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On Number and Numberlessness in Languages without Articles^{*}

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Introduction

This paper is concerned with the representation of number in languages without articles, focusing on two distantly related languages: Russian and Armenian. It is argued that morphological number and semantic number are mediated by syntactic number, encoded even in languages lacking articles via a dedicated functional projection, NumP. Thus, an argument is made against the strongest anti-DP position that denies any functional projections inside a nominal in a language without articles (cf. Fukui 1986, 1988; Chierchia 1998; Baker 2003:113). Instead, it is shown that at least the projection of NumP must be assumed even for article-less languages (cf. also Pereltsvaig 2001, 2006, 2007a, b, 2008, 2009; Rutkowski 2002a, b, 2006, 2007, 2012; Bailyn 2004).

The focus of this paper is on the so-called number-neutral nominals, that is nominals that denote ‘one or more X’: semantically, such nominals are neither singular (‘one X’) nor plural (‘more than one X’). We argue that the semantic number-neutrality of such nominals results from the lack of the syntactic number feature, normally hosted in NumP, which we show to be absent in such nominals. Depending on the language, such number-neutral nominals can be morphologically either singular or plural; furthermore, we show that the morphological expression of number neutrality does not correlate with whether a given language has articles or not.

The rest of the paper is organized as follows: number-neutral nominals are introduced in section 1 and their syntactic properties are discussed in more detail in section 2. In section 3 number-neutral nominals in article-less languages are compared with those in languages with articles. Section 4 fleshes out the analysis

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and discusses its consequences for *pluralia tantum* nouns in Russian.

1 Number-neutral Nominals

It has long been noted that some morphologically plural nominals in English, such as the boldfaced nominal in (1a), do not necessarily denote plural individuals. Thus, the question in (1a) can be truthfully and felicitously answered as in (1b):¹

- (1) a. Do you have **children**?
b. Yes, I have one.

A semantico-pragmatic analysis has been proposed for such instances of number-neutrality (also referred to as “inclusive plurals”) in Sauerland (2003), Sauerland, Anderssen & Yatsushiro (2005) and recently by Grimm (to appear). According to them, morphologically plural nominals denote both atomic and plural individuals, but under normal circumstances the atomic interpretation is ruled out by pragmatic principles; however, in certain semantically or pragmatically defined contexts (downward entailing for Sauerland et al., kind-instantiating for Grimm) these pragmatic principles do not apply, making the atomic interpretation available.

While such semantico-pragmatic approach may be appropriate for number-neutral nominals in English, we will show that it is not suitable for their counterparts in Russian or Armenian. In those languages, one also finds number-neutral nominals in contexts similar to those in the English examples:

- (2) a. Russian
U vas est' **deti**?
to you there-is children
'Do you have (**one or more**) children?'
b. (Western) Armenian (cf. Bale et al. 2010)²:
Bezdig unis?
child have(2.SG)
'Do you have (**one or more**) children?'

Two things are worthy of note here. First, while in Russian number-neutral nominals are morphologically plural, much like in English (cf. (1a) above), in

¹ Note that such number-neutrality in English is restricted by some (so far poorly understood) pragmatic factors: one is unlikely to enquire *Do you have husbands?* to find out about someone's marital status.

² Throughout this paper, Armenian is illustrated with examples from both Western and Eastern Armenian. The two varieties are very similar when it comes to number-neutral nominals but differ significantly in other respects.

Armenian number-neutral nominals are morphologically singular. Second, unlike in English, where number-neutral nominals are restricted to certain semantically/pragmatically defined contexts, as mentioned above, in Russian and Armenian number-neutral nominals can also be found in other contexts, which are defined syntactically rather than semantically, as discussed below.

In particular, in Russian number-neutral nominals are found as complements of intensive reflexives (cf. Tatevosov 2006; Kagan & Pereltsvaig 2011a, b), as in (3); as complements of the preposition *v* ‘into’ in the *v-prezidenty* construction (cf. Bailyn 2002; Pereltsvaig 2006), as in (4); and as complements of syntactic compounds (cf. Trugman 2008; Pesetsky 2010), as in (5). In the remainder of this paper, we will focus on the first two constructions. As in (2a) above, the number-neutral nominals in these constructions are morphologically plural, yet denote ‘one or more X’.

- (3) Lena na-jela-s’ **kotlet**.
 Lena na-ate-sja cutlets(GEN)
 ‘Lena ate her fill of cutlets.’ =
 = ‘Lena ate (one or more) cutlets & Lena doesn’t want to eat (one or more) cutlets anymore.’
- (4) Medvedeva vybrali v **prezidenty**.
 Medvedev they-elected into presidents
 ‘Medvedev has been elected president.’
- (5) klonirovanie **životnyx** / remont **avtomobilej**
 cloning animals / repairing cars
 ‘cloning of animals/an animal’; ‘repair of cars/a car’

Similarly, in Armenian number-neutral nominals are not limited to downward entailing or kind-instantiating contexts, as shown by the Eastern Armenian examples below from Dum-Tragut (2009:106) and Megerdooian (2011):

- (6) a. Dursek a pòloc’ **mard** tes a.
 go out AUX.1SG.AOR street person.NOM see AUX.1SG.AOR
 ‘I went out on the street and saw **(one or more)** persons.’
- b. Ara-n **girkh** a ań-el.
 Ara-NOM book AUX.3SG.PR buy-PERF
 ‘Ara has bought **(one or more)** books.’

Note that number-neutral nominals in Armenian are uniformly morphologically singular. In fact, morphologically plural nominals in Armenian can denote only plural individuals and cannot have the “inclusive plural” reading of English

plurals as in (1a). This is shown with a Western Armenian example from Bale et al. (2010):

- (7) **Bezdig-ner** unis?
child-(INDEF.PL) have(2.SG)
'Do you have (**two or more**) children?'

In the next section, we show that number-neutral plurals in Russian and number-neutral singulars in Armenian are but two sides of the same coin not only because of their common interpretation ("inclusive", or "denoting both atomic and plural individuals"), but because both types of nominals exhibit the same syntactic properties.

2 Properties of Number-neutral Nominals in Russian and Armenian

The number-neutral nominals in Russian and Armenian – despite differing in the morphological number – share a set of common syntactic properties: they are syntactically selected, but not syntactically incorporated (cf. Baker 1988), and they fit the syntactic profile of a Small Nominal (cf. Pereltsvaig 2006).

While the contexts in which number-neutral nominals can appear in Russian and Armenian cannot be defined in purely semantic or syntactic terms, as mentioned above, such nominals are clearly syntactically selected. For example, in Russian they can be selected by a certain preposition, the preposition *v* 'into', or by certain verbal morphology (specifically, the combination of the accumulative prefix *na-* and the reflexive suffix *-sja*, which as discussed in Kagan and Pereltsvaig 2011a, b does not amount to the sum of the two parts).³ In Armenian number-neutral nominals can appear in the predicative position (i.e., as complements of the copula) or as objects (i.e., complements of certain verbs); moreover, number-neutral nominals in subject position are quite restricted: typically, they appear as subjects of unaccusative verbs or the copula, that is as internal arguments of a verb.

However, it is not possible to analyze number-neutral nominals as being syntactically incorporated in the sense of Baker (1988). First, number-neutral nominals need not be adjacent to the selecting verb and can be separated from it by an adverbial:

- (8) a. Lena *na-jela-s'* s utra **kotlet.**
Lena *na-ate-sja* from morning cutlets.GEN
'Lena ate her fill of cutlets first thing in the morning.'

³ Pereltsvaig (2006) shows that verbal morphology (such as the accumulative prefix *na-*) can impose selectional restrictions on what appears to be the complement of the verb.

- b. Lena na-jela-s' do otvala **kotlet.**
 Lena *na-ate-sja* to falling.off cutlets.GEN
 'Lena ate cutlets up to the brim.'

Second, number-neutral nominals can contain more than just a bare noun: they can contain adjectival, adverbial or prepositional modifiers, as in (8a-c), or complements, as in (9).

- (9) a. Lena na-jela-s' **rybnyx kotlet.**
 Lena *na-ate-sja* fish cutlets.GEN
 'Lena ate her fill of fish cakes.'
 b. Lena na-jela-s' **kotlet po-požarski.**
 Lena *na-ate-sja* cutlets.GEN Pozharsky-style
 'Lena ate her fill of cakes Pozharsky-style.'
 c. Lena na-jela-s' **kotlet s podžaristoj koročkoj.**
 Lena *na-ate-sja* cutlets.GEN with fried-up crust
 'Lena ate her fill of cakes with a fried-up crust.'

- (10) Gorbačëva vybrali v **prezidenty SSSR.**
 Gorbachev they-elected into presidents USSR.GEN
 'Gorbachev was elected president.'

Thus, we must conclude that number-neutral nominals are phrasal. However, as we show immediately below, they are structurally deficient, lacking room for certain pre-nominal elements. In other words, these nominals fit the syntactic profile of a Small Nominal, more specifically of a bare NP. More specifically, number-neutral nominals lack the room for expressions of specificity. For instance, neither the complements of intensive reflexives nor the complements of *v* 'into' in Russian allow such modifiers as *opredelënnye* 'certain, specific', leading to the ungrammaticality of the following examples:

- (11) a. *Ja najelas' **opredelënnyx kotlet.**
 I *na-ate-sja* specific cutlets
 b. *On izbiraetsja v **opredelënnye prezidenty.**
 He being-elected into specific presidents

Similarly, in (Eastern) Armenian number-neutrality obtains only with non-specific morphologically singular objects. If a specificity marker is added, the nominal is no longer number-neutral (example from Megedoomian 2011):

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- (12) Ara-n **girkh-ə** aʔ-el a.
 Ara-NOM book-SP buy-PERF AUX.3SG.PR
 ‘Ara has bought {the / a specific} book.’ (not ‘books’!)

Furthermore, number-neutral nominals have no room for expressions of quantity. For example, a numeral or a measure noun cannot be added to such nominals in Russian, leading to the ungrammaticality of examples in (13) and (14); similarly, in Armenian a singular object with an overt numeral is not number-neutral (example in (15) is from Megerdooian 2011).

- (13) a. *Ja najelas’ **pjati kotlet.**
 I *na-ate-sja* five cutlets
 b. *Ja napilas’ **stakana vody.**
 I *na-drank-sja* glass water
- (14) *Obama i Medvedev byli izbrany v **dva prezidenta.**
 Obama & Medvedev were elected into two presidents
 ‘Obama & Medvedev were elected into presidents.’
- (15) yerex-erk-ə **me hat muk** en č’ar-el.
 child-PL-NOM one CL mouse AUX.3PL.PR find-PERF
 ‘The children have found a mouse.’ (not ‘mice’!)

Moreover, number-neutral nominals have no room for higher adjectival modifiers, in the sense of Svenonius (2008), Beuseroy and Knittel (2008), such as evaluative adjectives. This is true for complements of intensive reflexives, as shown in (16a), and complements of *v* ‘into’ in Russian, as shown in (16b).

- (16) a. *Ja najelas’ **otvratitel’nyx kotlet.**
 I *na-ate-sja* terrible burgers
 b. *On rešil ballotirovat’sja v **dostojnye gubernatory.**
 he decided to-run into worthy governors
 ‘He decided to run for a worthy governor.’

In addition to lacking room for expressions of specificity or quantity and for higher adjectival modifiers, number-neutral nominals pattern with other Small Nominals, discussed by Pereltsvaig (2006), in that they are inert for movement either for scope or for focus. As shown by Kagan and Pereltsvaig (2011), complements of intensive reflexives can have only surface scope; Pereltsvaig (2006) shows that complements of the preposition *v* ‘into’ are likewise scopally inert. Finally, bare singular objects in Armenian are likewise scopally inert: they cannot take scope over another quantified noun phrase:

- (17) amen mi yerexa girkh a af-el.
 all one child book AUX.3SG.PR buy-PERF
 ‘Every child has bought a book/books.’ (unambiguous: Karine
 Megedoomian, p.c.)

Nor can number-neutral objects in Armenian move outside the vP for focus. Thus, as discussed in detail by Megedoomian (2011), bare singular, number-neutral objects appear in the vP, whereas specific singular objects (which are not number-neutral, as discussed above in connection with (12)) can move out of the vP. Although the word order in the following two examples is exactly the same – S-O-Aux-V – Megedoomian argues that they have different structure: the vP is bracketed in both sentences below.

- (18) a. Ara-n [girkh a af-el].
 Ara-NOM book AUX.3SG.PR buy-PERF
 ‘Ara has bought {a book/books}.’
 b. Aram-ə girkh-ə a [af-el].
 Aram-NOM book-SP AUX.3SG.PR buy-PERF
 ‘It is the (specific) book that Aram bought.’

According to Megedoomian, the auxiliary can appear in Armenian in one of two positions: (a) as a second position clitic in the vP, with the element immediately preceding it marking the left edge of the vP, or (b) in FocP. These two possibilities are instantiated by the two sentences in (16a-b), respectively. In addition to the difference in interpretation (i.e., whether the object is focused, as in (16b), or not, as in (16a)), the structural differences between these sentences can be shown by placement of manner adverbials such as *arag* ‘fast’: it can be placed between the auxiliary and the lexical verb in (16b), but not in (16a):

- (19) a. *Ara-n [girkh a arag af-el].
 Ara-NOM book AUX.3SG.PR fast buy-PERF
 b. Aram-ə girkh-ə a [arag af-el].
 Aram-NOM book-SP AUX.3SG.PR fast buy-PERF
 ‘It is the (specific) book that Aram bought fast.’

The manner adverbial appears in Armenian at the left edge of the vP; hence, it can appear in the position preceding the lexical verb in (17b). Note that the auxiliary in this sentence appears outside the vP, in FocP, to be precise. In contrast, in (17a) the adverbial is not at the left edge of the vP, which leads to the ungrammaticality of this sentence. When both a manner adverbial and a bare singular object appear in vP, the former must precede the latter, with the auxiliary following the first element in the vP, in this case the manner adverbial:

- (20) Ara-n [arag a **girkh** aʔ-el].
Ara-NOM fast AUX.3SG.PR book buy-PERF
‘Ara has bought {a book/books} fast.’

To recap, the bare singular object, which is number-neutral, cannot appear outside the vP in Armenian. This is in line with the generalization that number-neutral nominals are inert to movement.

3 Comparison with Languages with Articles

As mentioned in section 1 above, number-neutral nominals are found also in languages with articles; for the purposes of this paper, we are particularly interested in number-neutral nominals whose occurrence is not determined by semantic-pragmatic factors, as it is the case in English. In fact, such number-neutral nominals are found in many languages with articles, including Norwegian, Brazilian Portuguese, Catalan (illustrated with examples below), as well as Spanish and Romanian (cf. Dobrovie-Sorin et al. 2010).

- (21) a. Norwegian (Borthen 2003):
Per har hatt **hund** i ti år.
Per has had dog in ten years
‘Per has had dog(s) for ten years.’
b. Brazilian Portuguese (Schmitt & Munn 2002):
Eu acho que vi **livro** espalhado pelo chão.
I think that saw book spread on floor
‘I think that I saw book(s) spread on the floor.’
c. Catalan (Espinal & McNully 2011:93)
Busco **pis**.
look-1SG apartment
‘I’m looking for {an apartment/apartments}.’

What is crucial here is that number-neutral nominals in Norwegian, Brazilian Portuguese and Catalan share with their counterparts a number of properties that “tend to cluster together” (Rullmann 2011). First, they are bare in the sense of lacking functional syntactic structure. Second, they are, as mentioned above, number-neutral. Third, they are not incorporated (in the sense of Baker 1988), that is, they are not morphosyntactically integrated with the verb tighter than regular objects. Forth, they are scopally deficient in the sense of obligatorily having the narrowest scope possible. Fifth and final, they are weakly referential in the sense of having only a reduced ability to license discourse anaphora.

These properties are illustrated below with the Norwegian bare singulars (which are, by definition, bare). That these bare singulars are number-neutral is

highlighted by the fact that they can be picked up by plural anaphors such as *alle* ‘all’ (example from Borthen 2003:146).

- (22) Per har hatt **hund** i ti år.
 Per has had dog in ten years
Alle har vært svært snille.
 all have been very kind
 ‘Per has had dog(s) for ten years. They all have been very kind.’

Furthermore, Norwegian bare singulars are not syntactically incorporated; in fact, they can be multi-word phrases and not just single (bare) nouns, as shown by the example below from Borthen (2003:164).

- (23) Ola ønsker seg kopp med bilde av Mikke Mus.
 Ola wants REFL cup with picture of Mickey Mouse
 ‘Ola wants a cup with a picture of Mickey Mouse.’

Like other number-neutral nominals considered in this paper, Norwegian bare singulars are scopally deficient, so that the sentence in (24) unambiguously means ‘All the children tried on some jacket or other’ (cf. Borthen 2003:24).

- (24) Alle barna prøvde jakke.
 all children-DEFSUFF tried jacket
 ‘All the children tried on some jacket or other.’

Finally, Norwegian bare singulars are weakly referential in that they license the type-anaphor *dét* ‘that’ but not the token-anaphor *den* ‘it’ (cf. Borthen 2003:39-41).

- (25) a. Per ønsker seg **ny** **båt**,
 Per wants REFL new boat(MASC),
 men **dét** får han nok aldri.
 but that-NEUT gets he probably never
 ‘Per wants a new boat, but he probably will never get that.’
 b. Jeg ønsker meg **sykkel** til jul.
 I want REFL bike to Christmas.
 ??**Den** er blå.
 ??it is blue
 ‘I want a bike for Christmas. It is blue.’

To account for this clustering of properties, we assume that the central property on which the others hinge is bareness. In particular, bareness implies that

there are no structural space for determiners or other quantificational elements, which in turn implies the properties of scopal deficiency and weak referentiality. Furthermore, we take bareness (in the relevant sense) to be a necessary but not a sufficient condition for syntactic incorporation into the verb. Finally and most importantly for the present paper, bareness implies that there is no syntactic number projection, which in turn results in number-neutrality. The parallel clustering of these properties in languages with and without articles suggests that syntactic number and the lack thereof (which translates into semantic number-neutrality) is to be analyzed in a parallel fashion in both types of languages. Ergo, languages without articles have a dedicated functional projection for number, NumP.

4 Proposal and Consequences

So far, we have argued that number-neutral nominals – including those in languages with and without articles – are syntactically bare, meaning they lack the functional projection hosting number and numerals, NumP. In other words, such number-neutral nominals are bare NPs (cf. Dobrovie-Sorin et al.’s 2010 analysis of bare singulars in Spanish).

However, you will recall from our discussion in sections 1 and 2 above that in Russian number-neutral nominals are realized morphologically as plurals. This means that morphological plurality does not always reflect the presence of [–singular] feature in syntax.⁴ Similar views are espoused by Pesetsky (2010) and Alexiadou (2011). For Pesetsky, however, it is morphological singularity that is not always a reflection of [+singular] feature in syntax, as he takes singular complements of paucal numerals to be numberless. As we show in this paper, truly number-neutral nominals in Russian are morphologically plural; for an alternative analysis of the apparently singular complements of paucal numerals, see Pereltsvaig (2011a, b). Alexiadou (2011) takes a similar view to ours, based on a different set of data. She discusses plural mass nouns in Greek (the English counterpart of which is something like *The river discharges its waters into the lake*) and comes to the conclusion that the plural morphology of such plural mass nouns is not associated with NumP.

Following Pesetsky (2010) and Alexiadou (2011), we propose here the number feature is introduced into the computation by the NumP projection. Furthermore, the head of NumP establishes an agreement relation with the noun. Thus, if the NumP has a [–singular] feature, the N receives the same value of the number feature and appears in the plural morphological form. Conversely, if the NumP has a [+singular] feature, the N receives the same value of the number feature and

⁴ For the sake of the presentation, we will assume that the number feature is [±singular]. The essence of our proposal does not change if the [±plural] feature is used instead.

appears in the singular morphological form. In the absence of NumP, the noun does not receive the value for its number feature; the default morphological realization of such numberless nouns is plural in Russian.

This analysis has an interesting consequence for the so-called *pluralia tantum* nouns in Russian, such as *nožnicy* ‘scissors’, *brjuki* ‘trousers’, *sutki* ‘24-hour period’, etc. Unlike other nouns, whose number specification is determined syntactically, through agreement with NumP, *pluralia tantum* nouns are specified for number lexically. In other words, they are specified as [–singular] in the lexicon. As a result, *pluralia tantum* nouns are not compatible with paucal numerals, such as *dva* ‘two’, *tri* ‘three’ and *četyre* ‘four’.

- (26) *tri {sutki / sutok }
 three 24-hour.period(PL).NOM / 24-hour.period(PL).GEN
 ‘3 24-hour periods (i.e., 72 hours)’

Paucal numerals introduce their own (paucal) number specification, which, following Bailyn and Nevins (2008), we will formulate as [–singular, –augmented]. *Pluralia tantum* nouns, however, have no paucal form; they are lexically specified as plural (which, taking into account the existence of paucal in Russian, might be rendered as [–singular, +augmented]). This clash between the paucal number introduced by the paucal numeral and the plural number of the *pluralia tantum* noun itself results in the ungrammaticality of examples like (26).

Note that there is no problem combining *pluralia tantum* nouns with non-paucal numerals. Non-paucal numerals in Russian include higher numerals (5+).

- (27) *pjat’ sutok
 five 24-hour.period(PL).GEN

Moreover, the so-called collective numerals are non-paucal as well, even though they can encode the same lower numerosities as paucal numerals: for example, semantically the collective numeral *troje* and the paucal numeral *tri* are identical in that both encode the same numerosity, ‘three’.

- (28) troe sutok
 three 24-hour.period(PL).GEN
 ‘3 24-hour periods (i.e., 72 hours)’

Note further that apart from their appearance with *pluralia tantum* nouns, collective numerals are limited to masculine human nouns.

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- (29) a. troe parnej
three chap.PL.GEN
'3 chaps'
- b. *troe devušek (OK: tri devuški)
three girl.PL.GEN three girl.SG.GEN
'three girls'
- c. *troe dnej (OK: tri dnja)
three day.PL.GEN three day.SG.GEN
'three days'

To recap, our analysis of number as being introduced into the computation by the NumP allows us to account for the peculiar combination possibilities of *pluralia tantum* nouns with different types of numerals in Russian.

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