

A syntactic analysis of Dutch nominal infinitives

Sietze Looyenga

0. Introduction

In this paper, I propose a syntactic analysis of Dutch nominal infinitives (from now on: NIs) within the framework of generative grammar outlined in Chomsky (1981, 1986).¹ NIs are phrases that are at first sight headed by an infinitival verb form. Yet, they occur in positions that are generally assumed to be reserved for nominal phrases.

This paper is organized as follows. The first section provides a brief discussion of both the internal and the external syntax of NIs. It is demonstrated that NIs are like 'ordinary' nominal phrases in their external behaviour, but that they exhibit both nominal and verbal properties internally. When the internal syntax is taken into consideration, there appears to be a distinction between NIs with a determiner and NIs without one, as will be shown. The discussion culminates in the formulation of three research questions that any analysis of NIs has to provide an answer for.

The second section contains a proposal for the internal structure of NIs that contain a determiner. According to this proposal, NIs with a determiner are nominal phrases that consist of an IP to which an affix expressing nominal features has been attached. The analysis of NIs with a determiner is thus embedded in the more general theory of nominal phrases put forward in Looyenga (1991). A proposal for an analysis of NIs without a determiner is presented in the third section. It is argued that NIs without a determiner are IPs that appear in argument positions. The distributional differences between IPs containing *te* 'to' and NIs without a determiner are accounted for in terms of the Exclusiveness Principle introduced in Reuland (1990).

1. The syntax of nominal infinitives

As for their external syntax or distribution, NIs behave like nominal phrases: they appear in positions in which nominal phrases can appear as well, while they are excluded from positions in which nominal phrases are not allowed

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either. The sentences in (1) and (2) serve to illustrate this. NIs can appear as the subject in finite sentences, or as the object of a verb or a preposition:

- (1) a Het schrijven van artikelen is moeilijk
the writing of articles is difficult
- b Ik haat het schrijven van artikelen
I hate the writing of articles
- c Ik houd van het schrijven van artikelen
I am fond of the writing of articles

NIs, on the other hand, cannot appear in positions that can be occupied by an extraposed IP headed by *te* 'to'. The same holds for ordinary nominal phrases:

- (2) a Het is vervelend artikelen te schrijven
it is annoying articles to write
- b *Het is vervelend het schrijven van artikelen
it is annoying the writing of articles
- c *Het is vervelend dit artikel
it is annoying this article

NIs diverge from nominal phrases in exhibiting nominal as well as verbal properties internally. There is a distinction between NIs with a determiner and NIs without one: the former have a mixed character, exhibiting both nominal and verbal properties, while the latter are purely verbal internally.

The first nominal characteristic of NIs with a determiner is of course the presence of this determiner. The mixed character of these NIs comes out very clearly when the positions in which the objects of the infinitive can occur are taken into consideration. In Dutch, objects precede the head in verbal phrases, while they follow it in nominal ones. In NIs with a determiner, the objects of the verb can precede as well as follow the infinitive. If an object can precede the infinitive, then the infinitive must have verbal features. If an object can follow it, then it must be nominal as well. This is illustrated in (3).

- (3) a het (aan) je vriendin bloemen geven
the (to) your girlfriend flowers giving
- b het (aan) je vriendin geven van bloemen
the (to) your girlfriend giving of flowers
- c het bloemen geven aan je vriendin
the flowers giving to your girlfriend
- d het geven van bloemen aan je vriendin
the giving of flowers to your girlfriend

Furthermore, NIs with a determiner can contain adjectives (recognizable by the affix *-e*) as well as adverbs. The presence of adjectival modifiers is typical for nominal phrases, while the presence of adverbial modifiers is a property of verbal ones. If an NI contains both an adjective and an adverb, the former always precedes the latter. The reverse order is excluded.

- (4) a dat constant/constante roken van sigaretten
that constantly/constant+ADJ smoking of cigarettes
- b dat irritante langzaam uitblazen van de rook
that irritating+ADJ slowly puffing out of the smoke
- c *dat langzaam irritante uitblazen van de rook
that slowly irritating+ADJ puffing out of the smoke

Adverbial modifiers that are realized as prepositional phrases can precede the infinitive in NIs with a determiner. This is another verbal characteristic.

- (5) a het met trillende handen roken van een sigaret
the with trembling hands smoking of a cigarette
- b het met een mesje schillen van de aardappels
the with a knife peeling of the potatoes

NIs without a determiner exhibit only verbal properties internally. The unacceptability of the NIs in (6) can be taken as evidence in favour of this claim: these NIs cannot contain an adjectival modifier or a prepositional phrase following the head that contains the direct object.²

- (6) a *constante roken (is irritant)
constant+ADJ smoking (is irritating)
- b *roken van sigaren (is irritant)
smoking of cigars (is irritating)

The fact that indirect objects occurring in a PP or adverbial PPs can follow the infinitive in these NIs does not constitute evidence against this claim. These appearances can be considered the result of the application of PP-over-V. In this view, the NI in (7a) is derived from the NI in (7b).

² Since an NI can only be combined with the definite determiner *het*, its head is neuter. Adjectives never bear the affix *-e* when they modify a neuter noun that is not combined with an overt determiner, cf. *groen gras* 'green grass' vs. **groene gras* 'green+ADJ grass'. Looked upon this way, the unacceptability of (6a) does not justify the conclusion that NIs without a determiner cannot contain adjectives.

- (7) a bloemen geven aan je vriendin
 flowers giving to your girlfriend
 b bloemen aan je vriendin geven
 flowers to your girlfriend giving

The examples given thus far strongly suggest that NIs with a determiner contain a verbal projection that is transposed into or embedded in a nominal projection (a process that is generally referred to as nominalization). The absence of nominal characteristics in NIs without a determiner seems to imply that these NIs do not contain a nominal projection. At this point, three research questions can be formulated that have to be answered in any syntactic analysis of NIs. In the remainder of this paper, I provide an answer for each of these questions.

- (A) How is the transposition of a verbal projection into a nominal one in nominal infinitives with a determiner established?
- (B) At which level is the verbal projection nominalized (i.e., transposed into a nominal projection)?
- (C) How is the distinction between nominal infinitives with a determiner and nominal infinitives without a determiner to be accounted for? Do nominal infinitives without a determiner contain a nominal projection or are they purely verbal?

Furthermore, I consider it useful to impose a general requirement on syntactic analyses of NIs: (try to) avoid structural representations or rules that do not receive independent motivation elsewhere in the grammar. In some of the previous analyses of NIs, this requirement is not met, as a result of which these analyses give the impression of being circular: since they are designed in order to provide an analysis of NIs, they handle NIs remarkably well. The assumptions on which they are based, however, are in some cases rather stipulative and not motivated on independent grounds.

2. Nominal infinitives containing a determiner

In this section, I present an analysis of the internal structure of NIs with a determiner. This proposal is embedded in the more general analysis of nominal phrases introduced in Looyenga (1991), in which nominal phrases are assumed to be DPs, which means that they are headed by a determiner and not by a noun (cf. Abney 1987). The category D of determiners is a functional category. One of the characterizing properties of functional categories is that

they select a unique complement (cf. Abney 1987, Fukui and Speas 1986). An element of the functional category *D* always takes an NP as its complement.

The approach presented in Looyenga (1991) provides a way to capture the restrictions involved in the process of complement selection. It is argued that both determiners and noun phrases are associated with a bundle of grammatical features such as person, number, gender and case. Determiners have inherently (i.e., lexically) specified values for these features. In the case of noun phrases, the values for these features are determined by an affix that is adjoined to the head of the phrase. DPs are licensed if the values for (some of) these features are identical for determiner and noun phrase.³ The canonical structure of a nominal phrase can then be represented as in (8).

$$(8) \quad [_{DP} [_{D'} D [_{NP} [_{N'} [_{N} N + \text{affix}]]]]]$$

$$\begin{bmatrix} \text{person} \\ \text{number} \\ \text{gender} \\ \text{case} \\ \text{.....} \end{bmatrix}$$

$$\begin{bmatrix} \text{person} \\ \text{number} \\ \text{gender} \\ \text{case} \\ \text{.....} \end{bmatrix}$$

The affix in nominal phrases is a dependent element in the sense of Koster (1987), representing structural properties of the category involved. In the same sense, the relation between the determiner and the affix is a dependency relation, having the required properties of obligatoriness, uniqueness of the antecedent, c-command of the antecedent and locality.

The analysis outlined above is applicable to NIs with a determiner if these NIs contain an affix expressing nominal characteristics that can agree with a determiner. The analyses of NIs proposed in Hoekstra and Wehrmann (1985), Hoekstra (1986) and Van Haaften et al. (1985) are partly based on the assumption that *-en* is a nominal affix that can be attached to a verb. This affix is held to be responsible for the transposition from verbal to nominal in NIs. A disadvantage of these analyses, however, is that they presuppose that verbs have two infinitives, one that contains a nominal affix *-en* and that occurs only in NIs and one in which the affix *-en* is verbal and that appears elsewhere. These analyses fail to meet the general requirement imposed on analyses of NIs in the preceding section that representations that cannot be

³ The analysis outlined here is meant to be an alternative for the analyses that were proposed by Higginbotham (1983, 1985) and by Reuland (1986, 1988), according to which nominal phrases contain a variable or an open place that has to be looked upon as a thematic role at the levels of D-structure and S-structure. The variable or open place in these analyses is replaced by the nominal affix in the present analysis. This affix corresponds to a variable at LF. The extent to which the values for the features associated with the determiner and the noun phrase have to be shared seems to differ among languages. See Looyenga (1991) for some details.

motivated on independent grounds are to be avoided. In the analysis I present, the affix *-en* is not ambiguous, but always verbal. In this way, there is no need to adopt the assumption that infinitives are categorially ambiguous. I consider this an advantage over the analyses just mentioned.

If the affix *-en* cannot be considered the nominal affix in NIs, then the question arises whether NIs contain another affix that expresses grammatical features such as person, number, gender and case. I assume that there is such an affix. In my view, this affix, that is adjoined to IP, establishes the transposition from verbal to nominal in NIs containing a determiner. This means that the canonical structure of NIs with a determiner is to be represented as in (9). This structure shows that I do not consider the affix *-en* to be an instantiation of I, but an affix attached to the verb that stands in an agreement relation to I. The nominal affix has to be lowered to the verb by means of a rule of Affix Hopping such as rule R (cf. Chomsky 1981).

- (9) $[_{DP} [_{D'} D [_{NP} [_{N'} [_{N} [_{IP} PRO [_{I'} [_{VP} V + en] I]] + affix]]]]]]]$

The affix provides the NI with nominal characteristics and gives it, together with the determiner, the internal grammar of a nominal phrase. A phrase has the internal grammar of a nominal phrase if it contains a determiner and an affix expressing nominal features that stand in a dependency relation in the sense of Koster (1987) to each other.

Evidence in favour of the structure in (9) is very hard to find in present-day Dutch, but it can be obtained from German, a language with a richer (i.e., less impoverished) inflectional system than Dutch. German has nominal infinitives that are very similar to the Dutch ones (cf. Abraham 1989). The head of German NIs with a determiner bears the genitival affix *-s* when the NI as a whole is assigned genitive case.

- (10) die Bestätigung des Empfangens dieses Briefes
the affirmation the + GEN receiving + GEN this + GEN letter

The question might be raised as to why an IP is allowed to combine with an affix that expresses nominal properties. In essence, the answer to this question will be semantic. An IP containing a PRO subject refers to a property (or to a set of individuals). This property can be predicated of any entity, but it can itself be the subject of a predication as well. In the latter situation, a property is assigned to another property. The expression that refers to the property to which another property is assigned occurs in an argument position. Hence, it must be identifiable as an argument. This can be established by means of the nominal affix that transposes the IP into a nominal phrase. This is, of course, exactly what the process of nominalization amounts to: the transposition of a predicative expression into an expression that functions as an argument.

The first research question formulated in the first section has received an answer by now: the transposition of a verbal projection into a nominal one is established by means of the attachment of a nominal affix. The second question concerns the level at which this transposition takes place. This question has already been answered implicitly, since according to the structure in (9) the transposition takes place at the maximal level in the projection of the (infinite) inflection element. It has been claimed (cf. Hoekstra and Wehrmann 1985, Hoekstra 1986) that the transposition from verbal to nominal can take place at any level in the projection of the verb. An analysis along these lines can be based on the Deverbalization Scheme introduced in Jackendoff (1977), that can be represented as in (11).

- (11) $X^i \rightarrow V^i$ affix

When N is substituted for X and when the affix is taken to be a nominal affix, this scheme can generate NIs. An analysis in terms of (11), however, is descriptively inadequate. In particular, it predicts wrongly that the NIs in (3a) and (5a), repeated below as (12), are ungrammatical.

- (12) a het aan je vriendin geven van bloemen
 the to your girlfriend giving of flowers
 b het met trillende handen roken van een sigaret
 the with trembling hands smoking of a cigarette

The NI in (12a) contains an indirect object that precedes the head. This implies that the head of the phrase is verbal at the level at which the indirect object occurs (the V^1 -level), and hence that the transposition from verbal to nominal has not yet taken place at this level. This is incompatible with the fact that in the same NI the direct object appears in a PP following the head, something which implies that the head is nominal at the X^1 -level and that the transposition has occurred at the V^0 -level. Something similar holds for the NI in (12b), at least if the standard assumption is adopted that adverbial PPs such as *met trillende handen* 'with trembling hands' are adjoined to VP.

An analysis according to which NIs contain a full fledged IP raises the question as to how it is possible for the objects of a verb to show up in the nominal part of an NI. In principle, there are three possible answers to this question. In the first place, it can be assumed that the objects of a verb are base generated within the projection of the verb and that they are moved to the nominal part of the NI, where a preposition is inserted in order to prevent a violation of the Case filter. The second option is to assume that the objects are base generated in the nominal part. Finally, it is possible to assume that the object position within the projection of the verb can be occupied by an empty pronominal element (such as *pro*) and that this

element can be bound by the object appearing in the nominal part of the NI. Since to my knowledge there is no independent evidence for the existence of *pro* in Dutch, I will not pursue the third suggestion.

The analysis according to which objects are generated within the nominal part of the NI is incompatible with the Projection Principle, one of the central principles within the theory of generative grammar (cf. Chomsky 1981). This principle requires that lexical information is projected onto syntactic structure. According to the principle, the object position of a verb such as *roken* 'to smoke' has to be filled at D-structure, since the lexical entry of this verb contains the information that it is transitive. If the Projection Principle is taken for granted, it has to be assumed that the objects are generated in their canonical position within the projection of the verb, and that they are moved from that position to the nominal part of the projection.

The question can be raised, however, whether this approach is the correct one. In the first place, the Projection Principle seems to be at stake in NIs anyway, since it is possible that none of the arguments of the verb is realized, as in the sentences in (13). The acceptability of these sentences seems to imply that the Projection Principle does not apply to NIs.

- (13) a Het aanbieden vindt plaats in de kantine
the offering takes place in the canteen
- b Het schrijven boeit mij niet meer
the writing fascinates me not more

Another argument against a movement analysis is that it is incompatible with the Structure Preserving Principle (introduced in Emonds 1976), at least if the PP containing the object is assumed to be the sister of the complex noun consisting of the VP and the affix. A violation of the Structure Preserving Principle can be prevented if the object is assumed to be adjoined at the N^I -level. In that case, however, the sentences in (14) are predicted to be grammatical, because there are no restrictions on the order of movements. Hence, it should be possible to adjoin an adverbial PP (as in (14a)) or an indirect object (as in (14b)) in the nominal part of the projection before moving the direct object. The sentences in (14) show that this possibility has to be excluded. This can be explained if the direct object is considered to be the sister of the complex noun when it occurs in a *van*-PP. If this is correct, then the direct object must be generated there, because moving it to the sister position would create a violation of the Structure Preserving Principle.

- (14) a *?Het roken in openbare gebouwen van sigaren is verboden
the in public buildings smoking of cigars is prohibited
- b *?Het ontvangen van bewonderaars van brieven is leuk
the receiving from admirers of letters is nice

Furthermore, moving an object out of the verbal projection in NIs is rather exceptional in that it requires the insertion of the case assigning preposition *van* after a phrase has been moved, a process that to my knowledge is not encountered elsewhere in the grammar of Dutch.

If the movement analysis is rejected, then only one possible answer to the question how the objects of a verb can show up in the nominal part of an NI remains: the objects are base generated there. This approach is also in need of at least one additional assumption. This assumption is that the argument structure or the thematic grid of the verb can percolate to a node that is categorially different, viz. the node that is the result of attaching the affix expressing nominal characteristics to IP.⁴ Once the thematic grid of the verb has ended up in a nominal projection, the Projection Principle cannot be violated anymore: it is well known that argument association is optional in the nominal domain. It appears, then, that the Projection Principle, that is generally assumed to be in force in the verbal domain, does not apply when a verbal projection is embedded in a nominal phrase. The same holds, by the way, for verbal projections that are embedded in adjectival phrases, such as *deze geld gevende instantie* 'this money giving authority', in which the adjectival affix *-e* has been attached to an IP (cf. Looyenga 1991).

Two of the three questions that were brought up in the first section have received an answer in this section. I have argued that the transposition of a verbal phrase into a nominal one is established by an affix expressing nominal characteristics, and that this affix is attached to IP. The third question, concerning the nature of the distinction between NIs with a determiner and NIs without one, can only be answered after NIs without a determiner have been subjected to closer investigation.

3. Nominal infinitives without a determiner

Nominal infinitives that do not contain a determiner do not display any nominal characteristics internally, as was already pointed out in the first section. This means that these NIs do not have the internal grammar of a nominal phrase. As argued in the previous section, a phrase has the internal grammar of a nominal phrase if it contains both a determiner and an affix expressing values for certain grammatical features. The determiner and the affix are mutually dependent: the determiner has to bind an affix, while the affix has to be bound by a determiner. This mutual dependency between a

⁴ Independent evidence that supports this assumption can be found in Roeper (1987), where it is argued that the roles in the thematic grid of a verb can be assigned even if an affix has been attached to the verb that changes the categorial status of the projection.

functional category and the thematic category it selects is generally considered to be a characterizing property of functional categories (cf. Abney 1987, Fukui and Speas 1986).⁵

If NIs without a determiner cannot be considered 'normal' nominal phrases, the question arises as to what categorial status they have. It could be assumed that they are exceptional nominal phrases (exceptional in that they do not have the internal grammar of a nominal phrase) created by a phrase structure rule like $DP \rightarrow VP$ or $DP \rightarrow IP$. An analysis in terms of such a rule, however, is ad hoc, incompatible with the principles of X-bar-theory and does not have any explanatory power. Another solution is to assume that these NIs are DPs the (empty) head of which is able to select a VP instead of an NP. In such a view, the structure of NIs without a determiner would be as in (15).

- (15) $[_{DP} D [_{VP} V + \text{affix}]]$

In Looyenga (1990), I have argued that an analysis along these lines has to be rejected for principled reasons: the affix attached to the verb expresses verbal characteristics instead of nominal ones. As a result of this, there can be no agreement relation between the determiner and the affix, and hence the nominal phrase cannot be licensed. Furthermore, it is unclear what the determiner would be in (15). In Looyenga (1990), I claimed that NIs without a determiner are DPs headed by a generic determiner and that the lack of nominal characteristics can be ascribed to properties of this determiner. It is, however, nearly impossible to account for the ungrammaticality of the NI in (16a) in this analysis, especially since comparable nominal phrases with a genuine noun phrase are grammatical (cf. (16b)).

- (16) a *Roken van sigaren is ongezonder
 smoking of cigars is unhealthy
 b Aanhangers van deze theorie zijn intelligent
 adherents of this theory are intelligent

Furthermore, it could be argued that NIs without a determiner are VPs occurring in an argument position. If the hypothesis that subjects are base generated VP-internally is adopted (cf. a.o. Koopman and Sportiche 1991), then these VPs can be assumed to have a PRO subject. A conceptual

⁵ I assume that this property of functional categories holds only at D-structure and at S-structure. The counterpart of this property at the level of Logical Form is the well-known prohibition on vacuous quantification in natural languages. Remember that the nominal affix has a variable as its counterpart at LF. The considerations presented here are similar to those in Reuland (1988). Reuland, however, assumes that nominal phrases contain a variable instead of an affix (cf. note 3).

objection that can be raised against this approach is that it cannot be reconciled with a theory of functional categories. Functional categories are generally looked upon as categories that establish a link between thematic categories. If NIs without a determiner are VPs occurring as an argument, then we would have a case of a thematic category being linked to another thematic category without an intervening functional category.

There is only one possible analysis of NIs without a determiner left over: they must be IPs. Since I do not consider the infinitival affix *-en* to be an instantiation of I (cf. the preceding section), these IPs do not contain a lexical realization of I in my analysis. This makes it possible to account for the complementary distribution of IPs containing *te* 'to' and NIs without a determiner. IPs with *te* are not allowed to remain in the position in which they are generated, but are extraposed obligatorily. NIs without a determiner, however, are not even allowed to be extraposed.

- (17) a **Artikelen te schrijven is leuk*
 articles to write is nice
 b *Het is leuk artikelen te schrijven*
 it is nice articles to write
 c *Artikelen schrijven is leuk*
 articles writing is nice
 d **Het is leuk artikelen schrijven*
 It is nice articles writing

These distributional differences can be accounted for in terms of a slightly revised version of the Exclusiveness Principle introduced in Reuland (1990). This principle states that functional heads cannot bear lexical characteristics. It does not allow functional heads to bear case, but it does allow them to transmit their case to the head of the thematic projection they select. The case assigned to the functional head of an IP cannot be transmitted to the VP selected by the IP, because only categories the head of which bears the categorial feature [+N] can be assigned case. A violation of the Exclusiveness Principle can only be prevented if the IP is moved to a position in which it is not assigned case. In this way, the obligatory extraposition of the IP in (17a), resulting in the grammatical (17b), is accounted for.

If NIs without a determiner are considered to be IPs, the question arises as to why they do not have to be moved from case marked positions. I assume that the NIs can remain in these positions precisely because they do not contain *te*, the lexical realization of I in infinite IPs. It is now impossible to violate the Exclusiveness Principle: although the IP occurs in a case marked position, there is no functional head bearing lexical characteristics. Hence, there is no need to extrapose the IP. The structure of these NIs can then be represented as in (18).

(18) $[_{IP} [_I \emptyset] [_{VP} (NP) V + en]]$

These considerations provide the answer for the third research question: NIs without a determiner differ from NIs with a determiner in that they do not contain a nominal projection. They are to be analyzed as IPs instead of DPs.

4. Conclusion

In this paper, I have proposed a syntactic analysis of Dutch nominal infinitives that gives adequate answers to the research questions that were introduced as representing the basic problems posed by NIs. I have argued that the class of NIs has to be divided into two subclasses: a categorial distinction has to be made between NIs with a determiner and NIs without one.

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