

## On the Compound Nature of Numerals in English<sup>1</sup>

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**Ahn, Sung-Ho G. 2017. On the Compound Nature of Numerals in English.** *Korean Journal of English Language and Linguistics* 17-2, 331-349. This paper explores the nature of English numerals, which are sometimes treated heterogeneously as compounds and syntactically composite numerals. Noting that “power-of-ten” words are never pluralized, however, this paper argues that every English numeral is a (compound) word. For this purpose, first, it checks if, and shows that, the so-called “syntactically composite” numerals in fact have overall properties of compounds: lexical complexity, lack of derivational affix, a compound stress pattern, allowance of a linker, right-headedness, syntactic inseparability, syntactico-semantic islandhood, and conceptual unity. Second, it also argues that their apparently problematic properties like productivity, compositionality, and idiomaticity cannot deter numerals from being treated as compounds, for example, on the basis of the facts that some other compounds can in fact be quite productive and compositional, and that numerals are quite “idiomatic” in that they allow only numerals as their components besides the linker *and*.

**Keywords:** English numerals, syntactically composite numerals, compounds, productivity, compositionality, idiomaticity

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## 1. Introduction

Numerals are linguistic expressions denoting numbers (Huddleston & Pullum (H&P, hereafter) 2002: 1715). They include cardinals, ordinals, fractions, dates, and so on, of which the first three types will be of main concern in this paper.

H&P classify numerals into a sub-class consisting of single words and another sub-class whose members are **syntactically composite**, and then further divide the first into (i) **simple** numerals involving *one* through *twelve*, (ii) **derived** numerals comprising *thirteen* through *nineteen*, and *twenty* through *ninety*, and lastly (iii) **compound** numerals like *twenty-one* through *ninety-nine*.<sup>2</sup>

H&P call those denoting the numbers equal to or greater than 100 "syntactically composite numerals" (SCNs, hereafter), and propose that an SCN consists of three immediate constituents: a **multiplier**, a **head**, and an **addition**. This is illustrated in the following:

(1)	MULTIPLIER	HEAD	ADDITION	
a.	five	hundred	and three	503
b.	five hundred	thousand	and ninety-seven	500,097
c.	two hundred and three	thousand	six hundred and ten	203,610
d.	four thousand five hundred	million	seven hundred thousand	4,500,700,000

[H&P: 1717, [65]]

For example, number 503 in (1a) is expressed numerically as "(5\*100)+3", and number 500,097 in (1b) is expressed as "(5\*100)\*1000+97". Further, they observe that the multiplier or addition constituent can be syntactically composite as in (1b-d),

<sup>2</sup> *KJELL* reviewer B raises the "tricky" question of how the compound can generally be differentiated from the phrase. The author assumes that the former will have a morphological structure while the latter will have a syntactic structure (Cheun, 1998, pp. 417-22).

capturing the fact that numerals are recursive.

How should we understand such SCNs? H&P label words like *hundred* and *thousand* **power-of-ten** words. They then make this significant observation: Outside the numeral system the power-of-ten words can occur inflected as in *hundreds of dollars* and *thousands of people*, but never in SCNs. Nouns combining with a numeral must have the property of countability, and when the numeral denotes a number greater than one, the head noun is expected to occur in its plural form, as shown in (2).

- (2) a. one book, five books      b. \*one books, \* five book

Nonetheless, the "heads" of the SCNs in (1) are consistently singular in form. In fact, SCNs become unacceptable if their "heads" are pluralized as in (3).

- (3) a. \*five hundreds and three  
 b. \*five hundred thousands and ninety-seven  
 c. \*two hundred and three thousands six hundred and ten  
 d. \*four thousand five hundred millions seven hundred thousand

What will be the reason for this? English words like *fish* and *deer* have the same form whether they denote one single entity or a plurality of entities. This is illustrated in (4).

- (4) a. We caught {one, five} fish.  
 b. We saw {one, three} deer.  
 (5) The fishes of the Fraser River include salmon and sturgeon.

When they are used in the plural form as in (5), they denote multiple kinds of those entities. [Cf. "Ask the English Teacher" at [http://crofsblogs.typepad.com/english/2005/02/fish\\_or\\_fishes.html](http://crofsblogs.typepad.com/english/2005/02/fish_or_fishes.html)]. Then, are

power-of-ten words of this word type? Perhaps, but this assimilation does not seem quite plausible, because *hundreds*, for example, wouldn't mean several types of hundred numbers.

The author actually came to pay a serious attention to this puzzle for the first time when Prof. Bob Bosley raised this question at a colloquium. It was when he was on a study leave at Essex University during the academic year of 2007 and 2008. Let us call this puzzle "Bosley's puzzle".

The purpose of this paper is to propose a way of working out this puzzle. It in fact proposes that H&P's compound analysis of numerals like *twenty-one* be extended to their SCNs. In other words, it will solve Bosley's puzzle on the basis of the hypothesis that every SCN is a compound, or that every numeral is a word, not a phrase.

This hypothesis, we check and support in sections two and three: First, in section two, we show that numerals satisfy most of the major properties of compounds. Then in section three, we discuss SCNs' properties that typical compounds wouldn't have: their productivity and compositionality, semantic non-idiomaticity, possession of a "syntactic" linker, and recursiveness, and show that the properties are in fact compatible with clear cases of compounds so cannot be critical obstacles to the plausibility of the thesis. In section four, lastly, we summarize our discussion and discuss implications of the thesis.

## 2. Compound-like properties of allegedly syntactically composite numerals

Lieber & Štekauer (2009a) claim that we do not have any established set of criteria that can be securely relied on in differentiating compounds from derived words or phrases. That said, they show that all the following criteria for compounds that

Donalies (2004) proposes are not tightly "water-proof".

- (6) a. are complex
- b. are formed without word-formation affixes
- c. are spelled together
- d. have a specific stress pattern
- e. include linking elements
- f. are right-headed
- g. are inflected as a whole
- h. are syntactically inseparable
- i. are syntactico-semantic islands
- j. are conceptual units

The structure of our argumentation, however, will be rather simple. All the criteria in (6) may be leaking to a certain extent, but they are the best that are available. If SCNs can be shown to satisfy most of them, then they should be accepted as compounds for the present.

First of all, SCNs are complex; they consist of more than one lexeme. This property, however, cannot distinguish them from derived words or phrases, which have the same property as well.

Unlike derived words, second, SCNs are clearly formed without derivational affixes; at least in English. Verbal compounds like *meat-eating* may have a derivational affix, but SCNs do not.<sup>3</sup> The SCN's lack of derivational affix strongly suggests that it is not a derived word. This property, however, does not distinguish SCNs from phrases, which do not need any derivational affix either: e.g., *this paper*.

Third, SCNs are not spelled together. As Lieber & Štekauer (2009a) point out, however, the spelling of representative

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<sup>3</sup> As pointed out by *KJELL* reviewer B, we cannot exclude the possibility that a "nominal" numeral zero-derives into an "attributive" numeral even in English, but its exploration is beyond the scope of this paper.

compounds is not consistent in English: for example, *blackboard*, *sound-wave*, and *blood bank*. Hence, the SCN's dissatisfaction of this property cannot pose a strong opposition to the thesis that SCNs are compounds. In English, therefore, this property cannot distinguish SCNs from separately spelled phrases like *the blue sky*.

Fourth, SCNs display the general stress pattern of compounds. In English, a binary compound word generally hosts the primary stress on its lefthand constituent,<sup>4</sup> and SCNs show the same general pattern. To check this, the author administered an email survey in January 2017 over instructors teaching English at a university in Seoul. Eight instructors voluntarily participated: five males and three females with the average age of 45.9. Seven participants were from the UK, US, Canada, and South Africa, and spoke English as their first language; participant 5 had Korean as her L1; all spoke one or two additional languages except for participant 2 at various levels of fluency.

The participants were requested to give their judgments on the underlined expressions reproduced in (7)–(8) with the following instruction: “In a neutral situation, ..., where would you give which level of stress? Write ‘1’ where comes the primary stress within the underlined expression, write ‘2’ where comes the secondary stress, and write ‘3’ where comes the tertiary stress.” In the survey sheet, the prompt sentences were arranged randomly in a straight numerical order (from 1 to 15), and had a pair of parentheses under every word as in (7), so the expression in (7d), for example, had seven such pairs of parentheses under the underline.

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<sup>4</sup> Lieber & Štekauer (2009a) point out that there are personal or contextual/pragmatic variations, and that several exceptional cases have their second constituents primarily stressed. In the same spirit, *KJELL* reviewer B mentions that compounds like *Long Island* and *well-educated* host the primary stress on the second constituent.

- (7) a. Two hundred is a big number for a kid.  
 (   ) (   )
- b. Two hundred and thirty is a complex number for a kid.  
 c. Three thousand two hundred and thirty is a big number.  
 d. Five thousand three hundred and thirty two is a big number.  
 e. I saw three hundred and sixty five bisons.  
 f. That was the five hundred and third time we went out together for a walk.  
 g. This is the five hundred thousand and ninety-seventh time that we gather together.  
 h. Fifty-two seventieths plus three one hundred thirtieths?  
 i. The difficulties of Korean economy emerged during the two thousand (and) tens.
- (8) a. This is a two-hundred-dollar cheque.  
 b. I don't quarrel with my bread and butter.  
 c. The result was a push toward sciences and bread-and-butter education.  
 d. Can I order a tuna fish salad sandwich, please?  
 e. I met a twelve-year-old genius last year, but this genius is only nine years old!  
 f. He has a two-car garage, and a two million five hundred thousand-word corpus.

The results included the following: For the SCNs in (7), all participants assigned stress 1 on to the first constituent for two cases, *two* in *two hundred* in (7a), and *two* in *two thousand (and) tens* in (7i); seven out of eight did so for (7c), (7d), (7e), (7g), and (7h); six did so for (10); and finally five did so for (7b). For the compounds in (8), all the eight participants assigned stress 1 on to the first constituent for (8b), (8d), and *two million five hundred thousand-word*, the second expression in (8f); seven did so for (8a), 8c), (8d), and the first expressions in (8e-f); six did so for the second expression in (8e). This quite consistent tendency in the stress patterns in (7) and (8) supports the thesis that SCNs are also compounds.

Derived words generally do not have the primary stress on an affix, so with prefixes the derived word usually shows a

weak–strong pattern: for example, *unaffécted*, and *disínterested*. Noun phrases generally show a similar pattern: for example, *blue birds*. That is, the stress pattern property distinguishes SCNs from derived words and phrases.

Fifth, SCNs can have a linking element, that is, the connector *and*, but not necessarily: for example, *two hundred (and) five*. Derived words do not, but in similar contexts phrases must have a similar linking element in English: for example, *beautiful birds* *\*(and) trees*.

Sixth, SCNs are arguably right–headed. That is, their right–hand constituents are the heads. If H&P's rather descriptive analysis reported in (1) were right and the heads would come in the center, SCNs would not satisfy the property of right–headedness in (6f). In this regard, however, there is evidence that the power–of–ten word cannot be the head of an SCN: The ordinal counterpart of an SCN always has only the last constituent of the cardinal “ordinalized”. Observe this, for example, in the following ordinal counterparts in (9) of the cardinals in (1). Only the last numeral constituent in each example is in its ordinal form, but all the other numeral components are in their cardinal forms even though they basically have their own ordinal forms. Contrast the different acceptability in (9) and (9').

- (9) a. five hundred and third  
 b. five hundred thousand and ninety–seventh  
 c. two hundred and three thousand six hundred and tenth  
 d. four thousand five hundred million seven hundred thousandth
- (9') a. \*five hundredth and third  
 b. \*five hundred thousandth and ninety–seventh  
 c. \*two hundred and three thousandth six hundredth and tenth  
 d. \*four thousand five hundred millionth seven hundred



thousandth

Semantically, the ordinal morpheme *-th* scopes over the entire numeral, but morphologically, it surfaces on the last constituent. As *KJELL* reviewer B suggests, this can best be regarded as a case of bracketing paradox, which is related to examples like *unhappier* and *nuclear scientist*. What is crucial is that they involve morphological adjuncts (*un-*, *nuclear*) and the underlined morphemes attach to the heads (Newell, 2005). This supports the thesis that the last component numerals in (9) examples are the heads and host the ordinalization morpheme *-th*.<sup>5</sup>

Further, only the last constituent numeral of an ordinal is pluralized, as in the following fractions in (10a), or with the number indicating a decade of years as in (10b).

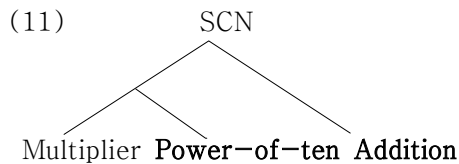
- (10) a. Fifty–two seventieths plus three one hundred thirtieths?  
 b. two thousand (and) tens (= 2010s)

Since the plurality morpheme attaches only to the head, this either indicates that the underlined entire parts (i.e., *seventieth*, *one hundred thirtieth*, *two thousand (and) ten*) are a compound, or that their last constituents are their heads.<sup>6</sup> These two possibilities are reciprocally supportive. If they are compounds, their last constituents will be their heads; if the last constituents are the heads, then it supports that they are compounds. Either way, the conclusion must then be that SCNs are right-headed. Given this,

<sup>5</sup> *KJELL* reviewer A and B referred to the fact that the genitive *-(e)s* in English attaches to a nominal “phrase” but phonologically realizes on its last lexical item constituent, not on its head. This is correct, but the ordinalization process must be treated differently from the genitive inflection. It involves all suppletive forms such as *first*, *second*, *third*, and so on, which strongly indicates that it in fact takes the last numeral as its base.

<sup>6</sup> This pluralization fact suggests that *-th* attachment is probably a type of derivation, because inflections cannot stack in English.

an SCN must be analyzed as follows, where the thick units must be the heads:



We can say that H&P are right, but only to a limited extent. The power-of-ten word must be analyzed as the head of the first immediate constituent of an SCN, the "multiplication constituent" of [multiplier\*power-of-ten], which is an **attributive compound** in the Bisetto & Scalise's (2005) sense. The entire SCN is made up of the multiplication constituent and the addition constituent, the second of which is the head. It is an instance of **coordinate compound**. Consequently, the English SCN comes to involve the two types of compounding: attributive and coordinate.

The possession of this property quite strongly assimilates SCNs to compounds, which is generally right-headed in English, and distinguishes them from derived words or phrases whose heads are positioned differently depending on the nature of their dependents (affixes or adjuncts or complements).

- (12) a. left-headed: *enable; something special, use the tool*  
 b. right-headed: *darken, mistrust; blue skies, quite elegant*

Seventh, as shown with fractions above, SCNs are inflected as a whole (cf. (10)). This is the case with derived words, but not with phrases as can be seen in (13).

- (13) a. actors, enables, ...  
 b. the students in my class, the boss of my friends

Observe here that derived words inflect as a whole, but that phrases have their heads inflected different than their dependents. This property clearly distinguishes SCNs from phrases.

Just like derived words, eighth, SCNs are syntactically inseparable. I presume that adverbs like *exactly* cannot intervene constituents of an SCN because I cannot witness any such numeral on the internet. With noun phrases, however, such intervention is possible to a certain extent as shown in (15).

- (14) a. {exactly one hundred ninety, exactly one hundred and three} students  
 b. \*{one hundred exactly ninety, one hundred and exactly three} students
- (15) a. I need exactly the same book.  
 b. I need the exactly same book.

That is, SCNs satisfy the seventh and eighth criteria as well.

Ninth, SCNs seem to be syntactico-semantic islands. As shown in the next pair of examples in (16), any constituent of an SCN cannot be taken out, while a constituent of, say, a noun phrase can be in an appropriate context.

- (16) a. \*How many are those students [one hundred \_\_\_\_] in number?  
 b. How many firms did you read [a report on \_\_\_\_]?

That is, SCNs satisfy the ninth criterion for compounds as well, differently from typical phrases.

Tenth, lastly, SCNs are conceptual units, as lexemes and derived words are. They each denote a unique number. Even though there are cases which are difficult to classify, phrases are generally quite different from typical compounds in this respect.

If we put the properties of SCNs together, we will get (17).

(17)	<i>Compound Properties</i>	<i>SCNs</i>	<i>Derived Words</i>	<i>Phrases</i>
a.	are complex	Yes	Yes	Yes
b.	are formed without word-formation affixes	Yes	No	Yes
c.	are spelled together	No	Yes	No
d.	have a specific stress pattern	Yes	No	Yes <sup>7</sup>
e.	include linking elements	Yes/No	No	Yes/No
f.	are right-headed	Yes	Yes/No	No
g.	are inflected as a whole	Yes	Yes	No
h.	are syntactically inseparable	Yes	Yes	No
i.	are syntactico-semantic islands	Yes	Yes	No
j.	are conceptual units	Yes	Yes	No

In summary, SCNs satisfy all of Donalies's (2004) compounding criteria except for the spelling criterion, which is not consistent anyway in English, and for the possession of linking elements, which is generally not the case with English compounds. Further, SCNs are quite clearly differentiated from phrases in many criteria. Even though we will not repeat all the checking process here, this is true for the numerals that H&P already analyze as compounds: *twenty-one*, and so on. Hence, we have quite a strong support here for the thesis that H&P's compound analysis must be extended on to SCNs as well, that is that every numeral is a (compound) word.

A final remark is in order regarding the multiplication constituent like *five hundred*. It must be regarded as a compound as well. It is right-headed, and in fact satisfies all the compound criteria that SCNs do.

Regarding Bosley's puzzle, we can then state that the reason why the numerals in (3), especially their power-of-ten words, are not inflected for plurality is that they ARE compounds: The puzzle

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<sup>7</sup> As pointed out earlier, compounds generally show a different stress pattern than phrases.

has been solved.

As a further support for the thesis, we can in fact notice that the property of no inflectional suffix is also witnessed with similar compound cases in English. Consider the following example:

- (18) I met a twelve-year-old genius last year, but this genius is only nine years old!<sup>8</sup>

When it occurs as a constituent of an adjectival phrase, *nine years* is the correct form. When it occurs as a part of the compound, *twelve-year-old*, notice that *twelve-year* must occur in its singular form.

Just like an SCN, further, such a compound can be used as a noun, as in the following:

- (19) Twenty-year-olds are three times more likely to reach their 100th birthdays than their grandparents and twice as likely as their parents (*Guardian*, 4 Aug 2011).

In this example, *twenty-year-olds* is in the plural form, proving that it functions as a compound noun.

### 3. Apparently problematic properties of SCNs

English numerals are completely productive. We can easily imagine that they are infinite in number. If they are compounds and hence new lexemes, we will have very, very long words, words that are longer than many sentences! Further, SCNs are quite regular and systematic in structure, which means that we do

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<sup>8</sup> The author would assume that *nine years* functions as the specifier of the adjectival head *old* here, in view of the fact that the first can be replaced by *that*, a degree expression, as in *Is she that old?*

not need to list them in the lexicon. Here, an important question arises: Can compounding be as productive as with numerals?

According to Roeper & Siegel (1978), English root compounds tend to be less productive than verbal compounds, and their meanings tend to be idiomatic, not compositional. If we compare SCNs with root compounds, the first will look quite extraordinary. However, English allows another type of compounds, which are quite productive and have a non-idiomatic, compositional meaning (cf. Cheun 1998). SCNs should be compared to such compounds. The following examples illustrate the two types of compounds: root compounds in (20a), and verbal compounds in (20b).

- (20) a. girl friend, frogman, snowflake, ash tray, doorknob,  
windmill, flour mill, ...  
b. truck driver, strange-sounding, hand-written,  
peace-making, ...

Just like compound numerals, such verbal compounds do not need to be listed in the dictionary. In fact, Lieber & Štekauer (2009a: 7) state that "the more productive the process of compounding in a language, the less chance that individual compounds will be lexicalized". This leads us to establish that "sufficiently" productive compounds do not need to be listed in the dictionary.

In fact, compounding tends to be completely productive when it operates on a pair of words involving a numeral as a component. An example is found in (21), which we discussed in the previous section. Compound adjectives like *twelve-year-old* are again infinite in number because in the slot of *twelve* any numeral can be plugged into. Exactly the same statement can be made about the compound noun, *twenty-year-olds* in (19). Jackendoff (2009: 109) provides additional examples of compound types involving numerals.

- (21) a. [two-car] garage  
 b. [2,300-word] corpus

It is easy to notice that such compounds are again infinite in number. All these nearly completely productive compounds need not be listed in the lexicon because they are completely predictable and compositional in meaning and structure.

Even though SCNs have such a high degree of predictability and compositionality, they are still quite idiomatic in Kavka's (2009) sense because he understands **idiomatic expressions** as "multiple-word chunks consisting of constituents which are bound lexically and syntactically". Only numerals are expected to occur in SCNs except the conjunction of *and*: other conjunctions are not allowed to occur in SCNs.

Another property of SCNs that apparently militate against their compound analysis is the very fact that they can involve conjunction *and*. Conjunctions are generally used to build up phrases. Can an SCN with *and* in it be regarded as a compound? Though not frequently observed, English does have some instances of compounds having *and*. An example immediately coming to mind is *bread and butter* as in the following examples.

- (22) a. quarrel with one's bread and butter  
 b. a bread-and-butter education

In this case, the compound denotes an entity that consists of two materials. In this regard, an SCN may be understood as denoting a number which can be dissected into two numbers.

The last potentially problematic property of SCNs is their recursiveness, which is typically attributed to syntactic phrasal structure. Can't compounding be recursive? Actually, it can be. For example, consider *washingmachine manufacturer*, which must be said to have a recursive structure where *washing* and *machine*

are compounded into the compound *washingmachine*, which again becomes a part of the larger, final compound. Other languages may have longer compounds: according to the Wikipedia article titled “Longest words”, for example, Finnish has the following instance:

- (23) lentokonesuihkuturbiinimoottoriapumekaanikkoaliupseerioppilas  
(‘airplane jet turbine engine auxiliary mechanic non–commis–  
sioned officer student’)

These instances of compounding seem to be pragmatically limited in length, but not in terms of grammatical mechanism. This predicts that if needs arise to denote a systematically changing group of entities, such as numbers, compounds may be generated completely productively, which is witnessed in fact with English numerals.

Almost the same analysis can be extended to all the other languages: For example, Korean will generate numerals, which must be compounds, in a similarly systematic way.

- (24) [9–chen 8–bayk 7–sip 3]–man 4–chen 5–bayk 2–sip 6  
(=9873,4526)

This language has “basic” power–of–ten words at one more level than English: *sip* (‘ten’), *bayk* (‘hundred’), *chen* (‘thousand’), and *man* (‘ten thousand’). For higher numbers, it recycles the first three above while English reuses power–of–ten words in two or three digits. Other than that, Korean numerals seem to have exactly the same structure as their English counterparts. In (24), for example, *man* is a power–of–ten word, and combines with the square–bracketed multiplier. It is followed by an “addition” to be analyzed as the head.



#### 4. Summaries and Implications

Our discussion in this paper has been concerned with Bosley's puzzle: Why doesn't the power-of-ten word in a syntactically composite numeral (or SCN) (e.g., *two hundred and three students*) ever inflect for plurality? This puzzle has led us to set up and explore the hypothesis that SCNs are not phrases but compounds. Through the discussion in section two we have seen that the hypothesis is strongly supported because they in fact pass most of Donalies's (2004) compound criteria, as summarized in (17). In section three, then, we have seen that their extraordinary properties in productivity, compositionality, idiomatity, conjunctionality, and recursiveness are not incompatible with their compoundhood. Given this, our conclusion is that all English numerals are words: simple, derived, or compound, and that SCNs are not pluralized because they are compounds. Bosley's puzzle is solved.

The discussion in this paper has also revealed that the SCN involves both attributive and coordinate types of compounding, in both of which the compounds are right-headed.

The results have also affirmed that compounding can be completely productive and compositional, and can generate words that need not be listed in the lexicon. They have also led us to expect that numerals in other languages would be best treated as compounds as well, as hinted by the Korean numeral system illustrated in (24).

A theoretical implication of this study is that numerals CAN be analyzed as heading a numeral phrase (or NumP) since they are of a lexical category in nature. Since a lexical item can also function as a specifier, it means that a numeral is expected to be capable of playing either the head or the specifier role. This opens a new possibility of describing nominal expressions containing both a cardinal and an ordinal numeral as follows:

- (25) a. [<sub>DP</sub>[<sub>Spec</sub> all] [<sub>D'</sub>[<sub>D</sub> these] [<sub>NumCP</sub>[<sub>Spec</sub> first] [<sub>NumC'</sub>[<sub>NumC</sub> three hundred and thirty two] [<sub>NP</sub>[<sub>AP</sub> very cute] [<sub>N'</sub> puppies]]]]]]]]  
 b. [<sub>DP</sub>[<sub>Spec</sub> all] [<sub>D'</sub>[<sub>D</sub> the] [<sub>NumOP</sub>[<sub>Spec</sub> five] [<sub>NumO'</sub>[<sub>NumO</sub> second] [<sub>NP</sub> runners]]]]]]]]

When we have a Num<sub>C</sub> head like *three hundred and thirty two* as in (25a), we can have a Num<sub>O</sub> functioning as its Specifier, and the roles of cardinals and ordinals can be reversed as shown in (25b).<sup>9</sup> This new hypothesis will wait for empirical checking.

In terms of compound typology, the “numeral compound” discussed in this paper cannot be a verbal compound; if at all, then perhaps it should be thought of a type of root compounds. As suggested KJELL reviewer A, it may be better thought of as a phrasal compound. This issue remains to be explored further.

### References

- Bisetto, A. and S. Scalise. 2005. The classification of compounds. *Lingue e Linguaggio*, 4(2), 319–32.
- Cheun, S.-B. 1998. *Yengehakgaylon* (‘Introduction to English Linguistics’). Seoul: Hankook.
- Donalies, E. 2004. *Grammatik des Deutschen im europaeischen Vergleich: Kombinatorische Begriffsbildung, vol. 1: Substantivkomposition*. Mannheim: Institute für deutsche Sprache.
- Huddleston, R. and G. K. Pullum. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.
- Jackendoff, R. 2009. Compounding in the parallel architecture and conceptual semantics. In Lieber, R. & P. Štekauer, eds., *The Oxford Handbook of Compounding*, 105–128. Oxford, UK: Oxford U. P.
- Kavka, S. 2009. Compounding and idiomatology. In Lieber, R. & P. Štekauer, eds., *The Oxford Handbook of Compounding*, 195–33. Oxford, UK: Oxford U. P.
- Lieber, R. and P. Štekauer. 2009a. *The Oxford Handbook of Compounding*. Oxford, UK: Oxford U. P.

<sup>9</sup> KJELL reviewer B notes that *second runner* in (25b) feels like a compound. In that case we will have a different story, but the author is concerned with the analysis where that is not the case.

- Lieber, R. and P. Štekauer. 2009b. Introduction: Status and definition of compounding. In Lieber, R. & P. Štekauer, eds., *The Oxford Handbook of Compounding*, 3–18. Oxford, UK: Oxford U. P.
- Newell, H. 2005. Bracketing paradoxes and particle verbs: A late adjunction analysis. In *Proceedings of ConSOLE XIII*, 249–272.
- Roeper, T. and M. E. A. Siegel. 1978. A lexical transformation of verbal compounds. *Linguistic Inquiry*, 9, 199–260.

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