

# ADNOMINAL PARTICIPLES

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Adnominal participles show a mixture of verbal and adjectival properties. This paper presents an analysis that captures this hybrid nature. Section 1 provides a description of the data. It is larded with examples and quantitative info from Lassy Small, a treebank of contemporary written Dutch (1 million words; 65200 sentences each with a unique identifier; automatically parsed; manually corrected). Section 2 provides an analysis. It is cast in the notation of Ginzburg and Sag (2000).

## 1 Description

Lassy Small contains 3275 present participles and 26566 past participles. 2474 of the former (75.54 %) and 3992 of the latter (15.03 %) are used in adnominal position, yielding a total of 6466 instances. 5688 of those are prenominal (87.97 %); the rest is postnominal.

### 1.1 Prenominal

Of the 5688 prenominal participles 5071 (89.15 %) consist of a single word, as in (1). The remaining 617 (10.85 %) are phrasal, as in (2).

- (1) *de stijgende zeespiegel*  
the *rising*.DCL sea.level  
'the rising sea level' (dpc-ind-001650-nl-sen.p.14.s.2)
- (2) *een in Rome gecentraliseerd politiek systeem*  
an *in Rome centralised* political system  
'a political system centralised in Rome' (wr-p-e-h-0000000055.p.204.s.4)

The phrasal ones are invariably head final. If the participle has a post-head modifier, such as *ooit* 'ever' in (3), it appears after the noun.

- (3) *het werd één van zijn best verkopende platen ooit*  
it became one of his *best selling*.DCL records *ever*  
'it became one of his best selling records ever' (wr-p-e-i-0000019936.p.7.s.179)

The participles show inflectional variation between declined (with *-e*) and non-declined (without *-e*) forms, just like prenominal adjectives.<sup>1</sup> The non-declined forms are canonically used in singular neuter indefinite NPs, as in (2), and the declined forms in other NPs, such as the singular non-neuter one in (1) and the plural one in (3).

Semantically, the participles constrain the denotation of the nominal they modify. In Predicate Logic this is modelled by variable sharing, in HPSG by index sharing (Pollard and Sag 1994, 55-57).<sup>2</sup>

<sup>1</sup>The distinction is neutralized when the stem ends in *-en*. This is the case for past participles of irregular verbs and for a number of adjectives, such as *open* 'open' and *houten* 'wooden'.

<sup>2</sup>In participial phrases, the index is also shared with the participle itself.

- (4) a. de stijgende<sub>i</sub> zeespiegel<sub>i</sub>  
 b. een [in Rome gecentraliseerd]<sub>i</sub> [politiek systeem]<sub>i</sub>

The participles take the same arguments as the verbs from which they are derived, but with the twist that the first argument is left unexpressed. It is externally controlled by the modified nominal.

- (5) a. de [X<sub>i</sub> stijgende] zeespiegel<sub>i</sub>  
 b. een [X<sub>i</sub> in Rome gecentraliseerd] [politiek systeem]<sub>i</sub>

Independent evidence for the existence of an unexpressed first argument is provided by the fact that it serves as the local antecedent of anaphoric pronouns, as in (6–7).

- (6) elke [X<sub>i</sub> zichzelf<sub>i</sub> respecterende] bierbrouwer<sub>i</sub> heeft zijn eigen type gist  
 every [X<sub>i</sub> REFL<sub>i</sub> respecting.DCL] beer.brewer<sub>i</sub> has his own type yeast  
 ‘every brewer who respects himself has his own type of yeast’ (wiki-8628.p.18.s.1)
- (7) allerlei [X<sub>i</sub> elkaar<sub>i</sub> tegensprekende] teksten<sub>i</sub>/\*tekst<sub>i</sub>  
 several [X<sub>i</sub> each.other<sub>i</sub> contradicting.DCL] text.PLU<sub>i</sub>/\*text.SG<sub>i</sub>  
 ‘several texts contradicting each other’ (not from the treebank)

Given that HPSG indices have person, number and gender features, the coindexation accounts for the fact that adnominal participles which contain a plural anaphoric pronoun, such as the reciprocal one in (7), can modify a plural nominal, but not a singular one.

Since the modified nominal shares its index both with the participle, as shown in (4), and with the unexpressed argument of the participle, as shown in (5), it follows that the participle shares the index of its unexpressed argument.

- (8) a. de [X<sub>i</sub> stijgende<sub>i</sub>]<sub>i</sub> zeespiegel<sub>i</sub>  
 b. een [X<sub>i</sub> in Rome gecentraliseerd<sub>i</sub>]<sub>i</sub> [politiek systeem]<sub>i</sub>

## 1.2 Postnominal

Of the 778 postnominal participles 760 (97.69 %) are phrasal. The phrases may be head final, as in (9), but the head initial order, as in (10), is much more common. If there is more than one dependent the participle may also take a medial position, as in (11).<sup>3</sup>

- (9) afkomstig van de activiteiten *door het Vlaamse Gewest ondernomen*  
 stemming from the activities *by the Flemish Region undertaken*  
 ‘stemming from the activities undertaken by the Flemish Region’ (dpc-bmm-001106-nl-sen.p.5.s.2)
- (10) het schepencollege van het Waasland *zetelend te Bazel*  
 the municipal.council of the Waasland *residing at Bazel*  
 ‘the municipal council of the land of Waas residing at Bazel’ (wr-p-e-i-0000108667.p.3.s.127)
- (11) het laat Prince zien, *in adamsuniform zittend in een reusachtige bloem*  
 it lets Prince see, *in adam.uniform sitting in a gigantic flower*  
 ‘it shows Prince sitting naked in a gigantic flower’ (wr-p-e-i-0000026563.p.3.s.128)

<sup>3</sup>Of the 71 postnominal present participial phrases, 1 is head final, 60 are head initial and 10 are head medial.

(11) also shows that a postnominal participle need not be adjacent to the nominal it modifies. Another difference with the prenominal participles is the lack of agreement with the modified nominal: The distinction between declined and non-declined forms is systematically neutralized.

What the postnominal participles have in common with the prenominal ones, is that they constrain the denotation of the nominal they modify and that they have an unexpressed first argument that is controlled by that same nominal.<sup>4</sup>

- (12) a. [de activiteiten]<sub>i</sub> [X<sub>i</sub> door het Vlaamse Gewest ondernomen]<sub>i</sub>  
 b. [het schepencollege van het Waasland]<sub>i</sub> [X<sub>i</sub> zetelend<sub>i</sub> te Bazel]<sub>i</sub>  
 c. het laat Prince<sub>i</sub> zien, [X<sub>i</sub> in adamsuniform zittend<sub>i</sub> in een reusachtige bloem]<sub>i</sub>

The unexpressed argument is comparable to a relative subject pronoun. In fact, if the participle in (12b) or (12c) is replaced by a finite form, the place of X is taken by a relative pronoun. That pronoun shows agreement with the modified nominal: *dat* for singular neuter and *die* for singular non-neuter and plural.

## 2 Analysis

### 2.1 Open lexemes

To model the properties which the adnominal participles share with the adjectives we use the notion of open lexeme, as defined in Van Eynde (2015, 135).<sup>5</sup>

$$(13) \text{ open-lx} \Rightarrow \left[ \begin{array}{l} \text{CONTENT} \left[ \begin{array}{l} \text{scope-object} \\ \text{INDEX } \boxed{1} \text{ referential} \end{array} \right] \\ \text{ARG-ST} \left\langle \left[ \begin{array}{l} \text{noncanonical-synsem} \\ \text{CONTENT | INDEX } \boxed{1} \end{array} \right] \right\rangle \oplus \boxed{A} \end{array} \right]$$

This captures the observation that adnominal participles share the index of their unexpressed first argument, as shown in (8). The latter is an object of type *noncanonical-synsem*, as defined in Ginzburg and Sag (2000, 40). That such objects have a referential index is spelled out in Ginzburg and Sag (2000, 55).

Evidence that (13) not only subsumes the adnominal participles but also the adnominal adjectives is provided in (14).

- (14) de [X<sub>i</sub> zich<sub>i</sub> van geen kwaad bewuste<sub>i</sub>]<sub>i</sub> matrozen<sub>i</sub>  
 the [X<sub>i</sub> REFL<sub>i</sub> of no evil aware<sub>i</sub>]<sub>i</sub> sailors<sub>i</sub>  
 ‘the sailors unaware of evil’ (not from the treebank)

Also here, the modifier shares its index with the modified nominal, on the one hand, and with its own unexpressed first argument, on the other hand, and also here the first argument provides the antecedent for an anaphoric pronoun.

<sup>4</sup>Also here the index of the participial phrase is shared with the participle, so that the participle shares the index of its first argument.

<sup>5</sup>In the hierarchy of lexemes this type belongs to the LINKING dimension (Van Eynde 2015, 113–121). It concerns the relation between arguments and semantic roles, and is orthogonal to the PART-OF-SPEECH and ARG-SELECTION dimensions.

## 2.2 Derivational rules

To model what the participles have in common with verbs we use derivational lexical rules. The one for the **present participle** is spelled out in (15).

$$(15) \left[ \begin{array}{l} v\text{-}lx \\ \text{FORM } \boxed{A} \\ \text{CONT } \boxed{1} \text{ } \textit{soa} \end{array} \right] \Rightarrow_{LR} \left[ \begin{array}{l} \textit{open-lx} \\ \text{FORM } F_{prp}(\boxed{A}) \\ \text{CAT} | \text{HEAD} | \text{VFORM } \textit{pres-ptc} \\ \text{CONT} | \text{RESTR} \left\{ \left[ \begin{array}{l} \textit{fact} \\ \text{PROP} \left[ \begin{array}{l} \text{SIT } s \\ \text{SOA } \boxed{1} \end{array} \right] \right], \left[ \begin{array}{l} \textit{fact} \\ \dots | \text{NUCL} \left[ \begin{array}{l} \textit{at-rel} \\ \text{ARG } s \\ \text{SIT-TIME } \boxed{2} \end{array} \right] \right] \right\} \\ \text{CONTEXT} \left[ \begin{array}{l} \text{C-INDS} | \text{LOC-TIME } \boxed{3} \\ \text{BACKGROUND } \{ \boxed{2} \circ \boxed{3} \} \end{array} \right] \end{array} \right]$$

The rule triggers a morpho-phonological change, involving the addition of the affix *-end*, and adds a specific VFORM value. Semantically, it embeds the state of affairs that the verbal lexeme denotes ( $\boxed{1}$ ) in a proposition that constrains the denotation of the participle: *stijgend* ‘rising’, for instance, denotes the entities for which it is a fact that they are rising. The rule also adds a temporal constraint: the situation that the proposition denotes is required to occur at a time which overlaps with a contextually given location time. The latter is usually left unexpressed, but can be made explicit by a temporal modifier, as in (16).

- (16) indien de *toen geldende* regels dergelijke namen niet hadden verwijderd  
 if the *then obtaining*.DCL rules such names not had removed  
 ‘if the rules in place at that time had not removed such names’ (dpc-dns-001068-nl-sen.p.17.s.4)

The relation between the location time and the utterance time is not constrained by the participle, but by lexical properties of the temporal adverb. In the case of *toen* ‘then’, for instance, it precedes the time of utterance.

Since the present participles are open lexemes, their unexpressed first argument is required to be referential. This implies that there are no present participles for verbs which require or allow a non-referential subject, such as the weather verbs and the subject raising verbs (*\*regenend* ‘raining’, *\*zullend* ‘shalling’).

For the **past participle** there are two lexical rules. One applies to unaccusative verbs, such as *blijven* ‘remain, stay, keep’.

- (17) de *relatief intact gebleven* industriële infrastructuur  
 the *relatively untouched remained* industrial infrastructure  
 ‘the industrial infrastructure that remained relatively untouched’ (wiki-208.p.86.s.1)

The rule which models the properties of these participles is similar to (15). The only differences concern the morpho-phonological function ( $F_{psp}$ ), the VFORM value (*past-ptc*) and the temporal constraint: the relation between the location time and the situation that the participle denotes is not one of overlap but of inclusion. In (18), for instance, the stranding is said to have taken place at some time in 1996, rather than during a period that overlaps 1996.

- (18) dat het *in 1996 gestrande* grondwettelijk proces  
 that the *in 1996 stranded*.DCL constitutional process  
 ‘that the constitutional process that stranded in 1966’ (dpc-kam-001286-nl-sen.p.10.s.1)

The other rule applies to transitive verbs, such as those in (2) and (9). It is similar to that of the unaccusative verbs, except for the fact that it changes the argument structure of the verbal stem: The latter’s first argument is demoted to the most oblique position, so that its second argument becomes the first one. This captures the passive sense of these participles.

### 2.3 Inflectional rules

Open lexemes are related to words by means of inflectional rules. Adopting the functor treatment of adnominal modifiers and specifiers, as laid out in Van Eynde (2006), the rule for the **postnominal** modifiers can be spelled out as in (19).

$$(19) \left[ \begin{array}{l} open-lx \\ FORM \boxed{A} \end{array} \right] \Rightarrow_{LR} \left[ \begin{array}{l} word \\ FORM \boxed{A} \\ CAT \left[ \begin{array}{l} HEAD | SELECT \left[ \begin{array}{l} CAT \left[ \begin{array}{l} HEAD \textit{noun} \\ MARKING \boxed{1} \textit{marking} \end{array} \right] \\ CONT | INDEX \textit{i} \end{array} \right] \\ MARKING \boxed{1} \end{array} \right] \\ CONT | INDEX \textit{i} \end{array} \right] \end{array} \right]$$

Postnominal modifiers select a nominal, share its index and its MARKING value, and have the same FORM value as the lexeme. For the **prenominal** ones we need separate rules for the declined and the non-declined forms, and the further constraint that the MARKING value is of type *unmarked*.

## 3 Conclusion

This paper has provided an analysis of the adnominal participles which captures both their verbal and their adjectival properties. What they have in common with the adjectives is captured by the constraints on the open lexemes and the inflectional rules. What they have in common with verbs is captured by the derivational rules.

## References

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