

# On derivational affixes and the functional-lexical divide

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## Abstract

Categories may be functional or lexical (Jespersen 1924; Abney 1987 a.o.). Yet, some categories, such as prepositions, are known to be hybrid. To capture the in-between status of prepositions Zwarts (1997) proposed that the functional-lexical divide is structured by means of three independent privative parameters, viz. [+/-lexical], [+/-functional] and [+/-categorial]. In this article I adapt and develop this proposal to demonstrate that derivational affixes are a hybrid category as well. More specifically, I show that derivational affixes have lexical meaning and that they are an open class, which defines them as [+lexical]. Yet, they obligatorily select a complement, which makes them [+functional]. They may or may not determine the category of their functional superstructure, which renders them [+/-categorial]. It is thus argued that derivational affixes are not purely functional or lexical, just like prepositions. Yet, within the lexical-functional divide these two hybrid categories occupy different spaces.

**Keywords:** morphology, derivational affixes, the functional-lexical divide, roots

## 1. Introduction

Syntactic theories have a long tradition of distinguishing between lexical and functional categories (Jespersen 1924; Jackendoff 1973; Chomsky 1981; Abney 1987; Belletti & Rizzi 1988; Grimshaw 1991; Déchaine 1993 a.o.). Lexical categories are associated with open class content words that project categorial features. Functional categories are associated with small words from a closed class that appear in the extended projection of the lexical categories (Grimshaw 1991).

The same tradition can be found in generative approaches to morphology. In Distributed Morphology, for example, lexical heads are roots, all other projections are functional. These items belong to different realms and are subject to different mechanisms. Roots are realized by means of free choice, functional projections are subject to a competition regulated by the Elsewhere Principle. Roots are assumed to have rich content but no syntactic features, whereas functional projections are defined by innate features that are interpreted compositionally.

The validity of such a dichotomy has recently been questioned in morphological contributions. De Belder & van Craenenbroeck (2014) have argued that semi-lexical items disturb the neat picture as defined by Distributed Morphology and they have shown that all functional items can be used as roots in quotative contexts. They propose that the vocabulary insertion mechanism for roots and functional items should be unified (see also De Belder (2011) and De Belder & van Craenenbroeck (to appear)). Harley (2014) argues for a certain degree of competition for roots to accommodate root suppletion. Svenonius (2014) points out that the criteria for functionality and lexicality have become vague in the generative morphological debate and suggests reassessing the mere existence of the distinction. In short, the functional-lexical divide has recently been put high on the morphological agenda. This article contributes to this debate. On the basis of an elaborated version of a proposal made by Zwarts (1997) for syntax it defines the functional-lexical divide as a domain regulated by three independent parameters that enable us to define hybrid categories precisely. It suggests that derivational affixes are a specific type of an in-between category in this domain.

For syntax it has been pointed out that a simple bifurcation between lexical and functional categories is probably too simple. The poster child in this discussion is the preposition, a hybrid category (Corver & van Riemsdijk 2001; Zwarts 1992, 1997; Littlefield 2009; Mardale 2011; Svenonius 2014). On the one hand, the preposition looks like a functional category as it forms a closed class of words, often with a reduced phonology, and as it can realize functional heads. On the other hand, prepositions seem to have lexical properties as they can occur without a

complement, as they can be stranded and as they can project categorial features (Zwarts 1997). In short, at least one category, viz. the preposition, shows mixed properties and a simple polarized view on the lexical-functional divide is therefore too naïve.

To capture the hybrid nature of the preposition, Zwarts (1997) replaced the functional-lexical dichotomy by a more fine-grained system based on three parameters. As I will discuss in detail below, he submitted that categories can be [+/-lexical], [+/-categorial] and [+/-functional]. These three parameters are independent. For example, from the lexical or nonlexical status of a category, one cannot predict its value for functionality. Zwarts submits that the traditional open class items, such as N, V and A, are lexical, categorial, but nonfunctional. The traditional closed class items, such as determiners, are nonlexical, noncategorial and functional. Prepositions are [-lexical] and [+categorial] in his system, and they can be both functional and nonfunctional.<sup>1</sup> In sum, Zwarts derives the following inventory of classes:

- (1) a. [+ lexical, + categorial, - functional], e.g. N
- b. [- lexical, - categorial, +functional], e.g. D
- c. [- lexical, + categorial, - functional], e.g. a subclass of the prepositions
- d. [- lexical, + categorial, + functional], e.g. a subclass of the prepositions

The interplay of three privative parameters yields eight hypothetical combinations. As can be seen in (1), Zwarts only discusses four of them. He has no developed proposal on the following categories:

- (2) a. [+ lexical, + categorial, + functional]
- b. [+ lexical, - categorial, + functional]
- c. [+ lexical, - categorial, - functional]
- d. [- lexical, - categorial, - functional]

In this article I propose that derivational affixes fill two of these four remaining slots. More specifically, I propose that the bulk of derivational affixes are [+lexical, +functional]. They can be both [+categorial] and [-categorial], depending on the subtype. It will thus become clear that derivational affixes are a hybrid category, i.e. not purely functional or lexical, just like prepositions. Yet, derivational affixes, which are [+ lexical, + functional], are a different hybrid category than prepositions, which are [-lexical, +categorial] (see Zwarts 1997). In sum, within the functional-lexical divide these two hybrid categories occupy different spaces.

There is a theoretical tension between the fact that this article contributes to present-day generative morphology, which is dominantly root-based, and the fact that I adopt Zwarts' scheme, which reflects Chomsky's (1981) categorial definition of lexical items and Grimshaw's (1991) notion of the extended projection. This article contains a discussion on how Zwarts' proposal and its present adaptation can be made compatible with root-based frameworks.

The article is structured as follows. In the next section, i.e. section 2, I present Zwarts' three parameters in detail. In section 3 I show that derivational affixes are functional as defined in section 2, in section 4 I show that they are lexical as well. In section 5 I demonstrate that they can be both plus and minus categorial. Section 6 focuses on the consequences of these insights for morphology. The final sections sum up and concludes.

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<sup>1</sup> To be precise, Zwarts also discusses the Dutch *van die*-construction, as in *van die koekjes* 'such cookies' (Lit. of those cookies) in which *van die* acts like a determiner. The preposition *van* in this discussion is treated as a determiner by Zwarts, hence it is [- lexical, - categorial, +functional].

## 2. Lexicality, functionality and categoriality as independent domains

### 2.1 Zwarts' (1997) proposal

The properties that are prototypically associated with functional items are listed in (3) (Abney 1987:64-65, Zwarts 1997)<sup>2</sup>:

- (3) closed class
  - phonologically and morphologically dependent
  - one obligatory complement
  - no stranding, i.e. inseparable from their complement
  - no role in morphology
  - no descriptive content

Abney (1987:64) observes that even though these properties are typically associated with functional items, they do not necessarily always apply. Zwarts develops this observation for prepositions. They are often morphemes with a reduced phonology and they belong to a closed class. Therefore they are nonlexical. Yet, a subtype of them can be used intransitively, can feed morphology and can strand.<sup>3</sup> In other words, one subtype seems to be non-functional. He therefore distinguishes between nonfunctional and functional prepositions. In sum, there is a subgroup of prepositions that is both nonfunctional and nonlexical according to the following criteria:

- (4) Nonlexical:
  - small morphemes (i.e. morphemes with a reduced phonology)
  - closed class
- Nonfunctional:
  - can be used intransitively
  - can strand
  - can feed morphology

Zwarts connects a theoretical distinction to this empirical distinction. He proposes that being lexical implies having a value [+N] and/or [+V].<sup>4</sup> Being functional, in contrast, involves being a function that maps phrases onto phrases. For example, a determiner is a function as defined in (5).

- (5)  $D = [ F ([+N, -V]) ]$

In (5) a functional head is described as an operator that applies to a bundle indicating the category of the phrase which that functional head applies to. A determiner is an operator which has an NP as its domain and it returns a DP. Crucially, the determiner itself is not nominal<sup>5</sup> and thus [-lexical]. As it is an operator, it is [+functional].

Even though the ratio behind the grouping of properties in (4) is not explicitly discussed by Zwarts, it is not hard to grasp the insight. Being operators, functional items are sensitive to tests showing that they cannot occur intransitively: they obligatorily select one complement, they are

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<sup>2</sup> The criterion of playing a role in morphology is listed in Zwarts (1997), but not in Abney (1987).

<sup>3</sup> Zwarts does not discuss the criterion of descriptive content (see Zwarts 1997, fn3).

<sup>4</sup> Nouns, verbs and adjectives are thus lexical as nouns are [+N, -V], verbs are [-N, +V] and adjectives are [+N, +V]. Prepositions are not lexical as they are [-N, -V] (Chomsky 1981: 48, 252).

<sup>5</sup> Only its domain is nominal.

inseparable from that complement and they cannot occur as the root in a morphological process as they cannot select a complement in such a syntactic context.<sup>6,7</sup>

On top of the parameters [+/-lexical] and [+/-functional] Zwarts adds a third one, viz [+/-categorial]. This property is reminiscent of Grimshaw's (1991) proposals on the extended projection. It can be stated that categorial items head their own projection, whereas noncategorial ones are part of an extended projection.<sup>8</sup> Categoriality can be approached from a theoretically more neutral angle if one restricts the discussion to its empirical effect. If items determine or alter the categorial properties of a phrase they are [+categorial], otherwise they are [-categorial]. For example, prepositions are categorial as they turn a DP into a PP, determiners are noncategorial as they do not change the nominal status of a DP. In the present article I will work with this empirical definition.

In Zwarts' scheme, the prototypical lexical categories, N, V and A, are lexical, categorial and nonfunctional. The prototypical functional categories, such as D, are nonlexical, noncategorial and functional. He proposes that prepositions are always nonlexical, as they do not form an open class. They are categorial, as they alter the category of the phrase; they turn a DP into a PP. They may or may not be functional as some prepositions can occur without a complement, whereas other cannot. Discussing Dutch prepositions, he points out that some, such as *achter* 'behind' and *op* 'on', may feed morphology, that they may strand and that they may occur intransitively. Other Dutch prepositions, such as *van* 'of' and *naar* 'to', do not show these properties. In sum, Zwarts derives the results in (6). The column 'type of the example' can be read as follows. If the type of the category is [+lexical] its name is N or V. If it is [+categorial], its name is not F. If the type is [+functional] and therefore selects a domain, its domain is noted between brackets.

(6)

class	example	type of the example	Lexical	Categorial	Functional
			+	+	+
N, V, A	kat 'cat'	N	+	+	-
			+	-	+
			+	-	-
P	van 'of'	P(N)	-	+	+
P	achter 'behind'	P	-	+	-
funct. items	de 'the'	F(N)	-	-	+
			-	-	-

## 2.2 Discussion and adaptation of Zwarts (1997)

There are three elements of Zwarts' proposal that I will not adopt. Firstly, the feature [+lexical] is defined as [+N/+V] by Zwarts. There are two reasons why we might want to avoid such a definition. The first problem is that [+lexical] under this definition implies [+categorial] as the features [+N/+V], are *in se* categorial.<sup>9</sup> Conceptually, it is less attractive to start from an

<sup>6</sup> Zwarts of course does not mention the notion *root*, he rather states that functional items cannot feed morphology. In the present context this may become confusing (as derivational affixes do feed morphology) and I chose to be as explicit as possible about the consequences for the present proposal.

<sup>7</sup> See De Belder & van Craenenbroeck (to appear), Alexiadou (2014) and van Craenenbroeck (2014) (pace Harley 2014) on the intransitivity of roots.

<sup>8</sup> Note, though, that Grimshaw (1991) states that the preposition is part of the nominal projection, which seems to contradict Zwarts' claim.

<sup>9</sup> All [+lexical] categories, i.e. N, V, A which are [+N] and/or [+V], are effectively [+categorial] for Zwarts. The parameters lexicality and categoriality can nevertheless function independently in Zwarts' proposal as the reverse does not hold: a category may be [+categorial], even though it is neither [+N] or [+V]. This holds, for example, for the prepositions, which are [+P]. The reasoning still holds if one adopts Chomsky's (1981) featural decomposition for prepositions, which is [-N, -V].

implicational relation between two parameters that are supposed to be independent. If we want the parameter [+/-lexical] to be truly independent of the parameter [+/-categorical] we will have to redefine it.

The second less attractive aspect of Zwarts' definition of lexicality is the fact that it creates a theoretical tension. It is incompatible with root-based frameworks. The morphemes that are [+lexical] in Zwarts' proposal are essentially the prototypical open class items. In root-based frameworks these items are called roots, which, by definition, are not marked with categorial features (see Halle and Marantz 1993, Harley and Noyer 1999, Borer 2005a,b,2013 and subsequent proposals). As such, there is a theoretical mismatch between Zwarts' definition according to which [+lexical] implies [+N/+V] and the notion of roots. This is a disadvantage, as it would render the present proposal, which clearly has morphological implications, incompatible with some of the most dominant approaches to present-day generative morphology. I will therefore start from a more theory-neutral definition.

I define [+/-lexical] on an empirical basis.<sup>10</sup> An item is [+lexical] if it has semantic content that is richer than what can be composed on the basis of innate features and if it belongs to an open class. Note that there is a natural connection between belonging to an open class and having the ability to contribute substantive content to the proposition. It goes without saying that items that have descriptive content belong to an open class or we would have very little to talk about. I therefore expect these two properties to cluster. In sum, for the purpose of a theory-neutral discussion I will treat the properties of belonging to an open class and having descriptive content as the defining properties of [+lexical] items.

Secondly, as I will propose that the present work is fully compatible with root-based frameworks I will eventually give the prototypical open class items, say roots, a different position in the scheme than Zwarts did as roots in root-based frameworks are by definition devoid of a category, i.e. they are [+lexical], but [-categorical]. This change is discussed in section 6.

Thirdly, Zwarts associates having a reduced phonology with the feature set [-lexical]. I fail to see the rationale behind this choice. *A priori* this property may be associated both with [-lexical] or [+functional]. One might argue that for an open class item with a rich descriptive content it is of more importance to have a richer phonology, connecting a reduced phonology to the feature [-lexical]. Conversely, one might argue that for items that obligatorily select a complement it is more natural to be reduced to a clitic or an affix. As such, one might claim that this property follows from the feature [+functional]. As it is not immediately clear to me how this property relates to the parametrical division, I will leave it undiscussed.<sup>11</sup>

In short, I will adapt some of the theoretical notions to make the proposal compatible with the present-day dominant approaches in generative morphology and I will leave one test undiscussed for conceptual reasons. The core insights of Zwarts, however, remain essentially unaltered and this work can therefore be understood as an addendum to his scheme.

### 2.3 Summary

Let us summarize what we have established so far. Zwarts redefined the lexical-functional divide as relying on three separate parameters, each of which is privative. As such, one predicts eight possible types. Zwarts proposed four of them:

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<sup>10</sup> I postpone a discussion of the theoretical implications till section 6.

<sup>11</sup> It can nevertheless be concluded from the remainder of this article that a reduced phonology should be associated with the feature [+functional], rather than with the feature [-lexical].

(7)

class	example	type of the example	Lexical	Categorial	Functional
			+	+	+
N, V, A	kat 'cat'	N	+	+	-
			+	-	+
			+	-	-
P	van 'of'	P(N)	-	+	+
P	achter 'behind'	P	-	+	-
funct. items	de 'the'	F(N)	-	-	+
			-	-	-

The remaining four slots are open for discussion.<sup>12</sup> To make such a discussion possible, we have established that subsets of Abney's criteria test for various parameters:<sup>13</sup>

- (8) [+/-lexical]  
+/-open class  
+/-descriptive content  
[+/-functional]  
+/- obligatory selection of one complement  
+/- inseparable from the complement  
+/- cannot function as the root in a derived word  
[+/-categorial]  
+/- determines the category of the functional superstructure

In this article I would like to propose that the bulk<sup>14</sup> of derivational affixes fill the slots that are [+functional, +lexical]. To count as [+functional] as defined here they have to obligatorily select a single complement, in order to count as [+lexical] they have to have rich lexical meaning and belong to an open class. In the next two sections I show that they indeed have these properties. I then discuss the fact that some derivational affixes are categorial, whereas others are acategorial. In sum, it will become clear that derivational affixes fill the following two slots in the scheme:

- (9) a. [+ lexical, + categorial, + functional]  
b. [+ lexical, - categorial, + functional]

### 3. Derivational affixes are functional.

The present section shows that derivational affixes are functional. As such, it is probably preaching to the choir. Nevertheless, it may be interesting to be explicit about what is at stake. In order to count as functional as defined narrowly in the previous section derivational affixes have

<sup>12</sup> The final slot in the table may be empty for conceptual reasons. It is not clear what the role of a closed class category with functional meaning, without categorial properties and syntactic functional properties may be.

<sup>13</sup> *Cannot function as the root in a derived word* was called *Cannot feed morphology* in Zwarts (1997). It is not in the list provided by Abney (1987).

<sup>14</sup> The question whether *all* derivational affixes are of the same type depends on the definition one has for derivational affixes. For example, Dutch has an applicative head that is realized by means of the prefix *be-*: *werken* 'to work (intransitive)' – *bewerken* 'to work (transitive)'. This prefix seems to be the exponent of a functional head and it is therefore probably fully functional, i.e. [-lexical, -categorial, +functional]. Whether we wish to classify such an applicative head as a derivational affix is an independent question. I will equally ignore Greek and Latin prefixes such as *pseudo*, *anti*, *ex* and *contra* as it is not even clear whether these vocabulary items are truly bound affixes in Dutch. They certainly can occur freely, as in *Zij is haar ex* 'She is her ex-partner' and *Zij is zo anti* 'She is so opposed'. The discussion is thus restricted to the set of prototypical affixes.

to obligatorily select one complement. This criterion meshes well with the familiar conception of derivational affixes. For example, Selkirk (1982:59) notes that affixes have two syntactic properties. They have a feature bundle and they select a sister of a specific category. For example, *-less* is adjectival and it selects nouns. In the present proposal the fact that *-less* is adjectival is not associated with functionality, but with categoriality, and I will therefore ignore this property in the current section. However, the fact that derivational affixes select a sister is highly relevant under the view that the defining characteristic of functional material is obligatory transitivity.

It is well known that derivational affixes may not occur independently. They obligatorily select a root or a phrase containing a root, other derivational affixes and possibly some low functional projections. Note that they are not under this obligation because they are [+bound]. If they only selected a complement because of such a morphophonological requirement, one predicts that a combination of a prefix and a suffix, as the Dutch example in (10), forms a licit word-form. After all, the prefix was able to bind the suffix morphophonologically and vice versa.

- (10) \* be-zaam  
 PREFIX-SUFFIX

This expectation is of course not borne out. The requirement is syntactic. Affixes have specific syntactic selectional requirements concerning their sisters. They explicitly select a phrase containing a root as their complement (see Borer 2013 for a detailed discussion on the syntactic status of the complements of derivational affixes in a root-based framework). In short, they are obligatorily transitive. It is well known that they cannot be severed from this lexical element either; stranded affixes are highly ungrammatical, as shown in (11)b.

- (11) a. een-zaam                                    b. \* Eén was ze –zaam.  
 one-SUFFIX                                    One was she SUFFIX  
 ‘lonely’                                        Intended: ‘She was lonely.’

Related to the fact that they cannot occur without a root or a phrase containing a root as their complement is the fact that they cannot function as a root themselves in compounding and derivational word-formation as roots are intransitive (see De Belder & van Craenenbroeck (to appear), Alexiadou (2014) and van Craenenbroeck (2014), pace Harley (2014) on the intransitivity of roots). This inability was already illustrated in (10) for derivational word-formation; the suffix *-zaam*, for example, cannot function as the root that was selected by the prefix *be-*. Consider further the fact that nominal compounding is highly productive in Dutch. Vocabulary items of various categories may realize the left-hand part in such compounds (see De Belder to appear), as shown in (12). Yet, derivational affixes are banned from this position, as can be seen in (13).

- (12) a. boek-druk    b. wals-druk    c. blauw-druk    d. blind-druk    e. in-druk    f. af-druk  
 book-print       roll-print       blue-print       blind-print       in-print       off-print  
 ‘letterpress’    ‘roll pressure’    ‘blue print’    ‘embossing’    ‘impression’    ‘print’

- (13) a. \* zaam-druk        b. \* heid-druk        c. \* es-druk  
 SUFFIX-print        SUFFIX-print        SUFFIX-print

Derivational affixes thus cannot feed compounding as they do not have the intransitive syntactic distribution of roots. In the present section we have seen that derivational affixes are syntactically required to select a complement. As such, they qualify as functions as defined by Zwarts and they are therefore [+functional].

## 4. Derivational affixes are lexical

### 4.1 Derivational affixes have lexical meaning

#### 4.1.1 Introduction

In what follows I show that derivational affixes are lexical as defined in section 2. More specifically, I show that they have a rich content, i.e. they have a lexical meaning, and that they are open-class items.

Derivational affixes contribute meaning. The English affix *-ess* as in *princess*, for example, expresses femininity. This can be concluded from the minimal pair in (14) and (15).

(14) The prince<sub>i</sub> called his<sub>i</sub> Irish Setter.

(15) The princess<sub>i</sub> called her<sub>i</sub> Irish Setter.

One may wonder whether this meaning, viz. femininity, is syntactic or lexical. If it is syntactic, the affix realizes the syntactic feature [feminine] which can also be found in, for example, feminine pronouns. If it is lexical it is similar to a root such as *woman*.

Intuitively, it is not immediately clear whether the meaning of derivational affixes is syntactic or lexical. Their meaning can be both quite abstract and concrete, yet the same holds for roots. The meaning of *-ness*, for example, is comparable to the meaning of the noun *property*. The Belgian Dutch affix *-elaar* in (16), in contrast, has a very specific meaning. It derives names of trees, as can be seen in (16).

- |      |    |             |    |            |    |            |
|------|----|-------------|----|------------|----|------------|
| (16) | a. | peer-elaar  | b. | vijg-elaar | c. | noot-elaar |
|      |    | pear-suffix |    | fig-suffix |    | nut-suffix |
|      |    | 'pear tree' |    | 'fig tree' |    | 'nut tree' |

One may therefore argue that it is synonymous with the Dutch root *boom* 'tree'. Yet, one might equally suggest its meaning is derived from a composition of specific syntactic features with which we are familiar from classifiers for animacy, shape and size such as [+/-animate], [+long] and [+big].

In this section I aim to answer this question. I show that the meaning of all derivational affixes is lexical and not syntactic. In other words, it is contentful and richer than what can be understood as a mere composition of innate features. To arrive at this conclusion I will show that the meaning of derivational affixes is malleable, that they can express kinds of matter and that they can refer to inventions. These properties have been associated with lexical meaning in the literature.

#### 4.1.2 The denotation of derivational affixes is malleable

Borer (2005) provides a simple test to distinguish between syntactic and lexical meaning. Syntactic meaning is not malleable, whereas lexical meaning is. A past tense, for example, will always be interpreted as such regardless of the context.<sup>15</sup> Example (17) illustrates this.

(17) \* Tomorrow I worked several hours.

The temporal adjunct *tomorrow* does not affect the temporal properties of the past tense; it is simply incompatible with it. Lexical meaning on the other hand can be molded by polysemy, metaphors, humor, syntactic and discourse context and so forth. An example, taken from Jackendoff (1991:17),<sup>16</sup> is given in (18).

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<sup>15</sup> Past tense can get a few other interpretations. For example, it can be interpreted conditionally. However, each of the various meanings is syntactic, rigid and listable. For example, if a past tense is used conditionally, it is rigidly interpreted as such. The relevant distinction is thus not whether a vocabulary item can get *several* interpretations. What is relevant, is the fact whether a particular interpretation is rigid and listable or malleable and context dependent.

<sup>16</sup> Jackendoff attributes the example to Nunberg (1979).



- (18) (One waitress says to another:  
The ham sandwich in the corner wants another cup of coffee.

It is clear in this example that *the ham sandwich* should be interpreted as ‘the customer with the ham sandwich’. This is obviously not listed as the meaning of *ham sandwich* in Encyclopedia. Rather, this information stems from the context; the use of *wants* suggest that the subject should be a voluntary agent, hence the hearer knows *ham sandwich* is used as a *pars pro toto* for a person. The system crucially relies on the fact that the most literal and common interpretation of *ham sandwich* is odd in the given context, and so the interpretation is molded in order to make sense. Only lexical meaning allows for this type of manipulation.

We can now apply this test to derivational affixes. If their meaning is fixed it is syntactic. If it can be manipulated and overridden, it is lexical. In what follows, I show that the semantics of affixes is flexible. Hence, I conclude that it is lexical.

Consider the Dutch suffix *-heid* for example. It contributes the notion of abstractness to the complex word containing it (de Haas & Trommelen 1993:247). An example is given in (19).

- (19) schoon-heid  
pretty-HEID  
‘beauty’

In principle, this abstract meaning could either result from a syntactic feature [abstract] which is realized by *-heid*, or it could just be the lexical meaning of the suffix. In the former case it is predicted that the notion of abstractness is rigid, in the latter case context can alter it. Now observe that it is possible to override the abstract meaning of *-heid*. This is shown in (20).<sup>17</sup>

- (20) Wat een schoon-heid!  
what a pretty-HEID  
‘What a beauty!’

In example (20) the word *schoonheid* ‘beauty’ can get a concrete meaning. It may refer to a woman, for instance. The same phenomenon can be observed for the suffix *-nis*, which also has abstractness as its core meaning (de Haas & Trommelen 1993:245).

- (21) hinder-nis  
hinder-NIS  
‘hindrance’

- (22) ken-nis  
know-NIS  
‘knowledge/acquaintance’

The word *hindernis* has both an abstract and a concrete interpretation. It can refer either to an abstract notion or to a concrete thing that prevents progress. In the same vein, *kennis* can refer both to the abstract notion of knowledge or to a person one is acquainted with.

Another example comes from the suffix *-itis*. Both in English and Dutch it exclusively refers to inflammations, as in (23).

- (23) a. bronch-itis  
bronch-ITIS  
‘bronchitis’  
  
b. hepat-itis

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<sup>17</sup> Not all complex words with the suffix *-heid* can be used to refer to people having the property expressed by the word formation. However, there is no reason to expect regularity in the domain of encyclopedic semantics.

hepat-ITIS  
'hepatitis'

c. vagin-itis  
vagin-ITIS  
'vaginitis'

However, this denotation is malleable. This is shown by the humoristic use of *-itis* in the Dutch example in (24) and the English ones in (25).

(24) aansteller-itis  
poser-ITIS  
'affectation'

(25) a. creditcarditis  
b. Hollanditis

Consider a fourth example. The suffix *-in* derives female persons, as in (26) (de Haas & Trommelen 1993:192).

(26) koning-in  
king-IN  
'queen'

The word *koningin* 'queen', however, can easily refer to things which are clearly not intrinsically female, such as a playing card, a piece in chess, the most excellent one in a given set, as in (27), or a cactus, as in (28).

(27) Oostende, de koning-in van de badsteden,  
Oostende<sub>NEUTER</sub>, the king- IN of the bath.cities  
'Oostende, queen of the seaside resorts'

(28) koning-in van de nacht  
king-IN of the night  
'selenicereus grandiflorus (a type of cactus)'

One could argue that it is *koningin* 'queen' as a whole which is malleable and not *-in*. However, this is not relevant. If *-in*, the head of the derived form, truly realized the feature [feminine], this femininity should be syntactically relevant and not alterable. It should, for example, block sentences such as the one in (29).

(29) De koningin<sub>i</sub> is zijn<sub>i</sub> schoenen vergeten.  
the queen is his shoes forgotten  
'The queen forgot his shoes'.

However, (29) is perfectly acceptable in a context in which a queen is played by a man. The contrast is clear when compared to a syntactic feature [feminine] on a pronoun, as in (30).

(30) \* Zij<sub>i</sub> is zijn<sub>i</sub> schoenen vergeten.  
she is his shoes forgotten

The examples above show that the syntactic derivation does not contain a syntactic feature [feminine] for (29) in contrast with (30).

The suffix *-ling* typically derives words that refer to persons (de Haas & Trommelen 1993:183).<sup>18</sup> This is illustrated in (31).

- (31) leer-ling  
learn-LING  
'pupil'

The animacy restriction can be overridden by the context, however. This is shown in (32).

- (32) Onze wijk was de beste leerling  
our neighborhood was the best learn-LING  
van de klas op het vlak van energieverbruik.  
of the class on the domain of energie.use  
'Our neighborhood scored best when it came to energy consumption.'

One may argue that the examples above illustrate incidental cases and are not indicative of the general meaning of derivational affixes. Note in this respect, however, that more than one fourth of the Dutch affixes have been described as deriving animates in general or feminines specifically (see de Haas and Trommelen 1993). One could easily repeat the arguments presented above for all members of this group. Note further that I have shown that the same observation holds for derivational affixes which do not refer to animates too, such as those which refer to abstractness. In other words, the examples above are far from isolated cases and are representative of the bulk of derivational affixes. Summarizing, the meaning of derivational affixes is not hardwired. Its interpretative source is therefore not to be found in syntactic features.

#### 4.1.3 Derivational affixes can express kinds of matter

Talmy (2000:12) observes that syntactic meaning cannot be specific as to certain aspects of the described situation, such as speed or kinds of matter. He concludes that Universal Grammar has no syntactic features to distinguish between different types of matter.<sup>19</sup> Hence, if vocabulary items do express different types of matter they do not express syntactic features, but lexical meaning.

There are derivational affixes in Dutch that vary according to the precise nature of matter referred to. The suffix *-icide* refers to poisons, *-aan* to gasses, *-een* and *-yl* to specific subsets of organic compounds, *-ase* to enzymes and *-ose* to sugars (de Haas & Trommelen 1993:274). Examples are given below.

- (33) a. insect-icide    b. prop-aan    c. malt-ase    d. malt-ose    e. vin-yl  
insect-ICIDE    prop-AAN    malt-ASE    malt-OSE    vin-YL  
'insecticide'    'propane'    'maltase'    'maltose'    'vinyl'

If Talmy is right that syntactic features systematically ignore differences in matter, then these derivational affixes express lexical meaning.

#### 4.1.4 Derivational affixes may refer to inventions

It is reasonable to assume that grammatical features cannot refer to inventions or artifacts (Talmy 2000, Kiparsky 1997 vs. Fodor 1981). Universal Grammar cannot have foreseen human inventions. Therefore, if derivational affixes refer to artifacts, their meaning is lexical, not functional. This is indeed the case, as the reader can already deduce from the previous section;

<sup>18</sup> There are some occasional exceptions such as *leerling* 'die'.

<sup>19</sup> To be precise, syntactic features do not distinguish between *types* of matters. For example, they cannot express the difference between *milk* and *water* or between *sugar* and *sand*. Arguably, there may be syntactic features that distinguish between consistencies. For example, a language may have different classifiers for liquids, such as *milk* and *water*, and semifluids, such as *mayonnaise*.

the suffix *-yl* refers to a synthetic substance. More examples can easily be found. The suffix, *-theek*, for example, refers to places where one can rent stuff, as in (34). The whole concept of renting is a human invention; animals do not rent stuff.

- |      |    |              |    |              |    |                                 |
|------|----|--------------|----|--------------|----|---------------------------------|
| (34) | a. | video-theek  | b. | biblio-theek | c. | speel-o-theek                   |
|      |    | video-THEEK  |    | biblio-THEEK |    | play-LP <sup>20</sup> -theek    |
|      |    | ‘video shop’ |    | ‘library’    |    | ‘place where one can rent toys’ |

These examples show that affixes can express inventions. This implies that the semantics of derivational affixes cannot be innate and therefore cannot be syntactic.

#### 4.2 Derivational affixes are an open class

Functional meaning is commonly associated with closed classes. The discussion above shows that derivational affixes express lexical meaning, yet they are claimed to be a closed set (Talmy 2000). In this section I briefly comment on this claim. Although the set of derivational affixes does indeed only grow slowly, it is essentially not a closed class.

Above we have seen examples of new affixes that are born together with new inventions and discoveries in, for example, the domain of chemistry. This is expected in the domain of items that are [+lexical]. If we want to be able to talk about inventions, we need open classes of lexical items and we need those classes to contain items with a semantics that surpasses a mere composition of innate features. The fact that newly coined affixes refer to inventions is therefore a strong indication of the fact that they have lexical meaning and that they therefore essentially need to belong to an open class.

New derivational affixes further may emerge from reinterpretations. De Haas & Trommelen (1993:278) point out that the suffixes *-tiek*, *-tel*, *-taria* and *-burger* are recent additions to Dutch Vocabulary. The suffix *-tiek* refers to a luxurious and specialized shop, as in (35)b. It stems from a reinterpretation of the word *boetiek* ‘boutique’ in (35)a.

- |      |    |            |    |                        |
|------|----|------------|----|------------------------|
| (35) | a. | boetiek    | b. | tegel-tiek             |
|      |    | boutique   |    | tile-TIEK              |
|      |    | ‘boutique’ |    | ‘luxurious tile store’ |

The noun *cafeteria* in (36)a gave rise to the suffix *-taria* for spots where one can grab a bite. This is shown in (36)b.

- |      |    |             |    |                                      |
|------|----|-------------|----|--------------------------------------|
| (36) | a. | cafeteria   | b. | snack-taria                          |
|      |    | cafeteria   |    | snack-TARIA                          |
|      |    | ‘cafeteria’ |    | ‘cafeteria where one can eat snacks’ |

A recent member of the set of Dutch derivational affixes is the suffix *-ama*. It refers to night wear, as in (37)b. It was derived from (37)a.

- |      |    |           |    |   |
|------|----|-----------|----|---|
| (37) | a. | pyjama    | b. | short-ama                                       |
|      |    | paj-AMA   |    | short-AMA                                       |
|      |    | ‘pajamas’ |    | ‘summer pajamas with short sleeves and a short’ |

The productive suffix *-fie* was borrowed from English and added to the Dutch vocabulary in 2013. It refers to selfies.<sup>21</sup> Note that it may select Dutch roots.

<sup>20</sup> LP = linking phoneme

<sup>21</sup> The noun *stemfie* was added to the electronic version of the dictionary *van Dale* in 2013. The noun *zvenmfie* is used by my students.

- (38) a. stem-fie  
vote-FIE  
'selfie taken while voting'
- b. zwem-fie  
swim-FIE  
'selfie taken while swimming'

Recent English suffixes are *-licious*, *-pedia*, *-tastic*, *-rama*,<sup>22</sup> *-fie* and the intensifying suffix *-ass* as in the examples below.<sup>23</sup>

- (39) a. booty-licious<sup>24</sup>  
b. cheetah-licious<sup>25</sup>  
c. mama-licious fashion  
d. choco-licious
- (40) a. Wiki-pedia  
b. Art-o-pedia  
c. babynames-pedia  
d. food-a-pedia  
e. Mario-pedia (encyclopedia containing information on Mario Bros)  
f. free-pedia (website containing free software downloads)
- (41) a. a nerd-tastic Halloween costume  
b. a fun-tastic summer  
c. photo-tastic memories
- (42) a. sign-a-rama (a shop for signs)  
b. crap-o-rama (a flea market or garage sale)  
c. source-o-rama (a center for spring water)  
d. link-o-rama (a webpage which is a collection of links)  
e. bumper-rama (a series of unfortunate events)
- (43) a. dogfie  
b. catfie  
c. workfie  
d. snowfie
- (44) a. a big-ass spider  
b. funny-ass pictures  
c. cool-ass cat names

The Dutch and English examples above show that in both languages new derivational affixes can be found. They are mostly formed via a reinterpretation of parts of words as affixes, a process called suffix clipping. Lehmann (1992:224) describes that a similar reinterpretation underlies the origin of the English suffixes *-ling* and *-able*. The suffix *-ling* was clipped from *apeling* 'nobleman', which actually contained the base VI *apele* 'noble' and the suffix *-ing*. The suffix *-able* was clipped from words such as *habitable* from the Latin word *habitabilis*. Clipping occasionally produces a new suffix. In short, although the class of derivational affixes grows slowly, it is essentially an open class. In this respect it differs from completely closed classes.

### 4.3 Summary

In the current section I have argued that derivational affixes adhere to the two defining properties of being [+lexical]. They have lexical meaning and they form an open class. I have

<sup>22</sup> The examples show that *-rama* requires a linking vowel which is *-o-* or *-a-*.

<sup>23</sup> The oldest appearance of the suffix *-licious* known to me is the word 'cha-licious' which is the name of the debut album of the rap band *Menajabtna*. It was released in 1994.

<sup>24</sup> *Bootylicious* is the title of a single from the pop trio *Destiny's child* which was released in 2001.

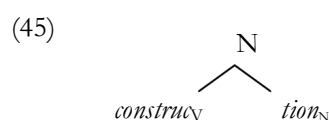
<sup>25</sup> *Cheetah-licious Christmas* is an album from the pop band *The Cheetah Girls*. It appeared in 2005.

argued that their meaning is richer than what can be defined on the basis of innate features as it is malleable, as it can refer to kinds of matter and as it can refer to inventions and artifacts. I have then demonstrated that derivational affixes are essentially an open class, even though this class only grows slowly. I conclude that derivational affixes are [+lexical].

## 5. Derivational affixes may or may not be categorial

### 5.1 Introduction

In order to count as categorial, derivational affixes have to be able to determine the category of the functional superstructure. It seems to be self-evident that they do so. Determining the category of the word of which they are the head is generally assumed to be the *raison d'être* for derivational affixes (Williams 1981:249). For example, *-tion* assigns the category N to the word *construction*. This is illustrated in (45) (the structure is taken from Williams 1981:249).



In (45) the suffix *-tion*, which is marked as nominal in the lexicon, is the head of the word. It therefore projects and assigns the category N to the entire derived structure. As such, the suffix determines the category of the complex word.

In this section I present data that show that this traditional analysis cannot be applied to derivational affixes across the board. About 20% of the Dutch affixes<sup>26</sup> do not unequivocally determine the category of the word they occur in. They are acategorial affixes. The remaining 80% of the affixes indeed seems to project a single category.<sup>27</sup> I will conclude that affixes may or may not be categorial in the sense that they may or may not determine the category of the functional superstructure.

### 5.2 Suffixes that can be found under a nominal and adjectival superstructure

Dutch has 143 affixes.<sup>28</sup> Twenty-one of them yield both nouns and adjectives. The suffix *-eel* and its allomorphs *-ieel*, *-ueel*, *-aal*, *-icaal*, *-onaal* and *-iaal*, for example, show this behavior.

(46) de intellect-ueel  
 the intellect-UEEL  
 'the intellectual'

(47) de koloni-aal  
 the colony-AAL  
 'the colonial'

(48) Zij is intellect-ueel-er dan haar vader.  
 she is intellect-UEEL-COMPARATIVE than her father  
 'She is more intellectual than her father.'

(49) een koloni-aal-e stijl  
 a colony-IAAL-COMMON style  
 'a colonial style'

<sup>26</sup> In what follows I ignore prefixes which have never been analyzed as category-changing, such as *contra-*, as in *contraproductive* and *pseudo-*, as in *pseudo-intellectual*. The term *affixes* thus comprises all suffixes and those prefixes which have been analyzed as category assigners, such as *en-*, as in *enlarge*.

<sup>27</sup> I will not discuss this group as they support the canonical view.

<sup>28</sup> This number is based on the inventory of affixes in De Haas & Trommelen (1993).

The determiners in (46) and (47) show that *intellectueel* and *koloniaal* can be used as nouns. In the same vein, the comparative in (48) and the adjectival inflection in (49) show that the same derived forms can be used as adjectives.

It is not the case that *-eel* systematically realizes one category and that the other category is systematically derived via a conversion mechanism. The affix *-eel* and its allomorphs can derive forms which only have a nominal status, as *houweel* ‘pickax’ and *bureel* ‘office’ or which only can be used as adjectives, such as *universeel* ‘universal’ and *paradoxaal* ‘paradoxal’. As such, it is not the case that the nouns result from a systematic conversion of the adjectives or vice versa. More generally, *-eel* is not marked for a specific category.

The suffix *-eel* is far from an isolated case in Dutch. There are 21 suffixes which can derive both nouns and adjectives. A complete list is given in (50).

(50)

suffix	N	A
-air	<i>diamantair</i> ‘diamond dealer’	<i>elementair</i> ‘elementary’
-oot	<i>malloot</i> ‘scatterbrain’	<i>idioot</i> ‘idiotic’
-(o)ide	<i>asteroïde</i> ‘asteroid’	<i>paranoïde</i> ‘paranoid’
-ieur	<i>interieur</i> ‘interior’	<i>inferieur</i> ‘inferior’
-aan	<i>mobammedaan</i> ‘Muhammadan’	<i>momentaan</i> ‘momentary’
-aat	<i>kandidaat</i> ‘candidate’	<i>accuraat</i> ‘accurate’
-ant/-ent	<i>communicant</i> ‘communicant’	<i>arrogant</i> ‘arrogant’
	<i>solvent</i> ‘solvent’	<i>coherent</i> ‘coherent’
-é	<i>exposé</i> ‘account’	<i>privé</i> ‘private’
-iel	<i>debiel</i> ‘imbecile’	<i>fragiel</i> ‘fragile’
-iet	<i>meteoriet</i> ‘meteorite’	<i>erudiet</i> ‘erudite’
-oos	<i>leproos</i> ‘leper’	<i>mucoos</i> ‘mucous’
-t	<i>product</i> ‘product’	<i>abstract</i> ‘abstract’
-(e)ling	<i>tweeling</i> ‘twins’	<i>mondeling</i> ‘oral’

-el	<i>aquarel</i> 'aquarelle'	<i>naturel</i> 'natural'
-er	<i>bakker</i> 'baker'	<i>Groninger</i> 'from Groningen'
-eel/-aal	<i>bureel</i> 'office'	<i>paradoxaal</i> 'paradoxical'
-iek	<i>motoriek</i> 'locomotion'	<i>sympathiek</i> 'congenial'
-ief	<i>collectief</i> 'collective'	<i>foutief</i> 'wrong'
-oir	<i>urinoir</i> 'urinal'	<i>notoir</i> 'notorious'
-ikoos	<i>abrikoos</i> 'apricot'	<i>studentikoos</i> 'studentlike'
-en	<i>Zweden</i> 'Sweden'	<i>houten</i> 'wooden'

The list above shows that it is common for an affix to form both nouns and adjectives. Below I discuss affixes that are ambiguous between other categories.

### 5.3 Suffixes that can be found under a nominal and verbal superstructure

The suffix *-el/-er* derives both nouns and verbs. The examples in (51) are nouns, those in (52) are verbs.

- (51) a. een krab-el  
a scratch-EL  
'a scribble'
- b. een trom-el  
a drum-EL  
'a drum'
- c. een klont-er  
a lump-ER  
'a lump'
- (52) a. krab-el-en  
scratch-EL-INFINITIVE  
'to scrawl'
- b. trom-el-en  
drum-EL-INFINITIVE  
'to drum'



- c. klont-er-en  
 lump-ER-INFINITIVE  
 ‘to lump’

Note that the fact that a suffix can occur both under nominal and verbal functional structure indicates that a featural decomposition of categories cannot be used to account for multicategorical affixes. One could argue to decompose categories in a feature matrix as in (53) (see Chomsky 1981). In (53) categories are defined by feature matrices, i.e. categories are defined by specific combinations of features. The table shows that two binary features, viz. V and N define four lexical categories, viz. V, N, A and P.

(53)

	V	N
Verb	+	-
Noun	-	+
Adjective	+	+
Preposition	-	-

For an affix such as *-eel*, which derives both adjectives and nouns, it is reasonable to assume that *-eel* realizes the feature [+N]. Although this account successfully derives the multicategorical behavior of *-eel*, it predicts that affixes never realize both verbs and nouns as these categories do not share a feature. The present section has shown, however, that the multicategorical behavior of affixes is not restricted to those categories which share a value. Hence, a feature matrix cannot be used to account for multicategorical affixes.

#### 5.4 Suffixes that can be found under an adjectival and verbal superstructure

The suffix *-ig* derives both adjectives, as in (54), and verbs, as in (55).

- (54) a. een maat-ig-e belangstelling  
 a measure-IG-INFL interest  
 ‘a moderate interest’

- b. een wet-ig-e echtgenote  
 a law-IG-INFL wife  
 ‘a lawful wife’

- c. een hart-ig-e hap  
 a heart-IG-INFL snack  
 ‘a savoury snack’

- (55) a. maat-ig-en  
 measure-IG-INFINITIVE  
 ‘to moderate’

- b. wet-ig-en  
 law-IG-INFINITIVE  
 ‘to legitimate’

- c. steen-ig-en  
 steen-IG-INFINITIVE  
 ‘to stone’

### 5.5 Suffixes that can be found under an adverbial and adjectival superstructure

The suffix *-(e)lijk* is used to derive both adjectives and adverbs. Example (56) shows an adjective, (57) an adverb.<sup>29</sup>

- (56) de sterf-elijk-e mens  
the die-ELIJK-INFL human.being  
'the mortal man'
- (57) Zij werd vals-elijk beschuldigd.  
she became false-ELIJK accused  
'She was falsely accused'

Dutch thus has an affix which can derive both adjectives and adverbs.

### 5.6 Multicategorical prefixes

Dutch has 5 prefixes which have been called category-defining.<sup>30,31</sup> Yet, four of them form both verbs and nouns. These are *be-*, *ver-*, *ont-* and *ber-*.<sup>32</sup> The examples in (58), (60), (62) and (64) are nouns which are derived by means of these prefixes. The examples in (59), (61), (63) and (65) are verbs containing those same prefixes.

*be-*

- (58) a. het be-leid  
the BE-lead  
'the policy'
- b. het be-zwaar  
the BE-heavy  
'the objection'
- c. het be-roep  
the BE-call  
'the profession'
- d. het be-raad  
the BE-advise  
'the consideration'
- (59) a. be-plant-en  
BE-plant-INFINITIVE  
'to plant'
- b. be-wierook-en  
BE-incense-INFINITIVE  
'to praise'
- c. be-loov-en  
BE-laud-INFINITIVE  
'to promise'
- d. be-zorg-en  
BE-care-INFINITIVE  
'to provide'

*ver-*

- (60) a. het ver-keer  
the VER-turn  
'the traffic'
- b. het ver-tier  
the VER-yell  
'the amusement'
- c. het ver-lof  
the VER-LOF  
'the permission'

<sup>29</sup> All Dutch adjectives can be used as adverbs. However, the reverse does not hold. The adverb *valselijk* 'falsely', for example, cannot be used as an adjective, e.g. *\*een valselijke beschuldiging*, Intended: 'a false accuse'.

<sup>30</sup> There is a sixth vocabulary item which may be considered to be a prefix, viz. *er-*. However, it is highly marginal as it only occurs in three verbs, viz. *erbarmen* 'to have mercy on', *erkennen* 'to recognize' and *ervaren* 'to experience'.

<sup>31</sup> Recall that I omit affixes such as *meta-* and *anti-* from the discussion.

<sup>32</sup> The category-defining status of *ber-* is in dispute. See de Haas and Trommelen (1993:89-94) for detailed discussion.

- (61) a. ver-wacht-en  
VER-wait-INF  
'to expect'
- b. ver-brand-en  
VER-burn-INF  
'to burn'
- c. ver-mager-en  
VER-meager-INF  
'to loose weight'
- (62) a. de her-komst  
the HER-coming  
'the origin'
- b. het her-stel  
the HER-put  
'the recovery'
- (63) a. her-waardeer-en  
HER-appreciate-INF  
'to revalue'
- b. her-enig-en  
HER-unite-INF  
'to reunite'
- (64) a. het ont-zag<sup>33</sup>  
the ONT-see  
'the respect'
- b. het ont-zet  
the ONT-set  
'the liberation'
- (65) a. ont-duik-en  
ONT-dive-INF  
'to evade'
- b. ont-maagd-en  
ONT-virgin-INF  
'to deflower'

The affix *ge-* yields nouns, as in (66), verbs, as in (67) and adjectives, as shown in (68).

- (66) a. het ge-bit<sup>34</sup>  
the ge-bite  
'the teeth'
- b. het ge-bed<sup>35</sup>  
the GE-pray  
'the prayer'
- (67) a. ge-loov-en  
GE-loov-INF  
'to believe'
- b. ge-draag-en  
GE-bear-INF  
'to conduct'
- (68) ge-trouw  
GE-loyal  
'loyal'

Prefixes thus commonly derive more than one category. Most of them can be used to derive at least both nouns and verbs.

### 5.7 Homonymy is not at play here

One might assume that it is not the fact that a suffix such as *-eel* may occur both under nominal and adjectival superstructure, but that there are rather two homonymic suffixes, one of which is nominal and one of which is adjectival. In this section I present tests to detect homonymy and I will show that the suffix *-eel* is not homonymic. For reasons of space I illustrate the tests solely using the suffix *-eel*. I define homonymy as in (69).

<sup>33</sup> *Zag* is a stem allomorph of *zje* 'see'.

<sup>34</sup> *Bit* is a stem allomorph of *bijt* 'bite'. The word *gebit* refers to a set of teeth.

<sup>35</sup> *Bed* is a stem allomorph of *bid* 'pray'.

- (69) Two affixes are homonyms if they are listed as two separate vocabulary items, even though they have the same phonological exponence.

Homonyms are thus two different vocabulary items with the same surface form. As they are two different vocabulary items, they each have their own semantics and insertion contexts. There are three ways to detect homonymy.

Firstly, allomorphy can be used to test for homonymy. As homonymic affixes are independent vocabulary items they have a different etymological source. It is therefore possible that they have different allomorphs.<sup>36</sup> As such, different allomorphs signal homonymy. If two homonyms had exactly the same allomorphs, this could only be ascribed to sheer coincidence. Such a view should therefore only be adopted if the unexpected identity of the allomorphs can be independently accounted for. In sum, I consider affixes with the same phonological form, but with different allomorphs to be homonyms. Conversely, affixes with the same phonological form and the same allomorphs are not homonyms.

Let me first illustrate how the test works. The Dutch pluractional suffix *-er*, as in (70), has the same phonological form as the agentive suffix *-er*, as in (71).

- (70) klap-eren  
clap-ER<sub>PLURACTIONAL</sub>-INF  
'to flap'

- (71) bak-er  
bake-ER<sub>AGENTIVE</sub>  
'baker'

Now, one does not expect a pluractional suffix and an agentive one to be one and the same affix. It is reasonable to assume they are homonyms. In other words, they are two independent vocabulary items which just happen to have the same form. In this respect it is unsurprising that these suffixes have different allomorphs. The agentive suffix has the allomorph *-aar*, which may occur after sonorants, as in (72). The pluractional suffix, in contrast, never occurs as *-aar*, not even after sonorants, as shown in (73).

- (72) win-aar  
win-ER<sub>AGENTIVE</sub>  
'winner'

- (73) wiel-er-en  
wheel-ER-INFINITIVE  
'to bike'

The pluractional suffix, in contrast, has an allomorph *-el*, as in (74). As expected, the suffix *-el* never occurs as an agentive suffix.

- (74) a. meng-el-en  
mingle-EL-INFINITIVE  
'to mingle'

In short, homonyms have different allomorphs.

Now consider the nominal and adjectival versions of *-eel*. It is clear that the affixes have the same allomorphs.<sup>37</sup> The examples below illustrate for each allomorph that it can occur both in nouns and in adjectives. The *a*-examples are used as nouns, the *b*-examples are used as adjectives.

<sup>36</sup> Similarly, homonymic verbs may have different irregular past tenses and participles, e.g. *bid*<sub>1</sub>

(as in 'He bid on the painting') has the participle *bid*, while *bid*<sub>2</sub> (as in 'bid farewell') has the participle *bade*.

<sup>37</sup> Their distribution is not determined by phonology, but by etymology (see the lemma -EEL in De Vries and te Winkel 2001).

(75) *-eel*

- a. het mor-eel  
the mor-AAL  
'the morale'
- het person-eel  
the person-EEL  
'the staff'
- b. de mor-eel-e verplichting  
the mor-EEL-INFL obligation  
'the moral duty'
- de univers-eel-e waarde  
the univers-EEL-INFL value  
'the universal value'

(76) *-ieel*

- a. het potent-ieel  
the potent-IEEL  
'the potential'
- het different-ieel  
the different-IEEL  
'the differential'
- b. het karakter-ieel-e profile  
the character-IEEL-INFL profile  
'the personality profile'
- de offic-ieel-e opening  
the offic-IEEL-INFL opening  
'the official opening'

(77) *-ueel*

- a. de homosex-ueel  
the homosex-UEEL  
'the homosexual'
- de convent-ueel  
the convent-UEEL  
'the conventual'
- b. de homosex-ueel-e jongen  
the homosex-UEEL-INFL boy  
'the homosexual boy'
- de contract-ueel-e verplichting  
thecontract-UEEL-INFL obligation  
'the contractual obligation'

(78) *-aal*

- a. de liber-aal  
the liber-AAL  
'the liberal'

het kapit-aal  
‘the capit-AAL  
‘the capital (i.e. wealth in the form of money)’

b. de liber-aal-e politicus  
de liber-AAL-INFL politician  
‘the liberal politician’

de kapit-aal-e fout  
the capit-AAL-INFL error  
‘the capital error’

(79) *-icaal*

a. de vert-icaal  
the vert-ICAAL  
‘the vertical’

de rad-icaal  
the rad-ICAAL  
‘the radical’

b. de vert-icaal-e lijn  
the vertic-AAL-INFL line  
‘the vertical line’

het nonsens-icaal-e antwoord  
the nonsens-ICAAL-INFL answer  
‘the nonsensical answer’

(80) *-naal*

a. de marg(e)-i-naal  
the margin-LP-NAAL  
‘the outcast’

het passie-o-naal  
the passion-LP-NAAL  
‘the passionate’

b. de marg(e)-i-naal-e groep  
the margin-LP-AAL-INFL group  
‘a fringe group’

de regio-naal-e overheid  
the region-NAAL-INFL overheid  
‘the regional government’

- (81) *-iaal*
- a. het equator-iaal  
 the equator-IAAL  
 ‘the equatorial telescope’
- het glac-iaal  
 het glac-IAAL  
 ‘the ice age’
- b. de pest-iaal-e ziekte  
 the pest-IAAL-INFL power  
 ‘the pestlike disease’
- het glac-iaal-e dal  
 the glac-IAL-INFL valley  
 ‘the glacial valley’

The examples show that the suffix which occurs in the nouns and the one which occurs in the adjectives have exactly the same allomorphs.<sup>38</sup> I conclude that they are the same vocabulary item. Therefore, they are not homonymic.

As a second test for homonymy consider the following. It is generally illicit to repeat the same affix in a derivation (Beard 1995:165). This is shown in (82) for English (the example is taken from Beard 1995:165) and in (83) for Dutch.<sup>39</sup> In contrast, it is common to combine two different affixes, as in (84).

- (82) \* a bakeryery  
 Intended: ‘a place of bakeries’

- (83) a. \* schrijv-er-aar  
 write-ER<sub>AGENTIVE</sub>-AAR<sub>AGENTIVE</sub>  
 Intended: ‘someone who is in one way or another involved with authors’

- b. \* print-er-aar  
 print-ER<sub>AGENTIVE</sub>-AAR<sub>AGENTIVE</sub>  
 Intended: ‘someone who is in one way or another involved with printers’

- (84) a **bakeryless** town

Given that different affixes can be combined, it is expected that homonymic affixes can also co-occur. After all, they are different affixes with their own unique semantics. Different instances of the same affix, on the other hand, cannot co-occur.

As an illustration of the test, consider again the pluractional suffix *-er* and the agentive suffix – *er/-aar*. Given that we assumed that they are homonyms, it is not surprising that the pluractional suffix *-er* can combine with the agentive suffix *-er*, as is illustrated in (85).

- (85) a. klap-er-aar  
 clap-ER<sub>PLURACTIONAL</sub>-AAR<sub>AGENTIVE</sub>  
 ‘flapper’
- b. kiek-er-aar  
 tumble-ER<sub>PLURACTIONAL</sub>-AAR<sub>AGENTIVE</sub>

<sup>38</sup> These allomorphs are not phonologically conditioned.

<sup>39</sup> In Dutch certain affixes may be repeated without any semantic or syntactic effect caused by the repetition. It is, for example, possible to reduplicate the comparative affix in informal speech, e.g. *groterder* (Lit. big-er-er). The form *groterder* does not differ in meaning or use from the regular form *groter* ‘bigger’.

‘tumbler’

In short, I take the combinability of two affixes with the same form as positive evidence for homonymy.

Now consider again the adjectival and nominal suffix *-eel*. The suffixes cannot co-occur. This is shown in (86)-(87).

(86) \* de nonsens-icaal<sub>A</sub>-aal<sub>N</sub>  
the nonsense-ICAAL-AAL  
Intended: ‘someone or something which is nonsensical’

(87) \* het convent-ueel<sub>N</sub>-eel<sub>A</sub>-e leven  
the convent-UEEL-EEL-INFL life  
Intended: ‘the conventual life’

The fact that these suffixes do not co-occur is immediately accounted for if we accept that they are one and the same vocabulary item. Hence, they are not homonyms.

Thirdly and finally, homonyms do not have the same synonym(s). I define synonymy in (88).

(88) Vocabulary items are synonyms if they have the same or a very similar meaning in at least one of their uses.

Clear homonyms, such as *too* and *two*, do not have the same synonyms. For instance, *also*, which is a synonym of the English word *too*, is not a synonym of *two*.<sup>40</sup> If it were, this would be due to a sheer coincidence.

As an illustration of the test, consider again the agentive suffix *-er*. One of its synonyms is the agentive suffix *-ant*. The synonymy is supported by the fact that they occasionally even attach to the same base vocabulary item, as shown in (89)-(90).<sup>41</sup>

(89) predik-er  
preach-ER  
‘preacher’

(90) predik-ant  
preach-ANT  
‘preacher’<sup>42</sup>

In contrast, the suffix *-ant* is not a synonym of the pluractional suffix *-er*. There are no examples in Dutch in which the suffix *-ant* expresses pluractionality. This indicates once again that the agentive suffix *-er* is a homonym of the pluractional suffix *-er*. In sum, if two phonologically identical affixes share the same synonym they are one and the same vocabulary item.

Let us now apply this test to the suffix *-eel*. Both for the nominal and the adjectival use of *-eel* and its allomorphs the same synonyms can be found. The suffix *-eel* and its allomorphs can be used to derive the name of a phoneme and the corresponding adjective. The noun is shown in (91), the adjective in (92).

(91) de guttur-aal  
the guttur-AAL  
‘the guttural’

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<sup>40</sup> In the same vein, they do not have the same antonyms either.

<sup>41</sup> I assume that the suffixes *-er* and *-ant* are not allomorphs as they do not share any phonological characteristics.

<sup>42</sup> In the Catholic church *prediker* and *predikant* are synonyms; both refer to a preacher. In the Protestant church they are not; a *prediker* is a preacher and a *predikant* is a clergyman.



- (92) de guttur-aal-e klank  
 the guttur-AAL-INFL sound  
 ‘the guttural sound’

The suffix *-ief* can be used for the same purpose. Example (93) refers to a phoneme, example (94) contains the corresponding adjective.

- (93) de plos-ief  
 de plos-IEF  
 ‘the plosive’

- (94) de plos-iev-e klank  
 the plos-IEF-INFL sound

Both the nominal and the adjectival suffix *-eel* thus have the same synonym, viz. *-ief*. When two instances of a suffix have the same synonym, they are the same vocabulary item and not homonyms. In sum, claiming that there are two affixes *-eel*, viz. a nominal and an adjectival one, obscures the fact that they have the same allomorphs and synonyms and that they cannot co-occur. I therefore conclude that every *-eel* is an instance of the same vocabulary item. This vocabulary item is not nominal as it can derive adjectives, but it is not adjectival either as it can derive nouns. I conclude that it is category neutral.

### 5.8 Summary

I have presented 29 Dutch affixes that are category neutral. 24 of them are suffixes, 5 are prefixes. Dutch has a total of 143 affixes.<sup>43</sup> 29/143 or 20% are not faithful to a single category. This observation is most outspoken for the prefixes. They all merge under more than one category. The vast majority of the ambiguous suffixes, i.e. 87,5%, forms both nouns and adjectives. In sum, in this section I have shown that one fifth of the Dutch derivational affixes do not determine the category of their functional superstructure.

In order to count as categorial under the definition presented in section 2 derivational affixes have to determine the category of the functional superstructure. In the present section it became clear that 20% of the Dutch derivational affixes does not do so. I conclude that one group is [+categorial] and that the other group is [-categorial].

## 6. Interim summary

In the previous sections I have show that derivational affixes are [+lexical, +/-categorial, +functional]. They are [+functional] as they obligatorily select a root or a phrase containing a root as their complement. They are [+lexical] as their meaning is malleable and descriptively too rich to be captured by syntactic features and as they form an open class. They are [+/-categorial] as they may or may not determine the category of the functional superstructure. We can now paste derivational affixes into Zwarts’ scheme:

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<sup>43</sup> A list of affixes which only yield one category can be found in section 4.4.

(95) Overview (preliminary version)

example	Lexical	Categorial	Functional
<b>-heid (deriv. affix)</b>	+	+	+
<i>kat</i> 'cat'	+	+	-
<b>-eel (deriv. affix)</b>	+	-	+
	+	-	-
<i>van</i> 'of'	-	+	+
<i>achter</i> 'behind'	-	+	-
<i>de</i> 'the'	-	-	+
	-	-	-

It is clear that derivational affixes fill two slots that were previously empty. Just like prepositions, they are in-between categories, but unlike prepositions, which are [-lexical, +categorial, +/-functional], derivational affixes are [+lexical, +/-categorial, +functional]. In other words, the two hybrid categories occupy different spaces in the functional-lexical divide. In the next section I discuss how this proposal can be adopted and understood in a root-based framework.

## 7. Consequences for root-based frameworks

### 7.1 Derivational affixes in Distributed Morphology and in the Exo-Skeletal Model

Root-based frameworks submit that the lowest projection of the syntactic structure is a root. The root node is devoid of any feature. It is typically realized by open-class lexical items. As it is not marked with any features the root is not marked with categorial features either. It rather inherits its category from the functional structure with which it merges. There are two main approaches to roots, viz. Distributed Morphology (Halle and Marantz 1993, Harley and Noyer 1999 and subsequent literature) and the Exo-Skeletal Model (Borer 2005a,b, 2013). Below I argue that the present proposal is problematic for Distributed Morphology, but that it is fully compatible with the Exo-Skeletal Model

Distributed Morphology assumes a dichotomy between lexical and functional material. It distinguishes between the root, which is lexical, and all the rest, which is functional. It follows that derivational affixes are functional heads in this framework as they are not roots (see Lowenstamm 2010 and De Belder 2011 for notable exceptions). In Distributed Morphology derivational affixes realize categorial heads, which are called little heads, such as  $n^{\circ}$ ,  $v^{\circ}$  and  $a^{\circ}$ . Whether such a categorial head can be assigned a rich, lexical meaning depends on its position in the structure. Only the categorial head that merges directly with the root can be assigned a stored interpretation (Marantz 2001). The meaning of all other heads is computed compositionally.

The present proposal is not immediately compatible with these views. The bifurcation between roots and non-roots is too crude and the view that a lexical meaning for derivational affixes depends on its position in the syntactic structure contradicts the conclusions we have reached in section 4.

The Exo-Skeletal Model, on the other hand, proposes that derivational affixes are of a different type than roots or functional items. They are an in-between class of items that select for a root, that are marked for a category and that are interpreted by Encyclopedia. Encyclopedia is able to assign a stored interpretation to an item. It applies to a restricted domain: it is blocked by functional items. Functional items are therefore not subject to an interface, which assigns a stored interpretation to them,<sup>44</sup> unlike derivational affixes.

The Exo-Skeletal view on derivational affixes meshes well with the present proposal. It acknowledges that the status of derivational affixes cannot be aligned with other functional affixes and it is fully compatible with the view that the meaning of derivational affixes is lexical and thus potentially surpasses what can be merely computed on the basis of innate features. The

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<sup>44</sup> The meaning of functional items is computed by LF, which operates strictly compositionally.

conclusions that have been reached in this paper are thus immediately applicable in root-based frameworks if one adopts some key-insights of the Exo-Skeletal Model.

## 7.2 The position of *cat* in the scheme

In order to be compatible with root-based frameworks, the original scheme proposed by Zwarts, as repeated in (96), has to be adapted slightly.

(96)

class	example	type of the example	Lexical	Categorial	Functional
			+	+	+
N, V, A	<i>kat</i> 'cat'	N	+	+	–
			+	–	+
			+	–	–
P	<i>van</i> 'of'	P(N)	–	+	+
P	<i>achter</i> 'behind'	P	–	+	–
functional items	<i>de</i> 'the'	F(N)	–	–	+
			–	–	–

Zwarts' scheme reflects the assumption that lexical nodes are marked with a category which they project. For example, *cat* is assumed to be a noun and as such it determines the nominality of the functional superstructure. By definition this assumption is incompatible with the root hypothesis, which postulates that the root is not marked with any features and that its category is determined by the category of the functional structure with which it has merged. Yet, the idea that categoriality is *in se* separated as a parameter from lexicality is fully compatible with the root hypothesis. It therefore suffices to assume that items such as *cat* are acategorial, as in (97)b, instead of being categorial as in (97)a.

- (97) a. Zwarts:  $cat = [+lexical, -functional, +categorial]$   
 b. Root-based:  $cat = [+lexical, -functional, -categorial]$

Let us summarize what we have derived. An overview is given in (98). For ease of exposition, I adopt Zwarts' notation to describe the type of the example. I use brackets to indicate obligatory transitivity (i.e. functionality). I use the name of the category (e.g. N) if a class is categorial, otherwise I use F. I have added the symbol for roots ( $\checkmark$ ) to the scheme to refer to roots.

(98)

class	example	type of example	Lexical	Categorial	Functional
derivational affixes	-heid (affix)	N(A)	+	+	+
?	?	?	+	+	–
derivational affixes	-eel (affix)	F(√)	+	–	+
roots	kat ‘cat’	√	+	–	–
prepositions	van ‘of’	P(N)	–	+	+
prepositions	achter ‘behind’	P	–	+	–
functional items	de ‘the’	F(N)	–	–	+
?	?	?	–	–	–

## 8. Conclusion

The scheme in (98) reflects the following key insights on the lexical-functional divide. Firstly, the divide results from the fact that there are three different parameters, independent of one another. They create eight slots in the scheme. Our prototypical perception of the lexical end of the divide is a slot which is [+lexical], i.e. which is defined by a rich semantics, and [–functional], i.e. which is intransitive. Prototypically functional is a slot which is [–lexical] and [+functional]. In between those two ends there are hybrid types, such as prepositions and derivational affixes. Even though prepositions and derivational affixes are both in-between types, they occupy a different space in the divide.

I have arrived at the conclusion that derivational affixes are [+lexical, +functional, +/-categorial]. I have argued that they are [+functional] as they are obligatorily transitive. I have further shown that they are [+lexical] by demonstrating that their meaning is lexical. This became clear through the fact that it is malleable and that it can refer to kinds of matter, artifacts and inventions. Moreover, I have shown that the class of derivational affixes is not closed. This is expected for a class that expresses lexical meaning. By discussing two distinct types of derivational affixes in Dutch I have argued that they may or may not be categorial. 80% of the Dutch derivational affixes unequivocally determine the category of their functional superstructure, yet, 20% do not. In sum, derivational affixes are [+lexical, +functional]. Most often they are [+categorial], but they can be [–categorial].

Two slots in the scheme are still empty. The last slot of the scheme may be empty for conceptual reasons. It is not clear what the function could be of a type which is neither lexical, functional or categorial. However, the emptiness of the slot [+lexical, +categorial, –functional] is more interesting. At first sight the hypothetical possibility seems to defy the root hypothesis. It seems to imply the conceptual possibility of a root that is categorial, *a contradictio in terminis*. However, note that the scheme summarizes the inventory of *vocabulary items*, not the inventory of *syntactic nodes*. Even though a root *node* that is marked for categorial features is a conceptual and syntactic impossibility (see De Belder & van Craenenbroeck to appear), a vocabulary item that is [+lexical, +categorial, –functional] is perfectly feasible. I leave a proposal on this possibility for future research.

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