

## On the Category and Morphosyntax of Numerals

**Problem and proposal** The cross-linguistic and intralinguistic categorial status of numerals is a long-standing problem for syntactic theory (cf., Corbett 1978, Hurford 1987). The goal of this paper is to investigate the syntactic category of cardinal and indefinite numerals by comparing their morphosyntax, primarily but not exclusively in Russian and Dutch. We show that a division into three subcategories is necessary: (i) numeral 1; (ii) cardinals  $\geq 2$ ; (iii) indefinite numerals such as MANY. Simplifying, we propose that DPs containing a cardinal  $\geq 2$  or an indefinite numeral have the bipartite structure in (1), building on Leu (2005), and Roehrs (2008) for the structure of morphologically complex quantifiers such as *someone*, and Martí Girbau (2010) for numeral containing DPs and partitives.

(1) [DP [D [ClassP-high [Class-high [PP [P [ClassP-low [Class-low [NP [N ]]]]]]]]]]]]

In this structure, the Class-low (or sortal) classifier projection is connected to a Class-high (or mensural) classifier projection by an (abstract) preposition. As for numeral 1, we build on Borer (2005), Barbiers (2007), Kayne (2020), Corver (2021) and propose that it is a classifier that individuates nouns and makes them countable. Numeral 1 is generated in Class-low. Distinctly from DPs with cardinals  $\geq 2$ , a DP with numeral 1 does not project the PP and ClassP-high layers of the structure in (1). Numeral 1 has an unvalued feature that can be valued as [person], [gender], [space], or [time], depending on the language and the syntactic context. In this respect, it behaves similar to the underspecified anchoring head at the clausal level proposed by Ritter & Wiltschko (2014). Indefinite numerals are generated in Class-high in Dutch, but in Class-low in Russian. Evidence for these claims comes from the distinct morphological and syntactic properties of the three subcategories, as demonstrated below.

**Background** Based on a typological survey Corbett (1978) claims that simple numerals fall between adjectives and nouns, while higher numerals tend to be more noun-like. Hurford (1987) uses morphosyntactic criteria such as case and agreement to argue that lower numerals are sometimes adjectives, sometimes nouns, and sometimes mixed. Aarts (2015) discusses various analyses of English numerals according to which they are determiners, postdeterminers, or nouns. Barbiers (2007) argues that numerals in Dutch are neither adjectives nor nouns, but a category of their own, with three morphosyntactically distinguishable subcategories: the numeral *één* 'one'; cardinals  $\geq 2$ ; indefinite numerals. Kayne (2020) proposes that numeral *one* in English contains a classifier, and is followed by (silent) *single* or *only*. For cardinals *two*, *three* and *four* he assumes a coordination analysis, and cardinals  $\geq 5$  in this system contain a silent counterpart of *set*.

**Explanation and Evidence** The structure and analysis in (1) is supported by the following pieces of evidence. Dutch numerals are distinct from adjectives, nouns and determiners in that they alone require quantitative *er* 'there' with noun ellipsis in Standard Dutch (this does not hold for many southern varieties of Dutch, which allow *er* with adjectives in the construction in (2b)).

- (2) (Talking about apples)
- |    |                            |    |                     |
|----|----------------------------|----|---------------------|
| a. | Ik heb *(er) één/twee/veel | b. | Ik heb (*er) groene |
|    | I have there one/two/many  |    | I have there green  |
| c. | Ik heb (*er) die ook       |    |                     |
|    | I have there those too     |    |                     |

In many languages, e.g., Russian, Finnish, Hebrew, Romance languages, Brabantish, numeral 1 is inflected for gender, as opposed to cardinals  $\geq 2$ . These subcategories also often differ in the case they trigger on the following noun. In non-oblique contexts in Russian the noun following cardinals  $\geq 2$  has genitive case, unlike nouns following numeral 1 (cf., Ionin & Matushansky 2018). Similarly, in Finnish only cardinals  $\geq 2$  trigger partitive case (Brattico & Leinonen 2009). We interpret these case effects as a consequence of the presence of the (abstract) PP layer in (1) with cardinals  $\geq 2$ , and its absence with numeral 1. This leads to the expectation that this PP layer can be made visible even in languages such

as Dutch in which cardinals do not trigger overt case on the following noun. We show that this is borne out in constructions such as *tal van boeken*, lit. '(high) number of books'; *een aantal (\*van) boeken* 'a number (of) books'; *Wat heb jij aan boeken gekocht?*, lit. 'what have you on books bought?' (with a list as a typical answer). Further evidence for the distinct status of numeral 1 includes, among others, the following facts: 1) it follows the noun in Hebrew, while cardinals  $\geq 2$  precede the noun (Borer 2005); 2) it disallows regular ordinal formation in many languages (Hurford 1987; Veselinova 1997; Barbiers 2007); 3) in Khasi (Mon-Khmer) all cardinals require a sortal classifier, but not numeral 1, which shows gender agreement with the noun (Mamta 2023); 4) in the classifier languages Mandarin, Cantonese and Vietnamese numeral 1 can be absent in the presence of a classifier (see Her et al 2015 and references cited there); 5) in Russian the classifier *čelovek* 'person' (see Yadroff 1999; Khrizman 2016 for discussion) cooccurs with cardinals  $\geq 2$ , unlike with numeral 1, as the contrast in (3) shows.

- |     |    |   |    |  |
|-----|----|---|----|--|
| (3) | a. | Pjat' (čelovek) pisatel-ej<br>Five.NOM person writer-PL.GEN<br>'five writers' | b. | Odin (*čelovek) pisatel'<br>one.NOM person writer.SG.NOM<br>'one writer' |
|-----|----|---|----|--|

More evidence for the distinct properties of numeral 1 in Russian comes from approximative inversion constructions. These observations lead us to propose that numeral 1 in many languages is a classifier itself. We argue that in languages with plural morphology on the noun, the features of this morpheme are generated in Class-low in (1), following Doetjes (1996); Borer (2005). Thus plural inflection and numeral 1 are both classifiers competing for the Class-low position. Cardinals  $\geq 2$  are generated in SpecClassP-low and move to SpecClassP-high whenever possible. We show that in Russian, this is the case in non-oblique contexts, while in oblique contexts the PP and ClassP-high layers are missing, giving rise to distinct case and agreement properties. Novel evidence for the distinct syntactic distribution of numeral 1, cardinals  $\geq 2$ , and indefinite numerals in Dutch comes from prepositional constructions such as *Zij kwamen bij-een/\*twee/\*veel*, lit. 'they came by one/two/many', 'They came together'; *Ik heb er eentje/\*tweetje(s)/\*weinigje(s)*, lit. 'I have there NUM+diminutive suffix', 'I have one', and *in z'n eentje* lit. 'in his one+diminutive suffix', 'on his own' *met z'n tweetjes/\*weinigjes/\*veeltjes*, lit. 'with his NUM+diminutive suffix', 'with the two of us'. Finally, we show that while indefinite numeral *veel* 'many' in Dutch is generated in Class-high, its Russian counterpart is generated and stays in Class-low if realized as *mnogie*, lit. 'many-PL', with a plural reading, while it moves from Class-low to Class-high if realized as *mnogo*, lit. 'many-o', with an amount reading.

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