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Recursive Compounds and Linking Morpheme

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Abstract

This paper shows that the existence of a linking morpheme is not related to recursion of compounds in the given language, but a linking morpheme does play a role in some ways or the other of recursion. Recursion of compounding is defined as embedding at the edge or in the center of an action or object of an instance of the same type. On the other hand, iteration, is simply unembedded repetition of an action or object (Bisetto 2010). Based on these definitions, it is argued that there are languages with a linking morpheme overtly realized in recursive languages. Second, there are also languages which have genitive compounds with a linking morpheme, although recursive compounds do not have a linking morpheme. On the other hand, there are languages with a genitive compounds and recursive compounds of coordinate VNN or nominal coordinate compounds. In these languages, recursive compounds are not so productive. Finally, Turkish and Greek show that the existence of a linking morpheme is not related to recursion of compounds. They have a linking morpheme in iterated compounds, but not in recursive compounds.

Keywords: recursive compounds, iterated compounds, linking morpheme, genitive compounds

1. Introduction

Recursion is said to be a fundamental property of human language that potentially differentiate language both from other human cognitive domains and known communication systems in animals (Hauser, Chomsky & Fitch 2002, Corballis 2011). The aim of this paper is to find out whether recursion of compounding is found in unrelated languages or not and whether the existence of a linking morpheme in compounds has anything to do with the recursion of compounding in the given language. Knowing about recursion of compounds will reveal some aspect of human language, different to those of other animals. Also, looking at compounds in unrelated languages will enable us to understand universality of compounding.

Before starting the discussion, let us define what recursion is. Summarizing the definitions by a number of linguists, such as Chomsky (1965), Ralli (2013), Bisetto (2010), Corballis (2011), and many others, recursion can be defined as follows: it is a phenomenon of embedding structures within structures in cyclic fashion to create sentences, as complex and long as we like. Here, complex means embedding of phrases within phrases of the same kind. In principle, it is possible to construct a limitless embedding structures in human language. At least, within the limitless of one's memory and processing capacity.

Although it is generally agreed that recursion is universal in human language, there is some counter-argument against this claim. Observing an Amazonian language, Pirahã, Everett (2009) argues that it lack the grammatical principle of recursion. When English or other languages allows embedding structures within structures, Pirahã does not. This criticism is supported by Nevins, Pesetsky, and Rodrigues (2009). As this paper focuses on recursion in compounding, whether recursion is observed in any human language or not will not be further discussed here.

Going back to recursion, Chomsky (1995) argues that units are merged to form larger entities and the merged entities can be themselves merged to form larger entities to describe the phenomenon of embedding of structures.

For example, Noun Phrases can be built from noun phrases in recursive fashion. Or sentences can be continued recursively, such as *Jane loves John and Jane flies airplanes*. Or a verb phrase, such as *seem to expect to try to love Mary* is a recursive phrase, because it has a complex structure that can be decomposed into two or more entities of the same type (Bisetto, 2010). In morphology, Katamba (1993, p. 53) argues that it is possible to form recursive prefixed structures involving the same prefix, such as *re-re-make.* Also, in compounding, recursion is

often accepted in many languages by many linguists (Plag, 1993; Bisetto, 2010; Mukai, 2008, 2013; Tokizaki, 2008).

Following Parker (2006), Bisetto (2010), argues that what is admittedly called recursion can be categorized into recursion and iteration. This paper uses Bisetto's definitions, because it is possible to see what recursion in compouding really is. Recursion involves embedding at the edge or in the center of an action or object of an instance of the same type. On the other hand, iteration is the simply unembedded repetition of an action or object. To show the difference of the two types let us consider the following English compounds.

(1) [student [film society]]

(2) [American [student [film society]]]

(3) [[[[student [film society]] committee] scandal] inquiry]

(Bisetto, 2010, p. 20)

In (1), the compound *film society* is expanded on the left side by means of the merger of a new constituent, *student*, and in (2), the compound *student film society* is enlarged through addition on the non-head side of the adjective *American*. These are iteration, as the adjunction of these constituents enables the denotation of the head constituent more restricted, by adding specification or modification. On the other hand, (3) is recursion, since each process of constituent addition implies

the preceding object/action the base constituent refers to. The merger of a new head, in fact, introduces a new referent bound to the preceding one (Bisetto, 2010).

This paper will be organized as follows. First, recursive compounds in some languages will be looked at to see whether the existence of a linking morpheme is related to the recursion of compounds. Next, it will be shown that there are also languages with iterative compound with a linking morpheme inside. This section will be followed by observations of languages of exceptions. The conclusion of this paper will be an answer to the hypothesis and some discussion on why recursion exists in compounding of some languages and not others.

2. Recursive Compounds

2.1 Recursive Compounds with a Linking Morpheme

As discussed in the previous section, compound formation can be recursive, just as phrase formation is. This is especially true for noun-noun compound words. Let us observe recursive compounds in Germanic languages.

(4) fot+boll-s-domare — Swedish
foot+ball-LINK-referee
'football referee'

(5) under+grund-s-vand — Scandinavian languages (Note 1)
under+ground-LINK-water
'underground water'

(6) fag+forening+præsident — Norwegian and Danish
subject+assosiation+president
'labour union president'

According to Josefsson (1997), the *–s* in the Mainland Scandinavian, represented in (4) and (5) can be called a linking element or a liaison form and it is a morpheme without independent meaning. The linking morpheme is realized phonetically in Scandinavian recursive compounds, and it must be used to get this structure and interpretation. Without the linking morpheme, Swedish is strictly iterative compounds. For example, without a linking morpheme the compound in (4) is interpreted only as 'ball referee for foot', whereas with one, the compound is interpreted as 'football referee'. As for Norwegian and Danish, the examples (5) and (6) show that linking morpheme is not always required in recursive compounds. The above examples all have to have a linking morpheme to gain the interpretation represented there.

In other non-English Germanic languages, too, there are a number of recursive compounds and a linking morpheme is realized between the constituent as the following examples show.

(7) fahrrad kurrier jacke German
bicycle courier jacket
'bicycle courier jacket'

(8) dampf+schiff+fahrt-s-gesell+schaft-s-kapitän-s-müzze German
steam+ship+journey-LE-journey+man-SUF-LE-captain-LE-cup
'cup of the captain of the steam ship company'

Unlike in Scandinavian languages, German recursive compounds do not have to have a linking morpheme, as the above two examples show (Neef 2009).

(9) weer-s-voorspelling-s-deskundige-n-congres Dutch
weather-LE-forecast-LE-experts-n-conference
'conference for weather forecast experts'

(10) boek+handl-s-korting Dutch
book+shop-LE-discount
'bookshop discount'

Dutch recursive compounds do not have to have a linking morpheme, either.

Scandinavian languages, Dutch and German do have iterative compounds, too. The examples are as follows.

(11) barn+bog+klubb Scandinavian languages
child+book+club
'book club for children'

(12) Plastik+garten+zwerg German
plastic+garden+dwarf
'plastic garden dwarf'

(13) beroep-s-auto+andelaar Dutch
professional-LE-car+dealer
'professional car dealer'

The difference between recursive and iterative compounds corresponds to a meaning difference. For example, the example (11) means 'book club for children'. In contrast, the left-branching compound with a linking morpheme means 'club for children's book'. In Dutch, the linking element exists in iterative compounds as the above example shows.

2.2 Genitive Compounds with a Linking Morpheme

Scandinavian languages, Dutch and German all have a linking morpheme between the two constituents in simple compounds, such as the examples below show. Firstly, in Scandinavian languages, there are some compound words whose first constituent is marked with a linking element, such as *–s* or *–e*.

(14) fred-s-konference Danish
peace-LE-conference
'peace conference'

(15) bord-s-lamp Swedish
table-LE-lamp
'desk lamp'

(16) jul-e-gave Danish and Norwegian
Christmase-LE-present
'Christmas present'

The phonetic form of the linking element corresponds to the genitive marker. The left-hand constituent of the compound word has either a linking morpheme (examples (14) and (15)), or vowel morpheme (example (16)).

According to Josefsson (1997), Holmberg (1992) and Mellenius (1997), the –s in the Mainland Scandinavian can be called a linking morpheme or a liaison form and it is a morpheme without independent meaning.

Similarly, in German, a linking morpheme occurs in noun-noun compound words. The inflectional class of the left-hand constituent determines whether a linking morpheme occurs and what kind. They are *-e, -es, -en -er, -n, -ens, -s,* and *-ns* (Neef, 2009; Bisetto, 2012). For example, *-er-* only ever occurs in classes where it is licensed in the nominative plural (for example (19)). Let us see some typical examples of compounds with linking morphemes in German.

(17) Kind-er-wagen (Wiese, 1996, p. 143)
child-PL-cart
'buggy'

(18) Schwein-e-braten (Collins German Dictionary, 2004, p. 708)
pig -PL-roast
'roast pork'

(19) Frau-en-held (Collins German Dictionary, 2004, p. 968)
woman-PL-hero
'womanizer'

(20) Tag-es-zeit (Wiese, 1996, p. 143)
day-PL-time
'daytime'

The morpheme comes from a former inflectional ending of a genitive, singular or plural (Neef, 2009; Bisetto, 2012). Similarly in Dutch, the following examples show that there are genitive compounds.

(21) weer-s-voorspelling
weather-LE-forecast
'weather forecast'

(22) stad-s-vernieuwing
city-LE-renewal
'city renewal' (Don, 2009, p. 380)

According to Booij (2002), an extended form of a noun with an additional schwa or *–s* exists in compounds. As the linking morphemes in Scandinavian languages, the schwa and the /s/ in Dutch do not contribute to the meaning of the compounds. Another similar characteristic of the linking morphemes in Dutch to those in Scandinavian languages is that they both are historically a genitive suffix. There has also been extensive discussion of whether the linking morphemes in German and Dutch are plural or not.

In this section, it has been argued that recursive compounds do exist in some of the Germanic languages and it has become clear that both recursive compounds in Scandinavian languages have a linking morpheme, whereas iterative compounds do not. On the other hand, recursive and iterative compounds in Dutch and German sometimes have a linking morpheme. In addition, these languages have so-called genitive compounds where a linking morpheme exists between the two constituents of the compounds. The linking morpheme is homonym of the one in recursive or iterative compounds. In the next section, compounds in other languages will be observed.

2.3 Compounds with a Linking Morpheme in Languages

In the following languages, there are so-called genitive compounds with a linking morpheme, homonym of the linking morpheme in recursive compounds in the given language. This is true even when recursive compounds do not have a linking morpheme. These languages are English, Finnish, Latvian, Lithuanian, Japanese, and Korean.

Let us consider some examples of genitive compounds in English.

(23) children's book

(24) woman's magazine

(25) Mother's Day (Shimamura, 1986; Taylor, 1996)

Shimamura (1986) and Taylor (1996) argue that genitive compounds are similar to compound words. Firstly, they argue that the semantics of genitive compounds follow from their status as a noun, not as a noun phrase. A genitive compound denotes a type of entity, not an instance of a type. Generally, the designated type is a subcategory of the type denoted by the second constituent. For example, 'woman's magazine' is a type of magazine for women in general. Another characteristic is that the *–s* morpheme is not equivalent to that in prenominal possessives. Shimamura states that it is neither a derivational nor an inflectional suffix. It is not a derivational suffix, as it does not affect the category of the first constituent as a normal derivational suffix does. On the other hand, it is not inflectional suffix, as an inflection cannot usually go inside a word.

Like the following examples show, there are recursive compounds in English but they do not have a linking morpheme.

(26) gourmet coffee cup

'cup for gourmet coffee'

(27) coffee maker maker

'maker for coffee maker'

(28) Labour Union president

'president of Labour Union'

Just like in non-English Germanic languages, the interpretation is different from that of the base compound. For example, the interpretation of the compound *gourmet coffee* is something to do with coffee. But by adding the new constituent, *cup*, the interpretation changes to *cup for gourmet coffee*.

English has iterative compounds, too. Some examples are as follows:

(29) adult book club

'book club for adults'

(30) evening computer class

'computer class in the evening'

(31) restaurant coffee cup

'coffee cup for restaurants'

(32) student film committee

'film committee for students'

Like in the non-English Germanic languages, again, they are typical iterative compounds in that the interpretation of the whole compound is different from that of their corresponding recursive compound.

Other languages that behave similarly, i.e., those which have recursive compounds without a linking morpheme and genitive compounds are as follows. Finnish has compounds similar to those of Germanic languages (Karlsson 1987). The most common type of compound is made up of two non-derived nouns.

(33) kirja+kauppa

book+store

'bookshop'

(34) vesi+pullo

water+bottle

'water+bottle'

(35) pallo+peli

ball+game

'ball game'

It is not just juxtaposition of two nominal elements. The left-hand constituent of these compounds is often in genitive case (Spencer, 2003). Also, there are compounds with more than two elements.

(36) maa+talous+tuotanto

land+cultivation+production

'agricultural production'

(37) elo+kuva+teollisuus

live+picture+industry

'film industry'

(38) huone+kalu+tehdas

room+thing+factory

'furniture factory'

(39) koti+tarve+myynti

home+need+scale

'household sale'

This language seems to be a case where compounding is recursive, as the above examples show.

In Latvian (Spencer, personal communication), noun-noun compounds are formed from uninflected stem forms, just like the example above. The form *gramat-* is a stem (or a root) which cannot surface as such in the syntax. However, in addition to this construction Latvian has a number of noun-noun compounds whose first member is in the genitive (either singular/plural) case. Typical examples are as follows.

(40) latviešu valoda

of-the Latvians language

'Latvian language'

(41) ziemasvetki

of-winter festival

'Christmas' (Mathiassen, 1997, pp. 55-56)

These are in the same form as normal genitive construction but thought of as compounds and have a stress on the left constituent. The basic types are uninflected root + word and noun-gen.pl + word as illustrated in the following examples:

(42) Gra'mat-a

'book'

(43) veikal-s

'shop'

(44) gra'mat-u veikals

book-gen.pl shop

'bookshop' (Spencer: personal communication)

Semantically these compounds do not really mean 'the shop of (the) books'. The genitive case marker is used purely in a modifying function and does not syntactically function. They represent a kind of compound in which the left-hand member is inflected. In this respect they are like the internally inflected compound nouns of Finnish and is slightly similar to that of Germanic genitive compounds.

Similarly, but a little bit differently from Latvian is Lithuanian. The linking morpheme is not homophonous with an inflected form of the compounded word, unlike in Germanic compounds. Lithuanian also has compounds consisting of noun-gen.pl + noun (Mathiassen, 1997, pp. 1179-1180). Thus, to translate 'Lithuanian', 'Latvian' in the sense of 'the Lithuanian/Latvian language' into these languages.

(45) Lietuv-iu kalba Lithuanian

Lithuanian.man-gen.pl language

'Lithuanian language'

(46) Latvies'-u valoda Latvian

Latvian.man-gen.pl language

'Latvian language'

According to Spencer (personal communication) compounding in both Latvian and Lithuanian is recursive and have genitive compounds, much as in Germanic. (Note 2)

Let us look at some Asian languages. First, Japanese has a number of genitive and recursive compounds.

(47) mago-no-te

grandchild-gen.-hand

'back scratcher'

(48) haha-no-hi

mother-gen.-day

'mother's day'

The above examples show that there is a genitive case marker between the two morphemes, *mago* and *te* and *haha* and *hi*. These examples are not genitive phrases because of the following reasons. In (47), the meaning of the whole compound is different to that of its corresponding phrase *mago no te* 'grandchild(ren)'s hand(s)'. Also, their accents are different. The compound does not attract a falling tone, whereas its corresponding phrase has a falling tone on *no*. In (48), the *haha* does not specify someone's mother, for example, Karen's mother unlike in its corresponding phrase. This compound denotes general concept. In other words, it is a day for anyone's mother.

(49) kokka+koan+iinkai

nattion+security+commity

'National Security Council'

(50) hahaoya+gakkyu+tekisuto

mother+class+text

'text for mother's class'

(51) kaigai+ryokoo+hoken

abroad+travel+insurance

'travel insurance for going abroad'

As the above examples show, a linking morpheme does not exist in Japanese recursive compounds, as in English. However, there are a number of recursive compounds, including already existing ones as well as nonce ones. Japanese also has iterative compounds, as the following examples show.

(52) #kodomo+hon+kurabu

child+ book+ club

'book club for children'

(kodomo no hon kurabu)

GEN

(53) #otona+hon+kurabu

adult+book+club

'book club fou adults'

(otona no hon kurabu)

GEN

(54) #yoru+konpyutaa+kurasu

evening+computer+class

(yoru no konpyutaa kurasu)

GEN

(55) resutoran+koohii+kappu

restaurant+coffee+cup

'coffee cup for restaurant'

Native speakers of Japanese seem to prefer the corresponding phrases of the examples marked with the symbol #, but they are grammatical. For some reason, iterative compounds are more restricted than recursive compounds. It is hard to construct iterative compounds with more than three constituents. This is also the case in Scandinavian (Josefsson 1997), although ambiguity is not a problem due to the presence of an overt linking morpheme. The explanation may be constraints on processing. A compound with too much recursion without constituents (iterative compounds) may cause processing problems. In recursive compounds, the speaker forms a constituent out of adjacent roots earlier than in iterative compounds, where a constituent cannot be formed until the last constituent is pronounced (Hawkins 1990).

In Korean genitive compounds seem to exist.

(56) kwukkwun-uni nal

soldier gen. day

'soldier's day'

The genitive case marker *uni* inside functions is assumed as a linking morpheme. Korean noun-noun compounding is very productive. Tokizaki (2011, p. 5) states that Korean compounding is recursive. An example is as follows.

(57) on+chən+yok

warm+spring+bathe

'bathing in a hotspring'.

In this section, it has been shown that there are recursive compounds in some unrelated languages and these languages have a linking morpheme in recursive compounds and two-member compounds. These do not show that linking morpheme enables the language in question to have recursive compounds. In the next section, iterative compounds in some languages are shown.

3. Iteration with a Linking Morpheme

The last subsection presented languages with a linking morpheme in recursive compounds. There are languages with iterative compounds with a linking morpheme. These languages contradict the claim that linking morpheme exists only in recursive compounds, as Mukai (2008) claims. Let us see recursive compounds in one of such languages, Greek.

(58) aghrot-o-dharni-o-dh?tisi

farmer-LE-loan-LE-giving

'money-lending to farmers'

(59) pedh-o-odhont-íatros

child-LE-tooth-doctor

'a children's dentist'

(60) asvest-o-polto-píisi

lime-LE-pulp-making

'lime-pulp-making' (Bisetto, 2010)

What is interesting and different from compounding in Germanic languages is that there is a linking morpheme after each constituent, whilst in Germanic languages, there is a linking morpheme after embedded compounds, not each constituent. Also, where the noun-noun pattern is productive and the two constituents host a linking vowel between them, addition of new constituents is not allowed on the head side but only on the non-head one (Ralli 2013). According to Agathopoulou (personal communication), for Greek native speakers, multistemmed compounds like the above in which the two initial constituents are in a hierarchical relation are relatively rare in the language. The example in (61) is made up by Di Sciullo and Ralli (1994). They maintain that it is acceptable by native speakers, and the examples in (62) and (63) are among the very few of this kind in the data given by Agathopoulou.

(61) ot-o-rin-o-laring-o-l?ghos

ear-LE-nose-LE-throat-LE-expert

'ear, nose, and throat specialist'

(62) kafe+zith+estiat?rio

coffee+ale+restaurant

'a coffee-and ale-shop'

(63) skulik-o-mirmingh-?-tripa

worm-LE-ant+hole

'a worm- and ant-hole'

One might say that there is another contradiction against Mukai (2008) in Turkish. It has unrestricted iterative compounds, but recursive compounds is constrained by the rule that multiple adjacent occurrences of the linking morpheme. However, this is due to the fact that the linking morpheme is final. So this is not really a contradiction, but we can say that a linking morpheme actually plays a role for recursion (Bisetto, 2010). The following examples show the iterative compounds in Turkish with a linking morpheme.

(64) gençlik+aşk-i-roman-i-kahraman-i

youth+love-LE-novel-LE-hero-LE

'character in a youth romance'

(65) roman+kahraman-i

romance+hero-LE

'character of a novel'

(66) ask+roman-i-kahraman-i

love+romance-LE-hero-LE

'character in a romantic novel'

(Bisetto, 2012)

As the examples above show, a linking morpheme in Turkish is final and signals subordination (Scalise and Bisetto, 2009), i.e., modified-modifier.

These two languages also have genitive compounds just like the languages discussed in the paper, as English, Mainland Scandinavian and German. The following examples show that this claim is right.

(67) nixt-o-lúludo Greek

night-LE-flower

(68) düksn+vitrin-i Turkish

shop+window-LE (Bisetto, 2012)

In Greek, the linking morpheme exists between the two constituents, whereas in Turkish it exists at the end of the head constituent.

Word formation in Slavic languages is similar to that of Romance languages in that word formation is from derivation rather than compounding (Clark, 1993). This is also true in children's spontaneous speech. Children seem to prefer coining new nouns through derivation rather than compounding (Clark, 1993). However, there is an additional type of compounding in these languages. For example, in Polish, when compounding takes place, a linking morpheme, similar to that in Germanic languages, does appear between the two constituents of compounds.

(69) gwiazd-o-zbiór

star-LE-collection

'constellation'

(70) star-o-druk

old-LE-print

'antique book'

(Szymanek, 2009)

Also, although limited in number, recursive compounds exist in these languages and there are coordinate adjectival compounds.

(71) polsjo+rosyjsko+ukrainskie

Polish+Russian+Ukranian

'Polish Russian Ukranian'

A number of linguists have argued that recursive compounds do not exists in Romance languages. However, formations such as: *direttore reparto giocattoli* 'toy department manager' do exist though they are not so frequent and are mainly used as headlines in newspapers or labels on office-doors. (Note 3)

Also, some 'V-N' compounds can be iterative compounds. A verb can be adjoined on the left-hand side.

(72) porta+stuzzica+denti

carry 3.pres+pick+teeth

'toothpick-holder'

(73) porta-asciuga-mani

carry 3.pres+dry-hands

'towel-holder'

(74) proteggi-reggiseno

protect-bra

'bra-protector'

(Bisetto, 2010)

In these examples, the base compounds (*stuzzicadenti, asciugamani, reggiseno*) work as the internal direct object of the added verb, just like the nouns (*denti, mani* and *seno*) in the base verb+noun compounds do.

It is often said that compounding is not productive in Romance, compared to Germanic languages. However, Scalise and Bisetto (2009) say that it is productive and compounding of types which Germanic languages do not have so many.

In Spanish, there are compounds with a linking morpheme, like the following examples show.

(75) pel-i-rrojo

hair-LE-red

'red haired' (Scalise & Fabregas, 2010, p. 115)

4. No Genitive Compounds but Recursion

Chinese is a typical language which has recursive compounds but no so-called genitive compounds. According Duanmu (1997), Chinese has two different kinds of nominal structures; [NN] and [N de N] where *de* is a particle. There is good evidence that these two constructions are syntactically different. Especially, [NN] is not a phrase but a compound. He uses productivity, conjunction reduction and adverbial modification to distinguish these two constructions. Even though Chinese does not have any genitive compounds, it has recursive compounds (Packard 2000). Let us see some examples of recursive compounds in Chinese.

(76) fèiwù chǔ zhì jìhuà

waste disposal plan

'waste disposal plan' (Tokizaki, 2008, p. 9)

(77) zhongguo gongchan dang

China communist party

'Communist Party of China'

(78) zhongguo gongchan dang zhongyang zhengzhiju

China communist party central authorities politbureau

'central politbureau of the CPC'

(Shäfer: personal communication)

As the above examples show, there seem to be recursive compounds in Chinese and they are productive, too. However, as discussed above, Chinese does not seem to have genitive compounds and so the existence of a linking

morpheme does no have anything to do with its recursion in the language.

5. No Recursion

Latin compounding is not so productive as Germanic languages or the Asian languages which this paper has discussed. Usually, where the other languages have compounding, Latin has affixation and agglutination and fewer sub-types of compounding. For example, Latin determinative compounds (normal type) and bahuvrihi or exocentric compounds. Compounding in Latin is not recursive. There are no genitive compounds either in this language (Josefsson 2005).

The Table 1 is a summary of the observation of the languages discussed so far. The second column shows whether the language has productive and recursive compounds and the final column shows whether there is a linking morpheme or not in the language.

Table 1. Recursion of compounds and linking morpheme

Languages	**Recursive**	**linking morpheme**
Swedish	Yes	Yes
Danish	Yes	Yes
Norwegian	Yes	Yes
German	Yes	Yes
Dutch	Yes	Yes
English	Yes	Yes in genitive
Finnish	Yes	Yes in genitive
Greek	No	Yes in genitive
Latvian	Yes	Yes in genitive
Lithuanian	Yes	Yes in genitive
Italian	Yes but not so many in coordinative and VNN	Yes in neoclassical compounds
Spanish	Yes coordinative VNN	Yes in compounds
Russian	Yes coordinate	Yes in compounds
Polish	Yes coordinate	Yes in compounds
Slovakian	Yes coordinate	Yes in compounds
Czech	Yes coordinate	Yes in compounds
Latin	No	No
Japanese	Yes	Yes in genitive
Korean	Yes	Yes in genitive
Chinese	Yes	No
Latin	No	No
Turkish	No	Yes in genitive

6. Conclusion and Some Implications for Future Research

The last five sections have discussed whether recursive compounding in unrelated languages or not and whether a linking morpheme enables recursion of compounding. It has been found that the languages that have been researched a linking morpheme in recursive compounds and/or some kind of compounds, except for Latin and Chinese. As for the question whether a linking morpheme enables recursion of compounding in the given language, the answer should be no, according to my observations in the languages. However, it is important to consider a possible reason for recursion of compounding in some languages and not in others.

One reason might be that the existence of a linking morpheme does play a role in forming recursive compounds in the given language. The existence might not enable recursive compounds, but it does play a role of expanding 'longer' compounds. This is clearly the case in the Germanic languages, Japanese, Korean, Finnish, Latvian, and Lithuanian. The exception is Chinese. On the other hand, the languages like Romance languages and Slavic languages, they do have a linking morpheme in two-member compounds, and there are some recursive compounds. Speakers of these languages prefer other form of word formation than compounding. But when there are, a linking morpheme does exist and this fact shows that the linking morpheme plays a role in forming 'longer compounds', like in other languages.

The tricky cases are Turkish or Greek where there are linking morpheme in iterative compounds. Iterative compounds are not 'true' recursive compounds, as discussed above. But then again, these languages to have linking morpheme and it does play a role in forming 'longer' compounds.

The linking morpheme seems to have no semantic function in compounds. However, it is there to signal formation of compounds.

The implications for future research are to observe compounds in more languages and see my claims are correct or not. Also, there needs to be further detailed studies on when a linking morpheme exists in compounds in each language.

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Notes

Note 1. When the example has 'Scandinavian languages' written beside, it means that the word exists in all the three languages, Swedish, Danish and Norwegian. When the example has only the language, the example is from only the language.

Note 2. I would like to thank Professor Spencer for commenting on this matter.

Note 3. I would like to thank Professor Bisetto for commenting on this matter.