Noun Phrase Structure by Reprojection

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Abstract

In this paper we argue that the concept of reprojection, often applied in the verbal domain, should be extended to the nominal domain. We develop an analysis according to which a moved N does not adjoin to a functional category; rather, it moves out of its projection and remerges with it. This movement is (indirectly) triggered by a certain kind of categorial probe feature that we call "Münchhausen feature" (Fanselow, 2003). In this way, conceptual problems resulting from head movement conceived as adjunction of one head to another are avoided. Furthermore, one of the main arguments for D as the head of the nominal projection (viz., that evidence for N movement is also evidence for DP on top of NP) is refuted, and we can return to the classic assumption that nominal projections involve an NP-over-DP structure (rather than a DP-over-NP structure; the DP hypothesis). In addition to showing that an NP approach to nominal projections is viable (given reprojection), we also provide one independent argument for it: The reprojection approach to NP structure turns out to automatically derive a core assumption that must otherwise be stipulated in the theories of word order variation in nominal projections developed by Cinque (2005) and Abels & Neeleman (2006) (viz., that only those projections can undergo movement within nominal projections that contain N).

1. Introduction

Head movement is required within the nominal projection for both empirical and conceptual reasons. To give just a few examples: Ritter

*For helpful comments and discussion, we would like to thank Klaus Abels, Petr Biskup, Ellen Brandner, Uli Lutz, Marc Richards, Florian Schäfer, and especially Fabian Heck. We are also grateful to the participants of a course on DP structure at Universität Leipzig (winter term 06/07), and the audience of the GGS meeting at Universität Konstanz (May 2007). This work was supported by a DFG grant to the project *Argument Encoding in Morphology and Syntax*, as part of Forschergruppe 742.

1-2-many, 263-301
Jochen Trommer & Andreas Opitz (eds.)
Linguistische Arbeits Berichte 85, Universität Leipzig 2007

(1988) argues for N movement in construct state nominals in Hebrew, Longobardi (1994) gives convincing arguments for head movement of proper names in Romance languages, and Abels & Neeleman (2006) need it to derive the typology of word order within NP. Chomsky (2007) argues that there is a functional category n that c-commands N and acts as the head of the nominal projection (rather than D). N raises to n, just as V raises to v in the verbal projection.[1]

However, the conception of head movement as adjunction of one head to another creates several problems with respect to highly general (and independently motivated) constraints on movement, e.g., the Extension Condition (Chomsky, 1995), or the (related) c-command requirement for traces; see Brody (2001), Mahajan (2001), Müller (2004), and Matushansky (2006) (among others) for relevant discussion. Requirements such as these cannot be fulfilled by head movement as adjunction unless one is prepared to invoke extra concepts (compare, e.g., Baker's (1988) more liberal notion of c-command which deviates substantially from what is the simplest version of the concept: α c-commands β iff β is, or is included in, the sister of α). Another principle that is systematically violated by head movement as adjunction to a higher head is Abels' (2003) Anti-Locality Constraint, which excludes attraction of a head by a c-commanding head as an operation that is too local. Thus, there is a dilemma: On the one hand, there is good evidence for head movement in nominal projections; on the other hand, the standard view of head movement as adjunction to the next higher head is incompatible with several well-established constraints on displacement.

A way out is to treat head movement as reprojection: A head H moves out of a phrase α and remerges with α, projecting its category label in the derived position.[2] We would like to contend that it

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[1] This is motivated by the assumption that verbal and nominal projections are structurally similar. Still, the semantic motivation of the phonologically empty categories v and n is questionable (for discussion see Larson (2004)).

[2] Early versions of this concept include Pesetsky (1985) (where reprojection after head movement at LF serves to circumvent bracketing paradoxes) and von Stechow & Sternefeld (1988) (where German verb-second clauses are treated as reprojections of a moved finite V). Holmberg (1991), Ackema et al. (1993), Koeneman (2000), Haider (2000), Hornstein & Uriagereka (2002), and Fanselow (2003) argue for reprojection in verb phrases; Bury (2003) and Bayer & Brandner (2007) apply the concept to *wh*-CPs, and Bhatt (2002) to N raising out of relative clauses (a version

is promising to transfer the concept of reprojection to the nominal domain, where movement of N to a functional head (D, or n, or something else) is often postulated. It turns out that such a move not only avoids conceptual problems with head movement as adjunction; what is more, it also calls into question one of the most important types of argument for a DP-over-NP structure of nominal projections (the DP hypothesis).

Indeed, it seems to us that many of the arguments that were presented in favour of a functional category D that heads the nominal phrase (see in particular Abney (1987) and Szabolcsi (1994)) have lost their force under minimalist assumptions (Chomsky, 1995, 2001, 2005). For instance, the availability of two separate positions in front of a noun in examples like (1-ab) (in English and Hungarian, respectively) does not provide evidence for a DP outside of NP if a multiple specifier approach is adopted.

(1) a. [$_{NP}$ [the Emperor's] [$_{N'}$ [every] [$_{N}$ wish]]]
    b. [$_{NP}$ [Peter] [$_{N'}$ [valamannyi] [$_{N}$ kalap-ja]]]
       Peter's every hat-DEF

As indicated, both prenominal items can be specifiers of N, given the possibility of multiple specifiers. In the same vein, it seems that many other arguments in support of D as the head of nominal projections can be shown to be spurious under minimalist assumptions. However, there is one type of argument in favor of the DP hypothesis that has so far resisted a straightforward minimalist elimination: There is strong evidence for movement of N, and if N moves, there must be a landing site (D) (cf. Alexiadou et al., 2007). The main claim of this paper is that reprojection of N severely weakens this argument (and, therefore, the DP hypothesis) because no further functional head is needed as a target for movement.

We will proceed as follows: In section 2 we discuss data that lend support to the assumption of N movement in nominal projections. Section 3 introduces the concept of reprojection and shows how it can be implemented in a derivational approach to grammar along the lines of the minimalist program. Next, we illustrate our theory of reprojection by implementing the approach to argument realization in verb phrases in German developed by Haider (2000, 2005, 2006). Finally, in section

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of Vergnaud raising, as in Kayne (1994)). Surányi (2005) offers a comprehensive theoretical discussion of the issue.

4 we return to nominal projections and show how N movement by reprojection derives the empirical evidence of section 2. In this context, we address the approach to word order variation in the nominal projection in Cinque (2005), and particularly the somewhat simpler version of this approach developed by Abels & Neeleman (2006); and we show how the sole remainig stipulative assumption that Abels and Neeleman need to make crucial use of (following Cinque) in their (otherwise simple and elegant) analysis (viz., that only categories including N can undergo movement in the nominal projection) can be dispensed with under reprojection.

Throughout this paper, we will use the term *nominal projection* in a theory-neutral sense that leaves open the question of whether D or N (or, in fact, n) is the overall head.

2. Arguments for N Movement

In this section we give an overview of three empirical domains that provide arguments for N movement and the DP hypothesis, and sum up relevant analyses given in the literature: N movement of proper name in Italian (Longobardi, 1994); N movement in construct state nominals in Hebrew (Ritter, 1988); and movement of (a category containing) N that derives the typology of the orders of noun, determiner, numeral and adjective (Cinque, 2005; Abels & Neeleman, 2006). In these analyses (which can to some extent be viewed as representative of a much larger research enterprise), a recurring pattern of argumentation emerges: First, there is evidence for movement of N to a higher position within the nominal projection. Second, if N is the head of the nominal projection, there is no such position. Third, consequently, a higher X^0 category must be available as a landing site for N movement. Fourth, this landing site may exhibit characteristic properties of D. Fifth and finally, at least in these cases, the landing site can be assumed to be D, and DP must thus be above NP (minimally, a functional head above NP is needed). If this reasoning is on the right track, then, at least in these environments, NP is a complement of D and the nominal projection is a DP; and if one assumes that selection of nominal arguments obeys categorial uniformity (such that V may not alternatively select DP or NP), then the DP hypothesis must be generalized.[3]

2.1. N Movement in Italian

Longobardi (1994) argues for movement of proper names in Italian on the basis of the following observations: Count nouns in the singular that function as arguments must be preceded by a phonologically non-empty determiner. Nouns that are not arguments (in vocative, predicative, or exclamation environments) do not fall under this requirement. The conclusion Longobardi draws from this is that a nominal expression can only be an argument of a predicate if it is introduced by an element of category D. Two problems arise for this simple generalization. First, bare count nouns in the plural and mass nouns show up without a visible determiner.

(2) Ogni giorno mangia patate.
every day eat.3SG potato
'He eats potatoes every day.'

This problem can be solved by assuming that these nouns are combined with an empty D which gives rise to an indefinite interpretation associated with bare plurals and mass terms.

Second, and more importantly in the present context, proper names do not have to be introduced by a determiner either. However, in this case, the solution cannot be this empty D because (singular) proper names are neither interpreted as plural entities nor are they indefinite. To solve this problem, Longobardi argues that proper names belong to the category N (an assumption that is supported by the fact that proper names can in principle be preceded by a determiner); a proper name N then moves to D, the head of the nominal projection. Strong evidence for this movement comes from the placement of adjectives in nominal projections in Italian. Consider the following examples.

(3) a. *[$_{DP}$ mio [$_{D'}$ il [$_{NP}$ [$_{N}$ Gianni]]]
my DEF Gianni

[3] However, see Franks & Pereltsvaig (2004) and Pereltsvaig (2006) on what looks like variable categorial features of nominal projections in Russian.

b. [$_{DP}$ il [$_{NP}$ [$_{AP}$ mio] [$_{N}$ Gianni]]]
   DEF my Gianni

c. #[$_{DP}$ il [$_{NP}$ t$_1$ [$_{N}$ Gianni]] [$_{AP_1}$ mio]]
   DEF Gianni my
   (only contrastive reading)

d. *[$_{DP}$ D [$_{NP}$ [$_{AP}$ mio] [$_{N}$ Gianni]]]
   my Gianni

e. [$_{DP}$ [$_{D}$ [$_{N_1}$ Gianni] D] [$_{NP}$ [$_{AP}$ mio] t$_1$]]
   Gianni my
   (no contrastive reading)

Adjectives (As) are merged between (overtly realized) D and N, never before D (see (3-a)). An adjective is unmarked in its prenominal base position, but if A is in postnominal position it receives a contrastive interpretation. This is shown for the possessive adjective *mio* in (3-bc). Thus, (3-c) implies a contrastive reading: There must be more than one *Gianni* provided by the context. Interestingly, when proper names appear without determiner, we might a priori expect (3-d), but this is impossible. Instead, the string N–A in (3-e) is well formed (and unmarked), which suggests that A is in its base position. Longobardi concludes that the base structure of (3-e) must then be as in (3-bd), with N having undergone movement to D in (3-e). The analysis accounts for the complementary distribution of N and D in the only position to the left of the adjective in the nominal projection; and it is far from obvious whether a convincing alternative analysis could be given of these facts that does not rely on N movement (given that *mio* has all the properties associated with in-situ prenominal adjectives in (3-e)).[4]

[4]Despite its many virtues, it should not go unnoticed that Longobardi's analysis also faces several (albeit arguably minor) problems. First, if head movement is adjunction of one head to another (as is standardly assumed), N must be adjoined to an empty D in (3-e). But then it is not evident why the usual (indefinite) interpretation of the empty D does not apply even in cases of N adjunction – the D head as such is still part of the structure. The problem does not arise if N is moved to D by substitution (rather than adjunction). But if N replaces D with all of its features, it should in fact become the head of the constituent and project an NP. Longobardi does not discuss these consequences, but the result of N movement via substitution would be quite similar in its consequences to the reprojection approach we will propose in section 4 – similar, but not quite identical, most obviously because movement via substitution is still at variance with the Extension Condition (X′ must exist before substitution movement of Y^0 out of the complement YP of

More generally, we can conclude that movement of N in proper name nominal projections in Italian is well motivated on the one hand, and incompatible with an analysis in which DP is merged in the specifier of N (an NP-over-DP analysis) on the other hand: The nominal projection has to be a projection of D (or of some other functional category).

2.2. N Movement in Modern Hebrew

Construct state (CS) nominals in Modern Hebrew arise when the head noun is immediately followed by a genitive phrase. The linear order in construct state nominals must be NSO, so the structuce is head-initial. (Following Ritter (1988), O stands for 'object' and S for 'subject', where both describe structural positions: S is the specifier of N and O its complement.) In construct state nominals, the definiteness marker *ha-* shows up postnominally as a proclitic to the genitive phrase, but in non-construct state nominals it appears in front of the head noun. Furthermore, definiteness spreading takes place in construct state nominals: *ha-* is realized in front of every item to the right of N. Relevant data are given in (4).

(4) a. beyt ha-mora
house DEF-teacher
'the house of the teacher'

b. ha-bayit
DEF-house
'the house' (*non-CS*)

c. harisat ha-oyev ′et ha-′ir
destruction DEF-enemy OM DEF-city
'the enemy's destruction of the city'

d. beyt ha-mora ha-yafe
house DEF-teacher DEF-pretty
'the pretty house of the teacher'

Ritter (1988) postulates the following structures for construct state nominals and non-construct state nominals:

X^0 can take place to the X^0 position) and other general principles (e.g., conditions of structure-preservation).

(5) a. [$_{DP}$ N (ha-) XP$_{gen}$ ...] (*CS*)
b. [$_{DP}$ (ha-)N ...] (*non-CS*)

Ritter's argument for N-to-D movement is as follows: First, the basic assumption is that construct state nominals and non-construct state nominals are to be derived from the same underlying structure (D-structure, in her case – governed by the principles of X-bar theory, and based on the assumption that heads precede complements). Second, SNO is assumed to be the base order. Third, this means that in construct state nominals, N must move to the left; the only position that is available for such movement is D. Movement of N necessarily takes place via left-adjunction to D. By assumption, D then assigns abstract genitive case to the specifier of NP; and the definiteness marker *ha-* cliticizes onto the following item (the genitive specifier); this latter movement, however, is not considered to be strictly syntactic (rather, it is viewed as a PF operation). The derivation of construct state nominals in Modern Hebrew in Ritter's analysis is sketched in (6).

(6) [$_{DP}$ [$_{D}$ N$_1$ D] [$_{NP}$ DP$_{gen}$ [$_{N'}$ t$_1$ DP]]]

If this analysis is on the right track, it provides a strong prima facie argument against analyses in which DP acts as a specifier of NP (rather than as a projection above NP): There must be a position to which N can move in construct state environments, so that it can end up in front of its genitive specifier.[5]

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[5] That said, Ritter's analysis has not gone unchallenged; in particular, her premise concerning the uniform base order (i.e., SNO) may not be fully unproblematic. As a case in point, Borer (1999) presents an alternative analysis of construct state nominals in Modern Hebrew; she shows that the word order facts can be derived without movement of N to D. For concreteness, Borer argues that there is a crucial difference between construct state nominals with de-verbal process nominals and construct state nominals with non-derived nominals. In the former case, there is syntactic nominalization of a verb embedded under N that is accomplished by V-to-N movement; in this construction, word order is fixed (except for active/passive alternations); see (i). In the latter case, there is free word order, with NOS as the base order (where S is right-adjoined to [$_{NP}$ N O], yielding [$_{NP}$ [$_{NP}$ N O] S]); on this view, NSO is derived by subsequent right-adjunction of O: [$_{NP}$ [$_{NP}$ N t$_{O}$] S] O]; see (ii).

(i) a. ha-harisa šel ha-oyev ′et ha-′ir
DEF-destruction of DEF-enemy OM DEF-city
'the enemy's destruction of the city'

2.3. N Movement and Constraints on Word Order in Nominal Projections

Cinque (2005) observes that out of the 24 possible orders of demonstrative (D), numeral (n = Num), adjective (A), and noun (N) given in (7), only the 14 orders in I are attested (as unmarked orders); the orders in II are not.[6]

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b. *ha-harisa 'et ha-'ir šel ha-oyev
DEF-destruction OM DEF-city of DEF-enemy
'the enemy's destruction of the city'

c. ha-harisa šel ha-'ir al yedey ha-'oyev
DEF-destruction of DEF-city by DEF-enemy
'the destruction of the city by the enemy'

(ii) a. ha-sefer šel ha-sifriya 'al ha-štixim
DEF-book of DEF-library about DEF-rugs
'the library's book about rugs'

b. ha-sefer 'al ha-štixim šel ha-sifriya
DEF-book about DEF-rugs of DEF-library
'the library's book about rugs'

If this approach is adopted, there is no argument for the DP hypothesis based on N movement because the word order can be derived without such movement: In (i), V moves to a nominalizating N head, and in (ii) both orders are derived by right-adjunction of nominal projections. Despite this lack of evidence from word order, Borer (1999) postulates that D is the head of the nominal projection after all, because [±def] is assumed to be a feature of N (rather than of D). It is realized as *ha-* and can only appear in its overt position if N raises to D.

In general, the analysis of construct state nominals is widely disputed in the literature, and we cannot attempt to do the phenomenon justice here. However, at least for the sake of the argument (and also taking into account that the kinds of right-adjunctions that Borer assumes are considered dubious in many theories of projection), we will henceforth assume that construct state nominals in Modern Hebrew do provide direct word order evidence for N movement, at least with non-derived nouns.

[6]Here and in what follows, we abbreviate Number heads as n, not as Num. This should not be confused with 'light' n as it was briefly discussed in the first section.

(7) *Possible and impossible orders in nominal projections*:

Ia	D	n	A	N
	D	n	N	A
	D	A	N	n
	D	N	A	n
	N	A	n	D
	A	N	n	D
	n	A	N	D
	n	N	A	D

Ib	D	N	n	A
	N	n	A	D
	N	D	n	A
	N	D	A	n
	N	A	D	n
	A	N	D	n

II	*	D	A	n	N
	*	A	D	n	N
	*	n	A	D	N
	*	A	n	D	N
	*	A	D	N	n
	*	n	D	A	N
	*	n	D	N	A
	*	A	n	N	D
	*	n	N	D	A
	*	N	n	D	A

For now, the difference between the orders in Ia and the orders in Ib orders can be ignored; it will become relevant later. An example from English instantiating one of the fourteen legitimate orders is given below:

(8) these seven white mice
D n A N

In the following two subsections we briefly outline two analyses that derive the data.[7]

2.3.1. Cinque's (2005) Analysis

Cinque makes five assumptions concerning base structure and constraints on movement to derive the possible orders and to exclude the impossible ones. First, he invokes the Linear Correspondence Axiom (LCA) (see Kayne (1994)) according to which each phrase has the following structure:[8]

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[7]Throughout this paper, we will not be concerned with potential counterexamples to these generalizations; these are tackled in the two articles on which our analysis is based. As before, our main concern is not so much the empirical correctness of every minute detail; recall that we are mainly interested in reanalyzing arguments for movement in nominal projections in an approach that does not envisage functional projections on top of NP. To this end, the arguments for movement must be assumed to be basically valid.

[8]Strictly speaking, it follows from the LCA that YP must be a unique adjunct, and X′ is XP. We ignore this complication here.

(9) $[_{XP}$ (YP) $[_{X'}$ X (ZP)]]

Heads always precede their complements and follow their specifiers; specifiers must be unique (thus, there are no multiple specifiers). Furthermore, the following hierarchy of the elements in their base position is postulated: D $\succ$ n $\succ$ A $\succ$ N, where $\succ$ stands for c-command. As a consequence, only this order can be base-generated and the other 13 possibilities are derived by movement. By assumption, head movement is excluded; all movement is phrasal. Movement must always go to the left (because of the LCA). Thus, movement targets specifier positions of additional functional heads in the nominal projection. In addition to these general assumptions, Cinque (2005) makes a number more specific assumptions about possible and impossible movement operations in nominal constructions. First, movement may apply totally to an XP that is the specifier of the highest functional category in the nominal projection, or it applies partially to a specifier of a functional category below the highest one. Second (and this will be of particular importance in the context of the analysis we propose in section 4), movement can only involve a subtree containing N. There are further restrictions on what such a subtree can look like. It may contain N and no other lexical item. Alternatively, it may involve pied piping of further material by N. Such pied piping comes in two varieties: In one, N stays in its base position and the constituent immediately containing N and its sister is moved (the *whose picture* type); in the other, N first moves alone and pied pipes its sister node in a second movement step (the *picture of who* type). The basic structure of nominal projections presupposed by Cinque's (2005) approach involves a number of additional functional projections (abstract agreement projections and projections providing specifiers for items like DP, nP, and AP to be merged in, here labelled WP, XP, and YP). It is given in (10):

(10) $[_{\mathrm{Agr}_w\mathrm{P}}$ – $[_{\mathrm{Agr}_w{}'}$ Agr_w $[_{\mathrm{WP}}$ DP $[_{\mathrm{W}'}$ $[_{\mathrm{W}}$ $[_{\mathrm{Agr}_x\mathrm{P}}$ – $[_{\mathrm{Agr}_x{}'}$ Agr_x $[_{\mathrm{XP}}$ nP $[_{\mathrm{X}'}$ X $[_{\mathrm{Agr}_y\mathrm{P}}$ – $[_{\mathrm{Agr}_y{}'}$ Agr_y $[_{\mathrm{YP}}$ AP $[_{\mathrm{Y}'}$ NP]]]]]]]]]]]]

Consider a few examples. The order N–D–n–A can be derived by totally moving (a constituent containing) N alone successive-cyclically through each specifier. D–A–N–n is the result of partially moving (a constituent containing) N and A (the *whose picture* type) to $\mathrm{SpecAgr}_X$. Movement of (a constituent containing only) N to $\mathrm{SpecAgr}_Y$ followed by movement of Agr_{YP} (*picture of who* type) to $\mathrm{SpecAgr}_X$ results in D–N–A–n. This way, all the established orders can be generated. However, if only one of the assumptions mentioned above were to be abandoned (e.g., the restriction that only subtrees containing N can be moved), unattested word orders would be predicted to arise. For instance, if AP could undergo movement alone, landing in, say, SpecAGR$_W$, the unattested word order *A–D–N-n would arise; or if nP could undergo movement alone, e.g., to SpecAgr$_W$, the unattested word order *n–D–A–N could come into existence.

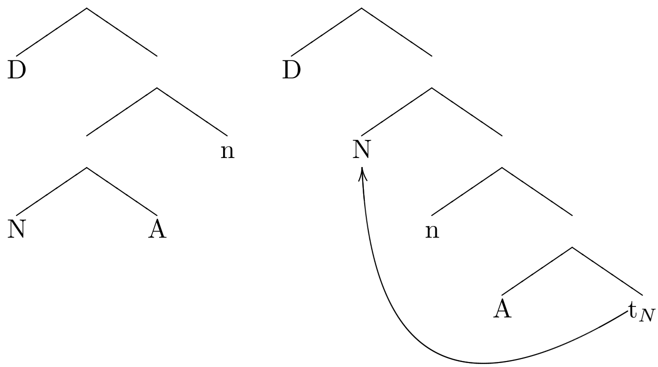
2.3.2. Abels & Neeleman's (2006) Reanalysis

Abels & Neeleman (2006) show that one can derive the patterns in (7) in a somewhat simpler way that shares some of Cinque's assumptions while abandoning others; in particular, the LCA is not adopted. Thus, Abels & Neeleman keep the assumption that the underlying hierarchical order of elements is D $\succ$ n $\succ$ A $\succ$ N for external Merge, but they abondon the LCA. Consequently, complements and specifiers may be generated to the left or to the right of a head, regulated by language-specific parameterization. Therefore, the orders in Ia in (7) can all be base-generated. In contrast, the orders in Ib in (7) are derived by movement. As before, there are a number of constraints on movement: General restrictions on movement imply that it must go to the left, and that it always ends in a c-commanding position. Interestingly, as in Cinque's (2005) approach, a specific assumption for movement in nominal projections is required: By stipulation, only those subtrees can undergo movement in nominal projections that contain N. These assumptions suffice to exclude the orders in II in (7). And again, each of these assumptions is necessary to achieve this result. If, for instance, movement of a constituent that does not contain N is permitted, or if the hierarchy of projections is not strict, unattested orders arise, exactly as we have seen with Cinque's (2005) analysis.

Some possible movements do not lead to new orders. For example, D–N–A–n may be base-generated with A and n to the right of N, and D to its left, but it may also be the result of moving the subtree N out of the basic order D–A–N–n. Both possibilities are shown below.[9]

[9] Abels and Neeleman do not label non-terminal nodes in their trees, because, as they point out, the labels do not have any impact on the point they want to make. Therefore, it is not clear whether the moved element adjoins to or substitutes for

(11)



Cinque (2005) assumes a single strict basic linearization of D, n, A and N, but allows various types of movement. In contrast, Abels & Neeleman (2006) permit more word orders to be base-generated (by abandoning the LCA) and constrain movement more strictly, thereby simplifying Cinque's system.[10]

Note that without the LCA, the lexical elements D, A and n do not need to be introduced by functional heads anymore. Given the possibility of multiple specifiers they do not have to erect their own projection each, a point that will also be important in our analysis in section 4. Nevertheless, in both analyses there remains the crucial but not independently motivated assumption that only a subtree containing N can move. We will show below that this follows automatically in an analysis that relies on reprojection of N.

3. Reprojection

3.1. Background

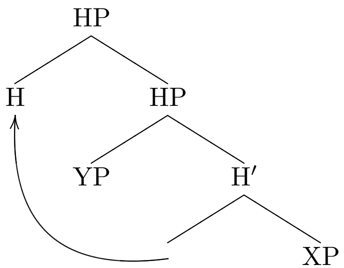
Surányi (2005) argues that assuming reprojection of heads (or 'root

a functional head, or neither of both. We will return to this question, and to the question of labelling the non-terminal nodes in our reanalysis in section 4.

[10]As shown by Abels & Neeleman (2006), a formal proof can be given that the two approaches are empirically equivalent: Translation rules can transform Cinque's approach into Abels & Neeleman's, and vice verse.

merger') instead of head movement as adjunction solves a range of problems associated with the latter concept. An adjoined head behaves differently from moved phrases in several respects, which gives rise to various problems. Among these problems are the following: An adjoined head does not c-command its base position (cf. Brody, 2001; Mahajan, 2001; Matushansky, 2006) unless the definition of c-command is complicated (as, e.g., in Baker (1988)); it does not extend the tree at its root as demanded by the Extension Condition (Chomsky, 1995); and it cannot apply successive-cyclically because the Head Movement Constraint (see Travis (1984)) excludes excorporation of a head (but also cf. Roberts (1991, 2001) for possible qualifications). If, however, head movement is interpreted in terms of movement and reprojection, these problems do not arise. Reprojection means that a head is moved out of its projection and takes it as its own complement by merging with it, projecting anew in the derived position; see (12).

(12)



Here, the remerged head c-commands its base posititon; the movement operation extends the tree generated so far; and the operation may be applied recursively.

An analysis that makes uses of reprojection (-like operations) is developed by Haider (2000, 2005, 2006). Haider is concerned with the question of how phrase structure is generated in SVO systems, where there is asymmetric c-command (from left to right) of items that are attached to the main projection line. His analysis relies on a specific version of a Larsonian VP shell approach (Larson, 1988). More specifically, Haider argues that VP shells are not introduced by designated (and semantically non-empty) functional categories, such as CAUS-v, VOICE-v, or APPL-v (see, e.g., Harley (1995), Kratzer (1996), Adger (2003), Schäfer (2007), and references cited in the latter two works). Rather, VP shells arise for purely formal reasons, due to the necessity of discharging subcategorization features of V – by assumption, such a feature discharge is not possible in English (or SVO systems more generally) by creating right-peripheral specifiers. Haider derives this from his *Branching Conjecture*, which demands that for any two nodes that are directly attached to the same projection line, the preceding node must c-command the node that follows. Hence, to derive the linearization of an English-type system, V must raise out of its base position and thereby create a VP shell, so that it can end up in a position to the left of its argument, which would otherwise precede the verb. In essence, then, this analysis relies on reprojection.[11] In what follows, we will essentially adopt Haider's subcategorization-based motivation for reprojection movement. However, our approach dispenses with the Branching Conjecture, and derives reprojection by invoking a special type of probe feature that may accompany a subcategorization feature, and that may trigger movement of a head in order to be checked under c-command. We call these features *Münchausen features.*[12] The system is outlined in detail in the next two sections.

3.2. Architecture of the System

We presuppose a version of derivational syntax according to which all syntactic operations are triggered by features; in particular, we assume that features trigger both Agree operations and structure-building operations (internal and external Merge).[13] Thus, suppose that exter-

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[11] Haider (2006) does not address the issue in exactly these terms, though, because he envisages a representational system in which head movement by reprojection is modelled in terms of multi-membered head chains.

[12] Baron Münchhausen is both a historical and a literary character. He shows up in various German tall tales; in one of them, he escapes from a swamp (where he is trapped on the back of his horse) by pulling himself up by his tuft. As far as we can tell, the use of the name 'Münchhausen' in syntactic theory goes back to Sternefeld's (1991) characterization of an operation employed in Chomsky's (1986) theory of barriers: Here, VP is a barrier, but a V moved to I can belatedly justify its own (originally impossible) movement across the VP barrier by L-marking VP and removing barrierhood – clearly a case of pulling oneself up by one's own hair. Fanselow (2003) applies the concept to reprojection movement ('Münchhausen-style head movement'); we follow him in this respect (although his approach otherwise bears little resemblance to ours).

[13] The basic system is laid out in more detail in Heck & Müller (2007) and Müller (2007). For the assumption that all structure-building operations (including external

nal Merge is triggered by *subcategorization* features, and that internal Merge (movement) is triggered by movement-type specific edge features. These two kinds of features can be subsumed under one type: *structure-building* features. We render structure-building features in a [•F•] notation. We further assume that linking is brought about by mapping hierarchies of Θ-roles onto hierarchies of subcategorization features on a predicate in reverse order; thus, subcategorization features show up on stacks (and only the topmost item is accessible at any given point, as with pushdown automata; see below).[14] On this view, multiple specifiers come into existence by successively discharging structure-building features of a lexical item. To ensure that all instances of subcategorization-driven structure-building precede all instances of movement (in the domain of a given lexical item), we assume that movement-inducing structure-building features always show up below subcategorization features in [•F•] feature stacks of heads.

In addition to structure-building ([•F•]) features, there are probe features, as in Chomsky (2000, 2001). Probe features (which we note as [∗F∗]) must find a matching goal under Agree; the Agree operation in turn requires c-command. Since such a c-command requirement does not hold for structure-building features (almost by definition, since they must be able to create specifiers), there is an interesting asymmetry between [•F•] checking and [∗F∗] checking; and it is this asymmetry that we will exploit in our approach to reprojection developed below. For now, we may confine ourselves to assuming that probe features and structure-building features are located on different feature stacks of lexical items (whether probe features are also ordered or not is irrelevant for what follows).

Next, we adopt the version of the Strict Cycle Condition (see Chomsky (1973, 1995)) in (13).[15]

Merge) are triggered by features, see, among others, Svenonius (1994), Stabler (1996, 1997, 1998), Collins (2003), Adger (2003), Heck & Müller (2007), Kobele (2006), Sternefeld (2006), Lahne (2006), and Pesetsky & Torrego (2006); this view is not compatible with Chomsky (2007), though.

[14]Such an approach has a long tradition going back to categorial grammar; see, e.g., Lewis (1972). Also cf. Pollard & Sag (1994), Wunderlich (1997), and Lechner (2004), among many others, for implementations in different theoretical frameworks.

[15]Two remarks. First, note that the Strict Cycle Condition in (13) not only derives cyclicity of rule application (in interaction with Last Resort as defined below); it also

(13) *Strict Cycle Condition:*
Only the head of the present root can have features that trigger operations ([•F•] or [∗F∗]).

A Last Resort requirement ensures that all syntactic operations must be triggered by features, and that only those (structure-building or probe) features are accessible at any given step that are located on top of a feature stack; see (14).

(14) *Last Resort*:
a. A syntactic operation must discharge (and delete) [•F•] or [∗F∗].
b. Only [•F•] or [∗F∗] features that are on top of a feature stack are accessible.

Given that there are two feature stacks, indeterminacies in rule application may arise. They are resolved in a principled way by the constraint in (15) (which is modelled on Chomsky's (1995) Merge over Move).

(15) *Agree over Merge*:
If both [•F•] and [∗F∗] can be discharged, [∗F∗] is given preference.

Let us illustrate the basic structure-building system with an NP, adopting the NP-over-DP hypothesis.[16] Consider the derivation in (16).

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ensures that all operation-inducing features must be checked (and discharged, i.e., deleted). Given the specific formulation in (13), the constraint is strictly speaking incompatible with the idea of feature valuation of probes. Indeed, throughout this paper, we presuppose a checking (rather than valuation) approach, but a minimal modification of (13) would make it compatible with valuation: Essentially, stripping away ∗ on probes would suffice. See Richards (2007) for discussion of some of the (mainly spell-out related) issues that are involved here. Second, as it stands, (13) requires a start symbol E:{[•C•]} in order to guarantee that there are no completed derivations with unchecked features (alternatively, the relevant derivations might be assumed to crash at an interface).

[16] N differs from V in that all subcategorization of arguments is optional; similarly, AP modifiers are optional; and (notwithstanding Longobardi's analysis of Italian) perhaps DP subcategorization is not entirely general either, but may be suppressed in certain environments, or in certain languages. For concreteness, we assume that optional subcategorization is captured by optionally deleting structure-building features when an item has entered the numeration; this operation applies freely with N, and is severely restricted with V. Of course, many other approaches are possible.

(16) a. N:{[•A•] ≻ [•n•] ≻ [•D•]} (initial features on N; lexicon)
b. N:{[•A•] ≻ [•D•]} (optional deletion; numeration)
c. Merge(N:{[•A•] ≻ [•D•]}, AP) ⇒ $[_{N'}$ AP N:{[•D•]}]
d. Merge($[_{N'}$ AP N:{[•D•]}], DP) ⇒ $[_{NP}$ DP $[_{N'}$ AP N:{–}]]
e. Merge(X:{[•N•] ≻ ... }, NP) ⇒ $[_{X'}$ X:{...} NP] etc.

Thus, suppose that a phrase is to be generated in which the head N takes a prenominal adjective and a demonstrative. According to the feature hierarchy on N in (16-a), the subcategorization features for A and D are ordered on N in the numeration as in (16-b). Consequently, [•A•] has to be discharged before [•D•] is discharged. This is shown in (16-c), where AP merges with N, yielding N′; and in (16-d), where DP is merged with N′ (triggered by N's remaining subcategorization feature), which yields NP (the constituent qualifies as a full XP if we assume that a projection is an XP iff its head does not have any structure-building or probe features). Finally, this NP may then undergo Merge with some other head, triggered by a structure-building feature of that head (see (16-e)).

So far, nothing is said about linearization. We make the standard assumption that Merge operations are independent of linear order. The linearization of complements and specifiers is regulated by language-specific (and also category-specific) linearitzation rules that affect the tree directly after each Merge operation.

Against this background (which we take to be fairly standard, no more than one of the several possibilities to implement structure-building and Agree operations in a derivational syntax based on certain minimalist assumptions), we can now turn to the role of Münchhausen features in inducing reprojection.

3.3. Münchhausen Features

A Münchhausen feature is nothing special: It is simply a probe feature with a category label as its content that accompanies a structure-building feature with the same category label; this way, it brings about a special identification of subcategorized items. Thus, if a feature [•F•] on a lexical item co-occurs with a corresponding feature [∗F∗], the latter is a Münchhausen feature. Agree over Merge demands that probe features are checked before structure-building features where possible, but of course, discharge of [∗F∗] (with F a category label) requires the presense of a category labelled F in the c-command domain of the head to be applicable. Two cases can be distinguished. First, [•F•] may be topmost on the initial stack, in which case it creates a complement with label F. In this case, [∗F∗] can (and, given Agree over Merge: must) be discharged immediately afterwards, which creates no discernible effect. Alternatively, [•F•] may not be topmost on an initial stack on a lexical item; i.e., it generates a specifier. In that case, the probe feature [∗F∗] accompanying it has an interesting effect. Being a probe feature, it must be checked under c-command. However, a head does not c-command its specifier. Therefore, the Münchhausen feature cannot be checked with a specifier if the head stays in situ.[17]

There is one way out of this dilemma: The lexical item bearing the Münchhausen probe feature that cannot be discharged with the specifier moves out of its projection and remerges with it, projecting anew. After this movement step, Agree becomes possible because the probe feature on the moved head c-commands the specifier of the projection that it was originally the head of. Since the head bearing at least one operation-inducing feature (viz., the Münchhausen feature – possibly there are still others left on it) has been moved out of its projection, this projection qualifies as an XP in the sense of the Strict Cycle Condition (see (13)): As soon as the head moves out, there are no probe or structure-building features left in its original projection.[18] All this is

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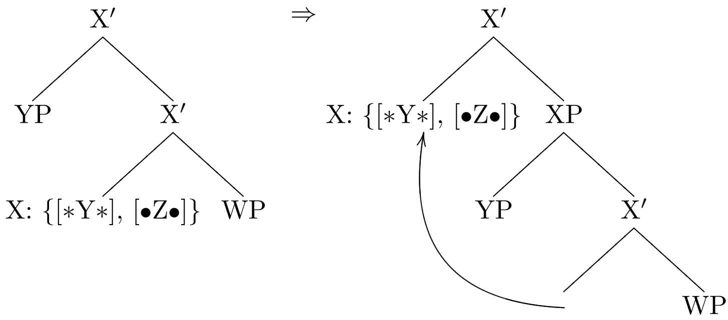
[17]This reasoning presupposes that operation-inducing features are not projected from a lexical item X to its X′ projections – otherwise, X′ could discharge a probe feature by Agree with a specifier. Indeed, it seems to us that such a feature projection should be rejected on conceptual grounds if possible: Either, an additional projection mechanism must be postulated that shares certain properties with movement, or the problem will arise that (unchecked) operation-inducing features are duplicated with each structure-building operation (and should therefore trigger many more operations than desired) – something that is unproblematic with features that do not trigger operations, like, e.g., the category label. (That said, nothing in what follows is incompatible with the idea that category labels are not projected either. See Collins (2003) for relevant discussion.) However, it should be noted that we will eventually invoke a projection of certain probe (not structure-building) features in section 4 (for one specific purpose: pied piping).

[18]The assumption that the base position of movement is inert in this sense is unavoidable if counter-cyclic operations (e.g., checking of identical features in the landing site and in the base position) are to be avoided. There are various ways to derive this. One is to assume that movement leaves traces (t), and traces lack operation-inducing features by definition. Another one is to assume that movement leaves copies; in that case, something extra needs to be (and can be) said so as to ensure that feature discharge may not accidentally leave unchecked features on the

shown schematically in (17), where the moved head X reprojects an X′ category and discharges its probe feature with the specifier of its original projection – note that X still has a structure-building feature in this derivation which will yield a ZP specifier in the derived projection in a subsequent movement step that is not depicted here.

(17)


The lexical head X must move immediately if it is possible to check its feature [∗F∗] afterwards, because probe features have to be deleted before subcategorization features (the Agree over Merge constraint; see (15)). Reprojection movement is not directly feature-driven and therefore violates Last Resort (see (14)); it is legitimated by feature checking of [∗Y∗], which becomes possible only *after* its application. Thus, we conclude that Last Resort must be minimally violable in favour of the Strict Cycle Condition in (13) (which implies that operation-inducing features must be discharged, among other things). This in effect amounts to an optimization procedure in syntax (see Prince & Smolensky (2004)), albeit of a fairly local type. More specifically, the local domain that serves as the domain for optimization cannot be the derivational step (as assumed in Heck & Müller (2007)); rather, it must be something that is a little bigger – either the completed phrase (see

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lower copy (see Nunes (2004)). A third possibility relies on the idea that movement gives rise to multidominance configurations (see Gärtner (2002), among many others); this option would seem to be incompatible with the present approach unless further assumptions are made. Finally, inertness of the base position of movement follows straightforwardly if movement does not leave anything behind – neither traces, nor copies (see, e.g., Epstein et al. (1998), Müller (1998)). For the sake of concreteness, we will adopt the last option in what follows; but nothing really depends on this choice.

Heck & Müller (2003), or at least the completed projection (i.e., the result of a structure-building operation, together with all Agree operations carried out in the new structure). For concreteness, we assume the latter (and this is also the domain in which Agree over Merge holds). The reason is that the present system requires minimal *look-ahead*: Movement of a lexical item bearing a Münchhausen feature (which cannot be checked when the lexical item is in situ, because of a failure of c-command) violates Last Resort, but this Last Resort violation is possible if the Münchhausen feature can be discharged in the next step, as a consequence of the movement.[19]

3.4. Reprojection within VP

With the basic system of reprojection movement in place, let us return to Haider's (2006) analysis of VPs in SVO languages, and see how it can be implemented in the present analysis. Consider a ditransitive English VP such as (18).

(18) Mary gave it to John

Suppose that what characterizes SVO systems like the English one is that all subcategorization features of V are invariably accompanied by corresponding Münchhausen probe features demanding Agree operations with the subcategorized arguments, i.e., requiring special identification of arguments.[20] The derivation of (18) then looks as in (19). By

[19] A viable alternative to assuming violability of Last Resort (in favour of the requirement that probe features must be checked) would consist in reformulating Last Resort in such a way that minimal look-ahead is permitted (say, by replacing "must discharge" by "must result in discharge in a subsequent (essentially: the next but one) movement step"). Such a version of Last Resort is in fact adopted in Surányi (2005), in the context of his discussion of reprojection movement. The two options instantiate a well-known trade-off between simplicity of constraint formulation (the optimality-theoretic perspective) and avoidance of constraint ranking (the non-optimality-theoretic perspective). This issue is orthogonal to our main concerns here.

[20] This leaves open the possibility that Münchhausen features could also be involved in the generation of VP shells in SOV languages (which, e.g., might underlie the different behaviour of preverbal argument NPs in German and Dutch with respect to issues like scrambling and anaphoric binding). In addition, nothing so far excludes systems with right-peripheral specifiers that asymmetrically c-command

assumption, there is a categorial probe feature for each subcategorization feature on V (see (19-a)); and there are three such subcategorization features for the ditransitive verb *give* that are derived by reversing the order of Θ-roles.[21] [•P•] (which corresponds to the Θ-role GOAL in V's Θ-grid) is topmost on the subcategorization feature stack, so it is discharged first, making PP V's complement; see (19-b). After this, the PP argument is (vacuously) identified by the categorial probe feature [∗P∗], under c-command (see (19-c)). In the next step, the THEME NP_2 is merged and becomes a specifier (see (19-d)); however, this time the Münchhausen feature [∗N∗] on V cannot be discharged immediately because NP_2 is not c-commanded by V in situ. Consequently, V movement and reprojection applies (as in (19-e)), and NP_2 in the specifier position can be identified by [∗N∗] discharge in the next step (cf. (19-f)). In the final three steps, the pattern is repeated: The remaining subcategorization feature [•N•] (which encodes the AGENT Θ-role) is discharged, creating an NP_1 specifier that the V head cannot agree with ((19-g)); movement and reprojection apply, in minimal violation of Last Resort (see (19-h)); and finally, the external argument NP_1 is identified by Agree involving [∗N∗] and the argument's category label. (see (19-i)).

(19) a. V's feature set:{[•P•] ≻ [•N•] ≻ [•N•], [∗P∗], [∗N∗], [∗N∗]} (*gave*)
b. Merge(V:{[•P•] ≻ [•N•] ≻ [•N•]}, PP) ⇒
$[_{V'}$ V:{[•N•] ≻ [•N•], [∗P∗], [∗N∗], [∗N∗]} PP] (*gave to John*)
c. Agree([∗P∗], PP) ⇒ $[_{V'}$ V:{[•N•] ≻ [•N•], [∗N∗], [∗N∗]} PP]
d. Merge($[_{V'}$ V:{[•N•] ≻ [•N•], [∗N∗], [∗N∗]} PP], NP_2) ⇒
$[_{V'}$ NP_2 $[_{V'}$ V:{[•N•], [∗N∗], [∗N∗]} PP]] (*it gave to John*)
e. Move(V:{[•N•], [∗N∗], [∗N∗]} $[_{VP}$ NP_2 $[_{V'}$ V PP]]) ⇒
$[_{V'}$ V:{[•N•], [∗N∗], [∗N∗]} $[_{VP}$ NP_2 $[_{V'}$ – PP]] (*gave it to John*)
f. Agree([∗N∗], NP_2) ⇒ $[_{V'}$ V:{[•N•], [∗N∗]} $[_{VP}$ NP_2 $[_{V'}$ – PP]]

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complements (and other specifiers merged earlier). We take this consequence to be empirically supported.

[21] External arguments are subcategorized by V on this view. However, nothing of what we have to say here would be radically changed if we were to assume that external arguments are not subcategorized by V but introduced by a designated functional category.

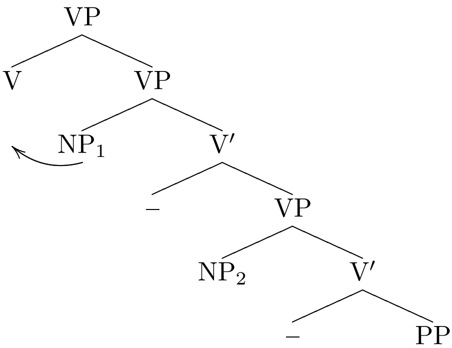
g. Merge([$_{V'}$ V:{[•N•], [∗N∗]} [$_{VP}$ NP$_2$ [$_{V'}$ – PP]]], NP$_1$) ⇒
[$_{V'}$ NP$_1$ [$_{V'}$ V [$_{VP}$ NP$_2$ [$_{V'}$ – PP]]]] (*Mary gave it to John*)

h. Move(V:{[∗N∗]}, [$_{VP}$ NP$_1$ [$_{V'}$ V [$_{VP}$ NP$_2$ [$_{V'}$ – PP]]]]) ⇒
[$_{V'}$ V:{[∗N∗]} [$_{VP}$ NP$_1$ [$_{V'}$ – [$_{VP}$ NP$_2$ [$_{V'}$ – PP]]]]]
(*gave Mary it to John*)

i. Agree([∗N∗], NP$_1$) ⇒ [$_{VP}$ V:{} [$_{VP}$ NP$_1$ [$_{V'}$ – [$_{VP}$ NP$_2$ [$_{V'}$ – PP]]]]]

The resulting structure is shown in (20): It is a complete VP (it does not have any operation-inducing feature anymore) that can then be merged with some other head. The external argument NP is moved to the subject position (SpecT) in a subsequent movement step, yielding SVO order (rather than the VSO order that is the output of (19)).[22]

(20)



4. Noun Phrase Structure by Reprojection

So far we have seen that a reprojection approach to head movement in terms of Münchhausen features is both conceptually (Surányi (2005)) and empirically motivated (Haider (2000, 2005, 2006)). In this sec-

[22]Note that the system does not necessarily have to predict VSO orders (although it seems to us that this consequence is innocuous, by and large). If external arguments are not subcategorized (see the previous footnote), this would be avoided. Alternatively, one might stipulate that all subcategorization features *except for the most deeply embedded one* are accompanied by a Münchhausen feature. This would exempt the external argument from special identification by V, and thus capture the idea that this is what is special about external arguments (see, e.g., Williams's (1981) externalization convention).

tion, we will show that assuming reprojection to also apply within NPs counters all arguments against NP as the highest projection of nominal projections that are based on movement of N.[23] We will in turn analyze the Italian data, the Modern Hebrew data, and the typological restrictions on word order in nominal projections presented in section 2 by making use the system outlined in the previous section.

4.1. Reprojection of N in Italian

Recall that Longobardi (1994) basically presupposes that there are two types of phonologically null D in Italian: Null D either receives a specific semantic interpretation as indefinite, or it has to be identified by N (the case of proper names). Longobardi suggests that an empty D can be identified by moving N to D; such an analysis is not available for principled reasons if DP is a specifier of N. Thus, we would like to suggest that D identification by N is accomplished in another way, viz., by a designated categorial probe feature [∗D∗] that accompanies the subcategorization feature [•D•] on N. Just as in Longobardi's analysis, it must be assumed that this option is only available with proper names, and if D needs to be identified by N in the first place (i.e., if D is not lexically filled). For the sake of concreteness, let us assume that N obligatorily has a subcategorization feature [•D•] in Italian; and if N is a proper name, and the specific determiner that is selected is phonologically null, N must also be equipped with [∗D∗] in addition.[24]

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[23]NP shell analyses have been advanced in order to accomodate c-command relations between arguments of N in languages like, e.g., English and German, where precedence implies c-command (as seen in the previous section for VPs in English); see Haider (2000) (based on nominal projections like (i-a) in German) and Adger (2003) (based on nominal projections like (i-b) in English), among others.

(i) a. Die Wut des Mannes$_1$ auf sich$_1$
the anger of the man on himself
b. the consul's gift of the gladiator$_1$ to himself$_1$

Of course, this can be implemented in the present approach in exactly the way that we have just seen with VPs. In contrast, in this section we focus on prenominal categories that are not arguments of N (but rather modifiers or quantifiers).

[24]The question arises of how the dependence of [∗D∗] on phonologically null D can be expressed. One possible answer is that Münchhausen features are (generally)

It turns out that nothing more needs to be said to derive the pattern in (3).

As a case in point, consider the derivation of an NP like *Gianni mio* (= (3-e)). By assumption, N always has a [•D•] feature. Since N is a proper name and D is empty, [∗D∗] is also present on N. Furthermore, N has a subcategorization feature [•A•]. [•A•] is always higher on N's stack of structure-building features than [•D•]. The ensuing derivation is shown in (21).

(21)
a. N's feature set: {[•A•] ≻ [•D•], [∗D∗]}
b. Merge(N:{[•A•] ≻ [•D•], [∗D∗]}, AP) ⇒ $[_{N'}$ AP N:{ [•D•], [∗D∗]}] (*mio Gianni*)
c. Merge($[_{N'}$ AP N:{ [•D•], [∗D∗]}], DP) ⇒ $[_{N'}$ DP $[_{N'}$ AP N:{[∗D∗]}]] (*D mio Gianni*)
d. Move(N:{[∗D∗]}, $[_{NP}$ DP $[_{N'}$ AP N]]) ⇒ $[_{N'}$ N:{[∗D∗]} $[_{NP}$ DP $[_{N'}$ AP –]]] (*Gianni D mio*)
e. Agree([∗D∗],DP) ⇒ $[_{NP}$ N:{–} $[_{NP}$ DP $[_{N'}$ AP –]]]

First, N is merged with AP (discharging [•A•]), then with DP (discharging [•D•]); empty D is a non-projecting (trivial) phrase (see (21-bc)). This leaves the categorial probe feature [∗D∗] on N to be checked. Discharge is impossible with N in situ (due to a lack of c-command), so N moves and reprojects (see (21-d)), which makes checking [∗D∗] possible (see (21-e)). Thus, if there is an AP complement present in the structure, N remerges in order to c-command its specifier DP and to check [∗D∗]; it then appears to the left of the adjective. If there is no [•A•] to begin with (hence, no AP complement), N must still discharge its Münchhausen feature [∗D∗]. However, this time, no movement is forced (and therefore, it is blocked by Last Resort) because c-command obtains with N in situ.

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inserted in the numeration or lexical subarray (but before the derivation proper starts, in accordance with Inclusiveness Condition; see Chomsky (2000, 2001)); and in the case of proper names and D in Italian, [∗D∗] is only inserted if D is null (and therefore requires special identification). Alternatively, one might distinguish between two types of [•D•] features; and [∗D∗] only shows up on proper name N if one of these two [•D•] is present (viz., the one that selects an empty determiner).

4.2. Reprojection of N in Modern Hebrew

Assuming the approach to construct state nominals developed in Ritter (1988) to be essentially correct (see footnote 5), let us address the question of how it can be implentend in the present analysis. First, suppose that N has a categorial probe feature [∗D∗] in addition to its subcategorization feature [•D•] in the presence of a genitive possessor, i.e., in the context for construct state.[25]

(22) Feature set of N in construct state contexts:
N:{[•N•] ≻ [•D•], [∗D∗]}

The probe feature [∗D∗] triggers movement of N in construct state environments because [∗D∗] cannot be checked in situ as N does not c-command its specifier DP. Therefore, reprojection movement of N is called for; and this produces the N-initial word order. This is shown in (23) (the analysis here is simplified for the sake of exposition; e.g., the issue of genitive assignment to the possessor is ignored).

(23) $[_{\text{NP}}$ $[_{\text{N}_1}$ beyt] $[_{\text{NP}}$ $[_{\text{DP}}$ ha- $[_{\text{N}'}$ $[_{\text{NP}_2}$ mora] –]]]]
house DEF- teacher
'the house of the teacher'

Note that this analysis makes an interesting prediction without further ado: D and the genitive possessor automatically form a constitutent. Recall that to derive this, Ritter (1988) had to postulate a further post-syntactic operation ensuring that the the definiteness marker *ha-* attaches to the possessor.

4.3. Deriving the Constraints on Word Order Variation

Finally, we show how Cinque's (2005) and Abels & Neeleman's (2006) analyses of the constraints on word order variation within nominal projections can be implemented in the present approach. The following four assumptions are crucial in Abels & Neeleman's reconstruction of

[25] See footnote 24 on how to express this correlation formally. In general, either it suffices that the relevant information is provided in the numeration, or we have to envisage a more fine-grained subcategorization feature than just [•N•] – for instance, $[\bullet \text{N}_{poss} \bullet]$.

Cinque's proposal, and it remains to be shown that the reprojection approach can derive the restrictions on this basis.

(24) a. External Merge respects the hierarchical order D $\succ$ n $\succ$ A $\succ$ N.
b. Movement ends in a c-commanding position.
c. Movement is leftward.
d. Movement in the nominal projection must involve a subtree containing N.

(25) is a faithful adaptation of Abels & Neeleman's (24-a) to the present proposal, and (24-bc) can be adopted unchanged.[26]

(25) The hierarchy [•A•] $\succ$ [•n•] $\succ$ [•D•] must be respected on N.

Of the four assumptions in (24), (25-d) is the most stipulative one: (24-bc) are very general constraints on movement (and (24-b) follows from the Strict Cycle Condition if Move is internal Merge); and (24-a) (or (25)) is simply a fact about language that any theory must encode in some way. However, the constraint in (24-d) is peculiar; in our view, it is the only conceptual blemish in Abels & Neeleman's (2006) reconstruction of Cinque's (2005) approach. To the extent that it is true, it should be derived from more basic assumptions.

As it turns out, (24-d) does not have to be stipulated in the present analysis; it follows as a theorem. Here is why: If N is the head of the nominal projection, all movements within this projection are either triggered by structure-building (movement-type specific) edge features on N, or they are triggered by the need to get rid of probe features in the next but one step (reprojection movement). The latter option can only be relevant for the head N itself (given the Strict Cycle Condition, non-heads cannot have operation-inducing features). The former option does not help in the case of A, n, and D. Suppose for the sake of the argument that N bears some feature [•F•] in addition to its subcategorization features for (say) A, n, and D that could in principle trigger movement ([•F•] must then be embedded below subcategorization features in the stack of structure-building features); and that one of these categories

[26] Note that (25) is formulated in such a way as to ensure that not all of the subcategorization features do in fact have to be show up on N all the time; cf. footnote 16. Note also that arguments of N will be introduced by other subcategorization features that are higher on the hierarchy; so the hierarchy in (25) is only partial.

(e.g., n) can actually provide a goal [F] for [•F•]. [•F•] could still not trigger movement of nP across DP to an outer specifier of N (thereby giving rise to an unattested order) because the resulting configuration is structurally identical to the pre-movement configuration: If nP can check N's [•F•] feature in a derived specifier position, it can just as well check the same feature in situ (roughly, [•F•] on X is interpreted as 'X wants to see F in its projection'). Consequently, movement is blocked by Last Resort in this case: When [•F•] becomes accessible on the stack of structure-building features, it can immediately be discharged, without any need for a syntactic movement operation, because the structural configuration required for discharge of [•F•] features is present in situ.[27]

Having laid out these premisses, let us consider again the possible and impossible orders in nominal projections from the present perspective; (7) is repeated here as (26) (with roman numbers added in Ib for reasons that will become clear immediately).

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[27]Note in passing that this reasoning is more or less the same as the one that Abels (2003) gives in his account of Anti-Locality effects – extremely local movement is blocked because it does not create a new configuration for feature checking. Furthermore, it is worth pointing out that the same reasoning will also block arguments of N from movement in the nominal projection. For those cases where it may at first sight look as if this restriction is too strong (like, e.g., the NP-internal topicalization construction (i) in German), and, more generally, for cases where it has been argued that some of the impossible patterns in (7) are possible after all – but only if certain information structure-related conditions are met –, one might assume that in these cases, nominal projections have discourse-based functional heads on top of them that attract categories in an anti-local way. As far as we can see, the only potential incompatibility would arise if the strict assumption is made that subcategorization of nominal projections by verbs is categorially uniform. That said, Lindauer (1995) has argued that the distribution of nominal projections of the type in (i) in German is much more restricted than that of ordinary nominal arguments that do not exhibit internal XP preposing.

(i) [$_{\alpha}$ [$_{PP_1}$ von Peter] [$_{NP}$ [$_{DP}$ das] [$_{N'}$ Buch t_1]]
of Peter the book

(26) *Possible and impossible orders in nominal projections*:

Ia	D	n	A	N
	D	n	N	A
	D	A	N	n
	D	N	A	n
	N	A	n	D
	A	N	n	D
	n	A	N	D
	n	N	A	D

Ib	(i)	D	N	n	A
	(ii)	N	n	A	D
	(iii)	N	D	n	A
	(iv)	N	D	A	n
	(v)	N	A	D	n
	(vi)	A	N	D	n

II	*	D	A	n	N
	*	A	D	n	N
	*	n	A	D	N
	*	A	n	D	N
	*	A	D	N	n
	*	n	D	A	N
	*	n	D	N	A
	*	A	n	N	D
	*	n	N	D	A
	*	N	n	D	A

As in Abels & Neeleman's (2006) analysis, the orders in Ia can be base-generated. Moreover, it can easily be verified (given the statements in (24)/(25)) that the orders in II cannot be generated. To give just one example: The order D–A–n–N in II cannot be base-generated (A and N are not adjacent). Movement of N to the right periphery of the NP is impossible since all movement is leftward; and movement of A alone to the left is impossible because any feature that could trigger such a movement on N could be discharged with A remaining in situ. Similar conclusions apply in the case of all the other illegitimate orders in II.

The orders in Ib are the most interesting ones from the present perspective. They cannot be base-generated, and it therefore remains to be shown that they can be derived by (reprojection) movement. Three cases can be distinguished. First, consider the two orders (i) and (ii) in Ib. These orders can be derived if N has a Münchhausen feature [∗n∗] requiring special identification of its second argument; since nP is a specifier of N (and thus not c-commanded by N), N undergoes reprojection movement in these cases to make Agree possible and discharge [∗n∗] (as soon as possible, given Agree over Merge). After reprojection, D is regularly merged. This is shown in (27) (the base order of AP and N is irrelevant).

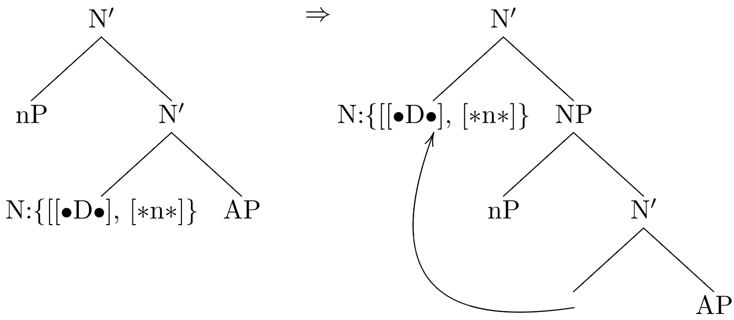
(27) *Orders (i), (ii)*:

(i) D N n A → N moves in front of n
N:{[•A•] ≻ [•n•] ≻ [•D•], [∗n∗]} initial specification
$[_{NP}$ DP $[_{N'}$ N_1 $[_{NP}$ nP $[_{N'}$ – AP]]]] derivation

(ii) N n A D → N moves in front of n
N:{[•A•] ≻ [•n•] ≻ [•D•], [∗n∗]} initial specification
$[_{NP}$ $[_{N'}$ N_1 $[_{NP}$ nP $[_{N'}$ – AP]]] DP] derivation

The relevant step of the derivation of order (i) is illustrated in (28).

(28)



Let us turn next to a second pair, (iii) and (iv) in Ib. These orders come into existence when N is equipped with a categorial probe feature [∗D∗] (rather than [∗n∗], as in the previous case). Now N must remerge and reproject after being merged with DP; see (29).

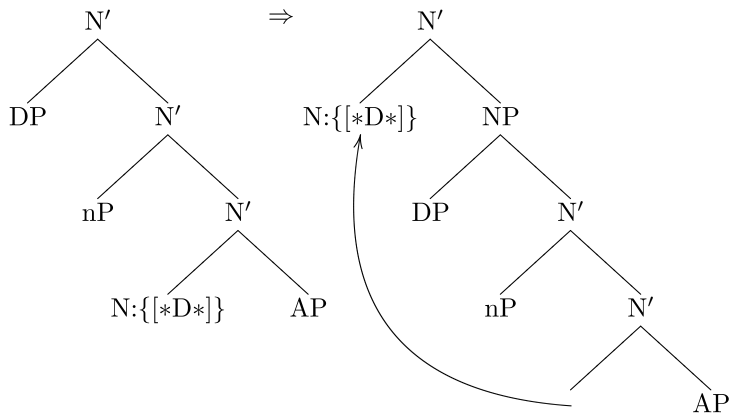
(29) *Orders (iii), (iv)*:

(iii) N D n A → N moves in front of D
N:{[•A•] ≻ [•n•] ≻ [•D•], [∗D∗]} initial specification
$[_{NP}$ N_1 $[_{NP}$ DP $[_{N'}$ nP $[_{N'}$ – AP]]]] derivation

(iv) N D A n → N moves in front of D
N:{[•A•] ≻ [•n•] ≻ [•D•], [∗D∗]} initial specification
$[_{NP}$ N_1 $[_{NP}$ DP $[_{N'}$ $[_{N'}$ – A] nP]]] derivation

The crucial step of reprojection movement in the derivation of order (iii) is shown in (30).

(30)



Finally, the orders in (v) and (vi) in Ib need to be derived. This time, the derivation is a bit more complex because no movement of a single N will be able to yield the surface strings where not only N, but also A shows up outside of D and n. These two cases require pied piping: N pied-pipes A when it moves by reprojection. The question is how pied piping can be effected in the present approach. We will adopt a standard analysis here according to which pied piping involves feature percolation.[28] Thus, suppose that a Münchhausen feature may in principle percolate to the immediately dominating category (in which case it is deleted on its original host).[29] In the case at hand, this means that a feature like [∗D∗] may percolate from N to [$_{N'}$ N AP] (or [$_{N'}$ A NP]). In languages that permit this operation, N′ effectively behaves as if it were a single head after percolation: It moves and reprojects in order to discharge [∗D∗] under c-command. As shown in (31), pied piping of this type gives rise to the orders in (v) and (vi).

[28] Arguably, feature percolation is an additional mechanism that should be avoided if possible; see Heck (2004, 2007) for arguments and an alternative. However, for present purposes, assuming feature percolation may suffice.

[29] Recall that we have explicitly excluded this option in the case of structure-building features.

(31) *Orders (v), (vi)*:

(v) N A D n → N+A moves in front of D
N:{[•A•] ≻ [•n•] ≻ [•D•], [∗D∗]}
initial specification; [∗D∗] percolates
$[_{NP}$ $[_{N'}$ N AP] $[_{NP}$ DP $[_{N'}$ nP –]]] derivation

(vi) A N D n → A+N moves in front of D
N:{[•A•] ≻ [•n•] ≻ [•D•], [∗D∗]}
initial specification; [∗D∗] percolates
$[_{NP}$ $[_{N'}$ AP N] $[_{NP}$ DP $[_{N'}$ nP –]]] derivation

Note that percolation does not give rise to unwanted orders – still, only items that contain N can undergo movement, so all the orders in II remain excluded.[30]

To end this section, note that our analysis differs from Abels & Neeleman's approach to word order restrictions in nominal projections in another interesting respect. Whereas derivational ambiguities can arise in their system, a given legitimate string involving D, n, A, and N can only have one possible source in the present framework: It is either derived by reprojection movement (Ib), or it is base-generated (Ia) – a derivation of the strings in (Ia) via movement turns out to be impossible under present assumptions (the relevant movements would all be too local).

5. Conclusion

To sum up, we have sketched an approach to reprojection that relies on what we call Münchhausen features, i.e., categorial probe features that target arguments that have just been merged (as a consequence of discharge of a structure-building feature). We have argued that there is good reason to assume reprojection movement of N in the nominal domain: If we do so, one of the strongest type of argument in support

[30] Suppose that an [∗n∗] feature (as it is required to generate the orders in (i) and (ii) could also percolate. This would pose no particular problem (in the sense that unattested orders are generated), but it would not have any interesting consequence either – percolation of [∗n∗] cancels the effect that the Münchhausen feature is designed to have because reprojection movement would then be avoided. In this regard, a percolating [∗n∗] feature is just like a regular [∗A∗] feature (if the latter generates a complement, i.e., if there is no argumental complement of N present).

of a DP-over-NP approach (the DP hypothesis) loses its force (viz., that there is good evidence for movement of N, and that D is needed to provide a landing site), and an NP-over-DP approach can in principle be entertained. We have also shown that assuming an NP-over-DP approach with reprojection movement of N driven by categorial probe features makes it possible to independently derive the one of the four assumptions in Abels & Neeleman's reconstruction of Cinque's approach to word order variation in nominal projections (see (24)) that looks stipulative (viz., that movement in the nominal projection must involve a subtree containing N; (24-d)). In our view, this is the most important result of the present paper, and to the extent that (24-d) must resist a principled explanation in DP-over-NP approaches, it presents a strong argument for NP-over-DP approaches.

Needless to say, if NP-over-DP approaches are to qualify as viable alternatives to standard DP-over-NP approaches, many more arguments for the DP hypothesis that have been brought forward in the literature must be addressed. Many of the original arguments given in support of the DP hypthesis center around data where more than one item precedes N (cf. Abney (1987), Haider (1988), and Szabolcsi (1994), among many others). As noted at the outset, these arguments lose their force if a multiple specifier approach is adopted – under this assumption, NPs with more than one prenominal category can receive essentially the same structural analysis that they did in Jackendoff (1977). Certain other arguments may not have been particularly convincing from the very beginning; among them is Abney's argument based on gerunds (where V movement to D can easily be reinterpreted as V movement to N; see von Stechow (1992)). Furthermore, agreement phenomena in nominal projections (in languages like Hungarian, Turkish, Yupik, and Tzutujil) have been assumed to provide arguments for the DP hypothesis (cf. Abney (1987) and subsequent work based on it), but again, it seems to us that they do not presuppose the existence of a functional head that mediates this agreement, and that closer scrutiny in fact reveals that they pose more problems than they solve (particularly if one adopts an Agree-based approach, where the concept of "mediation" is difficult to make sense of). Of course, there are many other arguments for the DP hypothesis that need to be tackled to prove the competing (and traditional) approach viable (see, e.g., Alexiadou et al. (2007)).

Then again, there have always been arguments against the DP hypothesis that, in our view, have not yet been convincingly rejected. For instance, facts about selection would seem to initially support the view that V embeds N rather than D in the unmarked case (see Grimshaw (2000)). Similarly, facts about incorporation would seem to support an NP-over-DP approach (see Baker (1988, 1996) and Rosen (1990)): Incorporation of N into V may strand D in the nominal projection. Given that incorporation is head movement, this is unexpected under the DP hypothesis (since a Head Movement Constraint violation should occur) but entirely unproblematic if the DP hypothesis is abandoned.

However, addressing further evidence for or against the DP hypothesis is clearly beyond the scope of the present paper; here we have confined ourselves to showing that generating NP structure by reprojection of N offers a viable alternative to N movement to D (and other functional projections) – an alternative that makes it possible to derive an otherwise stipulative statement needed in Abels & Neeleman's and Cinque's approaches to word order variation in nominal projections.

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