or DP, strongly contrasts with the discussion about other syntactic categories like APs, PPs, VPs and CPs where there does not seem to be a comparable uncertainty.

Against this background and given its recent 40th anniversary, the goal of this chapter is to reevaluate the DP-hypothesis by reviewing previous arguments advanced in its favor. As we will see, many (if not most) arguments are no longer decisive; given more recent assumptions about phrase structure, the relevant phenomena can also straightforwardly be handled by means of the NP-structure. I will consequently change perspective and investigate some of the rare claims in favor of the NP-hypothesis. This will also lead to an inconclusive result. I will then take a step back and try to establish robust criteria for headedness on

a very general level. With this in mind, I will then, in the last part of the chapter, turn to hybrid agreement in BCS (Bosnian-Croatian-Serbian), which in my view does present a strong argument in favor of the DP-hypothesis because it relies on a very basic property of headedness: The head is the element whose features are present on the maximal projection and which thus are most visible to the agreement targets outside the noun phrase.

The chapter is organized as follows: In section two, I will discuss previous arguments in favor of the DP-hypothesis. Then, in section three, arguments for the NP-hypothesis will be evaluated. In section four, I first establish good criteria for headedness before presenting the argument in favor of the DP-hypothesis. Section five concludes. Before proceeding, let me emphasize that this chapter will not discuss whether languages can differ with respect to the head of the noun phrase, concretely, whether all languages have DPs or whether some have DPs, while other only project NPs, cf. Bošković (2005). Furthermore, I will leave it open whether all noun phrases within a given language are of the same category (i.e. all NPs or DPs).

2 Arguments for the DP-hypothesis since Abney (1987)

In this section I will review a large number of arguments for the DP-hypothesis; this includes arguments that can were originally presented in Abney's thesis as well as arguments that can be found in more recent textbooks and overview articles such as Bernstein (2001), Longobardi (2001), Adger (2003), Coene & d'Hulst (2003), Alexiadou et al. (2007), Bruening (2009), and Punske (2014). The list of arguments will surely not be exhaustive, but I take it to be representative because it includes the relevant *types* of arguments:

There are conceptual/parallelism arguments, which are theory-internal and can be reanalyzed given more recent developments within (Minimalist) syntactic theory. There are constituency arguments in favor of the DP-hypothesis, but upon closer inspection, they only show that N+X forms a constituent to the exclusion of D. There are a number of c-command arguments, which essentially only show that the determiner is structurally higher than N. There are also head-movement arguments; they indeed provide evidence for an X^0 -position above N, but strictly speaking this does not constitute any evidence that this position has to be identified with D. In the last subsection, I will briefly discuss further miscellaneous arguments for the DP-hypothesis.

In all cases, I will argue, there is a reasonable alternative under the NP-hypothesis available. Note that I do not wish to claim that these alternatives are necessar-

ily superior to analyses based on the DP-structure; in fact, in some cases, the NP-alternative will require somewhat less standard assumptions. Nevertheless, I take the alternatives to be plausible enough to regard the arguments for the DP-hypothesis as inconclusive.

2.1 Conceptual arguments

2.1.1 Number of specifiers

The first argument for the DP-hypothesis comes from examples like (3), where in addition to the possessor there is also a prenominal determiner present (such structures are limited in English but frequent in other languages, e.g. Hungarian, cf. Abney 1987: 270ff.):

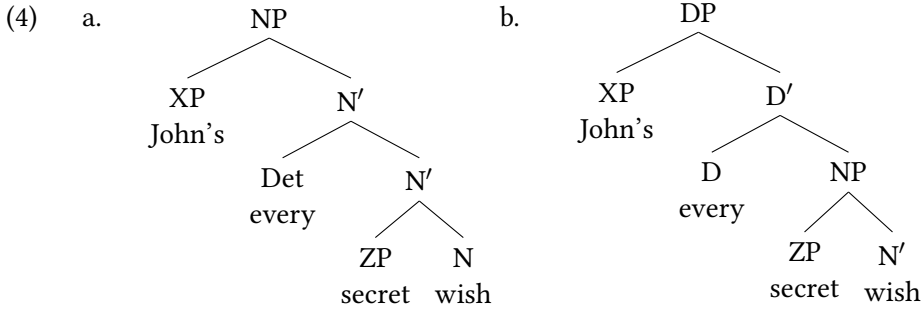
- (3) John's every secret wish

Such examples posed a problem under the X'-theoretic assumptions of the Government-and-Binding era because it was assumed that heads only project one specifier (cf. Abney 1987: 288f.). Since the both the quantifier and the possessor have to occupy specifier positions of N, analyzing (3) as in (4-a) was not an option.² No problems arise under the DP-hypothesis where the possessor occurs in the specifier, while the determiner occupies the D-position, cf. (4-b):³

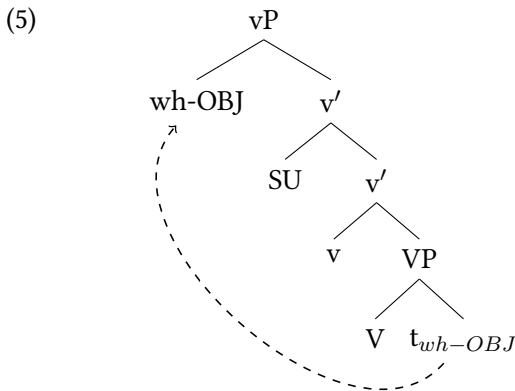
² Note that Jackendoff (1977) had already shown that the restriction to just one specifier is too restrictive. He argued in favor of three bar-levels to account for the range of options within the noun phrase. See also Abney (1987: 290ff.) for cases where two XPs occur above adjectives and thus require at least two specifiers within the noun phrase (SpecNP, SpecDP).

³ Prenominal adjectives are represented as specifiers of N in (4) for reasons of simplicity, even though Abney (1987: 322–350) actually argues that they are heads taking NP as their complement. I will come back to this issue in section 4 below.

Prenominal adjectives are sometimes argued to provide another – indirect – argument for the DP-hypothesis (e.g. Haider 1992: 307): Adjectives are generally treated as adjuncts, which traditionally are adjoined to maximal projections. Furthermore, while D-elements must be unique within the noun phrase, there can in principle be an unlimited number of prenominal adjectives. The traditional NP-structure seems ill-suited to capture these properties since both D-elements and adjectives appear in specifiers of N. Under the DP-hypothesis, however, adjectives can be adjoined to NP, which captures the asymmetries between adjectives and D-elements straightforwardly (given that adjuncts can be iterated, except in Antisymmetric approaches, of course, cf. Kayne 1994)). This is certainly true, but the assumption that adjuncts must be attached to a maximal projection is a purely theory-internal argument; in the verb phrase, at least in languages with flexible word order, there are cases where an adverb occurs closer to the verb than the verb's arguments. Adjunction to an intermediate projection is the descriptively most parsimonious solution in that case (rather than postulating obligatory movement of the arguments). The recursivity/non-recursivity of Ds and As, respectively, can



Importantly, the restriction is no longer adhered to in more recent work within the Minimalist Program (though see antisymmetric approaches where for reasons of linearization, heads also take just one specifier, which is treated as an adjunct, though, cf. Kayne 1994). Even in languages that do not have overt multiple *wh*-movement to the same functional projection it is standardly assumed that at least *v* can take several specifiers: Next to external Merge of the subject, an additional specifier is projected when objects undergo successive-cyclic movement, e.g. *wh*-movement to SpecCP:



Several specifiers of *v* are also often posited for languages with free word order; for German, for instance, it has been argued that multiple scrambling can target different specifiers of *v*, cf. Heck & Himmelreich (2017).

arguably also be captured semantically.

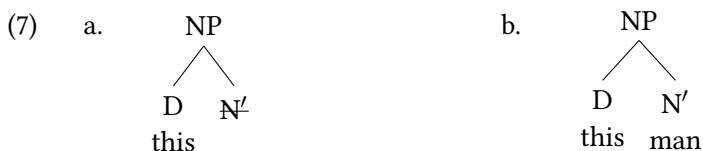
Note, finally, that the analysis of (4-b) is not compatible with the assumption that the possessive suffix occupies the D-position; if that assumption is to be upheld, an additional functional projection is required to host the quantifier.

2.1.2 Distribution of D-elements and consistent selection

The next theory-internal argument comes from selection and the distribution of D-elements. First, verbs can be combined with both nouns/noun phrases and pronouns. Since pronouns belong to category D, consistent selection by the verb favors treating noun phrases as DPs (Abney 1987: 74, 281ff.). Importantly, pronouns are sometimes reanalyzed as determiners taking a silent NP-complement (Elbourne 2005), cf. (6-a). However, once parts of the noun phrase can be silent, one can reanalyze pronouns as NPs headed by a silent N that take a D-specifier, cf. (6-b) (unless there is an independent requirement that only maximal projections can be silent, cf. also Abney 1987: 278–281):



Essentially the same issue arises with demonstrative pronouns, which have the same distribution as noun phrases with demonstrative determiners. Capturing the identical distribution is straightforward under the DP-hypothesis; however, once we allow N to be silent, the distribution also follows under the NP-hypothesis, cf. (7):⁴



2.1.3 Projection

Another conceptual argument for the DP-hypothesis comes from projection: Under the NP-hypothesis, Det seems to be the only category that does not project (by taking complements), cf. Abney (1987: 288f.). However (cf. Bruening 2009:

⁴ Haider (1992: 311f.) argues that differences in the position of modifiers between pronouns and nouns in German provides an argument for the DP-hypothesis: While nouns can be modified to the left and to the right, pronouns can take modifiers only to the right. If the pronoun replaces the entire DP, any modifier has to be an apposition, which in German is always adjoined to the right. Given a structure as in (6-b) or (7), however, the asymmetry follows as well because the pronoun does not occupy the head position of the noun phrase, but rather a specifier position, the same position as determiners. Since determiners do not allow any modifiers to their left, we do not expect any modifiers to the left of the pronoun either.

31), this is no longer an issue under bare phrase structure as adopted in the Minimalist Program (Chomsky 1995), where heads that do not take complements/specifiers are minimal/maximal and empty intermediate projection levels are no longer necessary. Quite apart from this, similar issues arise with other nominal modifiers like numerals, which also do not take complements under the NP-hypothesis. Furthermore, the assumption that every category has to project by taking complements cannot be generally correct once we take adverbs into account: They are generally assumed to project and attach to maximal projections, but they usually do not project via selection of a complement.

2.2 Parallelism arguments

This subsection deals with several arguments that are based on parallelism between the verbal and the nominal domain. The argument usually goes like this: Given that we find X in the verbal domain/X is a functional head in the verbal domain, its counterpart in the nominal domain should also be a functional head. As we will see, while these arguments are not per se implausible, there is always an analytical alternative under the NP-hypothesis so that these arguments cannot be considered conclusive.

2.2.1 Agreement – on functional heads only

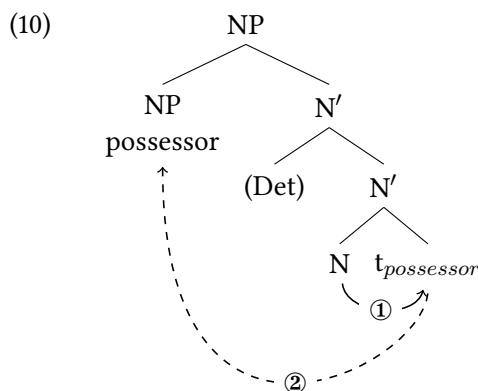
The first argument is based on the observation that in some languages we find possessor agreement on nouns (Abney 1987: 37–52), which in addition in some languages also looks morphologically identical to agreement at the clausal level, viz. on the T-head. From this it is concluded that there must also be a corresponding functional head in the nominal domain. Consider the following data from Yupik Eskimo discussed in Abney (1987: 39–42):

- | | | | | |
|-----|----|--|----|---|
| (8) | a. | angute-t kiputa-a-t
man-ERG.PL buy-OM.SG-SM.PL
‘The men bought it.’ | b. | angute-k kiputa-a-k
man-ERG.DU buy-OM.SG-SM.DU
‘the men (du) bought it’ |
| (9) | a. | angute-t kuig-a-t
man-ERG.PL river-SG-AGR.PL
‘the men’s river’ | b. | angute-k kuig-a-k
men-ERG.DU river-SG-AGR.DU
‘the men’s (du) river’ <i>Yupik</i> |

Upon closer inspection, however, it becomes clear that the parallelism is not as perfect as it may seem at first sight: Crucially, the object marker in the verbal paradigm in (8) occupies the same slot as the marker which encodes the noun’s inherent ϕ -features. If we were to interpret the parallelism in a very strict way,

we would be led to the rather questionable conclusion that the possessee occupies the equivalent of an object position in the nominal domain (see Bruening 2009: 32 for the same argument based on Passamaquoddy). It is also important to stress that the perfect morphological parallelism shown in the examples above is by no means found in all languages with possessor agreement; quite often, the agreement markers in the verbal and the nominal domain are different, cf., e.g., Turkish.

While possessor agreement can, of course, be handled by positing a DP with the D-head equipped with a ϕ -probe, the facts can also be captured under the NP-hypothesis once we locate the probe on N:



Note that under current assumptions agreement no longer requires a spec-head relationship (as was presupposed at the time of Abney 1987). Rather, c-command between probe and goal at some point of the derivation is sufficient (for an application to case assignment in the nominal domain, see Georgi & Salzmann 2011). Consequently, the correct result obtains as long as the possessor is c-commanded by the noun at some point of the derivation; this will be straightforward given that possessors are often assumed to originate within the projection of the possessee. Restricting phi-probes to functional heads is a purely theory-internal assumption.⁵

Related to the agreement argument is the argument based on silent pronouns. It has been observed that possessor agreement, like agreement on T, licenses a

⁵ Obviously, the argument is based on a rather simple structure of the noun phrase with no nP-layer above NP, which is often argued to host possessors). But such layers are usually also largely motivated by parallelism (the possessor is treated as the equivalent of the external argument of the verb); from a purely empirical point of view, though, no problems arise if the possessor originates lower.

silent *pro*. Consider the following pair from Hungarian, cf. Coene & d’Hulst (2003: 5):

- (11) a. a *pro* kalap-unk b. a mi kalap-unk
 the hat-POSS.1PL the we.NOM hat-POSS.1PL
 ‘our hats’ ‘OUR hats’ *Hungarian*

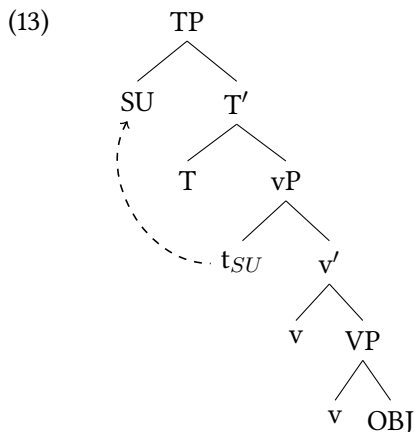
In the absence of an overt possessor the inflection is interpreted as pronominal, cf. (11-a). In the presence of an overt pronoun an emphatic interpretation obtains, cf. (11-b). This is parallel to what is found in *pro*-drop languages at the clausal level, cf. the following pair from Italian:

- (12) a. *pro* Canta. b. Lui canta.
 sing.PRS.3SG he sing.PRS.3SG
 ‘He/she sings.’ ‘HE sings.’ *Italian*

While there is indeed an obvious parallelism, the assumption that *pro* is only licensed by agreement on functional categories is a purely theory-internal assumption.

2.2.2 Possessors in different positions

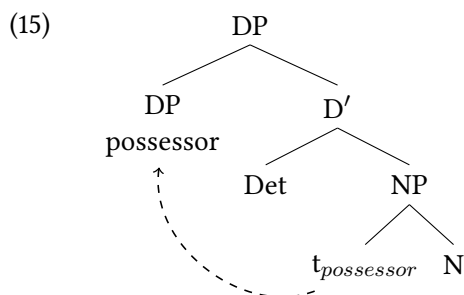
At the clausal level there is solid evidence for two subject positions in many languages (cf. e.g. expletive *there* constructions in English; for more evidence, cf., e.g., Hornstein et al. 2005: 80–90). Concretely, it is generally assumed that the subject is introduced in SpecvP and moves from there to SpecTP:



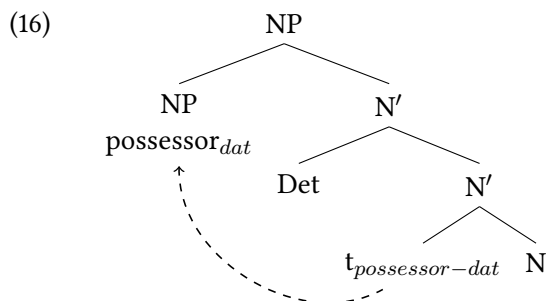
The following pair from Hungarian shows that possessors can occur both below and above the definite article; the alternation correlates with differences in case-marking: the higher possessor bears dative, while the lower occurs in nominative case, cf. also Abney 1987: 275):

- (14) a. a Mari kalap-ja b. Mari-nak a kalap-ja
 the Mari.NOM hat-3sg Mari-DAT the hat-3sg
 ‘Mari’s hat’ ‘Mari’s hat’ *Hungarian*

We thus have evidence for two possessor positions in the noun phrase. Given the parallelism with the clausal domain, it seems straightforward to argue in favor of movement from a lower position within the projection of the noun to a higher specifier position associated with a functional head, e.g., SpecDP:



However, the Hungarian data above only show that the dative possessor is structurally higher than the definite article but not that it has to occupy the specifier of a higher head. Moving the possessor from a lower complement position within NP, e.g., the complement of N, to the highest specifier of N is not a priori ruled out:



Admittedly, triggering such a movement may be somewhat difficult, but one could adopt a rule that assigns to dative-assigning nouns an EPP-/edge feature that triggers movement to a specifier of N.⁶ Alternatively, it is conceivable that possessors can be base-generated in different positions within NP depending on their case-feature. This will be sufficient for the possessor to receive a theta-role from N. Note that empirical evidence like floating quantifiers that would indicate the base-position of a higher and thus displaced possessor is missing to my knowledge.

2.2.3 SpecDP as an A'-position

It is generally assumed that long-distance movement in the clause proceeds via the specifiers of functional heads, concretely at least via SpecCP (and, according to the current majority view, also via SpecvP, cf. Chomsky 2001):

- (17) Who do you think [_{CP} ₁ that Mary likes ₁]?

To escape from a certain constituent, the extractee thus has to move via the edge of that constituent. Comparable evidence has also been found in the noun phrase. Possessor extraction in Hungarian is only possible if the possessor bears dative case (recall that this is the case borne by the possessors that precede the determiner in the Hungarian noun phrase):

- (18) a. Mari-nak₁ PETER látta [_{DP} ₁ a kalap-ja].
 Mari-DAT Peter saw the hat-3SG
 ‘Peter saw Mary’s hat.’
 b. *Mari₁ PETER látta [_{DP} a ₁ kalap-ja]
 Mari.NOM Peter saw the hat-3SG

Given the parallel with the clausal domain, this has been taken as evidence for movement via the Specifier of a functional projection, viz. SpecDP, which can consequently function as an A'-position.

Again, the argument is not unreasonable, but note that it has been argued that NP can also be a phase in some languages (those that lack definite articles); consequently, the outermost SpecNP could also function as an escape hatch, cf. Bošković (2016), who arrives at this conclusion to account for restrictions on left-branch extraction.

⁶ Obviously, this kind of movement will be ruled out if movement is subject to the anti-locality requirement proposed by Abels (2012). Note also that under the DP-hypothesis, one will also have to stipulate a connection between a dative case feature on D and an EPP-feature.

2.3 Constituency arguments

The arguments in this subsection show that the noun forms a constituent together with certain modifiers, to the exclusion of D-related elements. This is crucially different from showing that D is the head.

2.3.1 NP-ellipsis/one-substitution

It is a well-known fact that English VP-ellipsis is licensed by elements in T such as modals or the emphatic dummy verb *do*:

- (19) John likes this book and I do ~~like this book~~, too.

NP-ellipsis is generally taken to be licensed by D-related elements such as demonstratives:

- (20) John likes these red books and I like those ~~red books~~.

Given the parallelism with VP-ellipsis, it is thus argued that the licensing D-element is the head of the noun phrase. This argument also crucially presupposes that ellipsis has to target maximal projections.⁷ Otherwise, the facts from NP-deletion are only an argument that N forms a constituent with its prenominal adjectival modifiers (N' is a constituent as well).

The same type of argument has been made with **one**-pronominalization, which is also licensed by certain D-elements:

- (21) a. These **expensive bottles** of wine should be drunk.
b. These **ones** should be drunk.

Again, all this really shows is that noun + adjective form a constituent to the exclusion of the demonstrative; the consequence that D has to be a head only follows under the assumption that pronominalization necessarily targets maximal projections.

2.3.2 Coordination

It has been observed that the constituents consisting of A+N can be coordinated with a D-element having scope over both:

- (22) These [young dogs] and [old cows].

⁷ A claim that is not innocuous given the famous property of sluicing to always delete C-elements such as complementizers as well under putative TP-deletion.

This is sometimes considered evidence that D is a head (which in (22) would take coordinated NPs as its complement). However, co-ordination is a constituency test, not a test for phrasal status. Under the NP-hypothesis, the co-ordinated strings are also constituents, viz., N'-projections. Note that X'-categories can in principle be coordinated, as the following example with subject-ATB-movement shows:⁸

- (23) This girl in the red coat [_{T'} will __ eat her breakfast] and [_{T'} will __ put a picture of Bill on your desk before tomorrow].

2.4 C-command arguments

The arguments in this subsection provide evidence for hierarchical organization within the noun phrase. This evidence is crucially also compatible with the NP-hypothesis.

2.4.1 Hierarchical organization of arguments

The sentence in (24) only allows for certain interpretations in English:

- (24) Peter's picture of Mary

Peter must be interpreted as the possessor or the agent, while *Mary* is interpreted as the theme. The thematically higher argument thus occurs in a structurally higher position, which is reminiscent of the UTAH (cf. Baker 1988). Related to this is the fact that only the highest thematic role within NP can appear in a special possessive form (with an -s ending or as a possessive pronoun). This

⁸ Split topicalization in German as in (i) is sometimes taken as evidence for the DP-hypothesis because the NP, possibly with associated adjectival modifiers and quantifiers, can apparently be subextracted from the noun phrase, thereby stranding the determiner (and possibly numerals, quantifiers and prenominal adjectives):

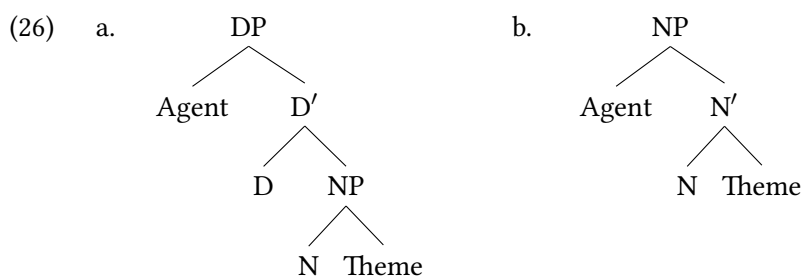
- (i) Roten Wein trinke ich keinen (billigen).
 red wine drink I no cheap
 'I don't drink any (cheap) red wine.'

If one wants to adhere to the standard assumption that movement is confined to maximal projections, the NP-hypothesis is indeed in trouble here because it seems that one is moving an N'-constituent. However, there is reason to believe that the subextraction analysis is misguided. As discussed in Ott (2015), there are examples of 'split topicalization' where each part is a fully fledged noun phrase so that an extraction analysis is unavailable.

also fits well with the observation that only the argument with the highest thematic role can be extracted from DP in Italian, cf. Coene & d'Hulst (2003: 23). If thematic prominence is mapped onto syntactic prominence, the thematically highest argument will also be structurally highest so that extraction of thematically lower arguments will be blocked by locality (i.e. by some form of relativized minimality/the Minimal Link Condition, cf. Chomsky 1995). Further evidence for hierarchical organization comes from binding: It is always the agent/possessor that binds the theme and not vice versa:

- (25) John_i's picture of himself_i

Of course, these facts all follow nicely if the agent occupies SpecDP, while the theme occurs in a lower position as in (26-a). However, they follow just as straightforwardly under the NP-hypothesis as long as the agent c-commands the theme, cf. (26-b):



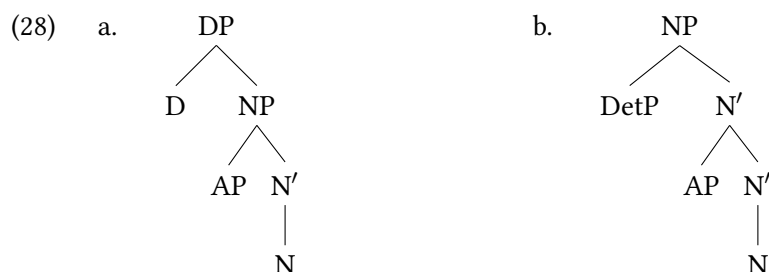
2.4.2 Adjectival inflection in German

Attribute adjectives in German display so-called strong and weak inflection. Synchronically, this inflection is not related to definiteness (as in some of the other Germanic languages). Rather, the inflection is determined by the form of the determiner. Simplifying somewhat, a zero determiner or a determiner without an ending selects the strong inflection, while a determiner with an ending selects the weak inflection:

- (27) a. (ein) rot-er Wein b. ein-em rot-en Wein c. rot-em Wein
 a red-STR wine a-DAT red-WK wine red-STR wine
 'a red wine' 'to a red wine' 'to red wine'

Given that heads frequently determine the form of their complement (cf. case marking, status government, see section 3.1 below), this interaction has been

taken as evidence for the head status of the determiner, cf. (28-a). While reasonable, the interaction between determiners and adjectives can also be captured under the NP-hypothesis, once we allow phrasal elements to act as probes (which seems hard to avoid given bare phrase structure): in (28), the determiner in SpecNP c-commands the Adj in a lower specifier of N:⁹



2.5 Head-movement evidence

The data discussed in this section show that there has to be another head-position above the base position of the noun. As we will see, this does not necessarily imply that this head is to be identified with D.

The literature contains quite a number of arguments for head-movement within the noun phrase. Consider first the following construct state example from Hebrew:

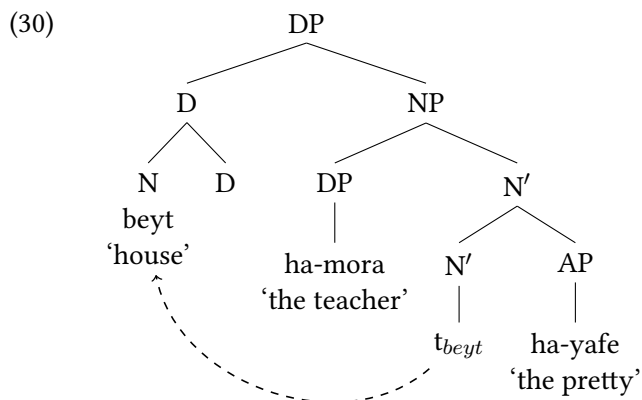
- (29) beyt ha- mora ha- yafe
 house.M the- teacher.F the- pretty.M
 ‘the teacher’s pretty house’*Modern Hebrew*

The noun has obviously stranded an attributive adjective. Since the noun also precedes the possessor, it is plausible to assume that the noun has raised out of

⁹ Note that it is far from clear that a syntactic analysis is the right solution to this phenomenon because the interaction crucially depends on the surface form of the determiner rather than particular morpho-syntactic features. See Sternefeld (2004) for an approach based on pre-syntactic morphology.

A similar argument can be made based on the genitive of quantification that is found in Slavic languages: The NP in the scope of the numeral/quantifier appears in the genitive, suggesting that it is the quantifier that is the head of the noun phrase. Note that in the analysis in Bošković (2006) the quantifier is in fact located in the specifier of a functional head, which assigns the genitive. It is a rather small step from such an analysis to one where the quantifier is located in SpecNP and assigns the genitive itself.

its projection to a higher head (it can be shown that what raises is really just a head and not a phrase). Concretely, the noun is usually assumed to move to D:

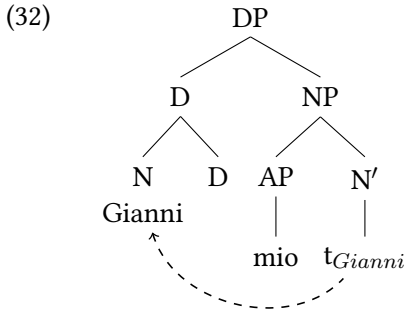


The same logic is illustrated by the following data from Italian: They show that the determiner precedes the possessive adjective, cf. (31-a/b). While the possessive adjective normally precedes the noun, cf. (31-b), the order is crucially reversed if there is no overt D-element, cf. (31-d).

- (31)
- | | | | |
|----|----------------|----|-------------|
| a. | *mio il Gianni | c. | *mio Gianni |
| | my the John | | my John |
| | 'my John' | d. | Gianni mio |
| b. | il mio Gianni | | John my |
| | the my John | | |

The alternation between (31-b) and (31-d) is consequently argued to result from movement of N to D:¹⁰

¹⁰ I abstract away from the question why this movement has to take place. Originally, it was argued that D has to be filled, but given an implementation of head-movement as adjunction and a post-syntactic approach to morphology, cf. Halle & Marantz (1993), this is no longer obvious.



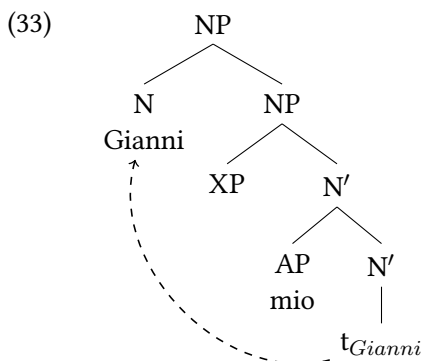
The data indeed suggest that there must be a head-position above the projection of the noun. However, even if we accept this conclusion,¹¹ this need not necessarily imply that there is a DP-layer on top of NP. It has been proposed that (certain kinds of) head-movement can be reanalyzed in terms of reprojection where the moving head projects rather than the target, cf. Georgi & Müller (2010) (cf. Haider 2000 for an application to VP-shells). Under this assumption, a DP-layer is no longer needed:¹²

¹¹ N-to-D-movement analyses have not gone uncontested, see, e.g., Bruening (2009: 33) for some references.

¹² Essentially the same argument can be made on the basis of binding relationships between postnominal arguments in German as in (i):

- (i) der Bericht von jedem Studenten_i über seine_i Arbeit
 the report of every student about his work
 'Every student_i's report on his_i work'

To capture the c-command relationships one can assume that both arguments are projected within NP and that N undergoes reprojection afterwards, see Sternefeld (2006). Finally, the determiner is merged as a specifier of N.



2.6 Miscellaneous arguments

In this subsection, I briefly discuss a few additional arguments in favor of the DP-hypothesis.

2.6.1 Selection

Some D-elements like those in (34) require the presence of a noun:

(34) the, a

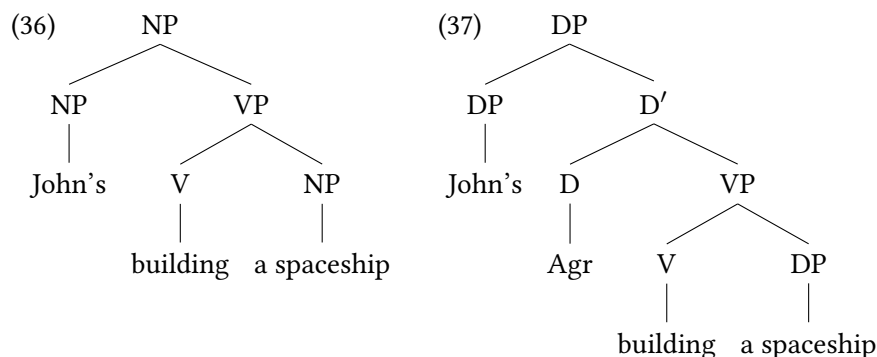
The reverse does not seem to hold as there are nouns that can occur without a determiner, e.g. bare plurals in English:

(35) books

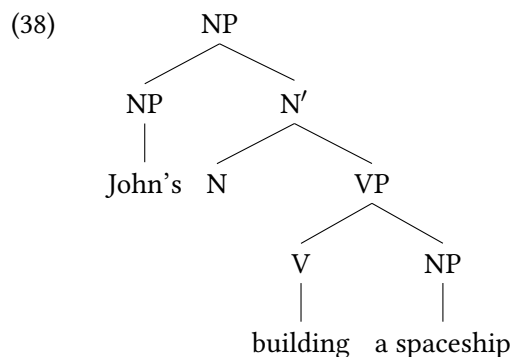
This may suggest that D selects N and not vice versa. This reasoning seems to presuppose that (35) does not contain a D-element; but then we would end up with inconsistent selection. Once we postulate a silent determiner in (35), the asymmetry between D and N is no longer that obvious. Note also that singular nouns in English do require an article. Quite apart from the fact that it is not really obvious which element selects which, whatever selectional requirement we find in this domain may also be semantic in nature rather than syntactic: Note that other categories such as adverbs also require a VP, but they are usually not classified as heads taking the VP as their complement. It is generally assumed that definite articles turn the noun, which is a predicate, into an expression of type $\langle e \rangle$, cf., e.g., Longobardi (1994). However, it is far from obvious that this requires the determiner to be the head (cf. Bruening 2009: 31 for more discussion). Again, this argument from selection is inconclusive.

2.6.2 Gerunds

Abney (1987: chapter 3) argues that (36-a) cannot be the correct structure of gerunds because this involves an exocentric structure and fails to account for the nominal properties of the agent (it behaves like the possessor of a noun phrase). Consequently, he proposes the structure in (36-b) with a D-head above VP:



While a nominal head is well-motivated, I fail to see what rules out a silent N-head instead (cf. nominalizing N-heads in derivational morphology like *destruction* or the silent derivational N-heads discussed in Ackema & Neeleman 2004 etc.):



2.6.3 Absence of D has syntactic consequences

Perhaps the most interesting though indirect argument for the DP-hypothesis comes from work by Željko Bošković, who has shown that languages without articles differ from languages with (overt) articles in a number of systematic ways, as shown by the table in (39) (from Bošković 2009):

		overt D	covert D
	allow LBE	no	yes
	allow scrambling	no	yes
	can be polysynthetic	no	yes
(39)	allow Neg-raising	yes	no
	superiority effects in wh-mvt	yes	no
	allow adj extraction from NP	no	yes
	allow trans. nominals with 2 non-lex. genitives	yes	no
	allow the majority superlative reading	yes	no
	island sensitivity in head-internal relatives	no	yes

This asymmetry can be explained more easily if in languages without (overt) articles the noun phrase involves a completely different structure, i.e. does not have a D-layer. Thus, languages would differ in that some have DPs, while others have only NPs. I find the basic logic of the argument convincing, although it is not fully trivial to relate all these properties to D. However, in principle, it is also conceivable that the mere presence vs. absence of an element (viz., the article) has drastic syntactic consequences; this may hold irrespective of whether it is a head (DP-hypothesis) or a specifier (NP-hypothesis). To make a concrete example, the ban against left-branch extraction in languages like English is related to anti-locality in Bošković (2005): An adjective that attempts to extract from DP has to move via SpecDP; however, this movement step is too local because it fails to cross a maximal projection (by assumption, the adjective starts out in an adjunction position to N). A reformulation under the NP-hypothesis does not seem impossible: Movement of the adjective from a lower to a higher specifier of N may also be ruled out given a certain definition of anti-locality.

2.7 Intermediate summary

It should have become clear that the arguments in the literature in favor of the DP-hypothesis are surprisingly weak given its stellar success in the last thirty years. All of the phenomena reviewed can arguably be handled under the NP-hypothesis as well; since this will sometimes require somewhat non-standard assumptions, the DP-hypothesis may be at a slight advantage in some cases, but none of the phenomena are such that they require the DP-hypothesis. Thus, the phenomena reviewed so far cannot in my view be used to decide between the NP- or the DP-hypothesis.

3 Arguments for the NP-hypothesis

In this section I will briefly take the reverse perspective and discuss a few arguments in favor of the NP-hypothesis. There has been hardly any discussion of this issue except for Bruening (2009), from which the first two arguments are taken. The third argument is based on an old observation whose importance in the current discussion has been overlooked as far as I can tell. The last argument is based on an issue that arises mainly within an HPSG-context.

3.1 Form determination (Bruening 2009)

A potentially useful diagnostic for headhood is form determination: Heads generally determine the form of their complements. This can be seen in case marking and morphological selection. With respect to morphological selection between verbs (also referred to as status government), it is generally the case that V_n determines the form of V_{n+1} , i.e. the governing verb determines the form of the immediately dependent element, as, e.g., in (40):

- (40) I might have been being handed some cocaine (when the police caught me).

Furthermore, it is usually the functional (auxiliary, modal, restructuring) verb that determines the lexical verb rather than the other way around (a possible exception being auxiliary selection, but the choice of auxiliary is often determined by several elements, including, e.g., directional PPs, not just the lexical verb):

- (41) I broke/was breaking/have broken/want to break the vase.

When we look at nominals the reverse situation seems to obtain: It is the noun that determines the form of other constituents inside the noun phrase. For instance, the count/mass distinction affects the choice of modifiers, cf. (42):

- (42) a. too many/*much people
b. too much/*many rice

While this may not constitute proper agreement but rather represent some semantic compatibility requirement, concord within the noun phrase is a clear case where the form of determiners and adjectives depends on features of the noun. This holds at least for those features that are inherent to the noun; this can be number as in the case of pluralia tantum, cf. (43-a) or gender, cf. (43-b):

- (43) a. these/*this scissors
 b. puer bon-us/ puella bon-a
 boy.MSC good-MSC girl.FEM good-FEM
 ‘good boy/good girl’ *Latin*

This kind of covariation is not found in the verbal domain.¹³ There is one systematic exception, viz., definiteness agreement: Definiteness is generally taken to be a property of D, but in some languages there is also a definiteness exponent on N, as, e.g., in Swedish:

- (44) det stor-a hus-et
 DEF big-WEAK house-DEF
 ‘the big house’ *Swedish*

The argument from concord is interesting, but it must be pointed out that it is crucially different from status government or Case assignment: It involves the copying/sharing of (inherent) features rather than the assignment of features to other constituents that the head/governor itself does not bear (note, for instance, that a verb that assigns accusative is not accusative itself). Furthermore, the fact that some properties seem to be determined by N (gender, number), while others (definiteness) are determined by D, suggests that concord is much less unidirectional than government. I conclude from this that the relationship between D and N is crucially different from that between the verbs in the sentence in (40) above. Therefore, in my view the concord data do not provide any conclusive evidence that N is the head rather than D.

3.2 An asymmetry in complement selection: Bruening (2009)

It is normally assumed that C-selection and morphological selection target the head of the selector’s complement. In line with this, verbs that take clausal complements select properties of those complements that are usually associated with the highest head of that complement (C if finite or +/- wh, +/- V2, +/- subjunctive; T if non-finite etc.). Some of the verbal selection may be semantic (+/- wh), but especially the cross-linguistic variation w.r.t. the finiteness of complements of verbs and whether the non-finite clause occurs as a *to*-infinitive or as a bare

¹³ There are cases where a certain verb does not occur in all tenses or is incompatible with finite/non-finite morphology (e.g. the German raising verb ‘seem’, which only occurs finite), or, as in the case of Latin deponent verbs, only with passive morphology (cf. Embick 2000). However, these cases are better described as paradigmatic gaps; there is clearly no covariation between different elements.

infinitive (cf. English *want* vs. German *wollen*) suggests that not all selection can be reduced to semantics.¹⁴

Once we look at noun phrases, we observe that verbs never select noun phrases with particular D-related elements such as certain determiners, with a particular definiteness value, or with an obligatory possessor. For instance, one does not find verbs that can select an NP without a possessor but not one with a possessor:

- (45) nonexistent pattern:
- a. John glorped books.
 - b. *John glorped his books. Bruening (2009)

There is thus little evidence that verbs select D-related properties when they combine with noun phrases (but see Abney 1987: 86f. for suppletive verbs in Navaho that are sensitive to number or class of the object). This does not support the DP-hypothesis; but for selection to represent an argument for the NP-hypothesis, we would have to find evidence that verbs select properties of N. Selection by the verb can target certain properties of N, e.g. whether it is animate/inanimate, but this is generally taken to be purely semantic selection. A clear case of syntactic selection would involve morphosyntactic features of N such as [gender] and [number], but such selectional dependencies have not been documented to my knowledge. The following examples show that cases of apparent number selection are only semantic: The verb *meet* selects a noun phrase that is *semantically* plural, not one that is syntactically plural.

- (46)
- a. The students met.
 - b. *A student met.
 - c. The French club met.

The result is thus inconclusive in my view (pace Bruening). While there is solid evidence that verbs select clausal complements of certain kinds, there is rather little evidence that they can select noun phrases of a particular type. The properties of noun phrases they select are neither morphosyntactic properties of D nor of N.

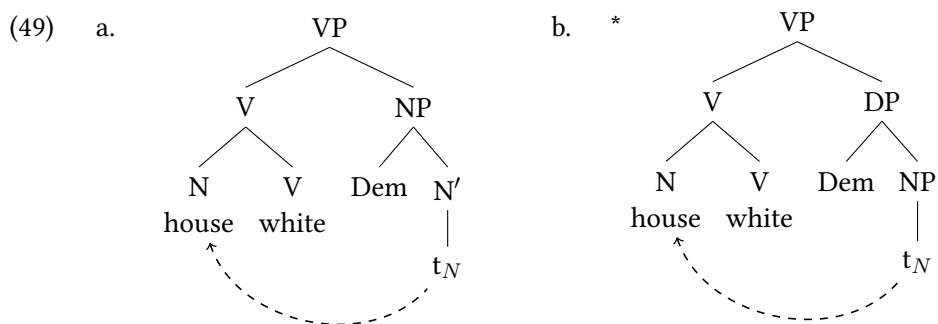
¹⁴ It must be added, though, that there are also cases of selection where the verb alone does not determine the form of its clausal complement; for instance, sometimes negation or a yes-no question in the matrix clause makes a +wh-complement possible that otherwise cannot occur with a particular predicate, cf. e.g. *sicher* 'sure' in German.

3.3 Noun incorporation: Baker (1988: 93–97)

In noun incorporation D-related constituents like demonstratives, numerals and possessors can be stranded. (47-a) is the baseline example, (47-b) illustrates stranding of a demonstrative, (48-a–c) illustrate stranding of a relative clauses, a numeral and a possessor (the verb *rakv* ‘be white’ is unaccusative):

- (47) a. Ka-rakv thikv ka-nuhs-a?. b. ka-nuhs-rakv thikv
 3N-white that PRE-house-SUF 3N-house-white DEM
 ‘That house is white’ “That house is white.” *Mohawk*
- (48) a. ka-nuhs-rakv [nehneh a-ak-ahninu]
 3N-house-white DEM INDEF-3F-buy
 “The house that she would like to buy is white.”
- b. ka-nuhs-rakv [ne wisk ni-ka-wa]
 3N-house-white five PART-3N-PL
 “Five houses are white.”
- c. Hrao-nuhs-rakv [ne sawatis]
 3M-house-white John
 “John’s house is white.” *Mohawk*

The structure of a noun incorporation example like (47-b), which is generally assumed to involve head movement, looks as follows under the NP- and the DP-hypothesis, respectively:



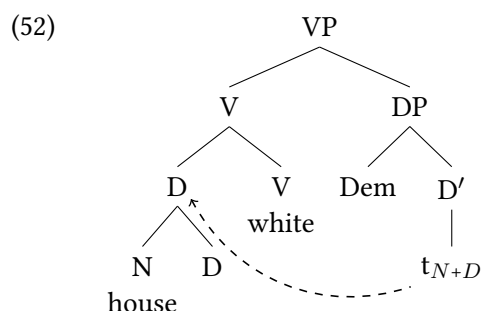
Under the DP-hypothesis in (49-b), the head-movement constraint in (50) is violated as the D-head has been skipped:

- (50) HEAD MOVEMENT CONSTRAINT (Travis 1984):
 Head-movement of X to Y cannot skip an intervening head Z

The derivation would thus be equivalent to the following English example where the perfective auxiliary has moved to C across the modal:

- (51) *Have they could t_{have} left?

No problems obtain under the NP-hypothesis, where the demonstrative is located in a specifier of N. One possibility to uphold the DP-hypothesis is to assume that all overt D-related elements are specifiers of D and that noun incorporation involves N + a silent D (alternatively, N-to-D movement could be followed by excorporation of N, but excorporation is often ruled out on principled grounds, cf. Baker 1988):



The derivation in (52) may in fact have certain advantages after all as it could account for the Government Transparency Corollary (Baker 1988, Stepanov 2012), viz., the fact that the newly formed head governs everything its parts governed before incorporation.

3.4 Possessors

Müller (2007: 85–87) provides an argument for the NP-hypothesis on the basis of possessive determiners in German as in (53):

- (53) seine Mutter
his mother
'his mother'

If the possessive determiner were the head of the noun phrase, Müller argues, we would expect the DP to carry its referential index and not that of the noun, contrary to fact. Since the possessive pronoun is visible for binding (cf. *his picture of himself*), one cannot simply identify its index with that of the noun; the problem is thus real. An alternative may consist in projecting the possessive determiner

in SpecDP with D remaining empty. Müller rejects the alternative because it is more complex than an NP-analysis with *seine* in SpecNP.

He adds another argument from relational nouns with prenominal s-possessors as in (54):

- (54) Peters Zerstörung der Stadt
 Peter's destruction the.GEN city
 'Peter's destruction of the city'

Since *Peter* is an argument of *Zerstörung*, it must be introduced within the projection of the noun and not of the determiner. An alternative with the possessor merged within NP and then moved to SpecDP, as is usually assumed in current Minimalist work, is rejected on grounds of economy.

This is certainly a reasonable argument; however, things change once the possessor doubling construction is taken into account, which can be found in all German dialects and in colloquial German. Here, the possessive pronoun is preceded by a dative possessor:

- (55) dem Hans seine Mutter
 the.DAT John his mother
 'John's mother'

In this construction the referential index of the possessor is arguably not borne by the possessive determiner but by *dem Hans*. Consequently, the determiner can be analyzed as an agreement element as in languages like, e.g., Turkish which have systematic possessor agreement (in addition to dependent marking on the possessor; cf. also the examples from Yupik in (9) above):

- (56) Hasan-in kitab-in
 Hasan-GEN book-POSS.3SG
 'Hasan's book'

Turkish

Thus, given the possessor doubling construction, projecting the possessive determiner in D is not necessarily problematic. For the version without an overt possessor as in (53) above, one can assume that, as in languages like Turkish, there is a small *pro* in SpecDP. Admittedly, such an assumption may arguably not be in the spirit of an HPSG-approach (where in fact the *pro* would not be projected in syntax but simply fill an argument slot of the predicate). But at least for varieties that allow the possessor doubling construction, the argument against the DP-hypothesis strikes me as somewhat weak; at the very least, the

DP-hypothesis cannot easily be ruled out. Let me add, though, that the possessor doubling construction is, of course, certainly compatible with the NP-hypothesis. For more detailed discussion of these issues, see Georgi & Salzmann (2011).

4 A good argument for the DP-hypothesis

In this last section I will present an argument for the DP-hypothesis that I consider rather strong because it relies on very basic phrase structural properties, viz., projection and c-command/dominance.

Before introducing the argument, I will briefly discuss two diagnostics for headedness:

- the head determines properties/features of the complement rather than vice versa: Case/status government
- the features of the head are present on the maximal projection

We have already discussed the first diagnostic in the section on the arguments for the NP-hypothesis. While I consider this diagnostic to be generally valid, it was shown to be inconclusive when applied to the noun phrase because there is no obvious government relationship between D and N (in neither direction).

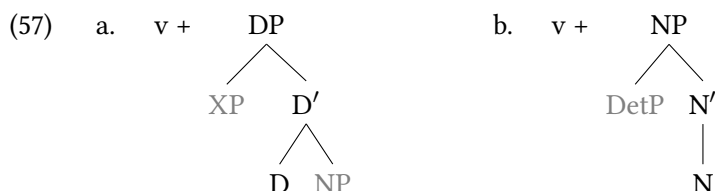
The second diagnostic has two implications:

- The head determines the distribution of the entire phrase
- The head of the noun phrase is closer to heads outside the noun phrase

The first property has already been discussed with respect to selection above; it was shown to be inconclusive for the current debate because both pronouns and noun phrases are amenable to either an NP- or a DP-analysis. The second property, however, is more promising because it makes predictions about interactions of the noun phrase with noun-phrase external material. Concretely, the head is the preferred element for the next higher to interact with w.r.t. agreement and selection; furthermore, the head of the noun phrase may block interaction between higher heads and material c-commanded by the head of the noun phrase (relativized minimality). While selection of (parts of) noun phrases turned out to be inconclusive for the question under discussion, I will now show that the question of headedness makes clear testable predictions for agreement/concord.

The relevance of headedness in agreement can be illustrated as follows: Suppose that a functional head such as *v/T* targets the noun phrase for subject/object

agreement. One expects it to preferably target (features of) the head because that constitutes the closest goal: note that it is generally assumed that the features of X are visible on the projection of X. Furthermore, the head may block access to features of lower heads; this may be related to phasehood if the highest head of the XP is a phase head or more generally to relativized minimality since the head of XP c-commands/the XP dominates (A-over-A-principle, cf. Chomsky 1973) lower heads/projections. The two different analyses of the noun phrase make crucially different hypotheses in this respect: Under the DP-hypothesis features of N may be inaccessible, while under the NP-hypothesis, things would be expected to be the other way around: Features of D may be inaccessible (material that may be inaccessible is set in gray).



In the argument to be presented below, noun phrase-internal concord will play an important role. For this we need to make certain assumptions about the locations of features within the noun phrase. What follows is a certain simplification because for each of the relevant features within the noun phrase it has been proposed that they reside in separate functional heads (see, e.g., Danon 2011 for discussion). For my purposes, the following simplification will not cause any problems: I will assume that both gender and number are inherent features of N, while person and definiteness are features of D. When a verb shows agreement with features of the noun phrase that originate from different noun-phrase-internal heads, there are two main analytical possibilities: Either the head (v/T) can probe several times and target different heads or the head (N or D) ‘collects’ the features so that it is sufficient for v/T to target only the head of the noun phrase so that it can copy everything from there.

Below we will look at an agreement phenomenon from BCS that involves both grammatical and semantic agreement. Crucially, the distribution of these two agreement types has been shown to be governed by a hierarchy:

- (58) The Agreement Hierarchy:
 ATTRIBUTIVE > PREDICATE > RELATIVE PRONOUN > PERSONAL PRONOUN
 ‘the possibility of syntactic agreement decreases monotonically from left to right. The further left the element on the hierarchy, the more likely

syntactic agreement is to occur, the further right, the more likely semantic agreement (that is, with no intervening decrease).’ Corbett (2006: 207)

Importantly, languages can have different cut-off points where they switch from grammatical to semantic agreement, and the cut-off point may be flexible even within a given language. Crucially, languages can also switch within the attributive domain, viz., between A and D and between different adjectives. Importantly, once there has been a switch to semantic agreement in a sentence, one cannot switch back to grammatical agreement, as schematically shown in (59) (A2 is a lower adjective, A1 a higher adjective, V is the participle used in compound tenses):

- (59) a. A2:gramm – A1:gramm – D:gramm || V:sem
 b. A2:gramm – A1:gramm || D:sem – V:sem
 c. A2:gramm || A1:sem – D:sem – V:sem
 d. *A2:gramm – A1:gramm || D:sem || V:gramm

An example from BCS with a switch between A and D (59-b/d) is given in (60). Note that the noun *vladika* ‘bishop’ is grammatically feminine, but its natural gender is masculine:

- (60) Ovi stare vladike su me juče posetili / *posetile.
 these.M.PL old.F.PL bishops are me yesterday visited.M.PL / visited.F.PL
 ‘These old bishops visited me yesterday.’ BCS

In what follows, I will adapt the analysis proposed in Puškar (2017) to my present concerns (this will be a gross simplification in many details and cannot do justice to the many aspects addressed in Puškar’s thesis). The analysis is based on the following assumptions: First, N has features for both grammatical and natural gender (Wechsler & Zlatić 2000). Second, natural gender is featurally more complex than grammatical gender as it also includes animacy. A probe (A, D, V) that is searching a gender feature can in principle target either gender. For this to be possible, the probe can be of variable complexity:

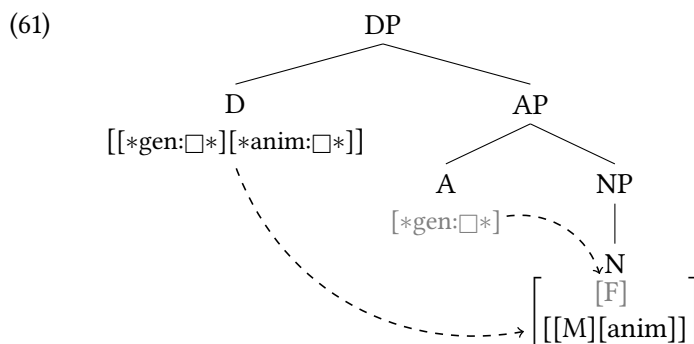
A grammatical gender → simple probe

B natural gender → complex probe

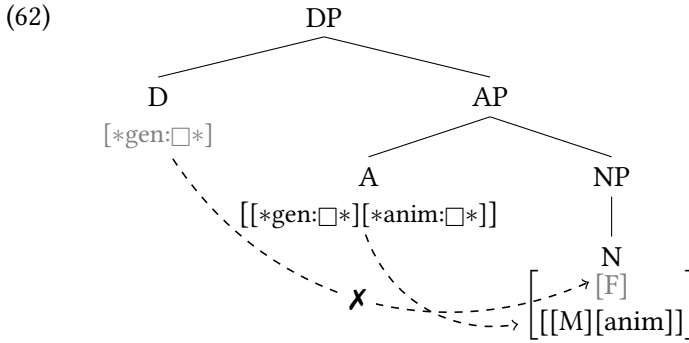
Furthermore, the following assumptions hold about relativized minimality in the interaction of probes and goals:

- 1 a complex probe *can* probe past a simple feature to find a complex feature below it (this follows under relativized minimality; a subset does not intervene)
- 2 a simple probe *cannot* probe past a complex feature to find a simple feature (relativized minimality, superset intervenes)
- 3 a simple probe cannot be valued by a complex feature, which leads to a crash (I assume that feature copying requires matching of all features)

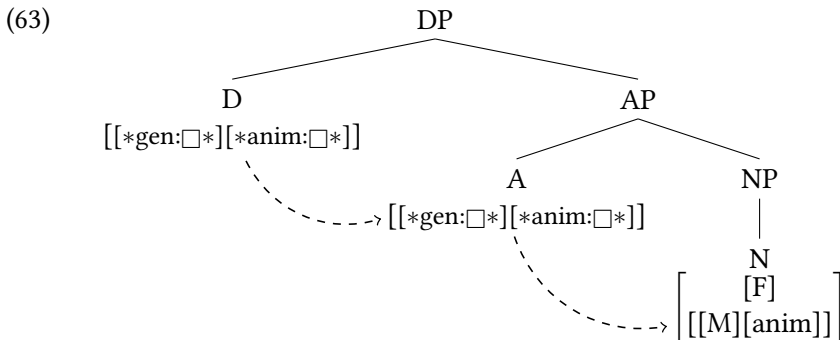
The relevance of the complexity of probe and goal and their interaction is illustrated in the following two tree diagrams (simple probes and simple gender features are set in gray):¹⁵



¹⁵ For the argument to go through, one has to ensure that the adjective is closer to N than D. This follows if the adjective is a head which takes the NP as its complement (as originally proposed in Abney 1987); however, given that in languages like German adjectives can take their own (pre-adjectival) complements, this is arguably not quite correct. A possibly more innocuous solution would treat the adjective as the specifier of a functional head, which takes NP as its complement. One then has to make sure that the features of the adjective are copied onto F and thus become visible on FP, which dominates AP and NP.

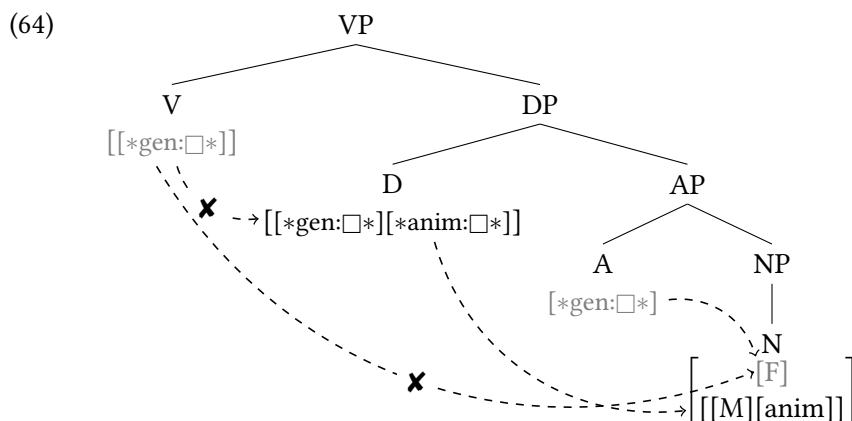


In both derivations, the adjective first agrees with the noun and copies a gender feature from it, the grammatical one in (61) and the biological one in (62). Then, the D-head probes.¹⁶ (61) illustrates that a complex probe can search past a simple feature. In this case we get a switch from agreement in grammatical gender to agreement in biological gender. (62) illustrates that a simple probe cannot search past a complex feature. In this case, the derivation crashes because D's feature cannot be valued (recall that since the biological gender feature contains more structure than the simple probe could accommodate, probing fails and the derivation crashes). A consequence of this is that once there has been a switch to biological agreement, the derivation will only converge if the next higher probe is complex. This captures the generalization that once there has been a switch to biological gender, there is no way back. (63) illustrates how a complex gender feature on D probes and finds the corresponding feature on A (after A has agreed with N):



¹⁶ I thus assume that there are proper D-elements in BCS even though it is a language without articles. The fact that the switch between D and A is easily possible but more restricted between two adjectives lends support to this view.

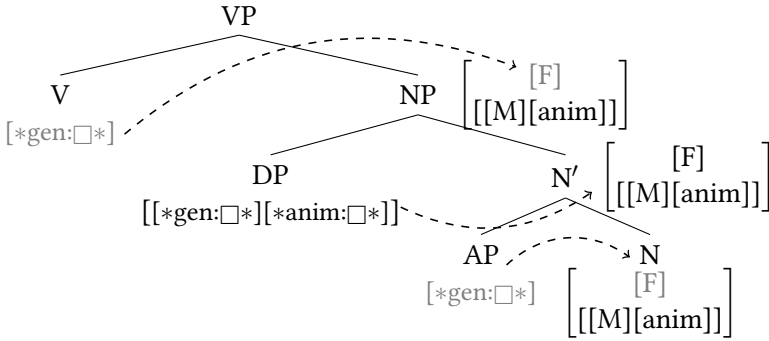
This crucially has the consequence that when the verb probes a DP as in (63), it will necessarily have to be of the complex type and agree with the biological gender feature on D. We thus correctly derive the generalization that a switch to biological gender agreement is not reversible within the same clause.



(64) shows that a reversal is not possible: a simple probe on V cannot target the complex feature on D as it cannot accommodate both features on D. Because of relativized minimality, however, it cannot probe past D either so that the probe on V remains unvalued and the derivation crashes. The only converging derivation in this constellation involves a complex probe on V, resulting in biological agreement.

Importantly, this result only follows under the DP-hypothesis because under the DP-hypothesis, D is closer to V than both A and N. Under the NP-hypothesis one would expect the reverse result: Because the features of N are present on the maximal projection, they would always be closest to outside probes like V. Consequently, one expects switching back and forth between grammatical and biological gender to be possible, contrary to fact. Since N is the closest goal for all probes in the tree, the value that obtains after Agree between A/D and N has no influence on Agree involving V – unlike in the derivation based on the DP-structure, where the earlier Agree operation affects the possibilities of the later. The tree in (65) illustrates the derivation of the ungrammatical example (59-d) above with a switch to biological gender on D and a switch back to grammatical agreement on V:

(65)



5 Conclusion

I have tried to show in this chapter that most of the arguments for the DP-hypothesis that can be found in the literature are either of a purely conceptual/theory-internal nature or rather diagnose hierarchy/constituency rather than headedness. The few arguments in favor of the NP-hypothesis that there are were shown to be inconclusive as well. While they show that the noun phrase differs from the clause with respect to selection and form determination, the facts eventually seem neutral between the NP- and the DP-hypothesis.

While most of the phenomena thus fail to show what they are purported to show, robust arguments for the DP-hypothesis can come from phenomena which show that D is closer to outside probes than N. This is expected to be visible in agreement processes because projection of features will ensure that the features of a head will be visible on the maximal projection. Consequently, it is more likely to interact with noun phrase external agreement targets than material it dominates. The agreement switch between grammatical and biological gender agreement in BCS shows very clearly that the features of D must be closer to V than those of N. This result only obtains if D is a head above NP and DP thus dominates NP.

Abbreviations

The abbreviations in the glosses follow the Leipzig glossing rules available at <https://www.eva.mpg.de/lingua/resources/glossing-rules.php>

Acknowledgements

Some of the ideas in this chapter were presented in my seminar on the syntax of the noun phrase in the winter term 2016/17 at the University of Leipzig. I thank the participants of the seminar for helpful comments. Many of my arguments have been sharpened by the fruitful discussion during the workshop on headedness at the FU Berlin. Particular thanks go to Ulrike Freywald, Hubert Haider, Stefan Müller, Martin Neef, Andreas Nolda, and Horst Simon.

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