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Revisiting exocentricity in compounding

Evidence from Greek and Cypriot*

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In this paper, the authors challenge the widespread view that the distinction between endocentric and exocentric compounds is fundamentally semantic. On the basis of data from Greek and Cypriot they propose, instead, that this is a structural distinction and that semantics cannot be a safe criterion for classifying exocentric compounds into various categories. They show that morphological features, e.g. gender and inflection class, cannot define exocentricity, since both Greek and Cypriot have many endocentric compounds displaying different features from those of their head. It is suggested that exocentricity might be an epiphenomenon of the order of application of the word-formation processes, according to which, when compounding and derivation co-occur within the same morphologically complex item, compounding precedes derivation. In contrast, a structure is endocentric if it contains only compounding, or involves derivation and compounding, in this particular order. Finally, the authors provide evidence that exocentric compounds may belong to the productive word-formation mechanism.

1. Problems in defining an exocentric compound

In compounding, endocentricity and exocentricity are traditionally related with the presence or absence of a lexical head. The head can be identified on formal and semantic grounds as the unit that transfers its category and other morphosyntactic

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and semantic properties to the compound as a whole (Scalise & Fábregas 2010). Given that headedness can be semantically shown by hyponymy, exocentric compounds cannot be interpreted as hyponyms of one of their constituents, as argued by Bloomfield (1933), and recently by Bauer (2008a, 2009) and Lieber (2009). On the contrary, an endocentric compound Z is a hyponym of its head, as defined by Allen's (1978: 11) 'IS A' condition, according to which Z denotes a subclass of its head element (Y).

(1) In a compound $[[]_X []_Y]_Z$, Z 'IS A' Y

Consider the Greek compound *ayrioyuruno*¹ (lit. wild pig), 'wild boar', deriving from the stems of the words *ayri(o)*² 'wild' and *yurun(i)* 'pig'.³ It must be endocentric, since it is a hyponym of *yurun(i)* (*ayrioyuruno* is a kind of pig), i.e. its head element, and shares with it the category of the noun and the neuter gender value. It contrasts with a formation like *xasomeris* 'loafer' (< *xas-* verb stem⁴ 'lose' + *mer(a)* 'day'),⁵ which fails the category and hyponymy tests: it is not a verb type meaning 'losing time', but a noun denoting 'someone who loses his day'. Thus, it is considered to be exocentric.

In a number of works (see, among others, Dressler 2006 and Bauer 2008a, 2010), exocentricity is treated as a cross-linguistically marked phenomenon in compounding, compared to endocentricity, and not widely attested.⁶ However, on the basis of an extensive corpus of compounds from several languages, Scalise

1. Examples are given in a broad phonological transcription.
2. Greek compounds, in their vast majority, involve stem combinations, as demonstrated by Ralli (1992, 2007, 2009a). The compound-internal *-o-* of *ayri-o-yuruno* is a linking element/compound marker and not the homonymous inflectional ending, as in the example *ayri-o* 'wild' (see Ralli 2008 for more information on compound marking).
3. For clarity reasons, the constituents of most examples are given in their fully inflected form, but inflectional endings and other stem material that do not appear in compound formation are included in parentheses.
4. *xas-* is the aorist stem of the verb *xan(o)* 'to lose'.
5. Following Ralli (2005, 2007), the analysis of *xasomeris* is as follows:

(i) *xasomeris* < *xas-* *mer(a)* *-i-* *-s*
 'loafer' lose day Dsuf NOM.SG

where Dsuf stands for derivational suffix and *-s* is the inflectional ending.

6. Interestingly though, Bauer (2008a, 2010) indicates that in some languages, such as Turkana (Dimmendaal 1983) and Kayardild (Evans 1995), the main productive compounding pattern reflects exocentricity.

et al. (2009)⁷ have shown that exocentricity is not a marginal phenomenon, and there are different degrees in which it can be manifested. In fact, in Cypriot Greek (hereafter Cypriot),⁸ the formation of exocentric compounds exhibits a high rate of productivity. It evokes the formation of the Ancient Greek exocentric compounds, as has been shown by Raftopoulou (2007).⁹

Generally, there is disagreement in the literature on what the types of exocentric compounds are. To begin with, Bauer (2008a, 2010) exploits exocentricity in a typological framework, and indicates that there are some problems with respect to the use of semantic criteria, namely with the overall use of the hyponymy test. He challenges the idea that compounds that are to be understood figuratively (metaphorical compounds),¹⁰ or are historical accidents, should be listed among the exocentric occurrences, since their interpretation does not depend on the structure and their status of being a compound. Thus, he disagrees with Søgaard (2004), who has proposed that metaphorical compounds, such as *dust bowl* (which is not a 'kind of bowl' but 'an area with no vegetation, a region reduced to aridity by drought and dust storms'), are exocentric. Instead, Bauer (2008a: 53) suggests that this particular compound is endocentric, where *bowl* 'deep dish' is to be interpreted metaphorically as something that resembles a dish. Nevertheless, and despite the fact that a metaphorical sense for him should be taken into consideration independently from exocentricity, he lists metaphorical formations among the five categories of exocentric compounds, the classification of which is mainly defined on the basis of semantic criteria. His other four categories include bahuvrihi, synthetic, transpositional, and exocentric co-compounds (Bauer 2010: 169). Bahuvrihi or possessive compounds are composed of an adjective and a noun, and they denote someone who has something expressed by the noun that is modified by an adjective.¹¹ The

7. URL [<http://morbocomp.sslmit.unibo.it/index.php?section=home>]

8. Cypriot Greek is usually considered as a dialect of the Greek language. However, it can also be seen as a language belonging to the Hellenic family, since it displays a number of significant differences from Standard Modern Greek, and it is the language of a different country from Greece.

9. There is a 17% of exocentric formations in a corpus of about 1000 Cypriot compounds of the recently founded *Laboratory of Modern Greek Dialects* of the University of Patras (URL: www.philology.upatras.gr/LMGD/el/index.html).

10. According to Bauer (2010:173), in a metaphorical compound "[...] the head element of the compound or the compound as a whole has a metaphorical interpretation."

11. According to another view, certain bahuvrihi compounds could be interpreted via metonymy (see Booij 2002; Benczes 2006), and are, thus, endocentric. For instance, for Scalise & Fábregas (2010:121) since all human beings have eyes, *green-eyed* could be used to denote a human being described by a salient property of his eyes via metonymy.

Cypriot *aniktokutalos* ‘who has open/broad shoulders’ (< *anikt(os)* ‘open/broad’ + *kutal(a)* ‘shoulder’) is such an example. Most of the times, a synthetic compound has an agentive reading, despite the fact that there is no affixal marking of the agent. The Italian *porta-cenere* ‘ashtray’ (< *porta* ‘carries’ + *cenere* ‘ash’), taken from Scalise et al. (2009:65), illustrates this category. Transpositional compounds have a more or less transparent meaning but an unexpected word-class. For instance, the Swahili compound *ujauzito* ‘pregnancy’ is a noun, although neither of its constituents (‘come’ + ‘heavy’) belongs to nouns (Bauer 2010:172). Finally, as already pointed out, exocentric co-compounds are those failing the hyponymy test. For instance, the Korean *puwu-ca* ‘father and son’ seems to be exocentric, since it is not a hyponym of either of its internal constituents (Bauer 2010:173).

A basic problem with this classification is due to the fact that some compounds may fall into more than one category. Consider, for instance, the Cypriot compound *makroxis* ‘long-handed’ (< *makr(i)* ‘long’ + *xer(i)* ‘hand’). Following Bauer’s classification, it is of the *bahuvrihi* (possessive) type (*makroxis* is ‘one who has a long hand’), but it also belongs to metaphorical compounds, because the whole construction could be figuratively used to denote a ‘thief’. Given that the same compound may belong to more than one semantically defined category, semantics cannot be used as the only criterion for classifying exocentric compounds into categories. Another problem is whether one should treat as exocentric a compound whose meaning is non-compositional. Since there is no discussion in the literature about the boundaries between semantic exocentricity and semantic opacity/non-compositionality, and since the notion of semantic compositionality is gradable, it is not clear, at least to us, to what extent a semi-compositional compound should be taken as exocentric or endocentric. As an illustration, consider the Greek example *psixokori* ‘adopted daughter’, taken from Ralli (2009a:459), which consists of *psix(i)* ‘soul’ and *kori* ‘daughter’. Assuming that Greek endocentric compounds are right-headed (Ralli 1992, 2009a), *psixokori* seems to be categorially and morphologically endocentric, since all of its morphological and categorial properties come from its right-hand head *kori*. Interestingly though, its meaning is not fully transparent but rather semi-compositional. Should it be analyzed as semantically exocentric, as several analyses seem to suggest for similar constructions (see, Scalise et al. 2009, among others)? However, *psixokori* is a hyponym of *kori* ‘daughter’, and according to the hyponymy test it should belong to endocentric formations.

Following an approach based on features, and not on constituents as a whole, Scalise et al. (2009) have proposed that exocentricity can be better understood if it is split into categorial, semantic, and morphological, depending on the type of head of the construction, i.e. categorial, semantic or morphological, as well as on the type of features one deals with. In other words, Scalise et al. challenge the

idea that headedness depends on a single head, which imposes all of its properties on the whole compound, since in their approach, a constituent can assume the role of the head, only with respect to some of its features.¹² Therefore, for a compound to be classified as exocentric, there is no need to combine all three types of exocentricity. Within this approach, a compound is categorially exocentric if neither of the constituents imposes its category to the whole construction. For instance, the Ancient Greek compound *philozo:os* ‘who loves animals’ belongs to adjectives, while its basic constituents are the verb *phile(o:)* ‘to love’ and the noun *zo:(on)* ‘animal’.¹³

For Scalise et al. (2009) a compound may exhibit morphological exocentricity if some of its morphological features, e.g. gender and inflection class in the case of noun compounds, are not identical with the morphological features of its internal constituents. The Cypriot compound *ḍakanomutas* (lit. who bites noses) ‘chameleon’, as illustrated in (2), combining the verb *ḍakan(o)* ‘to bite’ with the noun *mut(i)* ‘nose’, may be such an example. It can be characterized as morphologically exocentric, since *mut(i)* is feminine and inflects according to the third inflection class, whereas *ḍakanomutas* is masculine, belonging to the second inflection class.¹⁴

- (2) *ḍakanomuta-s* < *ḍakan(o) mut-i*
 lit. biting noses-M.IC2 to bite nose-F.IC3
 ‘chameleon’

In addition, *ḍakanomutas* is also semantically exocentric, since the whole compound belongs to a semantic class that does not derive from the semantic classes denoted by its constituents: the compound expresses an agent (‘someone who bites noses’), despite the fact that this interpretation does not follow from the two basic constituents, *ḍakan(o)* and *mut(i)*.

On the basis of splitting exocentricity into three types, categorial, morphological and semantic, Scalise et al. (2009: 63–64) have also suggested that semantic exocentricity is independent from the other two types, but semantic and morphological exocentricity interact in such a way that a compound cannot

12. The idea of splitting the head into several subheads is not entirely new. It reminds one of the proposal about the existence of *relativized head*, put forward by Di Sciullo & Williams (1987), according to which, in a morphologically complex word, more than one constituent can assume the role of the head, depending on the feature one deals with.

13. For Scalise et al. (2009), a compound exhibits *Absolute Categorial Exocentricity* (ACE) if its category differs from those of both basic constituents.

14. For the division of Greek and Cypriot nouns in inflection classes, we follow Ralli (2000), according to whom there are eight classes.

be semantically exocentric and morphologically endocentric. This suggestion is falsified by data from Greek and Cypriot, which offer a considerable number of counterexamples. Unless metaphorical compounds do not count as semantically exocentric (see above), the Greek *kamilopatima* (lit. step of a camel) ‘type of plant with large leaves’ (*kamil(a)* ‘camel’ + *patima* ‘step’) is such a counterexample, whose category and morphological features of neuter gender and eighth inflection class are shared by its right constituent *patima* ‘step’ although its meaning is not entirely compositional. Another generalization, also falsified in Greek and Cypriot, dictates that a compound having only one categorial head, which is also the semantic head, must be morphologically endocentric (*ibid.*: 63). Several examples, such as those listed in (3), contradict this generalization: they are semantically and categorially endocentric, but their gender and inflection class are different from those of their head:

- (3) a. Greek
diavoljinek-o < *diavol(os) jinek-a*
 devilish woman-N.IC5 devil woman-F.IC3
- b. Greek
kefalovris-o < *kefal(i) vris-i*
 head spring-N.IC5 head spring-F.IC3
- c. Greek
nerofid-a < *ner(o) fid-i*
 water snake-F.IC3 water snake-N.IC6
- d. Cypriot
*ambelopaxt-on*¹⁵ < *ambel(i) paxt-os*
 vineyard tax-N.IC5 vineyard land rent-M.IC1

Along the same lines, Scalise & Fábregas (2010: 125) claim that “[w]henver a compound is morphologically exocentric, it is also true that its semantic type cannot be derived from the denotation of any constituent, at least without any additional meaning operation such as metaphor or metonymy”. Once more, data from both Cypriot and Greek fail to support this claim, since there are several compounds whose morphological properties, such as gender or inflection class, differ from the morphological properties of their head element, but do not exhibit any kind of semantic opacity. A typical example is the Cypriot *aspromelon* ‘white-coloured honey’ (< *aspr(o)* ‘white’ + *mel(in)* ‘honey’), which displays a different inflectional ending (-*on*) from that of its head element (-*in*), but its

15. Tax imposed during the Ottoman rule.

meaning is transparent/compositional. Other examples indicative of this morphological particularity of Greek and Cypriot compounds are illustrated in (4):

- (4) a. Greek
kardioxtip-i < *kardi(a)* *xtip-os*
 heartbeat-N.IC6 heart beat-M.IC1
vromojinek-o < *vrom(iki)* *jinek-a*
 dirty woman-N.IC5 dirty woman-F.IC3
- b. Cypriot
afropul-on < *afr(os)* *pul-in*
 bird of the waves-N.IC5 foam bird-N.IC6
aguroxoraf-on < *agur(in)* *xoraf-in*
 cucumber field-N.IC5 cucumber field-N.IC6

2. Headedness and exocentric compounds

In this section, we challenge the widespread view that the distinction between endocentricity and exocentricity is primarily related to the issue of headedness. In the linguistic literature, headedness is defined on the basis of (a) the presence or absence of a head, and (b) the position of the head element. More specifically, it is generally accepted that an endocentric compound has a head – in many languages at the right-hand side – whereas the head is absent from an exocentric compound. In contrast to this view, we claim that exocentric compounds, at least in Greek and Cypriot, are not headless, but they differ from the endocentric ones in that they obligatorily involve derivation, and are subject to a specific order of application of the two word-formation processes, compounding and derivation. Following Ralli (2005, 2007) and Andreou (2010), we suggest that Greek and Cypriot exocentric compounds have a head inside their word limits, which gives them the basic category, meaning, and morphosyntactic features, but this head lies outside the confines of the structure involving the combination of two lexemes. We argue that the head is a derivational suffix,¹⁶ which is added at the periphery of this combination, and before the completion of the compound word, with the addition of a closing inflectional ending. Thus, the head is part of the word structure and does not have to be inferred, as has been argued by Dressler (2006:33). If our suggestion is correct, the presence or absence of a head element cannot be a safe

16. We deal only with derivational suffixes, since, as opposed to prefixes that are category neutral, derivational suffixes have the power to change the category of the items they are added to. Therefore, they can be heads of their constructions.

criterion for defining endocentricity or exocentricity. For instance, in a compound word such as *xasomeris* ‘loafer’ (5a), or *mesotzeritis* ‘middle aged’ (5b), the head, namely the derivational suffix, *-i* for the Greek example, and *-iti-* for the Cypriot one, follows the combination of the two stem constituents (*xas-* ‘lose’ and *mes-* ‘middle’ at the left-hand side, *mer-* ‘day’ and *tzer-* ‘time’ at the right-hand side), and precedes the inflectional ending *-s*:

- (5) a. Greek
- ```

 xasomeris
 / \
 xasomeri- -s
 / \
 xasomer- -i-
 / \
xas- mer-

```
- b. Cypriot
- ```

      mesotzeritis
     /      \
  mesotzeriti-  -s (Inflection)
   /      \
mesotzer-  -iti- (Derivation)
 /      \
mes-     tzer-17 (Compounding)

```

Within the spirit of this analysis, inflected exocentric compounds, such as *xasomeris* and *mesotzeritis*, combine compounding with derivation, since a derivational suffix follows the combination of two lexemes, in this particular case, the unattested bases **xasomera* int. ‘lose time’ and **mesotzer(os)* int. ‘middle time’, respectively. It should be noticed though that the head element, i.e. the derivational suffix, which gives the adjectival category and the basic meaning ‘who has the property of’ to the entire word, is not always overtly realized. In a number of constructions, it may be a zero affix, as the examples (6b) and (7b) illustrate:

- (6) Greek
- a. Overt suffix
- | | | | | | |
|--------------------|---|---------------|-------------|-------------------------|-----------|
| <i>anixtomatis</i> | < | <i>anixt-</i> | <i>mat-</i> | <i>-i</i> ¹⁸ | <i>-s</i> |
| ‘sharp-eyed’ | | open | eye | Dsuf | NOM.SG |
| <i>makrimalis</i> | < | <i>makr-</i> | <i>mal-</i> | <i>-i-</i> | <i>-s</i> |
| ‘long-haired’ | | long | hair | Dsuf | NOM.SG |

17. The *-o-* between *xas-* and *mer-* as well as between *mes-* and *tzer-* is the linking element/compound marker. See also Footnote 2.

18. As claimed by Ralli (2005, 2007), the final vowel /i/ in *anixtomatis* and *makrimalis* is a derivational suffix, and not the ending of the nouns *mati* ‘eye’ and *mali* ‘hair’, when taken as independent words. Significant proof for this claim is the fact that in plural, this *-i-* is substituted by an allomorphic variation *-iδ-* (*anixtomat-iδ-es* ‘open-eyed.PL’, *makrimal-iδ-es* ‘long-haired.PL’). On the contrary, the word final *-i* of *mati* and *mali* remains unchanged in the plural number (*mati-a* ‘eyes.PL’, *mali-a* ‘hair.PL’).

b. Zero suffix¹⁹

<i>kalokardos</i>	<	<i>kal-</i>	<i>karδ-</i>	∅ ²⁰	<i>-os</i>
'good-/kind hearted'		good	heart	Dsuf	NOM.SG
<i>kakotixos</i>	<	<i>kak-</i>	<i>tix-</i>	∅	<i>-os</i>
'unlucky'		bad	luck	Dsuf	NOM.SG

(7) Cypriot

a. Overt suffix

<i>aniktokutalatos</i>	<	<i>anikt-</i>	<i>kutal-</i>	<i>-at-</i>	<i>-os</i>
'who has broad shoulders'		open	shoulder	Dsuf	NOM.SG
<i>varipnas</i> ²¹	<	<i>var-</i>	<i>ipn-</i>	<i>-a-</i>	<i>-s</i>
'deep sleeper'		deep	sleep	Dsuf	NOM.SG

b. Zero suffix

<i>bukoylosos</i>	<	<i>buk(on-)</i> ²²	<i>γlos-</i>	∅	<i>-os</i>
'who speaks as if his mouth is full of food'		to have a bite	tongue	Dsuf	NOM.SG
<i>adromutsunos</i>	<	<i>aδr-</i>	<i>mutsun-</i>	∅	<i>-os</i>
'coarse-faced'		coarse	face	Dsuf	NOM.SG

19. The presence of zero affixes in exocentric compounds such as *sabre-tooth* can also be found in Kiparsky (1982).

20. As far as zero derivation is concerned, an anonymous reviewer calls our attention to Ackema & Neeleman's (2004) analysis of English compounds like *pickpocket*, where a zero manifestation arises when the word that hosts the suffix is the first constituent, and the zero spellout is the optimal way of avoiding conflicting phonological requirements. However, this is not the case in (6b) and (7b), since in these examples, the zero affix attaches to the whole compound and is not related to the first constituent (for an analysis of synthetic and parasynthetic compounds along the lines of Ackema & Neeleman, see Melloni & Bisetto 2010). The same reviewer wonders whether this zero morpheme creates a derived structure and not a compound. Following Ralli (2007), Greek and Cypriot compounds are combinations of two lexemes, and zero (null) lexemes are not acceptable as compound constituents. Besides, in our data, both zero and overt affixes may alternate (compare (6a) with (6b)), and in all cases where the head is overtly expressed, it is a derivational suffix and not a stem or a word.

21. *Varipnas* has also the meaning 'nightmare'. The compound does not display a word-internal linking vowel *-o-* because the second constituent *ipn(os)* 'sleep' begins with a vowel. See Ralli (2008) for more details on the phonologically conditioned absence of the linking vowel.

22. The derivational verbal suffix *-on-* of *bukon(o)* 'to have a bite' does not appear inside compounds due to an application of the so-called *Bare-stem constraint*, which hides all derivational material characterizing the first constituent. The reader is referred to Ralli & Karasimos (2009) for details on this constraint.

Note that postulating a zero derivational suffix, instead of supposing a mere conversion (a change in the category without the presence of a zero suffix), seems to be advocated by the existence of several alternating forms of Cypriot exocentric compounds, one with an overt suffix and another with a zero suffix. Consider the following examples:

- (8) a. *aniktokutal- at -os/aniktokutal- Ø -os* < *anikt- kutal-*
 ‘who has open/broad shoulders’ open shoulder
- b. *katsaromall- i -s/katsaromall- Ø -os* < *katsar- mall-*
 ‘who has curly hair’ curly hair
- c. *mesotzer- iti -s/mesotzer- Ø -os* < *mes- tzer-*
 ‘middle-aged’ middle time
- d. *makronur- i -s/makronur- Ø -os* < *makr- nur-*
 ‘long-tailed’ long tail

On the basis of these alternating types, we would like to suggest that the exocentric structure has an open slot, which needs to be instantiated by a suffix, and that, depending on the case at hand, sometimes this suffix may have an overt form, and sometimes a zero one.

3. The structure of exocentric compounds: Assumptions and claims

Following what we have claimed so far, Greek and Cypriot exocentric compounds seem to be created on the basis of the structural pattern of (9), where suffixal derivation follows compounding, i.e. the combination of two stems, derivation is realized by a suffix (overt or zero), and inflection marks the edge of the word:

$$(9) \quad [[[\text{stem stem}]_{\text{STEM}} \text{-Dsuf}]_{\text{STEM}} \text{-Infl}]_{\text{WORD}}$$

Crucially, the application of this pattern presupposes a number of assumptions, along the lines of Ralli (2005, 2009a, in preparation):

- a. Greek and Cypriot exocentric compounding involves stem combinations. This assumption is verified by the fact that compounds, in their vast majority, have a stem as their first constituent (i.e. an item without its inflectional ending), while the second constituent may be a stem or a fully inflected word, as the case may be. According to Drachman & Malikouti-Drachman (1994), Nespou & Ralli (1996), and Ralli (2005, 2007), Greek compounds are built on either a [stem stem] or a [stem word] pattern. The main criteria for such a division are the form of the inflectional ending and the position of stress: while [stem word] constructions have the same inflection and the same stress position as their second (word) constituent does, [stem stem] ones usually

have a different inflectional ending and another stress position from those of the second member, when it occurs as an independent word. The following examples illustrate these remarks:

(10) Greek

a. [stem stem] compounds

spirtókut-o < *spírt(o)*²³ *kut(i)*
 ‘match-box’ match box
kuklóspit-o < *kúkl(a)* *spít(i)*
 ‘doll-house’ doll house

b. [stem word] compounds

elafokiniγ-ós < *eláf(i)* *kiniγós*
 ‘deer hunter’ deer hunter
ayriánthrop-os < *áyri(os)* *ánthropos*
 ‘wild man’ wild man

(11) Cypriot

a. [stem stem] compounds

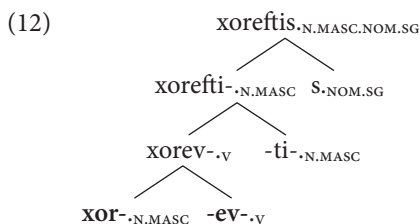
ambelopérvol-o < *ambél(i)* *pervól(i)*
 ‘garden with vines’ vine garden
arkopézun-o < *árk(o)* *pezún(i)*
 ‘wild pigeon’ wild pigeon

b. [stem word] compounds

arkokapn-ós < *árk(os)* *kapnós*
 ‘wild tobacco’ wild tobacco
aparopéxti-s < *ápar(os)* *péxti(s)*
 ‘gambler in horse races’ horse player/gambler

- b. Greek compounds and derived words are right-headed constructions. As shown by Ralli (2009b, in preparation), only coordinative compounds may be an exception to this generalization, since they are not clearly headed constructions.
- c. In a morphological structure, a head is locally defined, in that its features are projected to the immediate mother node, but do not necessarily percolate to that of the next formation cycle (Ralli 2005). Contrary to syntax, where a terminal head may have scope over the whole structure, in morphology, a head has scope only over the mother node of its local formation cycle. For an illustration, consider the formation cycles of the Greek noun *xoreftis* ‘dancer’, containing the stem *xor-* ‘dance’, the derivational suffixes *-ev-* and *-ti-* and the inflectional ending *-s*:

23. See Footnote 3.



In this structure, the verbal suffix *-ev-* is the head of the combination [xor-ev-], i.e. of the stem of the verb *xorevo* ‘to dance’, but not of the word *xoreftis* ‘dancer’, the latter getting its category (noun) and gender (masculine) from the nominal suffix *-ti-*.

On the basis of these assumptions, exocentric compounds must be built according to the [stem stem] pattern, since they have a different inflectional ending from that of the second constituent, when taken in isolation. For instance, *mesotzeritis* ‘middle-aged’ (see (5b) above) has the inflectional ending *-s*, while its second member *tzer(os)* ‘time’ inflects in *-os*. Moreover, although exocentric compounds are not headless, they display a different head at each formation cycle: the head of the lower cycle, i.e. of the compound as such, is one of the two stems, the derivational suffix (zero or overtly realized) is that of the upper cycle, while the head of the whole inflected word is the derived compounded stem (inflection being the non-head, as Ralli (1988, 1999) has suggested).²⁴

Following these observations, it is of utmost significance to stress that in our approach, a compound traditionally called exocentric in Greek and Cypriot is not taken to be the outcome of the composition process itself, but that of the creation of an inflected word which has been subject to both compounding and derivation, the two processes applying in this particular order. Accepting that there is a head at every single formation cycle, the notion of exocentricity does not presuppose the absence of head. On the contrary, as proposed here, exocentricity seems to be related with the order of application of the two word-formation processes, derivation and compounding, which interact in such a way that derivation follows compounding.

An important question that needs to be clarified now is whether there is a clear-cut distinction between exocentric and endocentric compounds. We would

24. According to Ralli (1999, 2000) the relation between a stem and its inflectional ending is a rather feature-matching and feature-passing relation, where specific values of the features of the ending pass on to the underspecified features of the stem. For example, in an inflected noun, the nominal stem is underspecified for case and number, the values of which (e.g. NOM, PL) are filled by those of the appropriate ending. As opposed to inflectional suffixes, derivational suffixes are heads of their formations, and, as such, their features are subject to percolation to the mother nodes, i.e. to the derived items.

like to propose that, at least in Greek and Cypriot, there *is* such a distinction, but it is an epiphenomenon, resulting from the application of the two word-formation processes, derivation and compounding. As seen in the preceding paragraphs, a structure is exocentric if compounding precedes derivation. In contrast, we assume that the opposite order, i.e. derivation occurring before compounding, results in creating endocentric structures. For an illustration of an endocentric compound containing derivation, consider the Greek verb *δendrofitevo* ‘to afforest’. It includes the noun stem *δendr-* ‘tree’, the noun stem *fit-* ‘plant’, the derivational verbal suffix *-ev-* and the inflectional suffix *-o*. Since this verb involves both compounding and derivation, there are two possible structures for its formation: (13a), where derivation precedes compounding, and treats it as endocentric according to our proposal, and (13b), where the opposite order of the two word-formation processes creates an exocentric construction:

- (13) a. [[stem] [[[stem]-Dsuf]-Infl]-Infl] b. [[[stem] [stem]]-Dsuf]-Infl]
- δendrofitevo

```

graph TD
    A[δendrofitevo] --- B[δendr-]
    A --- C[fitevo]
    C --- D[fitev-]
    C --- E[-o]
    D --- F[fit-]
    D --- G[-ev-]

```

δendrofitevo

```

graph TD
    A[δendrofitevo] --- B[δendrofitev]
    A --- C[-o]
    B --- D[δendrofit-]
    B --- E[-ev-]
    D --- F[δendr-]
    D --- G[fit-]

```

Crucial evidence in favor of the endocentricity of (13a) is given by the set of attested and possible compounds. In fact, (13a) seems to be the correct structure, since the inflected verb *fitevo* ‘to plant’ is an attested word, whereas the inflected noun **δendrofito* (13b) is neither attested nor possible as the base for the derivation of *δendrofitevo*. A formation **δendrofito* would mean ‘a plant which looks like a tree’, or ‘a plant that grows near trees’. Thus, it could not become the base for *δendrofitevo* ‘to afforest’.

Note now that derivational suffixes are not always present within compounds, whose constituents may also be non-derived items. In this particular case, we would like to propose that the structures should be considered as endocentric by default. An example would be the formation *plusiospito* ‘rich house’, composed from the stems of two existing words, the adjective *plusi(o)* ‘rich’ and the noun *spit(i)* ‘house’. Again, reference to attested or possible words can also be used as an argument for confirming the endocentricity of this compound, and generally of compounds without any derivational affixes, since it is impossible to create compounds by combining non-stems, that is, stems which do not become words with the appropriate inflectional endings.

Finally, we should also tackle the relation of exocentricity and coordinative compounds. The formation of coordinative compounds is particularly productive

in Greek, as opposed to Cypriot where it displays a moderate productivity. There are noun-noun (NN) and adjective-adjective (AA) compounds in both linguistic systems, see (14)–(15), while verb-verb (VV) constructions are frequent in Greek and very rare in Cypriot (16) (see Ralli 2009b; Manolissou & Tsolakidis 2009 for more details).²⁵

- (14) [N N]_N
- a. Greek
alatopipero < *alat(i) piper(i)*²⁶
 ‘salt-pepper’ salt pepper
- b. Cypriot
ammotsakilo < *amm(os) tsakil(i)*
 ‘gravel’ sand pebbles
- (15) [A A]_A
- a. Greek
mavroaspros < *mavr(os) aspr(os)*
 ‘black-white’ black white
- b. Cypriot
asprorosos < *aspr(os) rus(os)*
 ‘white-reddish’ white reddish
- (16) [V V]_V
- a. Greek
aniyoklino < *aniy(o) klino*
 ‘open-close’ open close

Coordinative compounds are generally problematic for the notion of headedness, and have been treated in diverse ways, depending on the author. For example, Fabb (1998), Kageyama (2009), Bisetto & Scalise (2005:234) and Scalise & Guevara (2006:191)²⁷ have proposed that they have two heads (i.e. both lexemes are heads), and as such, they are endocentric. In contrast, Haspelmath (2002:89) has claimed

25. Formations such as *poet-painter* that are often considered to be exocentric (see Bauer 2008a for relevant discussion) are not true compounds in Greek and Cypriot. They contain two fully inflected words, and are rather appositive constructions built in syntax. See Ralli (in preparation) for details.

26. Again, for clarity reasons, the constituents are given in their inflected forms, while the parts that do not participate in compounding are included in parentheses. See also Footnote 3.

27. Following Bisetto & Scalise (2005) and Bauer (2008b), a compound such as *meronixto* ‘day-night’ is exocentric, because the formation as a whole is not a hyponym of either *mera* ‘day’ or *nixta* ‘night’. On the basis of the fact that coordinative compounds do not generally involve any derivation, and according to our proposal in this paper, this type of compound should be characterized as endocentric.

that having two constituents as potential heads is like having none, and, therefore, coordinative compounds are to be considered exocentric. As proposed in Section 3, exocentricity and endocentricity are not primarily related to headedness. Thus, irrespectively of accepting a head, two heads, or no head in these compounds, and following our analysis of exocentricity, we would like to suggest that, at least in Greek and Cypriot, coordinative compounds are endocentric by default, given the fact that they do not involve any derivation following compounding.

4. Conclusions

In this paper, we have claimed that the distinction between endocentric and exocentric compounds is primarily structural. In order to support our position, we have used data from both Greek and Cypriot, where exocentric compounds exhibit a high rate of productive formation.

By examining a number of constructions, we have argued that semantics cannot be a safe criterion for distinguishing exocentric from endocentric compounds, given that the ‘hyponymy test’ fails in a number of situations, e.g. in metaphorical compounds, and there are no clear boundaries of the relation between semantic exocentricity and semantic opacity. In addition, semantics cannot give a discrete categorization of exocentric compounds, because some compounds may fall into more than one category.

We have demonstrated that since Greek and Cypriot have endocentric compounds displaying a different gender value and different inflectional endings from those of the head, the latter taken in isolation, morphological features such as gender and inflection class cannot define exocentricity, in the way Scalise et al. (2009) have proposed.

In our approach, exocentricity is an epiphenomenon, reflecting a particular order of application of compounding and derivation, according to which when compounding and derivation co-occur within the same morphologically complex item, compounding precedes derivation. In contrast, we have proposed that a structure is endocentric if it contains only compounding, or involves derivation and compounding, in this particular order.

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