

54. Closing suffixes

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First proof

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Abstract

Closing suffixes are a topic related to affix ordering. A closing suffix closes the word to further suffixation. The article discusses a number of theoretical issues relevant to closing suffixation and considers examples from different languages. It is shown that there are closing suffixes in inflection and closing suffixes in derivation and that in derivation attention should also be paid to evaluative suffixes, since they are not always trivially closing.

1. Introduction

Closing suffixes or closing suffixation (I use the two terms as interchangeable) is a topic related to affix ordering. The latter is a central issue in linguistics and many theories have been suggested to account for the way affixes combine (see the overviews in Manova and Aronoff 2010 and Rice 2011). According to Manova and Aronoff (2010), there are eight types of approaches to affix order: 1) phonological; 2) morphological; 3) syntactic; 4) semantic; 5) typological; 6) psycholinguistic; 7) cognitive; and 8) templatic. Phonological affix ordering uses phonological information, morphological ordering relies on morphological information, etc., and templatic ordering means that there is some order but it is (usually) inexplicable. Following this classification, closing suffixes are a sub-type of morphological ordering, since the definition of closing suffixation relies on morphological information such as the existence of suffixes (morphemes). The idea of closing suffixation is thus an additional attempt to explain restrictions on affix ordering. The logic behind it is the following. On the one hand, diagrammatic affixation (i.e. affixation by addition of an overt affix) is the most natural way of expressing addition of meaning (i.e. new semantics) in a natural language; on the other hand, the words are not always formed by the addition of affixes to already affixed words. This fact provides evidence, among other things, that some of the affixes a language possesses may serve to stop the further affixation. Such affixes seem to ‘close’ the word to the addition of further affixes and are therefore termed *closing*. In the literature, the issue has been discussed only with respect to suffixation, therefore the term ‘closing suffixes’. However, as we will see below, prefixation also appears compatible with the idea of closing morphemes.

2. History of research

The first mentioning of the term ‘closing’ with respect to morphological material is usually referred to Eugene Nida’s book *Morphology* (1946, 1949 2nd ed.). Nida (1949: 85) differentiated closing and non-closing morphemes and used the label ‘closing’ to describe the role of the inflectional suffixes in morphology, i.e. the fact that after an inflectional suffix no derivational suffixes can be added.

“Certain morphemes close the construction to further formation. For example, in English the use of a genitive suffix closes the noun to further suffixation. No suffix may follow the genitive.

[...]

[T]he addition of the plural *-s* closes any form to further derivation by such suffixes as *-ment*, *-ity*, *-ence*, *-ion*, *-ian*, *-ize*, *-er*. A genitive suffix does the same thing. This break in structure in English coincides with the division between inflectional and derivational formations.”

Thus, Nida’s definition of a closing suffix is a version of Greenberg’s “*Universal 28*: If both the derivation and the inflection follow the root, or they both precede the root, the derivation is always between the root and the inflection” (Greenberg 1963: 93).

In his 1985 Ph.D. dissertation, van Marle reported the “inability” of some Dutch derivational suffixes “to constitute the starting point for further morphological coining” (p. 236). However, van Marle did not use the term ‘closing suffix’ but spoke of suffixes the morphological valence of which is either low or zero (cf. Schultink 1962: 132 f.).

“The characteristic trait of *low-valence [derived] words* is that their morphological valence is (i) either highly restricted, or (ii) zero. In the case that their morphological valence is *not* equal to zero, there is a proviso that further coining is restricted to categories with a predominantly – or even exclusively – ‘syntax-directed’ nature.” (van Marle 1985: 236)

In a similar fashion, in the more recent literature on affix ordering closing suffixes are usually defined as derivational suffixes that do not allow addition of further derivational suffixes. A number of linguists have reported the existence of closing suffixes in various languages: Szymanek (2000) is on closing morphemes (the term Szymanek uses) in English and Polish; Aronoff and Fuhrhop (2002) report a phenomenon that bans the further derivation in German and explain it in terms of closing suffixes; Manova (2008, 2010) provides evidence for closing suffixes in Bulgarian and Russian; Plungian and Sitchinava (2009) speak of closing suffixes in Russian; Melissaropoulou and Ralli (2010) acknowledge the existence of closing suffixes in Greek derivational morphology; and Manova and Winternitz (2011) discuss closing diminutive suffixes in Bulgarian and Polish. (Note, however, that these studies, though dealing with closing suffixes, are not thorough investigations of the phenomenon of closing suffixation.)

It should also be mentioned that the term closing suffix is difficult to find in reference sources. Even reference books devoted exclusively to morphological terminology (e.g., Laurie Bauer’s *A Glossary of Morphology* 2004) do not have an entry for ‘closing suffix’. I could find ‘closing suffix’ only in the glossary of Aronoff and Fudeman’s book *What is Morphology?* (2005).

Finally, some approaches to affix ordering, without explicitly mentioning closing suffixes, are perfectly compatible with the phenomenon of closing suffixation. Approaches of this type are: the monosuffix constraint (Aronoff and Fuhrhop 2002); the Parsability Hypothesis (Hay 2001, 2002, 2003) and the elaboration of it termed *Complexity-Based Ordering (CBO)* (Plag 2002; Plag and Hay 2004; Plag and Baayen 2009). Finally, an analysis that relies on morphological selectional restrictions (Plag 1996) is also compatible with closing suffixes.

According to the monosuffix constraint, in English “suffixes that select Germanic bases select unsuffixed bases” (Aronoff and Fuhrhop 2002: 473), i.e. the Germanic part of the English derivational morphology allows only one derivational suffix and that single derivational suffix is thus a closing suffix. This issue is also discussed in Szymonek (2000) who illustrates it with copious examples and who, in contrast to Aronoff and Fuhrhop (2002), provides an analysis in terms of closing morphemes. Aronoff and Fuhrhop’s (2002) argument as to why they speak of the monosuffix constraint in English and of closing suffixes in German is the following: “If English Germanic suffixes were all closing suffixes, then all the adjectival suffixes would have to be viewed as exceptionally non-closing only when they are followed by *-ness*. When not followed by *-ness*, the same suffixes would be closing suffixes. So the exceptionality of *-ness* cannot be expressed properly within the closing suffix framework” (p. 475). Note that the English suffix *-ness* is closing.

The Parsability Hypothesis claims that a set of factors are responsible for morphological parsing, such as phonology, productivity, regularity, semantic transparency, and relative frequency. Since parsability depends on a number of factors, it is a gradual notion and allows affixes to be ordered hierarchically according to their degree of parsability. Parsability determines affix order in the sense that a more parsable affix should occur outside a less parsable affix because this order is easier to process. As a parsable affix adds morphological structure to a base, making the latter more complex morphologically, Plag (2002) termed affix ordering that depends on parsability *Complexity-Based Ordering (CBO)*. Thus the parsability hierarchy (or CBO ordering) of the suffixes A, B, C, D and E (see Table 1), where A is the least parsable suffix and E is the most parsable one, predicts that all combinations in which A is followed by the suffixes B, C, D and E should be possible, whereas combinations such as *CAD and *EAB should be impossible. This way of ordering of affixes assigns to the suffix E the status of a closing suffix. Table 54.1 illustrates this type of affix ordering with a hypothetical example of a parsability hierarchy:

Tab. 54.1: A hypothetical parsability hierarchy (‘+’ marks existing combinations)

SUFF1 \ SUFF2	A	B	C	D	E
A		+		+	
B			+		+
C				+	+
D					
E					

Note that in the parsability hierarchy more than one suffix can be closing. For example, in table 1 both D and E are closing.

Plag (2002) and Hay and Plag (2004) also demonstrate that parsability works in conjunction with selectional restrictions on affix order. An example of a selectional rule is the fact that the English suffix *-ization* always selects the suffix *-al*. On the role of selectional restrictions in English word-formation, see Plag (1996). Thus, a selectional rule may also state that a particular suffix is never followed by another suffix, i.e. that it is a closing suffix.

3. Delimiting the phenomenon and providing a precise definition

3.1. Delimiting closing suffixation

3.1.1. Terminal suffixes

A terminal suffix is the last suffix in a word form. However, since there may be a suffix that is terminal in one word and followed by a suffix in another word, not all terminal suffixes are closing. For example, the English suffix *-ation* is terminal in *organiz-ation* but followed by *-al* in *organiz-ation-al*.

3.1.2. Blocking

Another phenomenon related to closing suffixation is blocking. We speak of blocking if the existence of one lexeme prevents the derivation of another lexeme with the same or similar semantics (Aronoff 1976, and many others). For example, the existence of *glory* in English blocks the derivation of **gloriousity* (Aronoff 1976: 44) and thus also the suffix combination *-ous + -ity* in this particular case. However, if one of the combinations of the suffix *-ous* is blocked, it does not mean that *-ous* is closing. Consider, for example, *gloriousness*, where *-ous* is followed by *-ness*. Blocking refers to a single combination of two particular suffixes, often only in a single word (on blocking, see also Rainer 1988). Closing suffixation refers to the general combinability of a suffix, that is closing suffixation accounts for the non-combinability of a suffix with all other suffixes in a language. Additionally, while there is a clear semantic explanation of blocking, a closing suffix cannot be always successfully defined with the help of semantics only. The role of semantics in closing suffixation is discussed in section 4.2.

3.2. Closing suffixes and morphological organization

In this subsection I discuss closing suffixation in relation to various issues that I label ‘morphological organization’: base-driven versus affix-driven morphology, morphological language types, derivation versus inflection, evaluative morphology and suffixation versus prefixation.

3.2.1. Base-driven versus affix-driven morphology

In morphological theory, affixation is seen as being either (i) base-driven, i.e. it is the base that selects the affix and the direction of the derivation is thus from the base to the affix, or as (ii) affix-driven, i.e. it is the affix that selects the base and the direction of the derivation is from the affix to the base. Classical descriptive sources are affix-driven – they list suffixes and explain to what bases a suffix attaches to express a particular semantic meaning associated with that suffix. An example of a statement of this type is: the English suffix *-(at)ion* attaches to verbs derived by the suffix *-ize* to form abstract nouns, as in *nasalize* → *nasalization*. Studies on affix ordering are often base-driven, i.e. they would describe the same combination as starting with the suffix *-ize* (a verb derived with *-ize*, that is a base) to which then the suffix *-ation* is attached. Since closing suffixes stop the attachment of further suffixes but a closing suffix can follow other suffixes and bases, closing suffixation is base-driven by definition. This could be the explanation of why many sources, especially classical grammars and textbooks that provide affix-driven descriptions of morphology, do not mention closing suffixes.

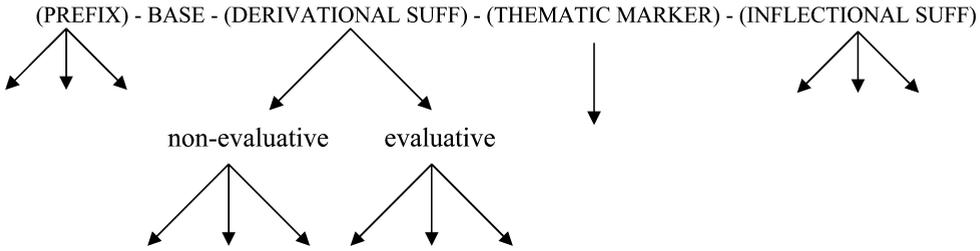
3.2.2. Closing suffixes and morphological language types

In the literature so far, closing suffixes have been discussed primarily in relation to the inflecting languages (recall the history of research). Closing suffixes have not been reported in agglutinating and incorporating languages, though they should be compatible with those morphological types too. This conclusion has the following motivation. There are two ways to produce morphological structure – template morphology and layered morphology. A template is a linear set of slots and each slot accommodates particular suffixes which are substitutable in that slot but never co-occur. Thus, the last slot in the template hosts the closing suffixes. On templates, see Stump (2006). Layered morphology is usually semantically compositional and also scopal by nature. In a scopal affix order, a suffix with a broader semantic scope follows a suffix with a narrower scope. Thus, the suffix(es) with the broadest scope in a language will be the closing one(s). On semantic scope in affix ordering, see Rice (2000). An accessible explanation of template and layered morphology with a comparison of these two types of morphological organization can be found in Manova and Aronoff (2010).

3.2.3. Derivation versus inflection

A language that distinguishes between derivational and inflectional suffix slots usually allows more than one derivational and more than one inflectional suffix. Such a situation is found in the Slavic family. (1) is a schema of the structure of the Slavic word. In (1), a slot that is associated with more than one arrow can host more than one affix. The term ‘evaluative’ is used after Scalise (1984) and denotes diminutive and augmentative suffixes.

(1) The structure of the Slavic word



(cf. Manova 2011b)

For German, a language that, like Slavic languages, distinguishes between derivational and inflectional suffixes, Aronoff and Fuhrhop (2002: 468) argue for two types of closing suffixes – closing suffixes in derivation and closing suffixes in inflection. We will also adopt this differentiation of closing material. A derivational suffix that is never followed by another suffix of the same type (i.e. another derivational suffix) is a closing derivational suffix, whereas an inflectional suffix that is never followed by another inflectional suffix is a closing inflectional suffix. A closing derivational suffix can be followed by inflection.

As regards inflection, in Slavic languages a word has either a single inflectional suffix or if there is more than one inflectional suffix, the order of the inflectional suffixes is fixed. (2) is an example of a fixed (also called templatic) order of inflectional morphemes. The template in (2) gives the order of the adjectival inflectional suffixes in Bulgarian; note that GEND and NUM share the same slot, i.e. are cumulatively expressed (Matthews 1972):

(2) BASE–GEND/NUM–DEF

- a. *krasiv-ø-ø* ‘beautiful’ (masculine)
krasiv-ø-ijat ‘beautiful-DEF’
- b. *krasiv-a-ø* ‘beautiful-FEM/SG’
krasiv-a-ta ‘beautiful-FEM/SG-DEF’
- c. *krasiv-o-ø* ‘beautiful-NEUT/SG’
krasiv-o-to ‘beautiful-NEUT/SG-DEF’
- d. *krasiv-i-ø* ‘beautiful-PL’
krasiv-i-te ‘beautiful-PL-DEF’

These examples show that the definite article (DEF) is a closing suffix in inflection. Let us now look into the order of the suffixes that occupy the evaluative derivational subplot in (1).

3.2.4. Evaluative suffixes

As indicated in (1), Slavic derivational suffixes are of two types – non-evaluative and evaluative; and as already mentioned, the latter type includes diminutive and augmenta-

tive suffixes. Aronoff and Fuhrhop (2002) exclude diminutive suffixes from their investigation of closing suffixes in German because according to these authors diminutive suffixes are closing by definition, which is due to the fact that a German noun can have only one diminutive suffix which is also always the last derivational suffix in the word form. In the Slavic languages, however, only the augmentative suffixes are like the German diminutive suffixes. The Slavic diminutive suffixes combine with each other (Szymanek and Derkach 2005; Manova 2011c; Manova and Winternitz 2011). Consider the following double diminutives: Russian *kartina* ‘picture’ → DIM1 *kartin-ka* ‘small picture’ → DIM2 *kartin-oč-ka* ‘very small picture’; Polish *dom* ‘house’ → DIM1 *dom-ek* ‘small house’ → DIM2 *dom-ecz-ek* ‘very small house’; and Ukrainian *dub* ‘oak’ → DIM1 *dub-ok* ‘small oak’ → DIM2 *dub-oč-ok* ‘very small oak’. Thus, in Slavic languages not all diminutive suffixes are closing.

Table 54.2 gives the exact combinations of diminutive suffixes in Bulgarian, a language in which also triple diminutives are possible: *dete* ‘child’ → DIM1 *det-ence* ‘little child’ → DIM2 *det-enc-ence* ‘very little child’ → DIM3 *det-enc-enc-ence* ‘very very little child’.

From table 54.2, we see that there are diminutive suffixes that are clearly closing: *-ec*, *-čica* and *-ička*. These suffixes are never followed by another diminutive (or other derivational) suffix. It is, however, not the case with the suffix *-ence* that is never followed by another diminutive suffix but can be repeated on adjacent cycles. (Recall also the examples of double diminutives from Russian, Polish and Ukrainian cited above.) In order to account properly for the repetition of a diminutive suffix, we should allow the recursive use of a closing derivational suffix.

Tab. 54.2: Combinability of the Bulgarian diminutive suffixes (from Manova and Winternitz 2011)

Nouns in	DIM1 suffixes	DIM2 suffixes	DIM3 suffixes
in -C	<i>-ec</i> (unproductive)		
	<i>-le</i> (unproductive) <i>-če</i>	<i>-ence</i>	<i>-ence</i>
	<i>-čica</i> (unproductive)		
in -a	<i>-ica</i>	<i>-ka</i>	
	<i>-ka</i>	<i>-ica</i>	<i>-ica</i>
	<i>-ička</i> (unproductive)		
in -o	<i>-ce</i>	<i>-ence</i>	<i>-ence</i>
in -e	<i>-ence</i> <i>-ice</i> (unproductive)		

Clearly, the suffixes *-ica* and *-ka* that occur in both orders, *-ica* + *-ka* and *-ka* + *-ica*, are both non-closing.

3.2.5. Are there closing prefixes?

In the literature, there is no information on closing prefixes but there are studies on prefixation that seem to offer evidence of the existence of closing prefixes. A closing

prefix will be the last prefix, outward from the root, in a sequence of prefixes. The account of the English prefixes in Zirkel (2010) where a CBO hierarchy of prefixes is provided (recall table 1) gives the closing prefixes in English. The assignment of the Slavic prefixes into different groups, such as lexical, super-lexical and perfectivizing (Babko-Malaya 1999; Svenonius 2004, among others) also seems to speak for the existence of closing prefixes, since the prefixes of the different groups combine in a specific way and there are prefixes that are always in the last position, outward from the root, in a sequence of prefixes. Thus, closing prefixation is an issue for future research.

3.3. Precise definition of closing suffixation

The following definition accounts for all instances of closing suffixes we discussed above:

Closing suffixation is a base-driven morphological phenomenon whereby a suffix closes the word to the addition of further suffixes of the same type: a closing derivational suffix is never followed by another derivational suffix, except by itself, i.e. a closing derivational suffix can be repeated on adjacent cycles or followed by inflection. A closing inflectional suffix is never followed by another suffix, be it derivational or inflectional.

4. Form and semantics in closing suffixation

4.1. The role of morphotactics

Homophonous suffixes can be used to check the role of morphotactics in closing suffixation. Put differently, if homophonous suffixes are always closing, morphotactics defines the feature [+/-closing]. The Polish suffixes $-k_1-a$ and $-k_2-a$ in (3) below are an instance of homophonous suffixes. The suffix $-k_1-a$ derives objects, whereas the suffix $-k_2-a$ subserves the formation of nouns for female humans from male humans. Intriguingly, the nouns derived by $-k_1-a$ can be further derived (3a), whereas nouns derived by the suffix $-k_2-a$ do not serve as bases for further derivation (3b).

- (3) a. *kolys-k₁-a* ‘cradle’ → ADJ *kolys-k₁-ow-y* ‘cradle-’
 kolys-k₁-a ‘cradle’ → DIM *kolys-ecz₁-k-a*
 b. *trener-k₂-a* ‘female trainer’ → ADJ ∅
 trener-k₂-a ‘female trainer’ → DIM ∅

Thus, (3) provides evidence that morphotactics cannot define closing suffixation.

However, Aronoff and Furhop’s (2002) account of German closing suffixes relies on morphotactics. Following the tradition of the generative morphology, they related the German closing suffixes to a non-semantic fact – the presence of a linking element in a compound with a first constituent a derived noun that terminates in a closing suffix. To exemplify:

- (4) Üb-ung-s-sache
 to train-ing-linking element-matter
 ‘a matter of training’

In this example, *-ung* is a closing suffix and *-s-* is a linking element. Note that German is a language with very productive compounding and almost every noun can be used as a first constituent of a compound. Therefore, Aronoff and Fuhrhop (2002) had to provide an explanation for why a closing suffix is followed by word-formation material in compounds, and they claimed that the German linking elements ‘reopen’ closing suffixes. However, linking elements are not a perfect diagnostic criterion for the feature [+/-closing]. For example, they cannot explain the closing character of the suffix *-ismus* that derives abstract nouns, as in the German noun *Real-ismus* ‘realism’, but does not require a linking element in a compound, e.g. *Real-ismus-streit* ‘polemic on realism’. Intriguingly, the suffix *-ismus* (English *-ism*, Russian *-izm*, Polish *-izm*, Bulgarian *-izám*, etc.) is one of the very few instances of a suffix that seems to be cross-linguistically closing.

Thus, we will conclude that morphotactics is not a sufficient diagnostic for the definition of a suffix as [+/-closing].

4.2. The role of morphosemantics

In order to check the role of semantics in closing suffixation, Manova (2009) compares the German closing suffixes from Aronoff and Fuhrhop (2002) with their semantic homologues from two Slavic languages, Bulgarian and Russian. In what follows, I will use the same strategy and some of Manova’s examples of closing suffixes in Bulgarian. I will not give Russian examples because there is a special article on closing suffixes in Russian (see article 56 on closing suffix patterns in Russian).

According to Aronoff and Fuhrhop (2002: 461), six German suffixes are closing: *-e*, *-heit/-keit/-igkeit*, *-in*, *-isch*, *-ling*, and *-ung*. With respect to the categories of the base and the output, we can define these German suffixes in the following way:

- | | | | | |
|-----|----------|-----------------------|---|-----------|
| (5) | V | + -e | → | N |
| | ADJ | + -heit/-keit/-igkeit | → | N |
| | N males | + -in | → | N females |
| | N person | + -isch | → | ADJ |
| | V, ADJ | + -ling | → | N |
| | V | + -ung | → | N |

The German pattern V + *-e* → N, as in *pflügen* ‘to care for’ → *Pflege* ‘care’, can be compared with Bulgarian derivations of the type *grīža se* ‘(I) care for’ → *grīž-a* ‘care’. Such derivations are, however, conversions in Bulgarian where the Bulgarian suffixes parallel to the German *-e* are purely inflectional (consider Bulgarian *grīž-a* → PL *grīž-i*), which explains why the suffix *-a* cannot be followed by derivational suffixes in Bulgarian.

The German pattern ADJ + *-heit/-keit/-igkeit* → N, e.g., *schön* ‘beautiful’ → *Schönheit* ‘beauty’, has a clear parallel in Bulgarian derivations such as *xubav* ‘beautiful’ → *xub-ost* ‘beauty’. In the two languages, N is an abstract noun expressing a property.

However, the Bulgarian parallels of the German closing suffix *-heit* (*-keit/-igkeit*) allow further suffixation. Consider, Bulgarian *cjal* ‘whole’ → *cjal-ost* ‘wholeness’ → *cjalost-en* ‘complete’ → *cjalostn-ost* ‘completeness’. The Bulgarian suffix *-ost* can be also followed by the suffix *-nik*. This unproductive pattern derives human nouns with negative characteristics, e.g., Bulgarian *xubav* ‘beautiful’ → *xubost* ‘beauty’ → *xubost-nik* ‘rascal’. Thus, the suffix *-ost* is not closing. Note that also the German suffix *-heit* can be followed by other suffixes, e.g. *ein-heit-lich* ‘uniform’. Such instances are, however, exceptions in German (Aronoff and Fuhrhop 2002: 460).

The German closing suffix *-in* derives female humans from male humans. Over ninety percent of all female humans in German are derived by the attachment of *-in*. Additionally, formations with other suffixes often have *-in* doublets or allow the addition of *-in*, e.g., *Baron-esse* and *Baron-in*, as well as *Prinzess-in* (cf. Wellmann 1975: 107 ff.) In other words, the fact that the suffix *-in* is closing is sufficient to determine the semantic meaning ‘a female human derived from a male human’ as closing in German. Bulgarian, however, possesses a set of suffixes for deriving female humans from male humans: *-ka*, *-inja*, *-kinja*, *-ica*, *-esa*, *-isa*, and *-va* (cf. Stojanov 1993). Manova (2008) establishes that the Bulgarian suffixes are closing only if the suffix is native and added to a base denoting a male person (except for the unique suffix *-va* which only forms a single noun). Suffixes deriving female animals are not closing, e.g. *magare* ‘donkey’ → FEM *magar-ica* → DIM *magarič-ka*. Female humans derived from foreign bases differ from those derived from native bases and can also be diminutivized, e.g. *princ* ‘prince’ → FEM *princ-esa* → DIM *princes-ka*, *poet* ‘poet’ → FEM *poet-esa* → DIM *poetes-ka*, etc. Another exception to the closing character of the pattern of female humans constitute lexicalizations, e.g., *daskal* ‘teacher (archaic)’ → *daskal-ica* ‘female teacher and female pupil’ → DIM *daskalič-ka* ‘little female teacher and little female pupil’.

The German *-isch*, as in *Schriftsteller* ‘writer’ → *schriftsteller-isch* ‘writer’s’, corresponds to Bg. *-ski*, e.g. *pisatel* ‘writer’ → *pisatel-ski* ‘writer’s’. The Bg. suffix *-ski* is closing, but since the same suffix is not closing in Russian (*-skij* in Russian), recent borrowings from this language could be analyzed as exhibiting the suffix combination *-ski + -ost = -skost*. Consider: *rus-sk-ost* ‘Russian-like style’, *svet-sk-ost* ‘worldly-minded style’, *det-sk-ost* ‘child-like style’. However, as such nouns are borrowings and used only in highly specialized texts, it is difficult to decide whether they should count as evidence for changing combinability of *-ski* in Bulgarian (see the discussion in Manova 2010).

The German *-ling* has no parallel in Bulgarian. It is also unclear where the suffix is closing in German. On the Internet one can find: *prüfen* ‘to examine’ → *Prüfling* ‘the examined person’ → FEM *Prüflingin*, *lehren* ‘to teach’ → *Lehrling* ‘the taught person’ → FEM *Lehrlingin*, *Haft* ‘prison’ → *Häftling* ‘prisoner’ → FEM *Häftlingin*. For an alternative explanation of the peculiar behavior of the German *-ling*, see Plank (2011).

The last German closing suffix *-ung* derives action nouns as in *bewegen* ‘to move’ → *Bewegung* ‘moving, movement’. This German suffix has two corresponding suffixes in Bulgarian, the suffix *-Vne*, e.g. *dviža (se)* ‘(I) move’ → *dviž-ene* ‘moving’, and the suffix *-Vnie*, e.g. *dviža (se)* ‘(I) move’ → *dviž-enie* ‘moving, movement’. Curiously, only *-Vnie* nouns can be diminutivized, e.g., DIM *dviž-eni-jce* whereas the suffix *-Vne* cannot be followed by other suffixes, *dvižene* ‘moving’ → *DIM. This different behavior of the two suffixes with respect to diminutivization can be explained as due to the more lexicalized character of the *-nie* pattern, i.e. *-nie* nouns often exhibit lexicalized semantics and

denote objects instead of actions (cf. Radeva 1991: 139), e.g. *piša* '(I) write' → *pis-anie* 'a piece of writing' (cf. *pis-ane* 'writing'). In other words, the Bulgarian *-Vne* is closing while *-Vnie* is not. Lexicalizations of *-ne* nouns are seldom. The reverse dictionary of Bulgarian (Andrejčin 1975) lists only *prane* 'laundry', *piene* 'drink', *jadene* 'food', and *imane* 'wealth'. Some native speakers use diminutivized forms of these nominalizations. (For lexicalizations of action nouns in English and Polish and how they relate to closing suffixation see Szymanek 2000.)

In sum, semantic meanings that are closing in German are not always closing in Bulgarian, which thus speaks against the existence of semantic patterns that are universally closing. However, we can define a specific closing suffix in a particular language by its semantics, e.g., the suffix *-Vne* that derives action nouns in Bulgarian is closing, as is the suffix *-ung* in German. We can even define sets of semantically related closing suffixes in one language and in different languages, e.g., native suffixes deriving female humans from male humans are closing in Bulgarian (except for the suffix *-va*) and in German. However, due to the exceptions found, we cannot conclude that closing suffixes can be defined properly on the basis of their semantics only.

So far, we saw that closing suffixes could have exceptions. However, the exceptions we had to deal with above were primarily due to borrowing and lexicalization. The role of lexicalization in closing suffixation is discussed in some detail in Szymanek (2000) who systematically differentiates between semantics that is compositional and semantics that is lexicalized (i.e., non-compositional). Szymanek argues that if only instances of compositional semantics are considered, closing suffixes do not have exceptions. However, I will now give examples of closing suffixes from Bulgarian that allow exceptions and which share the semantics of the closing pattern, i.e., exceptions that are also semantically compositional. The Bulgarian suffixes *-ina* and *-ota* both derive abstract nouns from adjectival bases, as in *dobrina* 'good deed' and *dobrota* 'goodness', both formed from the adjective *dobār* 'good'. Nevertheless, while the suffix *-ina* easily diminutivizes, one even does not need a basic word in order to produce the corresponding suffix combination *-in-ka* (as in *dobrinka* 'little good deed'), the suffix *-ota* is hard to diminutivize. Perhaps the only exception is *krasotička* 'little beautiful place' (found on the Internet), which is, however, a diminutive form of the lexicalized *krasota* 'beautiful place'. In addition, despite the existence of the suffix *-oten*, e.g. *straxoten* 'terrific' (note that there is no **straxota*, i.e. *-oten* is not a combination of *-ota_N* + *-en_{ADJ}*), abstract nouns in *-ota* do not adjectivize, i.e., there is no **dobroten* in Bulgarian. In other words, the suffix *-ota* seems to be a good example of a closing suffix. Nevertheless, two words that are clearly semantically compositional are exceptions to the closing character of *-ota*: (*sam* 'alone' → *sam-ota* 'loneliness' → *sam-ot-en* 'lonely' and (*čest* 'frequent' → *čest-ota* 'frequency' → *čest-ot-en* 'frequency-'). Thus, semantic compositionality is not a perfect diagnostic for the feature [+/-closing] either.

In sum, closing suffixes allow exceptions. If one of a set of suffixes with synonymous semantics is closing, the other suffixes of the set are not all closing. Lexicalizations always behave as exceptions but also semantically compositional derivations, including borrowings, that match a closing semantic pattern could allow further derivations. Nevertheless, there seems to exist some relation between closing suffixes and semantics. Suffixes that derive female humans as well as action and abstract nouns tend to be closing even in languages (such as Bulgarian and German) that do not belong to the same language family.

5. Closing suffixation and word-class specification

Of the six German closing suffixes in Aronoff and Fuhrhop (2002), five derive nouns; and this fact is neither because of the suffixes selected nor by chance. In what follows I will try to explain why nominal suffixes tend to be closing, while verbal and adjectival ones do not. For illustration of my argument, I will refer to word-formation in two Germanic languages, English and German, and three Slavic languages, Bulgarian, Russian, and Polish.

Germanic and Slavic languages have very productive patterns for derivation of deverbal nouns and suffixes that derive verbs always combine with at least one nominalizing suffix, which thus explains why Slavic and Germanic verbal suffixes are not closing. Of the above listed five languages, Bulgarian is the only language with a closing verbal suffix, the suffix *-Vsa-m* that is of a Greek origin. Then, Germanic and Slavic languages possess very productive patterns for derivation of abstract nouns from adjectives and in English, Russian and Polish every adjectival suffix combines with at least one nominalizing suffix (E. *-ness*, R. *-ost'* and P. *-ość*). Bulgarian and German, compared above, are rather exceptional in this respect; both languages have an adjectival suffix that is closing (*-isch* in German and *-ski* in Bulgarian). Thus, we come to suffixes that derive nouns in Germanic and Slavic. Nouns are the only word class with a potential for closing suffixes, which explains why closing suffixes usually have this syntactic specification.

6. Closing suffixes and diachrony

A language's morphology changes over time and one of the visible results of this processes is the changed morphological status of some affixes. For example, in the diachronic development of a language, an inflectional suffix may be reanalysed as a derivational formative. Such neo-derivational suffixes are closing. A good illustration of this type of closing suffixes is provided by the Slavic family. The example below is from Bulgarian, the situation is, however, the same in the other Slavic languages (Manova 2011a). In Bulgarian, the suffix *-in* that is found in singular forms of ethnicity terms, as in *bălgarin* 'a Bulgarian' (PL *bălgari* '(the) Bulgarians') is classified as a derivational suffix in the grammars (Stojanov 1993: 174). However, the suffix *-in* was originally a singulative (Georgiev 1969: 111–115; see also article 66 on singulatives); and since there is no other singulative suffix in Bulgarian, *-in* has been assigned to the class of derivational suffixes. This is the explanation for why *-in* is never followed by another derivational suffix in Bulgarian (and in the other Slavic languages).

7. Are conversion and subtraction closing rules?

In this section, I briefly discuss whether there is some relation between conversion (when new meaning is expressed by the same form) and subtraction (when new meaning is

expressed by some deletion of form) and closing suffixation. On conversion and subtraction as morphological rules, see Manova (2011a).

We devote attention to this issue, since when morphology ‘re-uses’ the same form (as in conversion) or shortens a form (as in subtraction), it, like in closing suffixation, avoids further suffixation; and one thus expects that conversion and subtraction could be closing operations too.

There are linguists who do claim that conversion (or zero suffixation) closes the word to further derivation in the way closing suffixation does (Sitchinava and Plungian 2009 for Russian; Szymanek 2000 based on Myers 1984 for English). This claim, however, seems unjustified. There are enough Russian conversions that allow further derivation, but since Russian is an inflecting language, Russian conversions involve deletion and addition of inflection and this makes conversion in Russia more difficult to identify than in English. Thus, in the limited space of this article, I will discuss only English conversions, as such examples are well known from the literature. In English, the level-ordering or stratal approach (Siegel 1974; Allen 1978; Kiparsky 1982) divides the lexicon in levels or strata that are ordered in a specific way: level-II affixes can follow both level-I and level-II affixes, but after a level-II affix no level-I affix can be attached. According to Kiparsky (1982), English verb-to-noun derivations are level-I, while noun-to-verb derivations are level-II. This analysis assigns thus conversions to nouns and verbs to different levels, conversions to nouns being level-I, which means that at least conversions to nouns should serve as bases for further derivation. This is indeed the case and can be illustrated with the following examples: *alarm-ist*, *escape-ism*, *segment-al*, etc. (Kiparsky 1982). In these examples, the bases *alarm*, *escape* and *segment* are derived by verb-to-noun conversion and then suffixed by an overt suffix. Examples such as these undoubtedly show that conversion is not a closing rule. For a discussion of these and similar issues within level-ordering, I refer the reader to Don (1993: 29–35).

As regards subtraction, the situation is similar to that for conversion. There are subtractions that allow further derivations and such that do not. Consider the following examples from Bulgarian (see Manova 2011a): *biologija* → *biolog* (derived by subtraction) → *biolož-ki* ‘biologist’s’ and *mečka* ‘bear’ → *meči* ‘bear-’ (with subtraction of *-k-*), → ∅, i.e. no further derivation is possible. However, we cannot attribute the missing further derivations from *meči* ‘bear-’ to the subtractive origin of this adjective, as the adjective *bioložki*, which is formed by affixation with an overt affix, cannot be further derived either.

8. Conclusion

Closing suffixation is a specific instance of affix ordering. There are closing suffixes in derivation and closing suffixes in inflection. A closing suffix closes the word to the addition of further suffixes of the same type but a closing derivational suffix may be repeated on adjacent cycles. There is evidence that closing suffixes exist in a number of languages, but it is hard to define semantic patterns that are cross-linguistically closing, though semantics is of importance to closing suffixation. Moreover, closing suffixation allows for exceptions. Therefore, closing suffixes seem best describable as a tendency, i.e. as suffixes that tend to prohibit further suffixation.

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