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# A syntagmatic analysis of ‘paradigmatic’ morphology

*Jan Don, Jing Lin*

## 1. Introduction

In the literature on inflectional morphology in the last twenty years two different perspectives have emerged. In one, dubbed the ‘globalist’ view by Embick (2010), morphology is paradigmatic in nature. This implies that at some point in the derivation of a particular form, inspection of one or more other forms (within the same paradigm) is needed to decide on the outcome of the derivation. In the other view on morphology, the ‘localist’ view in Embick’s terminology, such inspection is explicitly impossible and the derivation simply follows the rules.

Since Aronoff (1976) several morphologists have proposed that derivational morphology is sensitive to ‘paradigmatic’ forces. The idea is that the illformedness of \**gloriosity* is not caused by the impossibility of the grammar to produce such a form, the form nevertheless does not surface since it is **blocked** by another rival form with the same meaning, i.e. *glory*. In this paper we will argue that there is no need for such an organization in derivational morphology. The relevant data can also be understood in a more parsimonious way, using only syntagmatic means.

Zonneveld (1986) argues contra Van Marle (1985) that the derivation of female nouns in Dutch does not provide an argument for a theoretical notion ‘paradigm’ in derivational morphology. The discussion concerns the distribution of affixes such as *-e*, *-in*, *-es* and *-ster*. ‘Paradigmatic’ in the sense of Van Marle implies that there are ‘special’ cases and a single ‘general case’. The way we understand it is that Van Marle assumes the existence of a morphological category ‘female personal noun’. This morphological category defines the paradigmatic domain. The morphology of Dutch has several affixes that may realize this particular category. These affixes are in competition and the distribution amongst these affixes is determined on morphological and phonological grounds. The ‘special’ affixes take precedence and have independent morpho-phonological conditions, leaving the remainder of the space to the ‘general’ case. Viewed in this way, Van Marle’s approach can be quite easily translated in terms of Distributed Morphology. Although Van Marle claims that this requires a ‘paradigmatic’ organization of derivational morphology, this type of paradigmaticity is different from the notion paradigm that plays a crucial role in the distinction between the

‘globalist’ and ‘localist’ view as explained above. In Van Marle’s notion of ‘paradigmaticity’ it is not the actual forms that block the existence of other forms, it is a simple case of rules that have precedence over other rules thereby ‘blocking’ the potential results of the more general rule. In other words, this form of ‘paradigmaticity’ also fits a ‘localist’ view on morphological derivation: no inspection of other forms is needed to derive the correct output.

We believe that this particular notion of ‘paradigm’ has its merits in derivational morphology. The way we see it, is that Van Marle’s notion of ‘morphological category’ is a particular functional head in the morpho-syntactic representation of a word and this head may be realized or spelled out by different affixes. These affixes are in competition. The rules inserting these affixes are ordered disjunctively, leaving one ‘elsewhere’-case, which will be the ‘default’ affix that only comes in when the other affixes do not meet their conditions for insertion.

Booij (1997a, 1997b, 2010) proposes a ‘globalist’ perspective on derivational morphology. The rules that he proposes are paradigmatic in the sense that inspection of other forms is needed to derive the correct result. In the argumentation for this globalist paradigmatic view, so-called female inhabitatives in Dutch play a crucial role. The aim of this paper is to show that Booij’s arguments are not compelling and consequently, the analysis presented here neutralizes an important argument for this particular notion ‘paradigm’ in a theory of derivational morphology. We contend that a more restrictive theory of morphology is possible that only uses strictly syntagmatic means.

In several publications Booij (1997a, 1997b, 2010) has claimed that derivational morphology in Dutch is at least partly governed by a paradigmatic organization of the relevant morphological categories. One of the arguments to support this claim is based on the formation of so-called ‘inhabitatives’. These forms, meaning ‘inhabitant of <toponym>’, have toponymic names as their bases. Apart from an inhabitative form, all toponymic names also have a related adjective. These morphologically complex adjectives are not based on the toponyms but, according to Booij, they choose as their base the inhabitatives. Booij claims that since the toponymic adjectives do not have a semantics that is somehow related to the inhabitatives, we encounter a situation in which a morphological derivation is for its form dependent on a particular stem without being semantically composed of the meaning of this stem.

A look at the actual Dutch data may put some flesh on the abstract formulation above.

(1) <b>Toponym</b>	<b>Inhabitative</b>	<b>Adjective</b>	<b>Female Inh.</b>	<b>Gloss</b>
Amerika	Amerik-aan	Amerikaan-s	Amerikaans-e	‘American’
Brazilië	Brazili-aan	Braziliaan-s	Braziliaans-e	‘Brazilian’
China	Chin-ees	Chinees-s	Chinees-e	‘Chinese’
Finland	Fin	Fin-s	Fins-e	‘Finnish’
Griekenland	Griek	Griek-s	Grieks-e	‘Greek’
Rusland	Rus	Russ-isch /-is/	Russisch-e	‘Russian’
Zweden	Zweed	Zweed-s	Zweeds-e	‘Swedish’

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We can make the following observations with respect to these data. First, the adjectives are derived from the corresponding inhabitatives and not from their toponymic roots. So, the adjective *Amerikaan-s* 'American' is derived by adding a suffix *-s* to the inhabitative *Amerikaan* 'American'.

Second, the female inhabitatives are derived from the corresponding adjectives and not from their 'male' counterparts. For example, in order to derive the female inhabitative *Russische*, we add the suffix *-e* (a schwa) to the adjective *Russisch* 'Russian', rather than that we use the 'neutral' inhabitative *Rus* 'Russian'.

Third, stress shift only takes place during derivation of the inhabitatives. For example, in type B we see that the suffix-*aan* has main stress: *Brazilië* [bra'ziliə] 'Brasil' versus *Braziliaan* [brazili'an] 'Brazilian'.

The first two observations have been considered evidence for the paradigmatic nature of Dutch morphology (Booij 1997a, 1997b, 2010) and by extension for the paradigmatic nature of derivational morphology in general (see e.g. Bauer 1997). According to Booij (Booij 1997a: 45): "[...]The most straightforward formal analysis of the toponymic adjectives which are semantically derived from the toponyms is an analysis in which the suffixes *-s* and *-isch* are attached to a stem allomorph of the toponym which is formally identical to the corresponding inhabitative noun, another case of paradigmatically determined stem allomorphy.

As we can see from this formulation, this requires a globalist type of paradigmaticity that indeed requires the inspection of another form in order to derive the correct result.

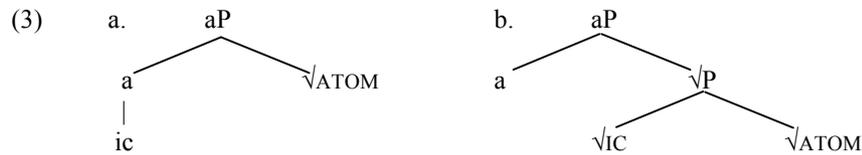
- (2) a.  $[[[a]_A - b]_B - c]_C$   
b.  $[[a]_{A-C}]_C$

(2a) is assumed to be necessary to derive the correct *form*, whereas (2b) expresses the derivational relationship of the complex form. *Braziliaans* has no semantic relation to the form *Braziliaan* (the inhabitative) but only to *Brazilië* (the toponym).

The aim of the paper is to show that the observations above do not necessarily lead to the conclusion that this morphology is 'paradigmatic' in nature. The paper is organized as follows. In section 2 we explain our purely syntagmatic model of derivational morphology which is framed in the theory of Distributed Morphology. In section 3 we start by looking into 'neutral' inhabitatives derived from toponyms. This forms the basis for the analysis of the toponymic adjectives. In section 4 we propose an analysis within this framework for the toponymic adjectives and show that this purely syntagmatic analysis is also able to explain the observations with respect to stress-shift (or the lack thereof). Moreover, some new observations will be made that support the proposed syntagmatic analysis. In section 5 we turn to the female inhabitatives and show how they follow from the proposed analysis. Section 6 summarizes the conclusions.

### **2. A syntagmatic morphological model**

Recently Lowenstamm (2010) and De Belder (2011) have argued that derivational affixes are not categorial heads as is traditionally assumed in theories of morphology. For example, Lowenstamm proposes the analysis in (3b) for the word *atomic*, while a 'classic' theory of derivational morphology offers the analysis in (3a):



The main empirical argument for Lowenstamm and De Belder’s proposal is that many affixes can be ‘flexible’, i.e. they are the heads of words with different lexical categories. For example, in English the affix *-ian* may both head nouns (*librarian*) and adjectives (*reptilian*). Therefore, in a classic approach we would have to assume that there are two different affixes in such cases. In the Lowenstamm/De Belder approach there is no need for such a move: the affix does not bear any categorial information. Lowenstamm/De Belder assume that affixes are roots: i.e. vocabulary items that do not contain any morphosyntactic information. We adopt this assumption, but only with respect to a subset of the affixes. We claim that a subset of the affixes in Dutch (and English) host categorial information and that there is a second type of affixes that do not. We will come back to this issue in due course.

Following proposals in Distributed Morphology, we assume that free morphemes are roots without any categorial information. Dutch examples of such elements are  $\sqrt{\text{WIJN}}$  ‘wine’ and  $\sqrt{\text{KAAS}}$  ‘cheese’. Furthermore, bound morphemes can be divided along two dimensions: whether or not they have categorial information, and whether or not they are root selecting. A root-selecting affix may attach to a root, whereas non-root selecting affixes always need to attach a categorized structure, i.e. to a word. This can be summarized in the following typology of affixes. We have given examples of Dutch affixes for each type:

(4)

	[+Cat.]	[-Cat.]
[+RS]	<i>-zaam, -(i)teit, -ig</i> (within the word domain)	$\sqrt{\text{AAN}}, \sqrt{\text{IST}}, \sqrt{\text{ISME}}$ (Root-affixes) (within the root domain)
[-RS]	<i>-baar, -heid, on-</i>	*

There are no affixes that are not root selecting [-RS] and do not bear categorial information [-CAT.]; the reason is that categories head words, and not roots.

In line with general assumptions within Distributed Morphology (Halle & Marantz 1993, Marantz 1997, Marantz 2007) and more in particular with a proposal made in Arad (2003), Embick and Marantz (2008) and Embick (2010), we assume that words are built in two different domains: a root-domain which involves all morphology before categorization, and a word-domain which includes all morphology after categorization has taken place. Furthermore, we assume that the categorial nodes mark ‘phase’-boundaries in the sense of Chomsky (2001). That is, we assume that this structure is sent off to PF and LF for phonological and semantic interpretation respectively. This implies that affixes in the root-domain as well as those affixes that mark the first categorial head (i.e. those affixes that are root

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selecting [+RS] and have a categorial specification [+CAT]) are predicted to be stress-sensitive. Affixes above the first categorial head are necessarily stress-neutral since they attach to that part of the structure that already has been given a phonological interpretation.

**3. Dutch inhabitatives**

In the introduction we have shown inhabitative adjectives in Dutch. However, in order to complete the picture, we also need to introduce a second type. We give examples of both types in (5), repeating the examples in (1) as (5a):

(5)

a. *Type A*

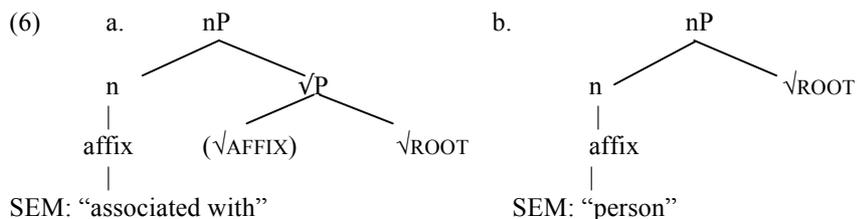
Toponym	Inhabitative	Adjective	Female Inh.	Glos
Amerika	Amerik-aan	Amerikaan-s	Amerikaans-e	'American'
Brazilië	Brazili-aan	Braziliaan-s	Braziliaans-e	'Brazilian'
China	Chin-ees	Chinees-s	Chinees-e	'Chinese'
Finland	Fin	Fin-s	Fins-e	'Finnish'
Griekenland	Griek	Griek-s	Grieks-e	'Greek'
Rusland	Rus	Russ-isch /-is/	Russisch-e	'Russian'

b. *Type B*

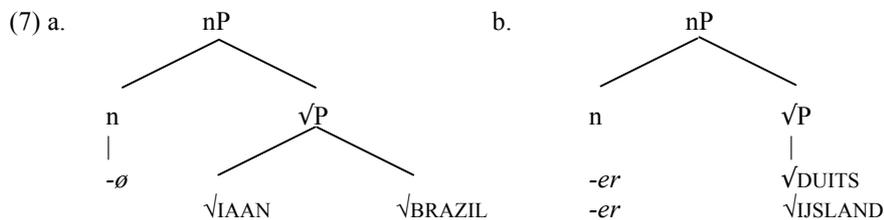
Toponym	Inhabitative	Adjective	Female Inh.	Glos
Duitsland	Duits-er	Duits-s	Duits-e	'German'
IJsland	IJsland-er	IJsland-s	IJslands-e	'Icelandic'
Nederland	Nederland-er	Nederland-s	Nederlands-e	'Dutch'
Engeland	Engels-man	Engels-s	Engels-e	'English'

At first sight there is only a single difference considering these types: the adjectives of type B are all formally related to the inhabitative noun, whereas those of type A are not. For example, *Braziliaans* (type B) is, as far as its form is concerned, built from *Braziliaan*. However, *Nederland-er* or *IJslander* (type A) are built from the toponym directly and not from the toponymic adjective (*Nederlands*, *IJslands*). It may seem that this is different in the example of *Duits-er* (adjective *Duits*) but a quick look at the toponym *Duitsland* shows that the root in this case is *Duits* rather than *Duit*.

We believe that the difference between the toponymic adjectives of type A and type B is caused by a structural difference in the form of the inhabitative. The grammar of Dutch offers two possibilities of forming an inhabitative. The two relevant structures are given in (6):



The structure in (6b) is the structure of type B inhabitatives. In a way these are the true inhabitatives: a nominal affix, meaning ‘person’, is added to the toponymic root, thus deriving a word with the meaning ‘person from <toponym>’. In (6a) a root-affix is added to the toponymic root after which the complex root is nominalized. This nominalization is not overly marked. The root affix attached to the toponymic root is interpreted as ‘being associated with’. Consequently, the meaning of *braziliaan* is ‘associated with <toponym>’. If this gets nominalized it is only pragmatically natural, although not necessary as we will see shortly, that an interpretation ‘person from <toponym>’ arises. So, the following structures for type A (7a) and type B (7b) inhabitatives are proposed:



Independent evidence for these structures first comes from the fact that type A inhabitatives, that we may call ‘pseudo-inhabitatives’, may also receive a different interpretation. Consider the data in (8):

- (8) a. hij rijdt in een Koreaan / Amerikaan / \*Duitser  
‘he drives in a Korean / American / \*German’ (Korean etc. car)
- b. we eten bij de Chinees / Griek / Italiaan  
‘we eat at the Chinese / Greek / Italian’ (Chinese etc. restaurant)
- c. we kijken altijd naar de Belg / Italiaan / \*Duitser  
‘we watch always to the Belgian / Italian / \*German’ (Belgian etc. tv)
- d. we drinken een Italiaan/ \*Fransman bij het eten  
‘we drink an Italian?/\*Frenchman at dinner’ (meaning: Italian wine)

As can be seen in (8a-d) the ‘pseudo-inhabitatives’ may also refer a different interpretation depending on the particular context in which they are used.

We conclude that the interpretation as ‘inhabitant’ is probably pragmatically the most salient interpretation out of many different possibilities. The difference between the relative freedom of interpretation of the nP’s of type A (7a) and the necessary interpretation ‘inhabitative’ of nPs of type B (7b) becomes even more apparent in comparing (9a) and (9b).

- (9) a. We eten morgen bij de Franse Italiaan.  
We eat tomorrow at the French Italian

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'Tomorrow we will have dinner at the French Italian restaurant'

- b. ?We eten morgen bij de Italiaanse Fransman.  
 We eat tomorrow at the Italian Frenchman  
 'Tomorrow we will have dinner at the Italian Frenchman'

(9a) makes perfect sense in a world in which Italian restaurants can be run by French 'maîtres' but (9b) sounds odd and can only mean that there is a Frenchman with Italian roots or something like that.

A second piece of evidence for our analysis comes from the stress-behavior of the affixes involved. All type A inhabitatives are formed with stress-sensitive affixes. In our analysis this is not a coincidence but directly follows from the structure in (7a). These affixes are all root-selecting and have no category, i.e. they are 'flexible'. Therefore, they are attaching in the root-domain and hence, they are stress-sensitive. Since their phonological make-up is a 'superheavy syllable' these forms always predictably receive final stress (cf. Trommelen & Zonneveld 1989). The type A inhabitatives on the other hand are necessarily built from stress-neutral affixes. Since the construction of these forms involves a categorial head, and the affixes forming these inhabitatives attach to a word rather than a root, these affixes are necessarily stress-neutral.<sup>1</sup> The following example illustrate this point:

- (10) a. bra'zilië      brazili'aan      b. 'nederland      'nederlander  
          a'merika      ameri'kaan            'ijsland            'ijslander  
          'moskou      mosko'viet

Thirdly, the analysis is supported by the existence of so-called 'doublets'. Some toponyms have two inhabitatives:

- |      |                |                    |                    |              |
|------|----------------|--------------------|--------------------|--------------|
| (11) | <b>Toponym</b> | <b>Type A Inh.</b> | <b>Type B Inh.</b> | <b>Gloss</b> |
|      | Wallonie       | wallonier          | waal               | 'Wallonia'   |
|      | Frankrijk      | fransman           | fransoos           | 'France'     |
|      | Noorwegen      | noorman            | noor               | 'Norway'     |

These doublets are expected by our analysis since two types of structures are possible for any toponym. The fact that we do not find doublets in all cases must then be attributed to a form of blocking. The fact that it is common to express the inhabitant of e.g. Brazil as a *Braziliaan*, obviates the need for a form as *Braziliër*, although we claim that native speakers of Dutch would find the latter form at least a possible word of Dutch. Note that we do not invoke a *grammatical* mechanism in which one form blocks the other, but that blocking as we understand it here, belongs

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<sup>1</sup> Note that there are in fact affixes that do spell out a categorial head and yet are stress-sensitive. In Creemers et al. (in prep.) it is proposed that these affixes are the first attaching affixes outside the root-domain. In line with Embick (2010) we propose that these first categorial heads are shipped off to PF and LF together with the contents of the phase they head.

to the conventions of language use. Which of the possible grammatical forms is actually used is not something that is grammatically determined but results from coinage by individual speakers.

We conclude that there is enough evidence to accept the analysis presented in (7). This implies that there are two types of inhabitatives: type A, that we call pseudo-inhabitatives for reasons explained above and type B, the true inhabitatives. We now turn to the formation of the inhabitative adjectives of type B that form the argument for ‘paradigmatic morphology’.

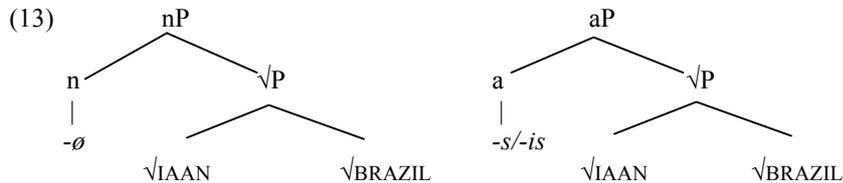
#### 4. Toponymic adjectives

Booij (2010) proposes the following rule that ‘paradigmatically’ (Booij’s term) relates two so-called schema’s. The schema left of the  $\approx$  gives the schema that Booij assigns to type A inhabitative nouns, and the schema to the right is the schema of the adjectives: (Booij 2010:35)

$$(12) \langle [x]_{Ni} \leftrightarrow [\text{inhabitant of } j]_i \rangle \approx \langle [[x]_{Ni}-(i)s]_{Ak} \leftrightarrow [\text{relating to } j]_k \rangle$$

Note that the semantic description of the adjective contains an index ‘j’ that is also part of the semantic description of the noun. This is how the relation between the adjective and the base noun is expressed in Booij’s constructionist approach.

In our approach, given the analysis of the inhabitative in section 2, the step to the analysis of the toponymic adjectives of type A is quite simple. Recall that there is no reason, other than the formal correspondence between the inhabitant and the adjective, that the latter should be derived from the former. The analysis in Section 2 now allows us to propose the structure in (12b) for the toponymic adjectives:



In order to see the correspondence between the adjective and the inhabitative nouns we repeated structure (7a) as (13a). The only difference between the adjectives and the nouns is the categorial node that heads the complex root. As the structures make clear, the same complex root underlies both the inhabitative noun and the toponymic adjective, thus explaining the fact that the allomorphy of elements within the complex root is identical in both cases. In this way we are able to account for the identity between these forms without invoking any ‘paradigmatic’ means. So, there is on the basis of the correspondence in form between the inhabitative nouns and toponymic adjectives no reason to assume that derivational morphology is different from syntax in this respect. We now turn to the analysis of the female inhabitatives.

#### 5. A syntagmatic analysis of female inhabitatives

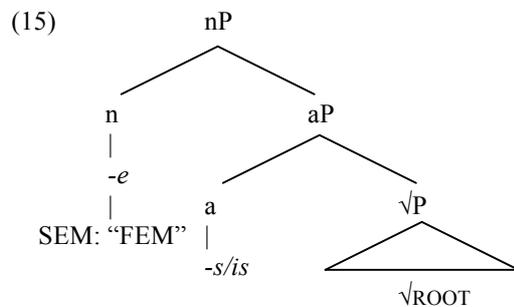
Booij (1997a) has argued that the female inhabitative nouns (rightmost column in (1)) are all based w.r.t. their form on the adjectives. According to Booij, one derives a female noun (with a few exceptions to which we turn below) in Dutch by adding a schwa to the adjectival stem. He considers this an unexpected state of affairs, as can be concluded from the following quotation: "Unlike what we may expect, such nouns are not derived from their neutral counterpart, but from the corresponding toponymic adjective, by adding a suffixal schwa." (Booij 1997a: 45).

We don't see why any one would expect that female inhabitatives would be derived from their neutral counterparts. This assumption seems unwarranted. Interestingly, Booij (2010) also takes a different route. In his constructionist morphology the female inhabitants are paradigmatically related to the toponym in the following way: (Booij 2010:36)

$$(14) \langle [[x]_{Ni-(i)s}]_{Ak} \leftrightarrow [\text{relating to } j]_k \rangle \approx \langle [ [ [x]_{Ni-(i)s}]_{Ak} e ]_{Nm} \leftrightarrow [\text{female inh. of } j]_m \rangle$$

Simply put, this paradigmatic schema states: by adding a *-e* (schwa) to the toponymic adjective, we derive the female inhabitant.

Take again our informal description of the semantics of the toponymic adjectives: 'related to <toponym>'. If we would add a nominal node expressing 'female' to such a structure, it seems only natural that the resulting structure can be used to refer to a female inhabitant of the embedded toponym. In other words, we propose that the structure of the female inhabitatives is indeed based on the adjectives and that, as is always the case in a localist syntagmatic approach, this explains the formal correspondence between the two. The relevant structure is given below:



Examples of this structure would be *Amerikaanse* ('American-fem'), *Portugese* ('Portugese-fem.') etc.

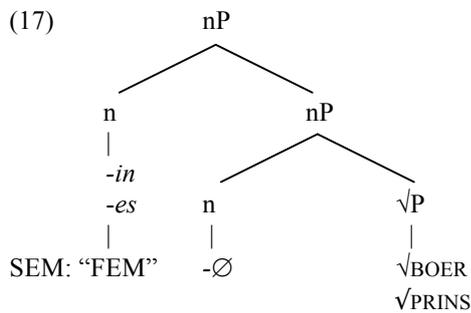
Evidence for this structure again comes from stress. This analysis predicts that the schwa in these cases is stress-neutral: if it were part of the root domain, we would certainly expect 'stress-attracting' behaviour, since a final schwa in underived words always forces prefinal stress (Kager & Zonneveld 1985/6). The forms under consideration do not have prefinal stress despite the final schwa, showing that this later affix is stress-neutral and therefore should attach outside the root-domain.

Apart from the structure in (15) there is a second way in which Dutch female personal nouns may be formed from toponyms. There is a small list of

‘special’ affixes (in the sense of Van Marle) that can be added to ‘neutral’ personal nouns. Some examples are given in (16):

(16)	boer	‘farmer’	boer-in	‘farmer-fem.’
	prins	‘prince’	prins-es	‘princess’
	kok	‘cook’	kokk-in	‘cook-fem.’
	herder	‘shepard’	herder-in	‘shepard-fem.’

We claim that these female personal nouns have the following structure:



As far as we are aware there are no examples in which *-in* attaches to an adjective; it thus seems that it has a subcategorization property: it requires a noun as its complement. This explains why examples of the type *\*amerikan-in*, *\*portuges-es*, etc. are ill-formed. Second, the affix itself is non-flexible: it always marks nouns; therefore, we assume it spells out a categorial head as indicated in (17). The acute reader will have noticed that this is problematic for our claim that affixes attaching outside a first categorial head are stress-neutral. The suffix *-in* is considered stress-sensitive since the main stress is always located on this affix. However, this type of stress-sensitivity can easily be accounted for, even if we assume that the structure is as in (17). The property that the affix *-in* receives main stress should somehow be encoded in the affix itself. It must carry a feature of the type expressing the fact that it needs to be the prosodic head of the phonological word it is part of. Thus, the fact that the smallest nP in (17) already has received a phonological interpretation before the affix *-in* is attached does not preclude the possibility that the latter attaching affix receives the main stress of a new prosodic word, thereby downgrading the stress assigned in the previous phonological cycle.

Interestingly, as in the case of the inhabitatives, there are a few doublets. Consider the examples in (18):

(18)	<b>Inhabitant</b>	<b>Female Inh. I</b>	<b>Female Inh. II</b>	<b>Gloss</b>
	Fries	Friezin	friese	‘Frisian’
	Jood	Jodin	Joodse	‘Jew’
	Rus	russin	russische	‘Russian’

The female inhabitatives II have the structure (15). But this cannot be the structure of the female inhabitatives I: they have a structure, which is exactly parallel to the one in (17).

Summarizing, female personal nouns from toponyms come in two types: those built from adjectives by adding a schwa and those built from nouns by adding *-in*. The fact that we only find a limited number of doublets must again be attributed to a pragmatic form of blocking.

## 6. Conclusion

Above we have argued that 'paradigmatic' schema's that have the power to form words from just any complex morphological form are not necessary in accounting for Dutch derivations from toponymic roots. Inhabitatives of the type *braziliaan* 'brasilian' are formed on the basis of the same complex root ( $\sqrt{\text{BRAZIL}}-\sqrt{\text{AAN}}$ ) as the inhabitative noun; consequently, the same allomorphy is pertained in the noun and in the adjective; no 'global' means are invoked to derive this result. With respect to the female inhabitatives, we have proposed that they are derived from the adjectives. We claim that the semantics of the female personal includes the semantics of the adjective. Again, this fits a 'localist' view on derivational morphology.

Of course one cannot claim on the basis of these case studies that there is no need in general for global paradigmatic means. However, since localist theories are more parsimonious, the burden of proof lies with proponents of such relatively powerful devices.

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