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The nominalization of Dutch particle verbs: schema unification and second order schemas

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### **Abstract**

The event nominalizations of Dutch particle verbs and other types of separable complex verbs are not derivations from particle verbs, but compounds nouns, with a deverbal head preceded by a word that functions semantically as a modifier of the verbal base of the head noun. This structural analysis explains two empirical generalizations: (i) simplex verbs allow for nominalization with *-ing* when embedded in compounds; (ii) particle verbs have corresponding nominalizations with the same unproductive type of nominalization as the corresponding simplex verbs.

In order to account for these generalizations, the following related concepts from the theoretical framework of Construction Morphology are used: the representation of word formation patterns by means of constructional schemas (in which form-meaning asymmetries can be specified), schema unification (with unified schemas having their own degree of productivity), constructional idioms (constructional schemas with lexically filled slots), and second order schemas. Thus, this case study illustrates the descriptive power of Construction Morphology.

### 1. Introduction

The nominalization patterns of Dutch particle verbs form a challenge for linguistic analysis, and provide evidence as to how phrasal and morphological constructs can be related in a systematic fashion. Particle verbs are complex predicates consisting of a particle and a verb, in most cases a simplex, underived verb. They are not morphological compounds, although they are lexical items. In this paper I will focus on an important aspect of particle verbs that has not been discussed in detail in the relevant literature on particle verbs: the way in which they are nominalized. I will argue that nominalizations of particle verbs are not to be seen as derived words, but as nominal compounds consisting of a particle and a nominalized verb. For instance, the nominalization of the particle verb *aankomen* ‘to arrive’ has the form *aankomst* ‘arrival’. My claim will be that this is a nominal compound, with *komst* as its head:  $[[aan]_{\text{Pt}} [[kom]_{\text{V-st}}]_{\text{N}}]_{\text{N}}$ . From a semantic point of view one might have expected the structural analysis  $[[aan-kom]_{\text{V}} .st]_{\text{N}}$  for this word, because *aankomst* means ‘event of arriving’. I will discuss the source of this mismatch between form and meaning in this type of complex word, and how it can be accounted for. In section 2, I will provide a general picture of

deverbal nominalization in Dutch. Section 3 will then discuss how particle verbs and similar phrasal predicates are nominalized, and how this kind of nominalization can be accounted for. Section 4 extends this analysis briefly to agent nominalizations of particle verbs. Section 5 summarizes the findings of this paper.

## 2. The nominalization of Dutch verbs

Before we go into the details of the nominalization of particle verbs let us first have a look at the various ways in which Dutch verbs are nominalized in general. The type of deverbal nominalization that I will focus on in this article is event nominalization, nominalization for short. These deverbal nominalizations denote the event mentioned by their base verb. The default formal expression of nominalization is suffixation of the verbal stem with the suffix *-ing*, or the use of the infinitive form of the verb, that is, stem + *-en*. Whereas one can always make the infinitive form of a verb, with a transparent meaning, the use of the suffix *-ing* is subject to restrictions, and deverbal nouns of this type often have semantic idiosyncracies. Complex verbs lend themselves much easier for nominalization with *-ing* than simplex verbs, although it is not completely excluded for simplex verbs (Van Haeringen 1971). This is illustrated in (1) in which simplex verbs contrast with their derivatives as to the use of suffixation with *-ing*. The question mark does not indicate that the word in question is ill-formed, but that it does not occur by itself (but it may occur in compounds, as shown below in (14)):

(1)	<i>verbal stem</i>	<i>nominalization</i>
	denk ‘think’	?denk-ing
	be-denk ‘consider’	bedenk-ing ‘objection’
	door-denk ‘think through’	doordenk-ing ‘thinking through’
	ver-denk ‘suspect’	verdenk-ing ‘suspicion’
	geef ‘give’	?gev-ing
	ver-geef ‘forgive’	ver-geving ‘forgiveness’
	spreek ‘speak’	?sprek-ing
	be-sprek ‘discuss’	besprek-ing ‘discussion’
	ver-sprek ‘make a slip’	versprek-ing ‘slip of the tongue’

In other cases, however, both simplex and derived verb have a nominalization with *-ing*:

(2)	<i>verbal stem</i>	<i>nominalization</i>
	dreig ‘threat’	dreig-ing ‘threat’

be-dreig ‘threat’	bedreig-ing ‘threatening’
spreid ‘spread’	spreid-ing ‘spreading’
ver-spreid ‘distribute’	verspreid-ing ‘distribution’

The relative preference of *-ing*-nominalization for complex verbs compared to simplex verbs - this preference also holds for *-ung*-nominalization in German, Demske (2000)-, may relate to differences in syntactic valency or meaning between these two classes of verbs: the suffix *-ing* seems to have a preference for verbs that express an action towards an object, and such verbs are often complex (Booij & Van Santen 1998: 66). However, I will not go deeper into this issue, as it does not affect the analysis presented below.

In many cases, the simplex verb has a corresponding deverbal noun coined by means of conversion, or a stem change, with or without an additional suffix. These patterns are unproductive. Here is a survey of these unproductive nominalization patterns. In some cases these verbs also have a nominalization in *-ing*. In these cases, there is normally a semantic difference between the two nominalizations. This is the usual pattern when an unproductive morphological pattern competes with a default productive one: the existing nominalization will block the use of the productive pattern, unless there is a semantic difference between the unproductive and the productive type.

(3)	<i>verbal stem</i>	<i>nominalization</i>	<i>nominalization in -ing</i>
a.	no formal change (conversion)		
	val ‘fall’	val ‘fall’	vall-ing ‘slope, cold’
b.	with vowel change		
	bied ‘offer’	bod ‘offer’	bied-ing ‘bidding’
	spring ‘jump’	sprong ‘jump’	
c.	with suffix <i>-st</i>		
	kom ‘come’	kom-st ‘arrival’	
	gun ‘concede’	gun-st ‘favour’	gunn-ing ‘tender’
	vang ‘catch’	vang-st ‘catch’	
d.	stem change and suffix <i>-t</i> or <i>-e</i>		
	geef ‘give’	gav-e ‘gift, talent’	
		gif-t ‘gift’	
e.	with suffix <i>-enis</i> :		
	erf ‘inherit’	erf-enis ‘inheritance’	
	laaf ‘feed’	laf-enis ‘comfort’	
f.	with suffix <i>-te</i>		
	sterf ‘die’	sterf-te ‘mortality’	

beloof 'promise'

belof-te 'promise'

The *-ing*-derivatives for the simplex verbs in (1) above are not acceptable in isolation. However, as we will see below, *-ing* derivatives of these simplex verbs may occur as parts of complex words. When we need a nominalized form of these simplex verbs to be used in isolation, we can always use the infinitive form (stem + *-en*) of these verbs, which functions as neuter noun:

- (4)    het kenn-en van de stof 'the knowing of the material'  
      het krijg-en van cadeaus 'the receiving of gifts'  
      het ploff-en van de ketel 'the exploding of the kettle'

This nominalization option is available to complex verbs and particle verbs as well.

It is also possible to use the prefix *ge-* for the creation of deverbal nouns that denote an event (5a). Nominalization is also possible with the suffix *-arij/-erij* (5b). These two types of nominalizations often carry the meaning of intensive or repeated action:

- |     |                    |                        |
|-----|--------------------|------------------------|
| (5) | <i>verbal stem</i> | <i>nominalization</i>  |
| a.  | roep 'call'        | ge-roep 'calling'      |
|     | schreeuw 'shout'   | ge-schreeuw 'shouting' |
|     | zeur 'nag'         | ge-zeur 'nagging'      |
| b.  | bedel 'beg'        | bedel-arij 'begging'   |
|     | droom 'dream'      | drom-erij 'dreaming'   |
|     | pest 'pester'      | pest-erij 'pestering'  |

Like prefixed verbs, suffixed verbs also admit suffixation with *-ing* quite unrestrictedly. For verbs ending in *-eer* there is a competing process, the replacement of *-eer* with *-atie*, as shown in (6).

- |     |                                  |                      |                     |
|-----|----------------------------------|----------------------|---------------------|
| (6) | <i>verbal stem</i>               | <i>noun in -atie</i> | <i>noun in -ing</i> |
|     | centralis-eer 'centralize'       | centralis-atie       | centraliser-ing     |
|     | egalis-eer 'equalize'            | egalis-atie          | egalisering         |
|     | falsific-eer 'falsify'           | falsific-atie        | falsificering       |
|     | industrialis-eer 'industrialize' | industrialis-atie    | industrialiser-ing  |
|     | reanim-eer 'reanimate'           | reanim-atie          | reanimering         |

As pointed out above, a verb may have both a deverbal noun formed with *-ing* and one formed with one of the unproductive processes. In that case the nominalizations usually differ in meaning, as illustrated in (8).

(8)	<i>verbal stem</i>	<i>noun in -ing</i>	<i>other type of noun</i>
	bied 'offer'	bied-ing 'bidding'	bod 'bid, offer'
	bind 'bind'	bind-ing 'bond'	band 'band'
	breek 'break'	brek-ing 'breaking'	breuk 'fracture'
	sluit 'close'	sluit-ing 'closure'	slot 'ending'

Although prefixed verbs prefer nominalization with *-ing*, there are a number of prefixed verbs that have a nominalization of an unproductive type, that is, one of the patterns listed in (3). These are verbs that have been coined at a time that these now unproductive processes were still productive:

(9)	<i>verbal stem</i>	<i>nominalization</i>
	be-drijf 'act'	bedrijf 'act'
	be-gin 'begin'	begin 'beginning'
	be-ken 'confess'	beken-tenis 'confession'
	be-lijd 'confess'	belijd-enis 'confession'
	be-loof 'promise'	belof-te 'promise'
	be-moei 'interfere'	bemoei-enis 'interference'
	be-roep 'call'	beroep 'calling'
	be-teken 'mean'	beteken-is 'meaning'
	ge-beur 'happen'	gebeur-tenis 'happening'
	ge-loof 'believe'	geloof 'belief'
	ge-schied 'happen'	geschied-enis 'history'
	ge-tuig 'witness'	getuig-enis 'witness'
	her-rijs 'resurrect'	herrijz-enis 'resurrection'
	ont-vang 'receive'	ontvang-st 'reception'
	ont-werp 'design'	ontwerp 'design'
	ver-bied 'forbid'	verbod 'prohibition'
	ver-bind 'connect'	verband 'connection'
	ver-koop 'sell'	verkoop 'sale'
	ver-rijs 'resurrect'	verrijz-enis 'resurrection'
	ver-toon 'exhibit'	vertoon 'exhibition'

This survey of data gives an impression of the event nominalization patterns in Dutch, and will serve as the necessary background for the next section, where I will focus on the nominalization of particle verbs.

### 3. The nominalization of particle verbs

As mentioned briefly in section 1, particle verbs are phrasal lexical items consisting of a particle and a verb. Their phrasal nature is clear from the fact that the two constituents of a particle verb are split in main clauses (10b), and can also be separated by an auxiliary (10c). On the other hand, they may also behave as a unit, as illustrated in (10d) where the auxiliary *wil* precedes the complex predicate *aan-vallen*.

- (10) a. omdat het leger de vijand aan-valt  
because the army the enemy at-falls  
‘because the army attacks the enemy’
- b. Het leger valt de vijand aan  
The army falls the enemy at  
‘The army attacks the enemy’
- c. omdat het leger de vijand aan wil vallen  
because the army the enemy at wants fall  
‘because the army wants to attack the enemy’
- d. omdat het leger de vijand wil aan-vallen  
because the army the enemy wants at-fall  
‘because the army wants to attack the enemy’

In (10c) the particle verb *aan-vallen* ‘to attack’ is split by the finite verb *wil* ‘wants’, that is, *aan-vallen* is dealt with as a phrasal combination, just as in (10b), where the verb appears in second position, and the particle at the end of the sentence. In (10d) on the other hand, *aan* and *vallen* form a unit that forms a clause-final complex verbal predicate with *wil*. In Booij (2010) and Los et al. (2012) this behaviour of particle verbs is accounted for by assuming two different non-morphological structures for such verbs, that of a verb phrase (V-projection) for (10b,c), and that of a syntactic compound for (10d):

- (11) a.  $[[\text{aan}]_{\text{prt}} [\text{val}]_{\text{v}}]_{\text{V}}$  (V-projection)  
b.  $[[\text{aan}]_{\text{prt}} [\text{val}]_{\text{v}}]_{\text{V}}^0$  (syntactic compound)

Structure (11a) accounts for the phrasal nature of particle verbs, and makes it possible that their parts can be split in main clauses (10b), or by an auxiliary, as in (10c). The syntactic compound structure in

(11b) means that particle and verb form a tighter unit than a verb phrase, that of a syntactic compound, and this structure predicts that a particle verb may function as one unit in complex verbal predicates (as in 10d). Note that structure (11b) is still a non-morphological structure, a syntactic structure in which a particle is Chomsky-adjoined to a verb, with which it forms a  $V^0$ . A particle verb such as *aan-vallen* (with main stress on the particle *aan*) cannot be interpreted as a compound in the morphological sense, witness the ungrammaticality of a sentence such as *\*Het leger aanvalt de vijand* ‘The army attacks the enemy’. In this sentence the particle verb as a whole occurs in verb-second position which leads to flagrant ungrammaticality. On the other hand, prefixed verbs such as *over-vallen* ‘lit. over-fall, to surprise’ (with main stress on the verb) do occur in this position, as in *Het leger overvalt de vijand* ‘The army surprises the enemy’.

In most cases, the particle-verb combination can be used in both structures (Booij 2010: Chapter 4-5, Los et al. 2012: Chapter 3). The proper analysis of particle verbs is a complicated issue (cf. Los et al 2012 and the references mentioned there). For the analysis of particle verb nominalization presented below, it suffices to accept the claim that particle verbs are not words in the morphological sense.

Particle verbs can be nominalized by means of the nominalization processes discussed above. For instance, the particle verb *aan-komen* ‘to arrive’ has the corresponding nominalization *aan-kom-st*, and the particle verb *op-hangen* ‘to hang up’ is nominalized as *op-hang-ing*. We might assume an analysis of these nouns in which the particle verb is a constituent of the derived noun, with structures such as  $[[[aan]_{part} [kom]_V]_V^0]_{-st}]_N$  and  $[[[op]_{part} [hang]_V]_V^0 .ing]_N$  respectively. The formal structures of these nouns will then be isomorphic to the structure of their semantic interpretation, with the nominalizing suffix having semantic scope over the meaning of the particle verb.

However, this analysis raises a problem. Unlike compounding, where the non-head can be a phrase, processes of morphological derivation in Dutch do not apply to phrases, but to words (Ackema & Neeleman 2004: 147ff.). For instance, the suffix *-er* cannot be attached to verb phrases such as *hard werken* ‘to work hard’ witness the ungrammaticality of *\*hard werker* ‘hard worker’. Instead, we have to coin the noun phrase *harde werker*. Similarly, the suffix *-ist* as in *bloem-ist* ‘florist’ can not be attached to a noun phrase like *bloem uit Aalsmeer* ‘flower from Aalsmeer’: *\*bloem uit Aalsmeer-ist* is ungrammatical (example from Ackema & Neeleman 2004: 149). This is not an absolute constraint, however, since there are words like *derde-klass-er* ‘third grad-er’ in which a noun phrase *derde klas* ‘third grade’ forms the basis of the derived word. The explanation for this violation of the no-phrase constraint for derivation may be that a noun phrase such as *derde klas* ‘third grade’ functions as a lexical item.<sup>1</sup>

The fact that particle verbs seem to feed derivation has led Ackema & Neeleman (2004) to conclude that phrasal verbs must be morphological constructs (Ackema & Neeleman 2004: 66). However, this goes against the observations concerning their syntactic behaviour mentioned above. Moreover, it does not explain why prefixation avoids phrases as bases. For instance, the nominalizing

prefix *ge-* mentioned in (5) cannot be prefixed to a particle verb such as *op-bellen* ‘to phone up’. If one wants to coin such a derived noun in order to express annoyance about being called repeatedly, the nominalized verb is not *\*ge-opbel*, but *op-gebel*, as in:

- (12) Ik word moe van dat op-gebel van Jan  
‘I get tired of this continuous phoning up by John’

Note that *opgebel* is a well-formed complex word of Dutch: it is a compound consisting of a particle *op* and a deverbal head noun *gebel*. However, semantically, *op* and *bel* form a unit, and together they express the meaning ‘to phone up’. A list of 42 of such nominalizations is given in Appendix 14 of Tálasi (2009), for instance *af-ge-zak* ‘slipping down’ and *toe-ge-roep* ‘call out’.<sup>2</sup> Prefixation thus provides more direct evidence for the necessity of a compound interpretation than suffixation, because the prefix comes after the particle, whereas in the case of suffixation the linear order of the constituents is the same, whatever the formal structural analysis one assigns to such complex words.

The use of phrasal bases for derivation can thus be avoided by the grammar of Dutch making use of the productive compound structure [Particle Noun]<sub>N</sub> for this type of nominalization. This type of compound structure is motivated independently, as shown by the occurrence of compounds such as:

- (13) *aan-dacht* ‘lit. at-thought, attention’  
*op-roer* ‘lit. up-stir, revolt’  
*tegen-actie* ‘counter-action’  
*tegen-beweging* ‘counter-movement’  
*voor-spoed* ‘lit. fore-speed, prosperity’

Compounding is different from derivation as to phrasal inputs, since it allows phrases to function as the modifier constituent of nominal compounds, as illustrated by the following examples (Booij 2002: 146-48):

- (14) *blote-vrouwen-blad* ‘nude women magazine’  
*ban-de-bom-demonstratie* ‘ban the bomb demonstration’  
*doe-het-zelf-winkel* ‘do it yourself shop’  
*ver-van-mijn-bed-show* ‘lit. far from my bed show’

The observation that there may be a conflict between the prohibition on phrase-based derivation on the one hand, and the need for derivatives of lexical items with a phrasal structure on the other hand, has also been made Modern Greek and Italian (Booij and Masini 2015). For instance, in modern Greek (Ralli 2013: 133ff., 247) complex adjectives can be ‘derived’ from corresponding A +



compounds. In compounds such as *hersenschudding* ‘brain concussion’ we find the same pattern: *schudding* ‘shaking’ is not used in isolation, but is acceptable as part of a compound. There is no verb *hersenschudden* ‘to brain-shake’ that could be the base of *hersenschudding*.

(ii) Particle verbs often select an unproductive type of nominalization, and in that case they select the same unproductive nominalization type as the corresponding base verb. For instance, the nominalization of *komen* ‘to come’ is *komst*, and the particle verb *aan-komen* ‘to arrive’ has the parallel nominalization *aan-komst* ‘arrival’. In order to account for this parallelism, we analyze *aan-komst* as the compound  $[[aan]_{\text{part}} [kom-st]_{\text{N}}]_{\text{N}}$ . Because *komst* is listed as a derived word, it can combine with a particle into a compound. This implies that we are confronted with an asymmetry between meaning and form, since the nominalizing suffix *-st* has semantic scope over the particle verb *aan-kom* (the stem of *aankomen* ‘to arrive’) as a whole.

These two observations and their implications for the analysis of the nominalizations of particle verbs are discussed in detail in the next subsections.

### 3.1. Nominalization of particle verbs with *-ing*.

Consider the data concerning nominalization of simplex verbs and related particle verbs in (17):

(17) <i>verbal stem</i>	<i>nominalization</i>
breng ‘bring’	?breng-ing
om-breng ‘kill’	om-breng-ing ‘killing’
dank ‘thank’	?dank-ing
af-dank ‘dismiss’	af-dank-ing ‘dismissal’
doen ‘do’	?doen-ing
af-doen ‘settle’	af-doen-ing ‘settlement’
aan-doen ‘do to’	aan-doen-ing ‘disorder’
merk ‘notice’	?merk-ing
aan-merk ‘comment’	aan-merk-ing ‘comment’
op-merk ‘remark’	op-merk-ing ‘remark’
vecht ‘fight’	?vecht-ing
aan-vecht ‘contest’	aan-vecht-ing ‘contest’
volg ‘follow’	?volg-ing

op-volg ‘succeed’

op-volg-ing ‘succesion’

The productive use of *-ing* for these particle verbs, and the contrast with the lack of applicability of this word formation process to simplex verbs is similar to what we observed for prefixed verbs versus their simplex base verbs in (1): nominalization of the simplex verb itself does not apply, but is fine for particle verbs.

Particle verbs form a subset of the class of separable complex verbs (Booij 2002, 2010). Instead of a particle (which corresponds with an adposition), we also find adverbs, nouns, and adjectives as first parts of such phrasal verbs. For instance, *opeen-hopen* ‘lit. together-pile, pile together’ is an adverb-verb combination, *los-barsten* ‘loose-burst, burst out’ is a combination of an adjective and a verb, and *boete-doen* ‘penance-do, do penance’, a combination of a noun and a verb. PPs can also function as first parts of phrasal predicates, as in *in gebruik nemen* ‘lit. in use take, put to use’. In this case we do not speak of separable complex verbs, as these word sequences cannot function as a unit in clause-final complex predicates. Such PP-V sequences are to be qualified as verb collocations. Therefore, the explanation that separable complex verbs function as a kind of complex verb, similar to prefixed verbs, and thus allow for *-ing*-nominalization, might be invoked for those cases where there is a corresponding separable complex verb, such as *los-barsten* ‘lit. loose-burst, burst out’ and *gezond-maken* ‘lit. healthy-make, make healthy’, but cannot explain the nominalizations for those verb collocations that do not have the status of particle verb. As Van Haeringen (1971 [1979: 80] put it:

“Sommige formaties van deze soort zijn des te interessanter, omdat ze niet of niet meer te herleiden zijn op een syntagma waarvan een verbum deel uitmaakt, zoals *bewaargeving*, *erflating*, *genoegdoening*.” [Some formations of this type are even more interesting, because they cannot be linked to a syntagma, of which a verb forms a part, such as *bewaargeving* ‘deposit’, *erflating* ‘bequest’, *genoegdoening* ‘atonement’.]

Moreover, some word + verb combinations do form syntagmas (collocations), but do not function as separable complex verbs. For instance, *betekenis geven* ‘to give meaning’ is an established collocation, but is not a separable complex verb, because it cannot behave as a unit in the Dutch progressive construction *aan het V-en* which is a litmus test for separable complex verbs (Booij 2010: Chapter 6):

- (18) Hij was {betekenis aan het geven / \*aan het betekenis geven} aan deze gebeurtenis  
He was {meaning at the give.INF / at the meaning give.INF} to this event  
‘He was assigning meaning to this event’

Both types, nominalizations with and without a corresponding separable complex verb (SCV), are listed below:

(19)	<i>deverbal noun</i>	<i>complex word</i>	<i>SCV</i>
	?barsting ‘bursting’	los-barsting ‘burst out’	los-barsten ‘burst out’
	?doening ‘doing’	boete-doening ‘penance’	boete-doen ‘do penance’
	?geving ‘giving’	bericht-geving ‘reporting’	--
		betekenis-geving ‘meaning assignment’	--
		wet-geving ‘legislation’	--
	?hoping ‘piling’	opeen-hoping ‘accumulation’	
	?lating ‘leaving’	erf-lating ‘bequest’	--
		los-lating ‘release’	los-laten ‘release’
		ader-lating ‘bloodletting’	ader-laten ‘blood-let’
	?legging ‘laying’	grond-legging ‘foundation’	--
		vast-legging ‘record’	vast-leggen ‘record’
		ter-inzage-legging ‘deposit for inspection’	--
		eerste-steen-legging ‘foundation stone laying’	--
	?making ‘making’	bewust-making ‘alerting’	bewust-maken ‘make aware’
		gezond-making ‘healing’	--
		kennis-making ‘acquaintance’	kennis-maken ‘make acquaintance’
	?neming ‘taking’	deel-neming ‘taking part in’	deel-nemen ‘take part’
		in-bezit-neming ‘taking possession of’	--
		in-beslag-neming ‘seizure’	--
	?prijzing ‘praising’	lof-prijzing ‘praise’	lof-prijzen ‘praise’
	?schelding	kwijt-schelding ‘discharge’	kwijt-schelden ‘discharge’
	?schrijving ‘writing’	geschied-schrijving ‘history writing’	--
	?schudding ‘shaking’	hersens-schudding ‘brain concussion’	--
	?stelling ‘making’	betaalbaar-stelling ‘making payable’	--
		borg-stelling ‘guarantee’	--
		buiten-gebruik-stelling ‘close down’	--
	?treding ‘treading’	in-dienst-treding ‘begin of employment’	--
		in-werking-treding ‘coming into force’	--
	?voering ‘conduct’	oorlog-voering ‘war conduct’	oorlog-voeren ‘conduct war’
		penseel-voering ‘brush technique’	--
	?zegging ‘saying’	dank-zegging ‘thanksgiving’	dank-zeggen ‘thank’
	?zetting ‘setting’	gevangen-zetting ‘imprisonment’	gevangen-zetten ‘imprison’

Some of the nouns in the leftmost column do occur as words by themselves, but only with an idiosyncratic meaning. This applies to *voering* ‘lining’, *stelling* ‘thesis’, and *zetting* ‘setting’. Some of these nouns, such as *doening*, *giving*, *hoping*, and *making* occur by themselves in older forms of Dutch, as the *Woordenboek der Nederlandsche Taal* reveals. Speakers of present-day Dutch, however, consider these older nominalized verbs as odd, unless they are embedded in complex words.

In sum, a number of the complex nouns in (19) of which the deverbal noun does not occur in isolation, do not have a corresponding separable complex verb, and the word sequences listed in (20) below cannot even be used as regular verb phrases with a bare noun as object<sup>3</sup>:

- (20) \*erf laten ‘to bequest-leave, to bequest’  
 \*geschied schrijven ‘to history-write, to write history’  
 \*hersens schudden ‘to brain-shake, to concuss brains’  
 \*penseel voeren ‘to brush-conduct, to conduct brush’  
 \*wet geven ‘to law-give, to legislate’

For instance, a sentence like *\*Rembrandt voerde uitstekend penseel* ‘lit. Rembrandt conducted excellent brush, Rembrandt painted excellently’ with the bare noun *penseel* as a grammatical object, is ungrammatical. Yet, we have the compound *penseel-voering* ‘brush technique’.

Therefore, the possibility of coining a deverbal noun in *-ing* cannot be claimed to be dependent on the existence of a corresponding separable complex verb. Instead, the following generalization appears to hold: nominalization of simplex verbs with *-ing* is productive if the nominalized verb is part of a compound word. This generalization is a case of ‘embedded productivity’, a concept used in Booij (2010) for denoting the phenomenon that the productive use of a word formation process may be conditioned or boosted by its output words being part of a complex word. In order to see how embedded productivity can be accounted for, I will introduce some theoretical concepts of Construction Morphology in the next subsection. A more detailed exposition of these concepts can be found in Booij (2010).

### 3.2. Schemas, schema unification, and second order schemas

In Construction Morphology word formation patterns are seen as abstract constructional schemas that generalize over sets of existing complex words with a systematic correlation between form and meaning. This is illustrated here for the Dutch deverbal nouns ending in *-ing*. These nouns denote the event that is expressed by the corresponding base verb.

$$(21) \quad \langle [[x]_{vi} \text{ ing}]_{Nj} \leftrightarrow [\text{Event of SEM}_i]_j \rangle$$

The abbreviation SEM (of SEMANTICS) stands for the meaning of a constituent. This constructional schema specifies by means of co-indexation how the formal parts on the left of the double arrow contribute to the meaning of these words as specified on the right of the arrow. The verbal base and its meaning (SEM<sub>i</sub>) carry the same index *i*. The meaning of the structure as a whole is indexed as *j*. Note that the suffix *-ing* carries no meaning in isolation, it is only through combination with a verbal base that it evokes the meaning of ‘event denoted by the verb’. The angled brackets demarcate a constructional schema. The presence of the variable *x* on the left indicates that this is an empty slot that can be filled in by all sorts of verbs.

Each schema is instantiated by a number of words that have been formed according to this schema, and are listed. The schema dominates these words. The individual instantiations of a schema may also have unpredictable, idiosyncratic properties. This is the case for many deverbal nouns in *-ing*. For instance, the deverbal noun *vergader-ing* ‘meeting’ not only denotes an event, but also the group of people involved in this event. Therefore, a schema defines the default properties of a set of complex words, and for individual instantiations of that schema additional or deviating properties will be specified if necessary. This lexical specification may overrule the properties predicted by the schema. This is the idea of default inheritance: a complex word inherits the properties from the corresponding schema except in so far these properties are overridden by the lexical representation of that word (for details concerning default inheritance, see Booij 2015).

Schemas have two roles. If they are productive, they specify how new words of a certain type can be made. Schema (21) is a productive schema, although there are certain restrictions, as observed above. The second role of a schema (productive or unproductive) is that of motivation: it provides motivation for the form-meaning relationships that hold for existing complex words. Thus, schemas reduce the degree of arbitrariness in the relationship between form and meaning of language constructs, and specify to what extent the information on individual lexical items counts as redundant (Jackendoff 1975, Booij 2015). This also applies to unproductive word formation patterns. For instance, even though the nominalizing suffix *-st* is unproductive in present-day Dutch, we want to express that a word like *komst* does not have an arbitrary form and meaning but can be predicted to be a noun, and its meaning can be related to the meaning of its base verb.

The analysis of nominal compounds is also central to the analysis of particle verb nominalizations proposed in this paper. Compounding in Dutch is right-headed. Hence, the general schema for Dutch nominal compounds is the following:

$$(22) \quad \langle [X_k N_i]_{Nj} \leftrightarrow [\text{SEM}_i \text{ with relation R to SEM}_k]_j \rangle$$

This general schema indicates that the meaning of the first constituent has some semantic relation R to the meaning of the head noun. The precise nature of this semantic relationship R is specified in the individual entries for these compounds. There are various subschemas that are dominated by (22), because X can have various values, as illustrated in (23):

(23)	A+N	fris-drank ‘lit. fresh-drink, non-alcoholic beverage’
	N+N	bureau-stoel ‘desk chair’
	V+N	leun-stoel ‘lit. lean chair, arm chair’
	Adv+N	terug-tocht ‘lit. back tour, retreat’
	Part+N	in-tocht ‘lit. ‘in-tour, entry’
	PP+N	onder de toonbank-verkoop ‘under the counter-sale’

Schemas may therefore dominate subschemas. Schema (22) will dominate the subschema for N+N-compounds, where X = N. This subschema has specific properties, for instance that the constituents themselves can also be compounds, the property of recursivity. This does not hold in the same way for A+N compounds, which require a simplex adjective as first constituent. The dominating schema (22) expresses the generalization that all nominal compounds are right-headed.

In schema (22), the head noun can be a derived, deverbal noun of the type specified in schema (21). In words like *uit-barst-ing* ‘explosion’, the nominalization of the particle verb *uit-barsten* ‘to explode’ we observe the simultaneous use of two word formation schemas, that for *-ing* nouns and that for Particle +N compounds. There is no existing derived noun *barst-ing* to which the particle *uit* could have been added subsequently. This co-occurrence of two word formation processes can be accounted for by unification of the two word formation schemas involved. Unification is a basic operation of structure building. For instance, given the phrase structure schemas  $[\text{Art N}]_{\text{NP}}$  and  $[\text{P NP}]_{\text{PP}}$ , we can derive the schema  $[\text{P} [\text{Art N}]_{\text{NP}}]_{\text{PP}}$  through unification of these schemas. The word formation schemas (21) and (22) can be unified, thus leading to a complex schema:

$$(24) \quad \langle [[X] [V\text{-}ing]_{\text{N}}]_{\text{N}_j} \leftrightarrow [\text{Event of SEM}_i]_j \rangle \text{ where } \langle [X + V]_i \leftrightarrow \text{SEM}_i \rangle \quad \text{Property: productive}$$

This unified schema appears to have a life of its own in that it is specified positively for productivity, whether the verb is simplex or complex, whereas being a simplex verb restricts its productivity in the non-embedded schema  $\langle [V_i\text{-}ing]_{\text{N}_k} \leftrightarrow [\text{Event of SEM}_i]_k \rangle$ . The meaning description of these compounds is more specific than that of nominal compounds in general as specified by schema (22), because it refers to the meaning of the XV combination. This meaning description specifies the nature of the semantic relation R between the X modifier and the head noun of a compound in more detail. Here are some examples of these types of compound with a deverbal noun in *-ing*:

(25)	[A [V-ing] <sub>N</sub> ] <sub>N</sub>	gezond-mak-ing ‘lit. healthy-mak-ing, healing’
	[N [V-ing] <sub>N</sub> ] <sub>N</sub>	wet-gev-ing ‘lit. law-giv-ing, legislation’
	[Adv [V-ing] <sub>N</sub> ] <sub>N</sub>	opeen-hop-ing ‘lit. up-pil-ing, accumulation’
	[Part [V-ing] <sub>N</sub> ] <sub>N</sub>	op-merk-ing ‘lit. on-mark-ing, remark’
	[PP [V-ing] <sub>N</sub> ] <sub>N</sub>	in-bezit-nem-ing ‘lit. in-possession-tak-ing, taking possession of’

If there exists a corresponding separable complex verb (SCV), the interpretation of XV will normally be that of the corresponding SCV, and the meaning of the compound as a whole will be that of ‘event denoted by the SCV’. For instance, since there is an SCV *op-merken* ‘to remark’, an instantiation of X + V, the meaning of this SCV will be a semantic component of the complex word *op-merk-ing* ‘remark’. This will be discussed in more detail below, cf. (28). If there is no corresponding SCV, the meaning of the XV combination will have to be computed without reference to an existing SCV. The X constituent functions semantically as a modifier of the meaning of the V, and the precise nature of the modification depends on the word class of X. If the modifier is a noun, it will function as an argument of the verbal predicate, if it is an adjective, it will denote the result of the event, etc.

The claim that the words in (25) have the formal structure of nominal compounds predicts correctly that the stress patterns of these words are exactly as those of (other) Dutch nominal compounds. In Dutch nominal compounds, the main stress is located on the non-head constituent, and the same stress pattern is found for the words in (25), for instance *opéénhoping*, *ópmerking* and *inbezítneming*.

This structural analysis of *-ing*-nominalization implies an asymmetry between form and meaning, because X and V do not form one formal constituent. Word formation schemas as envisaged in Construction Morphology can deal with such asymmetries between form and meaning, as illustrated by schema (24).

This type of asymmetry can be observed for other types of nominal compound as well. Consider the following two compounds of Dutch:

(26)	metaal-bewerk-ing ‘metal-process-ing’
	metaal-bewerk-er ‘metal-process-or’

In both compounds the left constituent *metaal* ‘metal’ functions as the Patient argument of the verb *bewerk* ‘to process’. Hence, the suffixes have semantic scope over the meaning of the combination of the left constituent and the verb.

The phenomenon that a derived word is only acceptable when embedded in a compound is also found with derived agent nouns such as *hebb-er* ‘haver’ derived from the verb *hebben* ‘to have’. In its transparent interpretation *-hebber* can be used in isolation with the idiosyncratic meaning ‘greedy person’, but more often with the form *hebberd-* we find *hebber* only in compounds such as:

- (27) bevel-hebber ‘lit. command-haver, commander’  
 gezag-hebber ‘lit. authority-haver, authority’  
 lief-hebber ‘lit. dear-haver, lover’  
 macht-hebber ‘lit. power-haver, ruler’

In section 4, I will discuss these parallels between event nominalizations and agent nominalizations in more detail.

The observed correspondence in meaning between existing particle verbs and compounds headed by a deverbal *-ing*-noun can be accounted for by a second order schema, which specifies the paradigmatic relationship between two (or more) construction schemas (Booij & Masini 2015). The term ‘second order schema’ was coined by Nessel (2008), and also motivated by Kapatsinki (2013). The paradigmatic relationship is indicated here by the symbol  $\approx$ :

$$(28) \quad \langle [[\text{Part}_i] [\text{V}_k\text{-ing}]_{\text{N}}]_{\text{N}_j} \leftrightarrow [\text{Event of SEM}_i]_j \rangle \approx \langle [\text{Part}_i \text{V}_k]_{\text{V}}^0 \leftrightarrow [\text{MOD}_i \text{SEM}_k]_i \rangle$$

The first schema in (28) is a subcase of the schema in (24), in which the variable X is instantiated by the more specific variable Particle. The second schema in (28) is the general schema for particle verbs that generalizes over a number of subschemas for the various particles and their specific meaning contribution to particle verbs. Particles function as modifiers (MOD) of the meaning of the verb. The particle *door*, for instance, may contribute the meaning of continuous aspect to the meaning of the verb, as in *door-gaan* ‘lit. through-go, to continue’, and the particle *op* expresses, among others, the meaning of cognitive activation, as in *op-bellen* ‘lit. up-phone, to phone up’. Hence, we need subschemas for the specification of the meaning contribution of each individual particle to the particle verb in question. Second order schema (28) states that the specific meaning of an individual particle verb can be a semantic component of the meaning of compounds of the form  $[[\text{Particle}] [\text{V-}i\text{ng}]_{\text{N}}]_{\text{N}}$ . Note, however, that this semantic relationship is not an obligatory component of interpretation, because words of this form may also be interpreted in accordance with the general interpretation for nominal compounds. For instance, the interpretation of the compound *aan-slag* ‘attack’ cannot be related to the meaning of the particle verb *aan-slaan* which does exist, but with a different meaning, ‘to catch on’. In other words, it is not the case that the meaning of a Particle-Noun compound can always be motivated by the meaning of a corresponding particle verb. This point is illustrated in more detail in (35) below.

The second order schema (28) is not only necessary in order to express the semantic correspondence between particle verbs and the corresponding nominalization, in which the idiosyncratic meaning of the particle verb is found as well. We also need it because the occurrence of some nominalizations as heads of compounds may be dependent on the existence of a corresponding

particle verb. As pointed out in Booij (2010: 133), a number of particle verbs exhibit a conversion effect. Examples are the following particle verbs which do not have a corresponding base verb, only a corresponding base noun or base adjective:

(29)	<i>noun</i>	<i>particle verb stem</i>	<i>nominalization</i>
	huwelijk ‘marriage’	uit-huwelijk ‘marry off’	uit-huwelijk-ing
	tak ‘branch’	af-tak ‘branch off’	af-takk-ing
	perk ‘bound’	in-perk ‘restrict’	in-perk-ing
	polder ‘polder’	in-polder ‘impolder’	in-polder-ing
	<i>adjective</i>		
	diep ‘deep’	uit-diep ‘deepen’	uit-diep-ing
	dik ‘thick’	in-dik ‘thicken’	in-dikk-ing
	fris ‘fresh’	op-fris ‘refresh’	op-friss-ing
	zwak ‘weak’	af-zwak ‘weaken’	af-zwakk-ing

In these cases, the particles appear to trigger conversion of the noun into a verb, since there are no corresponding converted verbs such as \**huwelijken* or \**diepen*. That is, a word is inserted into the N-slot or the A-slot of the structure of these particle verbs, [Part [N]<sub>V</sub>]<sub>V</sub><sup>0</sup> or [Part [A]<sub>V</sub>]<sub>V</sub><sup>0</sup>. These schemas are unifications of the Particle Verb schema and the schemas for conversion of N’s and A’s into V’s. They thus form another case of embedded productivity, since the conversion of nouns and adjectives to verbs is boosted within the context of particle verbs.

Since *-ing* is a deverbal suffix, the verbal status of words like *huwelijk* and *diep* have to be ascertained for *-ing* to be able to show up in the head position of nominal compounds. This is guaranteed through the paradigmatic correspondence with the relevant particle verb, as specified in (28). So we have instantiations of second order schema (28) like the following, in which the particle verb conversion schemas [Part [N]<sub>V</sub>] and [Part [A]<sub>V</sub>] are unified with schema (28):

- (30) a.  $\langle [[\text{Part}] [[\text{N}]_{\text{V-ing}}]_{\text{N}}]_{\text{N}_j} \leftrightarrow [\text{Event of SEM}_i]_j \rangle \approx \langle [\text{Part} [\text{N}]_{\text{V}}]_{\text{V}}^0 \leftrightarrow \text{SEM}_i \rangle$   
 b.  $\langle [[\text{Part}] [[\text{A}]_{\text{V-ing}}]_{\text{N}}]_{\text{N}_j} \leftrightarrow [\text{Event of SEM}_i]_j \rangle \approx \langle [\text{Part} [\text{A}]_{\text{V}}]_{\text{V}}^0 \leftrightarrow \text{SEM}_i \rangle$

When the slots for Particle and N or A are filled in by the particle *uit* and the noun *huwelijk* or the adjective *diep*, we get compounds like *uit-huwelijking* ‘marrying off’ and *uit-dieping* ‘deepening’:

- (31)  $[[[\text{uit}]_{\text{Part}} [[[\text{huwelijk}]_{\text{N}}]_{\text{V}} -\text{ing}]_{\text{N}}]_{\text{N}}$   
 $[[[\text{uit}]_{\text{Part}} [[[\text{diep}]_{\text{A}}]_{\text{V}} -\text{ing}]_{\text{N}}]_{\text{N}}$



op-geef ‘state’	op-gav-e ‘statement’
uit-geef ‘spend’	uit-gav-e ‘expense’
kom ‘come’	kom-st ‘arrival’
aan-kom ‘arrive’	aan-kom-st ‘arrival’
op-kom ‘rise’	op-kom-st ‘rise’
slaan ‘hit’	slag ‘hit’
aan-slaan ‘touch’	aan-slag ‘touch’
af-slaan ‘turn off’	af-slag ‘turn’
op-slaan ‘store’	op-slag ‘storage’
door-slaan ‘come through’	door-slag ‘deciding factor’
in-slaan ‘strike’	in-slag ‘strike’
staan ‘stand’	stand ‘position’
op-staan ‘stand up’	op-stand ‘revolt’ / op-stand-ing ‘resurrection’
af-staan ‘give up’	af-stand ‘giving up’
zien ‘see’	zich-t ‘sight’
aan-zien ‘view’	aan-zich-t ‘view’
in-zien ‘realize’	in-zich-t ‘insight’
toe-zien ‘supervise’	toe-zich-t ‘supervision’
op-zien ‘supervise’	op-zich-t ‘supervision’

Nominalization of simplex verbs is lexically governed to a high degree. The crucial observation is that if the nominalized form of a particle verb is not created by means of the productive suffixation with *-ing*, the particular unproductive pattern that is selected is exactly the same as that for the deverbal noun of the corresponding simplex verb. For instance, the verb *vallen* ‘to fall’ has conversion as type of nominalization, and the particle verb *aan-vallen* ‘to attack’ has the same type. Hence, the nominalized form is *aan-val* ‘attack’. Similarly, as *komen* ‘to come’ has *kom-st* ‘coming’, so *aankomen* has *aankom-st*, and not a form like *\*aan-kom* or *aankom-t*. This is predicted by the proposed analysis, because there is no word *kom* or *komt* available as a noun for forming a nominal compound, only *komst*.

Particle verbs may sometimes also have a nominalization with *-ing*, as in *aan-bied-ing* ‘special bargain’ besides *aan-bod* ‘offer’. The existence of such pairs is predicted by the present analysis. *Aanbod* is a compound formed from *aan* and the lexicalized noun *bod*, and *aanbieding* is formed according to schema (24), a subschema for compounds with a deverbal noun in *-ing* as head. In such

cases, there is often a meaning difference between the different nominalization forms, as we saw above, and is illustrated by the glosses of *aanbod* and *aanbieding*. The application of a morphological schema can be impeded by a competing schema if there is complete synonymy of the two output words. However, blocking is not an absolute principle. For instance, we find both *in-beslag-name* and *in-beslag-nem-ing* with the same meaning ‘confiscation’, just as we find both *realiser-ing* and *realis-atie* as synonymous nominalizations of *realiseren* ‘to realize’.

For some particle verbs, the unproductive nominalization is not used. For instance, *vinden* ‘to find’ has the lexicalized nominalization *vond-st*, whereas *uit-vinden* ‘to invent’ has the nominalization *uit-vind-ing* ‘invention’, formed according to schema (24). The verb *vangen* ‘to catch’ has two unproductive nominalizations, *vang* and *vang-st*. The corresponding particle verb *opvangen* ‘to intercept, to take care of’ has two nominalizations, *opvang* ‘shelter’ and *opvang-ing* ‘interception’, both predicted to be possible by schema (22) and subschema (24) respectively. This shows that particle verbs may have different nominalizations for different submeanings, and illustrates the prominent role of conventionalization and lexicalization in the domain of nominalization.

This observation concerning the selection of a particular unproductive type of nominalization for the particle verb is accounted for straightforwardly by the claim that nominalizations of particle verbs are compounds that consist of a particle plus the nominalized form of the simplex verb. Hence, the form part of the general schema for these particle compounds is:

(33) [Particle [y [x]<sub>V</sub> z]<sub>N</sub>]<sub>N</sub>

where [y [x]<sub>V</sub> z]<sub>N</sub> stands for the nominalized form of the simplex verb. The variable *y* may stand for a prefix or zero, and the variable *z* for a suffix or zero. All instantiations of unproductive types of nominalization will of course be listed. Hence, nouns like *komst* and *zicht* will be available for combining with a particle into a compound. Thus, it is predicted that the nominalized form of a particle verb corresponds to that of the nominalized form of the corresponding simplex verb. The *-ing* form is possible as well, but will be blocked by the existence of the unproductive type, unless there is a meaning difference. In most cases, nominalization is expressed by a suffix, but the prefix *ge-* can also be used. In that case, the variable *y* = *ge-*. That is, we need the structure [Particle [ge-V]<sub>N</sub>]<sub>N</sub> for nominalizations of particle verbs by means of the prefix *ge-*, such as *op-ge-bel* ‘repeated phoning’ derived from *op-bellen* ‘to phone’, where the nominalizing prefix splits the particle and the verbal stem. This again illustrates the form-meaning asymmetry inherent in the nominalization of particle verbs, since the prefix *ge-* has semantic scope over the particle verb combination as a whole.

The structure for compounds of the form (33) has to be available anyway in the grammar of Dutch, as there are a number of compounds of this form without a corresponding particle verb. This applies to, for instance, the following nouns:

(34)	<i>compound word</i>	<i>lacking particle verb</i>
	af-dronk ‘after-taste’	?af-drinken
	bij-slag ‘bonus’	?bij-slaan
	toe-gang ‘access’	?toe-gaan

In other cases, the corresponding particle verb does exist, but with an unrelated meaning. In such cases the meaning of these complex words can only be motivated by the meaning of its two constituents. The meaning of such words may be pretty opaque, as is the case for many existing complex words:

(35)	<i>compound word</i>	<i>semantically unrelated particle verb</i>
	af-komst ‘descent’	af-komen ‘to come off’
	in-slag ‘nature’	in-slaan ‘to strike’
	aan-slag ‘attack’	aan-slaan ‘to catch on’
	uit-komst ‘result’	uit-komen ‘to come out’
	toeslag ‘allowance’	toeslaan ‘to strike’

In order to account for the particle verb nominalizations of the unproductive types, the second order schema (28) has to be generalized as applying to all types of deverbal event nouns, not only to those with *-ing*. Hence, we generalize (28) into the following second order schema:

$$(36) \quad \langle [[\text{Part}_i] [y V_k z]_{N_j}]_{N_j} \leftrightarrow [\text{Event of SEM}_i]_j \rangle \approx \langle [\text{Part}_i V_k]_{V_i}^0 \leftrightarrow [\text{MOD}_i \text{SEM}_k]_i \rangle$$

An exemplary case of nominalization of particle verbs is formed by complex predicates with the verb *nemen* ‘to take’ and their corresponding nominalizations. The deverbal noun *name* ‘taking’ related to the verb *nemen* ‘to take’ is never used as such, only in combination with a particle verb. So *name* is a kind of bound noun, but at the same time it can be used for the nominalization of particle verbs and other verbal collocations such as *stelling nemen* ‘position-take, to take position’ and *in gebruik nemen* ‘in use take, to put to use’:

(37)	[aan] <sub>Part</sub> -nemen ‘to assume’	aan-name ‘assumption’
	[in] <sub>Part</sub> -nemen ‘to take’	in-name ‘take’
	[op] <sub>Part</sub> -nemen ‘to record’	op-name ‘record’
	[over] <sub>Part</sub> -nemen ‘to take over’	over-name ‘take over’
	[deel] <sub>N</sub> -nemen ‘to take part’	deel-name ‘participation’
	[stelling] <sub>N</sub> -nemen ‘to take position’	stelling-name ‘position’
	[in-beslag] <sub>PP</sub> -nemen ‘to seize’	in-beslag-name ‘seizure’
	[in-gebruik] <sub>PP</sub> -nemen ‘to put to use’	in-gebruik-name ‘start of operation’

The phrasal verbs in (37) clearly contribute to the semantic motivation of the corresponding nouns, as the idiomatic meanings of these verbs recur in the corresponding nominalizations. This can be expressed by the following second order subschema for these *name*-compounds:

$$(38) \quad \langle [X_1 [name]_N]_{N_j} \leftrightarrow [Event\ of\ SEM_i]_j \rangle \approx \langle [X_1 [neem]_{vk}]_{V_i^0} \leftrightarrow [MOD_1\ SEM_k]_i \rangle$$

In this second order schema two slots are lexically filled, with *neem* and *name* respectively. Such schemas with a combination of variable slots and lexically filled slots are referred to as ‘constructional idioms’. The first schema in (38) accounts for the bound nature of the deverbal noun *name*, as it is only specified in this schema and its instantiations, and is not listed in the lexicon as a lexical item by itself.

In conclusion, the proposed analysis predicts that a particle verb has the same unproductive type of nominalization as its base verb.

#### 4. Agent nominalizations

The phenomenon that a deverbal noun can sometimes only be used as part of a complex word is not restricted to event nominalizations, and can also be observed for deverbal agent nouns in Dutch, coined with the productive suffix *-er*. Such nouns in *-er* may also express other meanings such as ‘instrument’ or ‘event’ (Booij 1986), but for the issue at stake here it suffices to have a look at agent nouns.

(39)	<i>verbal stem</i> <sup>4</sup>	<i>noun</i>	<i>compound noun</i>
	doen ‘do’	doen-er	boos-doen-er ‘evil-doer’ wel-doen-er ‘well-doer’
	gaan ‘go’	gang-er	kerk-gang-er ‘church-goer’ Syrië-gang-er ‘Syria-goer’
	heb ‘have’	hebb-er	bevel-hebb-er ‘command-haver, commander’ lief-hebb-er ‘love-haver, lover’ macht-hebb-er ‘power-haver, ruler’
	kom ‘come’	kom-er	laat-kom-er ‘late-comer’ nieuw-kom-er ‘new-comer’
	slaan ‘hit’	slag-er	koper-slag-er ‘copper smith’ touw-slag-er ‘rope-maker’
	zien ‘see’	zien-er	op-zien-er ‘over-seeer’ toe-zien-er ‘over-seeer’

The words *doener*, *hebber*, *slager* and *ziener* do occur by themselves, but only with an idiosyncratic meaning, not with the regular meaning that they have in the compounds in the right column of (39):

- (40) doen-er ‘very active person’  
 hebb-er ‘greedy person’  
 slag-er ‘butcher’  
 zien-er ‘prophet’

Thus, the data in (39) show once more that a word formation process may be boosted by its output words being embedded in complex words. They also show that the suffix *-er*, like *-ing*, has semantic scope over the combination of the modifier constituent and the verbal base. This leads to the assumption of another unified schema, a unification of compounding and the schema for deverbal *-er* nouns:

- (41)  $\langle [[X]_I [V_i\text{-er}]_{Nj}] \leftrightarrow [\text{Agent of SEM}_k]_j \rangle$  where  $[X_i V_i]_k \leftrightarrow [\text{MOD}_I \text{SEM}_i]_k$

In this schema, the correspondence between form and meaning of this morphological construction is specified, including the property that the suffix has semantic scope over the combination of modifier and verb. The meaning  $\text{SEM}_k$  is specified as that of the verb modified by the meaning of the X constituent.

Some of the agent nouns in (39) have irregular forms. For instance, the agent noun for *gaan* ‘to go’ is *gang-er*, a word that only occurs in compounds, just like *name* in (37). Moreover, the form is irregular since the expected agent noun for the verb *gaan* is *gan-er* (compare *doen-er* ‘doer’). Hence, we need a subschema (a constructional idiom) of (41) in order to specify the existence and the properties of this positionally bound noun:

- (42)  $\langle [[X] [gang\text{-er}]_{Nj}] \leftrightarrow [\text{Agent of [GO To X]}]_j \rangle$

Above, we came across a number of compounds headed by an *-ing*-noun for which no corresponding separable complex verb or verbal collocation exists. The word constituents involved do occur in a corresponding agent noun:

- |      |                             |                           |                          |
|------|-----------------------------|---------------------------|--------------------------|
| (43) | <i>non-existing verb</i>    | <i>compound -ing-noun</i> | <i>compound -er-noun</i> |
|      | wet-geven ‘law-give’        | wet-gev-ing ‘legislation’ | wet-gev-er ‘legislator’  |
|      | erf-laten ‘inheritance-let’ | erf-lat-ing ‘bequest’     | erf-lat-er ‘testator’    |
|      | dag-sluiten ‘day-close’     | dag-sluit-ing ‘epilog’    | dag-sluit-er ‘epilogist’ |

geschied-schrijven	geschied-schrijv-ing	geschied-schrijv-er
‘history-write’	‘historiography’	‘historiographer’

This correspondence between the two types of compound as to the specific semantic interpretation of the noun and the verb can be expressed by a second order schema that specifies the paradigmatic relationship between the two word formation schemas involved:

- (44)  $\langle [N_i [V_j -ing]_N ]_{Nk} \leftrightarrow [Event\ of\ [MOD_i\ SEM_j]]_k \rangle \approx$   
 $\langle [N_i [V_j -er]_N ]_{Nm} \leftrightarrow [Agent\ of\ [MOD_i\ SEM_j]]_m \rangle$

The same observation applies to compounds headed by a deverbal noun of which the base verb is complex, as in:

- |      |  |   |
|------|--|---|
| (45) | <i>compound -ing-noun</i>                    | <i>compound -er-noun</i>                  |
|      | boek-be-sprek-ing ‘book-review’              | boek-besprek-er ‘book reviewer’           |
|      | tijd-waar-nem-ing ‘time-keeping’             | tijd-waarnem-er ‘time-keeper’             |
|      | verkeers-deel-neming ‘traffic participation’ | verkeers-deelnem-er ‘traffic participant’ |

For these compound nouns, there are no corresponding verbs like *boek-bespreken*, *tijd-waarnemen* or *verkeers-deelnemen*. Again, the second order schema (44) predicts that compounds headed by a deverbal *-ing-noun* may correspond to nouns in *-er* and vice versa, without the corresponding complex predicate being necessarily in existence.

In conclusion, the facts discussed above concerning deverbal agent formation lend further support to the analysis proposed for the nominalization of particle verbs and other separable complex verbs in section 3.

## 5. Summary and conclusions

The complicated range of facts concerning the nominalization of Dutch particle verbs and other types of separable complex verbs provides evidence for the claim that these nominalizations are not derivations from particle verbs, but compounds nouns, with a deverbal head preceded by a word that functions semantically as the modifier of the meaning of the verbal base of the head noun. By analyzing these nominalizations as nominal compounds, the exceptionality of phrase-based affixation in Dutch is maintained. The consequence of this analysis is that we have to accept an asymmetry between form and meaning of these nominalizations. It appeared that this kind of asymmetry is also found for agent nominalizations. This structural analysis is supported by the two main empirical generalizations of this paper:

- (i) simplex verbs that do not have a corresponding *-ing*-noun listed in the lexicon, do allow for nominalization with *-ing* when embedded in compounds;
- (ii) particle verbs usually have corresponding nominalizations with the same unproductive type of nominalization as the corresponding simplex verb.

For this analysis, I made use of a number of related concepts as developed in the framework of Construction Morphology:

- (i) the representation of word formation patterns by means of constructional schemas, in which form-meaning asymmetries can be specified;
- (ii) schema unification (with unified schemas possibly having their own degree of productivity);
- (iii) constructional idioms, i.e. constructional schemas with lexically filled slots;
- (iv) second order schemas.

Thus, Construction Morphology has been shown to have the descriptive and theoretical power to account for the nominalization of Dutch particle verbs.

## Notes

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1. The derivational suffix *-achtig* ‘-like’ does combine with phrases, as in *grote-mensen-achtig* ‘adult-like’. It is well known that *-achtig* derivatives behave like compounds in various ways (Booij 2002: 169-171), and this may explain its exceptional behaviour, as compounds also allow for phrasal constituents.

In some words with denominal *-er* this prohibition on phrase-based derivation is also ignored, as in the following example, but this is a case of intentional, playful language, a register in which the violation has a specific intended effect:

- (i) tussen-wal-en-schipp-er-s (newspaper *Trouw*, 3 October 2012)  
 between-quay-and-ship-er-s  
 ‘people between two stools’

The phrase *tussen wal en schip* means ‘between two stools’.

Note that derived adjectives with the suffix *-s*, such as *boven-grond-s* ‘lit. above-ground-s, on the surface’, and *tussenbeen-s* ‘lit. between leg-s, between one’s legs’ are not derived from phrases, as *boven grond* and *tussen been* are ungrammatical PP’s. Here, the suffix *-s* clearly takes a sequence of two words as its basis.

2. De Haas & Trommelen (1993: 85) mention a few words in which *ge-* precedes the particle verb, nouns such as *ge-uit-lach* ‘laughing at’ and *ge-voor-lees* ‘reading out’. However, this is a very marginal phenomenon. Moreover, in addition to *ge-uit-lach* one also finds *uit-ge-lach*.

3. The word *geschied* ‘history’ is an older and shorter form for Modern Dutch *geschiedenis* ‘history’, and only occurs in compounds.

4. The verbs *doen*, *gaan* and *zien* are exceptional in they have an infinitive form ending in *-n* instead of *-en*, and moreover, this form is used as stem in derivation. The verb *slaan* (also with an infinitive in *-n*) uses the stem allomorph *slag*.

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