

# How close to syntax are compounds? Evidence from the linking element in German and Modern Greek compounds

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This paper investigates the morphology-syntax interface by focusing on the interfixation properties of compound structures. The starting point of this study is the conception that compound formation is a morphological process situated closely to syntax. Evidence is taken from a contrastive analysis between German and Modern Greek compounds. Although these two languages share many morphological properties related to the word-formation process of compounding, they differ in many aspects as far as the existence of a linking element in a compound is concerned. Through the contrastive analysis of the properties of the linking element a clearer picture can be given concerning the closeness of German and Modern Greek compound formations to syntax.\*

## 1. Introduction

Compounds are regarded as the outputs of a morphological operation situated closer to syntax than any other morphological formations. This opinion has been clearly stated by Scalise (1992: 4): *“Compounds constitute an extremely delicate area in that they are the most syntactic morphological contractions in grammar”*.

Many studies have been carried out on this issue, more precisely on the distinction between compounds and phrases based on selected criteria mostly concerning the formal properties of a compound contrary to those of a syntactic phrase (e.g. Borer 1988, Scalise 1992, Bisetto & Scalise 1999, Bauer 2001, Olsen 2001, Donalies 2004, Gaeta & Ricca 2009, Schlücker & Hüning 2009). Despite the detection of specific criteria, there is no clear-cut distinction between compounds and phrases. In this sense, ‘closeness to syntax’ is defined on the basis

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of particular features and their resemblance to characteristics of syntactic phrases.

The present study elaborates on one of these basic criteria proposed for distinguishing compounds from phrases, namely the existence of a linking element, by analyzing the interfixation properties of a compound. A linking element is considered to be a semantically empty element that links the two parts of a compound. Its existence and specifically its morphological features are significant for the characterization of the structure as a morphological one. With regard to this, the degree of closeness of compound structures to the syntactic component is viewed through the structural aspects of linking elements. In particular, the appearance of a linking element still closely related to syntactic properties – e.g. to the inflectional paradigm of the preceding element – can be viewed as a signal of the compounds being close to syntax. On the contrary, a morphologically driven appearance of a linking element reveals the morphological character of the compound structure itself.

The present study will take advantage of a contrastive analysis of the linking element in German and Modern Greek<sup>1</sup> compounds. The selection of these two languages is not arbitrary; rather, it is based on the morphological similarities that they share. They belong typologically to the category of fusional languages since in both languages the formation of words is based on morphemes, which carry a great deal of morphosyntactic information. Furthermore, they display a very high productivity in compounding.<sup>2</sup> The high productivity of this word-formation process is not connected to the morphological typology that fusional languages display, since there are also non-fusional languages, like Chinese, in which the formation of compounds is also productive (Packard 2000).

From a formal standpoint, German and Greek compounds are both right-headed, and involve all the major grammatical categories, namely Noun (N), Adjective (A) and Verb (V)<sup>3</sup> (1-2). Nominal compounds consisting of two nouns [NN] (1a, 2a) are the most productive in both languages. Furthermore, in both languages, there is the possibility of appearance of a linking element between the two constituents, as shown in the following examples.<sup>4</sup>

- |     |    |                                   |   |                    |                     |
|-----|----|-----------------------------------|---|--------------------|---------------------|
| (1) | a. | <i>Liebe-s-brief</i> <sub>N</sub> | ← | Liebe <sub>N</sub> | Brief <sub>N</sub>  |
|     |    | ‘love letter’                     |   | ‘love’             | ‘letter’            |
|     | b. | <i>seite-n-lang</i> <sub>A</sub>  | ← | Seite <sub>N</sub> | lang <sub>A</sub>   |
|     |    | ‘of many pages’                   |   | ‘page’             | ‘long’              |
|     | c. | <i>not-Ø-landen</i> <sub>V</sub>  | ← | Not <sub>N</sub>   | landen <sub>V</sub> |
|     |    | ‘to make an emergency landing’    |   | ‘need’             | ‘to land’           |

(2) a.	τυρ-ό-πιτα <i>tir-o-pita<sub>N</sub></i> 'cheese pie'	←	τυρ(ι) <i>tir(i)<sub>N</sub></i> 'cheese'	πιτ(α) <i>pit(a)<sub>N</sub></i> 'pie'
b.	κακ-Ø-άσχημος <i>kak-Ø-aschimos<sub>A</sub></i> 'very ugly'	←	κακ(ά) <i>kak(a)<sub>Adv</sub></i> 'badly'	άσχημος <i>aschimos<sub>A</sub></i> 'ugly'
c.	χαρτ-ο-παίζω <i>chart-o-pezo<sub>V</sub></i> 'play cards, gamble'	←	χαρτ(ιά) <i>chart(ia)<sub>N</sub></i> 'cards'	παίζω <i>pezo<sub>V</sub></i> 'play'

However, the analysis has proven that there are differences in German and Greek compounds concerning the appearance of a linking element, referred to in the German literature as “*Fugenelement*” (Fuhrhop 1996, 1998, Ramers 1997, Fleischer & Barz 2012). The most important ones are the following: (a) form-variation displayed by the German linking elements (1), compared to the stable form of the Greek linking element (2); (b) non-systematic appearance of a linking element in German compounds, contrary to its almost obligatory presence in Greek compounds. Specifically, non-interfixed German compounds seem to be a very common phenomenon that could be characterized as the default choice in this language<sup>5</sup> (e.g. *not-Ø-landen* ‘to make an emergency landing’ (1c), *Stadt-Ø-bahn* ‘city railway’). The lack of obligatoriness in addition to the unsystematic appearance of the linking element in German compounds will be further investigated in order to uncover some regularities or generalizations about them (§3). This study will capitalize on those differences in order to further examine certain compound types in these languages and their degree of closeness to the syntactic component.

The paper is structured as follows: §2 contrasts all the formal properties of the German and Greek linking elements, namely their position, origin and relation to the two constituents (§2.1.), their presence (§2.2.), their new character and function (§2.3.). Then, §3 discusses the difference in the systematicity of (non-) appearance of the linking elements in the languages under study and reveals further properties of the German linking element that signifies closeness to syntax. Finally, §4 draws a number of conclusions.

## 2. Characteristics of linking elements

### 2.1. Position, origin and relation to the constituents

In both German and Greek, the linking element is always found between the first and the second constituent of the compound. This

word-internal position<sup>6</sup> is justified by the diachrony of the linking element in the two languages. The origin of the German linking element lies in the inflectional suffixes of a preposed genitive, singular or plural (Becker 1992). As Fuhrhop (2000) argues, German compounds originate from syntactic constructions bearing a genitive suffix between the two constituents. Although these syntactic formations have become reanalyzed as morphological in nature and the linking element has acquired a new status (see also 2.3.), its position remains the same. Moreover, it has been argued that the appearance of the German linking element still depends on the first constituent in the following aspects:

- a) The linking element is coordinated with the first constituent (Ramers 1997: 34-35, Fuhrhop 1998: 187), as proved by the following example:

(3) *Frühling-s- und Herbst-tage* ← Frühling Herbst Tage  
 ‘spring and autumn days’ ‘spring’ ‘autumn’ ‘days’

- b) The possible appearance of the linking element is related to the lexical category of the first constituents, since it appears after nominal (*Liebe<sub>N</sub>-s-brief* ‘love letter’, 1a) or verbal constituents (*Les<sub>V</sub>-e-buch* ‘reading book’) and not after adjectival ones (*Rot<sub>A</sub>-Ø-wein* ‘red wine’) (Fuhrhop 1996: 529).
- c) The appearance of the linking element is also related to the inflexional paradigm of the first constituent (Fuhrhop 1996, 1998).

Consequently, the position of the German linking element, but also the dependency on the first constituent of the compound can be explained by the origin of the linker.

Similarly, the word-internal position of the Greek linking element *-o-* is related to its origin, found in the Ancient Greek thematic vowel short *-ō-*, which was combined with the root in order to give the stem of a noun or a verb (e.g. *ánthropos* ‘man’: [[[*anthrop*<sub>root</sub>] [-*o*<sub>thematic vowel</sub>]] stem -*s*<sub>infl.suffix</sub>]word) (Anastassiadis-Symeonidis 1983, Ralli & Raftopoulou 1999, Crocco Galès 2002: 151, Ralli 2008: 34). Contrary to the German linking element, the *-o-* gives no sign of dependency on the first or the second constituent, since it displays the following characteristics:

- a) the linking element *-o-* can be combined with all lexical categories of the first or the second constituent (e.g. *tir<sub>N</sub>-o-pita<sub>N</sub>* ‘cheese pie’ (2a), *chart<sub>N</sub>-o-pezo<sub>V</sub>* ‘play cards, gamble’ (2c), *mavr<sub>A</sub>-o-psaro<sub>N</sub>* ‘black fish’, *kitrin<sub>A</sub>-o-prasinós<sub>A</sub>* ‘yellow-green’, *anev<sub>V</sub>-o-katevazov<sub>V</sub>* ‘to bring up and down’);

- b) *-o-* is independent of the inflectional properties of both constituents (see also §2.3.);
- c) coordination between compounds, as the example \**ntomat-o- kai patat-o-salata* ('tomato and potato salad') is ungrammatical in Greek.

Thus, it can be argued that *-o-* is equally linked to both constituents. This means that the linking element in Greek has totally abandoned its original characteristics, apart from those that are related to its position. In contrast, the diachronic origin of the German linking element is still transparent. By displaying a dependency relation with the first constituent it is proved that it still bears some of its diachronic features related to its origin from syntactic phrases.

## 2.2. *Presence*

A linking element appears in both German and Greek compounds, although not under the same circumstances. Ralli (2008: 22-24) argues that the appearance of a linking element in the compound structures of a given language in general is related to the "parameter of an overtly expressed paradigmatic inflection". The term paradigmatic inflection refers to "a set of phonologically related forms sharing the same category of the base and the same semantic contribution, the morphosyntactic features of which vary according to context" (Ralli 2008: 23). In other words, the "parameter of an overtly expressed paradigmatic inflection" is satisfied in languages which have various inflectional suffixes. I would like to claim that this parameter should be restricted only to the nominal inflectional paradigms, which seem to be relevant for the appearance of a linking element in the compounds, specifically with regard to the German compounds which come diachronically from nominal syntactic phrases, as already mentioned above (§2.1.).

Despite the fact that in the two languages under study the appearance of a linking element is possible, there are major differences with regard to the following aspects: (a) form variation and (b) optionality and (un)systematicity of appearance. Specifically, the German linking element displays a variety of forms, prototypically found in [*noun-noun*] compounds, which include the following elements:<sup>7</sup> *-e-* (schwa), *-s-*, *-es-*, *-n-*, *-en-*, *-er-* and *-ens-* (Fuhrhop 1996, 1998; Dressler et al. 2001: 186). According to Dressler *et al.* (2001: 190-191) the elements *-s-* and *-n-* are the most productive<sup>8</sup> among the interfixed compounds, as, for example, in the compounds *Ansicht-s-karte* in (3a) and *folge-n-reich* in (3b). Apart from the native elements,

there are also some loans, such as the *-o-* derived diachronically from Greek compounds (*Elektr-o-gerät* ‘electric appliance’) and the unproductive *-i-* from Latin (*Strat-i-grafie* ‘stratigraphy’) (Fleischer & Barz 2012), which are found in the so-called “neoclassical compounds”.<sup>9</sup>

The form of the linking element in a German compound varies according to the morphophonological properties and the grammatical category of the first constituent (Wellmann 1991, Becker 1992, Neef 2009, Fleischer & Barz 2012). Linking elements are mostly found in structures where the non-head is a noun (4), or a verb (5),<sup>10</sup> independently of the grammatical category of the head. Specifically, the linking element displays great formal variation after a nominal first constituent. By contrast, it is limited only to the schwa (5a) or to the non-interfixated formation (5b) when the first constituent is a verbal one (Fuhrhop 1996: 539, 1998: 205-206).

- |     |    |                                     |   |                             |                            |
|-----|----|-------------------------------------|---|-----------------------------|----------------------------|
| (4) | a. | <i>Ansicht-s-karte</i> <sub>N</sub> | ← | <i>Ansicht</i> <sub>N</sub> | <i>Karte</i> <sub>N</sub>  |
|     |    | ‘picture postcard’                  |   | ‘aspect’                    | ‘card’                     |
|     | b. | <i>folge-n-reich</i> <sub>A</sub>   | ← | <i>Folge</i> <sub>N</sub>   | <i>reich</i> <sub>A</sub>  |
|     |    | ‘consistent’                        |   | ‘consequence’               | ‘rich’                     |
| (5) | a. | <i>Zeig-e-finger</i> <sub>N</sub>   | ← | <i>zeigen</i> <sub>V</sub>  | <i>Finger</i> <sub>N</sub> |
|     |    | ‘forefinger’                        |   | ‘point’                     | ‘finger’                   |
|     | b. | <i>Ess-Ø-zimmer</i> <sub>N</sub>    | ← | <i>ess(en)</i> <sub>V</sub> | <i>Zimmer</i> <sub>N</sub> |
|     |    | ‘dining room’                       |   | ‘eat’                       | ‘room’                     |

It has been argued that the choice of the linking element in a compound with a nominal first constituent may be determined by the paradigmatic relations between the linking element and the inflectional suffixes. However, one of the most productive elements, *-s-*, does not follow this constraint (see Becker 1992, Fuhrhop 1996, 1998, Dressler 2001 for (un)paradigmatic interfixation). We should also not ignore compounds with the same nominal first constituent, which present a variable choice of linking elements, as shown in the following examples, in which the first constituent is always the noun *Land* ‘country’, but the linking element which is attached to it differs:

- |     |    |                       |   |   |              |
|-----|----|-----------------------|---|---|--------------|
| (6) | a. | <i>Land-Ø-karte</i>   | ← | <i>Land</i>   | <i>Karte</i> |
|     |    | ‘country map’         |   | ‘country’   | ‘card’       |
|     | b. | <i>Länd-er-spiel</i>  | ← | <i>Land</i> <sub>NOM.SG</sub> , <i>Länder</i> <sub>NOM.PL</sub> | <i>Spiel</i> |
|     |    | ‘international match’ |   | ‘country’   | ‘game’       |
|     | c. | <i>Land-s-mann</i>    | ← | <i>Land</i> <sub>NOM.SG</sub> , <i>Lands</i> <sub>GEN.SG</sub>  | <i>Mann</i>  |
|     |    | ‘compatriot’          |   | ‘country’   | ‘man’        |

Taking these cases into consideration, Fuhrhop (1996, 1998, 2000) argues that the first constituent and the linking element construct allomorphic stems that participate in the compounding process<sup>11</sup> (“Kompositionsstammformen”). It has been also claimed that the selected linking element for the formation of compound neologisms is often based on analogy.<sup>12</sup> Despite the detection of some constraints (e.g. paradigmatic relations, analogy), the choice between the various forms of the linking element or the possibility of non-interfixed compounds in German cannot be easily predicted – I will elaborate further on the issue of predictability of non-interfixed compounds later in this study (§3).

Contrary to the considerable formal variation displayed by the interfixation process of German compounds, in Greek compounds, there is only one form of the linking element, *-o-*. It is considered to be a widely known linking element since it appears in the neoclassical compounds of many European languages, as already mentioned above for German. Its appearance in compound structures is systematic. Its exceptional absence depends either on phonological or morphological factors. A second compound constituent beginning with the vowel /a/ prevents the appearance of the linking element *-o-*, as in the example *lemon-Ø-anthos* (‘lemon flower’) in (7) (see also *kak-Ø-aschimos* ‘very ugly’ (2b)).

(7)	λεμον-Ø-ανθός	←	λεμόν(ι)	ανθός
	<i>lemon-Ø-anthos</i>		lemon(i)	anthos
	‘lemon flower’		‘lemon’	‘flower’

The element *-o-* is also missing when the first constituent of a compound structure is an independent word and not a stem, as in the examples *epta-Ø-psichos* (‘who has seven lives’, (8a)) and *ksana-Ø-leo* (‘repeat’, (8b)) (Ralli 2005).

(8)	a. [ <i>word-stem</i> ]			
	επτά-Ø-ψυχός	←	επτά	ψυχ(ή)
	<i>epta-Ø-psichos</i>		epta	psych(i)
	‘who has seven lives’		‘seven’	‘soul’
	b. [ <i>word-word</i> ]			
	ξανά-Ø-λέω	←	ξανά	λέω
	<i>ksana-Ø-leo</i>		ksana	leo
	‘repeat’		‘again’	‘say’

Consequently, the Greek linking element displays a stable form and a certain systematicity of appearance, since the cases of its absence

can be predicted, in contrast to the linking element in German, which is characterized by form variation and non-systematic presence. According to Ralli (2008), the formal characteristics and the (non-) systematic presence are related to the type of constituents preferred in a given language for compound formation. Specifically, languages preferring word constituents to form compounds are found to have form-variable and unsystematic linking elements. This argument is confirmed to a great extent by German compounds, since most of them are word-based (e.g. *seitenlang* ‘of many pages’ (1b), see also (1a,c), (3-4), (6)), although stem-formations<sup>13</sup> are not excluded (e.g. *Zeigefinger* ‘forefinger’ (5a), see also (5b)). Ralli also argues that stem-based compounds are characterized by form-stable and systematic linking elements, as in the case of the linking element in Greek. The clear preference for stem constituents in the formation of Greek compounds, as in the following examples (see also (2), (7)), supports this argument.

- (9) a. [stem-stem]  
 καρὰβ-ὄ-πανο ← καρὰβ(i) παν(i)  
*karav-o-pano* ← karav(i) pan(i)  
 ‘sailcloth’ ‘ship’ ‘cloth’
- b. [stem-word]  
 θάλασσ-ο-ταραχή ← θάλασσ(α) ταραχή  
*thalass-o-tarachi* ← thalass(a) tarach(i)  
 ‘rough sea’ ‘sea’ ‘disturbance’

With regard to the main issue of the present study, the degree of closeness to syntax of the compounds under study, the German linking element still proves some kind of connection to its syntactic origin. Apart from the position, the linking element in German has also kept the formal characteristics related to its origin, proving that it is still dependent on the features of the original syntactic phrases. The fact that some forms of the linking element – mainly the *-s-* – have acquired a high degree of productivity, especially in compound structures in which there is no paradigmatic relation to the first constituent, is a certain sign of its transition from a syntactic to a morphological element. On the other hand, the stable form of the *-o-* element in Greek, its systematicity of appearance, the fact that it has lost all the characteristics related to its origin and that it is equally liked to both compound constituents indicates its stable morphological role.

### 2.3. New character and function

The linking elements in both German and Greek have been undergoing a process of linguistic change and thus they display a new

character, which is not related to their diachronic origin. Specifically, it has been argued that the linking elements are semantically empty, namely that they do not preserve the semantics and structural properties of the source elements.<sup>14</sup> This claim is of great importance, especially with regard to the German linking element, which still keeps some characteristics of its origin. Moreover, this argument has been put forward not only from the point of view of morphology (see e.g. Becker 1992, Fuhrhop 1996) but also on the basis of psycholinguistic experiments (Dressler et al. 2001).

There is, however, still discussion among scholars about whether all forms of linking elements have ended up displaying an unparadigmatic relation to the inflectional suffixes of the first constituent (Gallmann 1998, Libben et al. 2009). There is a clear agreement that in most cases the linking element *-s-* shows no dependency on the inflectional paradigm of the first compound constituent<sup>15</sup> (Becker 1992: 12-13, Fuhrhop, 1996: 529, 545; 1998: 191-197). This is proved in two ways: firstly, the *-s-* element appears in cases in which there is no homophonous suffix in the inflectional paradigm of the first constituent, as in (10a). Secondly, there are formations in which an *-s-* element would be expected, since there is a possessive meaning associated with the first constituent, but the compound is non-interfixed, as in (10b). Moreover, the appearance of the *-s-* element in this compound would be ungrammatical, as in (10b').

- |         |                          |   |                                    |                                 |             |
|---------|--------------------------|---|------------------------------------|---------------------------------|-------------|
| (10) a. | <i>Liebe-s-paar</i>      | ← | <i>Liebe</i> <sub>NOM/GEN.SG</sub> | <i>*Liebes</i>                  | <i>Paar</i> |
|         | 'love couple'            |   | 'love'                             |                                 | 'couple'    |
|         | b. <i>Apfel-Ø-kern</i>   | ← | <i>Apfel</i> <sub>NOM.SG</sub>     | <i>Apfels</i> <sub>GEN.SG</sub> | <i>Kern</i> |
|         | b'. <i>*Apfel-s-kern</i> |   | 'apple'                            |                                 | 'core'      |

A new character is often argued also for the *-n-* element, since it appears in cases in which there is a homophonous plural suffix of the first constituent. However, in this case the *-n-* element does not indicate any plural meaning associated with the first constituent, as in (10c) (Becker, 1992: 11, Fuhrhop, 1996: 545).

- |         |                       |   |                                |                                 |               |
|---------|-----------------------|---|--------------------------------|---------------------------------|---------------|
| (10) c. | <i>Sonne-n-schein</i> | ← | <i>Sonne</i> <sub>NOM.SG</sub> | <i>Sonnen</i> <sub>NOM.PL</sub> | <i>Schein</i> |
|         | 'sunshine'            |   | 'sun'                          |                                 | 'shine'       |

Apart from *-s-* and *-n-*, the other forms of the linking element in German compounds show signs of dependency on the inflectional suffixes of the first constituent and are thus still paradigmatically related to it. Although scholars generally agree that the linking ele-

ments are semantically empty – as mentioned above – and thus cannot be considered to have the function of inflectional suffixes, there are still counter-examples where this interpretation is possible. For instance, in the structure *Jahr-es-anfang* ('beginning of the year'), the *-es-* element carries a possessive meaning, as also does the homophonous genitive suffix of the first constituent (*Jahr*<sub>NOM.SG</sub> - *Jahres*<sub>GEN.SG</sub> 'year'). Similarly, in the example *Büch-er-regal* ('bookshelf') the linking element *-er-* can be regarded as having a plural meaning and thus indicating that this shelf is to be used for more than one book.

- |         |                         |   |   |               |
|---------|-------------------------|---|---|---------------|
| (11) a. | <i>Jahr-es-anfang</i>   | ← | <i>Jahr</i> <sub>NOM.SG</sub> , <i>Jahres</i> <sub>GEN.SG</sub> | <i>Anfang</i> |
|         | 'beginning of the year' |   | 'year'  | 'beginning'   |
| b.      | <i>Büch-er-regal</i>    | ← | <i>Buch</i> <sub>NOM.SG</sub> , <i>Bücher</i> <sub>NOM.PL</sub> | <i>Regal</i>  |
|         | 'bookshelf'             |   | 'book'  | 'shelf'       |

In contrast, the Greek linking element *-o-* has acquired a totally new character. As a result of linguistic change, the thematic vowel *-o-* has become a semantically empty linking element (Ralli 2008). Moreover, *-o-* has none of the syntactic properties of the homophonous inflectional suffix *-o-* (Ralli 2005:167). This can be proved in different ways: in most cases the first constituent of a compound is a stem, meaning that the inflectional suffix of the word is removed (12a). In addition, in compounds derived from an adjective plus a feminine noun [AN<sub>FEM</sub>] the inflectional paradigm of which does not include the suffix *-o-*, the adjectival first constituent loses its inflectional suffix (*-i-*) and attaches to the noun with the semantically empty element *-o-* (12b). Another proof is related to the inflected compound structures, which preserve the form of the linking element *-o-*, although the inflectional suffix of the second constituent has changed (12c).

- |         |  |   |                                    |                                      |
|---------|--|---|------------------------------------|--------------------------------------|
| (12) a. | <i>πατατ-ο-σαλάτα</i>                    | ← | <i>πατάτ(α)</i>                    | <i>σαλάτα</i>                        |
|         | <i>papat-o-salata</i>                    |   | <i>patat(a)</i> <sub>FEM.SG</sub>  | <i>salata</i>                        |
|         | 'potato salad'                           |   | 'potato'                           | 'salad'                              |
| b.      | <i>μικρ-ο-επιχείρηση</i>                 | ← | <i>μικρ(ή)</i>                     | <i>επιχείρηση(η)</i>                 |
|         | <i>mikr-o-epichirisi</i>                 |   | <i>mikr(i)</i> <sub>FEM.A</sub>    | <i>epichiris(i)</i> <sub>FEM.N</sub> |
|         | 'small company'                          |   | 'small'                            | 'company'                            |
| c.      | <i>σπιρτ-ό-ξύλο</i>                      | ← | <i>σπίρτ(ο)</i>                    | <i>ξύλ(ο)</i>                        |
|         | <i>spirt-o-ksilu</i> <sub>NEU.NOM</sub>  |   | <i>spirt(o)</i> <sub>NEU.NOM</sub> | <i>ksil(o)</i> <sub>NEU.NOM</sub>    |
| c´.     | <i>σπιρτ-ό-ξύλου</i>                     | ← | <i>σπίρτ(ο)</i>                    | <i>ξύλ(ου)</i>                       |
|         | <i>spirt-o-ksilu</i> <sub>NEU.GEN</sub>  |   | <i>spirt(o)</i> <sub>NEU.NOM</sub> | <i>ksil(u)</i> <sub>NEU.GEN</sub>    |
| c´´.    | <i>*σπιρτ-ού-ξύλου</i>                   | ← | <i>σπίρτ(ου)</i>                   | <i>ξύλ(ου)</i>                       |
|         | <i>*spirt-u-ksilu</i> <sub>NEU.GEN</sub> |   | <i>spirt(u)</i> <sub>NEU.GEN</sub> | <i>ksil(u)</i> <sub>NEU.GEN</sub>    |
|         | 'matchstick'                             |   | 'match'                            | 'wood'                               |

The new character of the linking elements and the possible loss of their diachronic characteristics are related to the question of what kind of function the linking elements fulfill. As far as the German linking element is concerned, it cannot be claimed that there is an identical function for all the different forms, since some of them still show a connection to their diachronic features. Agreement among scholars has been found concerning the new morphological function of the *-s-* element (Fuhrhop 1996, 1998, Kürschner 2010, Koliopoulou 2013). It has been claimed that *-s-* marks the boundary between the two constituents when the first constituent is morphologically complex.<sup>16</sup> This means that *-s-* follows first constituents that bear a prefix (13a), a suffix (13b) or constituents that are already compound formations (13c).

(13) a.	[[Ver-[kauf]]-s-[angebot]]	←	Verkauf	Angebot
	‘sales offer’		‘sale’	‘offer’
b.	[[Sicher] [-ung]]-s-[kasten]]	←	Sicherung	Kasten
	‘fuse box’		‘security’	‘box’
c.	[[Hand]-Ø-[werk]]-s-[kammer]]	←	Handwerk	Kammer
	‘chamber of handicrafts’		‘craftsman’	‘room’

Aronoff & Fuhrhop (2002: 451-466) go a step further by arguing that first constituents bearing a derivational closing suffix<sup>17</sup> are usually followed by the *-s-* element (13b). Since a derivational closing suffix prevents the stem, to which it attaches, from participating in further word-formation processes, the claim is that the presence of the element *-s-* overrides this “closure” and enables the stem to participate further in processes like derivation or compounding. This property of *-s-*, of the most productive form of linking element, is purely morphological and confirms its new character in German compounding. Its current function shows that *-s-* is under a grammaticalization process, since it is not related to the inflectional paradigm of the first constituent – rather, it shows dependency on the morphological complexity of the first constituent (Koliopoulou 2013, Nübling & Szczepaniak 2013).

As far as the Greek *-o-* is concerned, Ralli (2007) has claimed that its obligatory appearance in almost all compound structures strengthens the boundaries between stem constituents, as in the examples *karav-o-pano* (‘sailcloth’) and *thalass-o-tarachi* (‘rough sea’) in (9a,b). A major argument is that it appears in copulative compounds, which are regarded as displaying a loose structure, in contrast to the determinative ones. The appearance of the linking element *-o-* in copulative compounds reinforces the relation between the

constituents, as in the compounds *pijen-o-erchome* ('come and go') and *mavr-o-aspros* ('black and white') in (14a,b).

- |         |   |   |  |  |
|---------|---|---|--|--|
| (14) a. | <p><i>πηγαιν-ο-έρχομαι</i><br/> <i>pijen-o-erchome</i><br/>         'come and go'</p> | ← | <p><i>πηγαίν(ω)</i><br/> <i>pijen(o)</i><br/>         'go'</p>   | <p><i>έρχομαι</i><br/> <i>erchome</i><br/>         'come'</p>  |
| b.      | <p><i>μαυρ-ό-ασπρος</i><br/> <i>mavr-o-aspros</i><br/>         'black and white'</p>  | ← | <p><i>μαύρ(ος)</i><br/> <i>mavr(os)</i><br/>         'black'</p> | <p><i>άσπρος</i><br/> <i>aspr(os)</i><br/>         'white'</p> |

The appearance of the linking element in this loose type of compounds is obligatory, even in cases where there is a phonological restriction, since the second constituent begins with the vowel /a/, as in *mavr-o-aspros* in (14b). Thus, Ralli (2005, 2007, 2008) argues in favour of the existence of a "compound marker", which functions as a marker of the word-formation process of compounding.

Summing up, it has been concluded that there is a difference between the two languages concerning the new character and the function of the linking elements in the languages under study. With regard to the linking elements in German compounds it cannot be argued that all the variable forms have an identical function. Specifically, it has been argued that *-s-* is not paradigmatically related to the first constituent. Consequently, it displays a new character and thus a new morphological function. With regard to the other forms of linking element in German it cannot be argued similarly that they also display a new morphological function. They still show some signs of paradigmatic relation to the first constituent, since they have kept to some degree their diachronic features. This fact could support the interpretation that they are still close to syntax. In contrast, the Greek linking element *-o-* has acquired a totally new synchronic character, showing no relation to the characteristics of its diachronic origin and thus no relation to syntactic features.

### 3. Systematicity of (non-)appearance of the linking element

Apart from the general characteristics of the linking element discussed above, some of them still showing relation to syntactic features, specifically with regard to the linking element in German, the systematicity of its appearance is another important characteristic that must be analyzed in depth. As already mentioned above (§2.3.), the presence of the Greek element *-o-* is systematic, mainly in the

copulative compounds, a type of compounds displaying a kind of loose structure.

Contrary to this, the appearance of a linking element in German compounds is not obligatory. Thus, the existence of non-interfixed compounds is a very common phenomenon. Moreover the possibility of non-appearance of a linking element is not determined by specific rules. In an attempt to specify, in some way, the unpredictable absence of the German linking element, Wellmann (1991: 57) has suggested that there is a systematic non-appearance of linking elements in copulative compounds<sup>18</sup> with appositive relations, as for example in the [noun-noun] compounds in (15a).

(15) a. *Copulative compounds with appositive relation*

<i>Dichter-Ø-komponist</i>	←	Dichter <sub>N</sub>	Komponist <sub>N</sub>
'poet-composer'		'poet'	'composer'
<i>Fürst-Ø-bischof</i>	←	Fürst <sub>N</sub>	Bischof <sub>N</sub>
'prince-bishop'		'prince'	'bishop'
<i>Fürst-Ø-abt</i>	←	Fürst <sub>N</sub>	Abt <sub>N</sub>
'prince-abbot'		'prince'	'abbot'
<i>Insel-Ø-staat</i>	←	Insel <sub>N</sub>	Staat <sub>N</sub>
'insular state'		'island'	'state'
<i>Bett-Ø-sofa</i>	←	Bett <sub>N</sub>	Sofa <sub>N</sub>
'sofa bed'		'bed'	'sofa'

On the basis of Wellmann's suggestion I assume that there is a distinction between two compound types, as far as the semantic relation of the constituents is concerned, according to which the systematicity of appearance of a linking element is determined. On the one hand, the constituents display a rather tight semantic relation characterized by the possible but non-systematic appearance of a linking element. This type of compound structures includes determinative compounds in which the head is modified by the non-head, as for instance most of the examples presented until now (e.g. *Liebesbrief* 'love letter' (1a), see also (1b,c), (3-6), (10-11), (13)), but also copulative compounds with an additive relation, such as those presented in (15b). In this kind of copulative structures the constituents display a close semantic relation allowing natural coordination.<sup>19</sup> Specifically, the two meanings are blended together. According to Arcodia et al. (2009: 18-19) the semantic outcome of the whole compound is in this case a hypernym of its constituents.

(15) b. *Copulative compounds with an additive relation*

<i>Hose-n-rock</i>	←	Hose	Rock
‘baggy pants’		‘trousers’	‘skirt’
<i>Bluse-n-kleid</i>	←	Bluse	Kleid
‘short dress’		‘blouse’	‘dress’
<i>Jacke-n-kleid</i>	←	Jacke	Kleid
‘two-piece dress’		‘jacket’	‘dress’

On the other hand, the second type includes compounds displaying a rather loose semantic relation between the constituents. In this case the linking element is systematically absent. This kind of loose relation is found in copulative compounds with appositive relations, such as those in (15a). In this type of structures the semantic outcome bears two separate identities that are not merged into one and thus it could be regarded as a hyponym of both constituents (Arcodia et al. 2009: 18-19). The semantic transparency of these compounds is actually a typical characteristic of syntactic phrases. Thus, it can be argued that copulative compounds with an appositive relation characterized by the non-appearance of a linking element are more closely related to syntax than any other compound type.

Consequently, I argue that the presence of a linking element in German depends on the type of compound structure. More specifically, I propose that its appearance is related to those compounds whose morphological structure displays a tight bond, and that its absence is motivated by the loose structure of some compounds, such as that in appositive ones, as mentioned above. Since compounding is regarded to be a morphological word-formation process closely related to the syntactic component (Scalise 1992: 4), I also claim that the systematicity of non-appearance of the linking element in German depends on how close to the level of syntax the compound type is (see also Koliopoulou, 2013: 260-262). In order to present this argument schematically, I adopt a continuum, in Bybee’s (1985) terms, where morphology precedes syntax, but the two components are not sharply distinguished. In this continuum the copulative compounds with an appositive relation are placed at the lower level of morphology, situated closer to syntax than any other compound type, as shown in figure (16).

(16)

MORPHOLOGY
DERIVATION
COMPOUNDING
Determinative compounds
Copulative compounds with additive relations
Copulative with appositive relations
SYNTAX
Phrases

In contrast, Greek compounds show no signs of closeness to syntax. As far as the linking element *-o-* is concerned, it has totally abandoned the features of its diachronic origin and displays a new morphological function. As already mentioned, the *-o-* appears systematically, while its absence is phonologically or morphologically determined. Moreover, its appearance in the copulative compounds is obligatory, without exceptions, in order to reinforce the relation between the constituents that would otherwise be loosely related. Consequently, Greek compounds seem to be more ‘morphological’ constructions than German compounds.

#### *4. Conclusions*

Since compounding is regarded to be situated closer to syntax than any other morphological word-formation process, it may be expected that compound formations display some syntactic features. The degree of closeness to syntax differs among languages. A clear picture of how close to syntax a compound structure is has been drawn by the examination of the formal properties of the linking elements. This kind of examination can be applied to languages in which the formation of compounds is a productive process and in which the appearance of a linking element is possible. In this way, some information can be gained not only as far as the degree of closeness of compounding to syntax is concerned, but also, in general, as regards the existence of a continuum between morphology and syntax.

In the present study, the analysis of linking elements has been carried out in a contrastive way, namely between German and Greek compounds. As far as the linking elements in German compounds

are concerned, there is a dividing line: on the one hand, *-s-*, the most productive linking element, shows clear signs of a transition from syntax to morphology. Through a grammaticalization process it has acquired a new character and consequently a new morphological function. Specifically, it has developed an independent distribution related to the morphological complexity of the first constituent. On the other hand, the other forms of linking element are sensitive to syntactic features, since they are still closely tied to the inflectional paradigm of the preceding constituent. Moreover, I have argued that among the different compound types, those that are the closest to the syntactic component are the copulative compounds with an appositive relation, in which the absence of a linking element is systematic, contrary to the other compound types, where the appearance of a linking element is possible but not systematic.

In contrast, the linking system of Greek compounds is purely morphological. The element *-o-*, the only form of linking element, is totally depended on morphological features. Its obligatory appearance, especially in copulative compounds, a type of structures displaying a rather loose relation between the constituents, proves its morphological function. Consequently, based on the results of this contrastive analysis, I have concluded that German compounds are situated closer to syntax than Greek compounds, which display pure morphological characteristics as far as the appearance of linking elements is concerned.

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#### *Notes*

<sup>1</sup> Modern Greek will be mentioned in the following simply as Greek. Any reference to Ancient Greek will be specified.

<sup>2</sup> See e.g. Schlücker & Hüning 2009 and Ralli 2007 for the two languages respectively. Specifically, as far as German is concerned, it has been characterized as a ‘compounding-friendly’ language (“kompositions-freundlich”, Coseriu 1977).

<sup>3</sup> It is worth noting that Greek displays a great variety of synthetic compounds (2c), which in many languages are usually rare and unproductive.

<sup>4</sup> With regard to the examples presented in this study, hyphens are used to signify the linking element in each compound structure. The use of the arrow means that the structure is composed of the following two constituents. In case a suffix

of the compound constituents is given in parenthesis, it is indicated that the constituent is a stem and not a word.

<sup>5</sup> According to Barz (1998: 494), less than one-third of all German compounds display a linking element.

<sup>6</sup> According to Ralli (2008: 29-32), the word-internal position of the linking element is determined, to a large extent, by the fusional morphology that both languages display.

<sup>7</sup> Some scholars argue that among the different forms of linking element the umlaut should also be added, symbolizing cases in which there is a stem alternation of the first constituent, as in the example *Mütter-Ø-sterblichkeit* ('maternal mortality', *Mutter*<sub>NOM.SG</sub> 'mother') (Becker 1992: 11, Kürschner, 2010: 830). This stem alternation can be also combined with some of the forms of the linking element, having in this way the corresponding form of an inflectional suffix of the first constituent, as in the example *Büch-er-regal* ('bookshelf', *Buch*<sub>NOM.SG</sub> 'book'-*Bücher*<sub>NOM.PL</sub> 'books').

<sup>8</sup> The linking elements *-s-* and *-n-* are characterized by Dressler et al. (2001: 190-191) as productive – in terms of grammatical productivity – after certain types of first constituents (e.g. after feminine nouns or after nouns with specific derivational suffixes). See also Nübling and Szczepaniak (2011: 53) for productivity in *-s-* interfixation.

<sup>9</sup> The linking elements *-o-* and *-i-* found in neoclassical compounding are considered synchronically to be part of the first constituent (Booij 2005: 86-87). In this sense, the linking element should not be given separately from the preceding constituent in the following examples – as also given in the main text: *Elektro-gerät* 'electric appliance', *Strati-grafie* 'stratigraphy'. For a detailed analysis of German neoclassical compounds see also Lüdeling et al. (2002).

<sup>10</sup> There is also a small possibility of the appearance of a linking element after an adjectival stem. These structures are usually compounds displaying the Greek pattern of compound formation (*german-o-romanisch* 'German-Romanic') and are thus characterized by the presence of the loan linking element *-o-*, also coming from Greek compounding.

<sup>11</sup> Although Fuhrhop (1996, 1998, 2000) argues in favour of the existence of allomorphic stems, she does not reject the notion that the German linking element and especially the *-s-* form has a morphological function (s. further 2.5.).

<sup>12</sup> The concept that compounds are built on an analogical pattern has been reflected in several studies (e.g. Motsch 1981), particularly with regard to the selection of the proper form of linking element in German (Becker 1992, Krott et al. 2007). Since the linguistic mechanism used for the selection of the linking elements is not the main issue in the present study, analogical formation will not be discussed further.

<sup>13</sup> Becker (1992) and Darski (1996) use the term "stem" (Stamm/Flexionsstamm), while Dressler et al. (2001) prefer the term "root" to describe cases such as the compound *Kirsch-Ø-kuchen* ('cherry pie'), where in the first constituent *Kirsche* ('cherry') the thematic vowel *-e* is removed.

<sup>14</sup> Although opposite views have also been expressed (i.e. Libben et al. 2009).

<sup>15</sup> It has been claimed that *-s-* can in some cases be paradigmatically related to the inflectional paradigm of the nominal first constituent forming a plural with the suffix *-s* (*Auto*<sub>NOM.SG</sub>, *Autos*<sub>NOM.PL</sub>). If those nouns are found in the first position of a compound, the linking element *-s-* usually does not appear in these structures (e.g. *\*Auto-s-bahn* 'motorway') (Fuhrhop 1996: 533-534).

<sup>16</sup> Nübling & Szczepaniak (2009, 2011: 66) argue that *-s-*, apart from morphologically complex first constituents, also marks phonologically complex first constituents.

<sup>17</sup> A closing suffix is an inflectional or derivational suffix which prevents the stems to which it attaches from participating in further word-formation processes. Aronoff and Fuhrhop (2002) refer to the nominal closing suffixes *-heit*, *-keit*, *-igkeit*, *-ling* and *-ung*.

<sup>18</sup> The possibility of appearance of a linking element, especially in copulative compounds, has also been discussed by Breindl & Thurmair (1992: 39-40, 60), who conclude that there is no difference between copulative and determinative compounds, since in both cases the appearance of a linking element is possible.

<sup>19</sup> See Wälchli (2005) for the terms of natural vs. accidental coordination.

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