Numberless kinds: Evidence from Russian*

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Abstract

As is well-known from both descriptive and formally oriented literature, kind referring nominal phrases in Russian can appear in both morphologically singular and plural forms (Chierchia 1998; Doron 2003; Dayal 2004). The main contribution of this article is to argue that morphologically singular kind expressions are, in fact, numberless nominal phrases. In other words, we will argue that the best way to analyse these expressions, which we refer to as definite kinds, following the terminology of Borik & Espinal (2012, 2015), is by representing them as lacking both syntactic and semantic Number. We base our analysis on the theoretical postulate that, semantically, Number can be viewed as a *Realization Operator* converting properties of kinds into properties of objects, and that definite kinds do not activate such an operator whatsoever. We show how the analysis we propose for definite kinds can be extended to explain the peculiarities of the word order found in modified kind expressions in Russian.

Keywords: kind reference; number; Russian

Resum. *Classes sense nombre: evidència en rus*

Tal com es discuteix a la bibliografia descriptiva i formal, les expressions nominals del rus que fan referència a classes poden aparèixer en singular o en plural (Chierchia 1998; Doron 2003; Dayal 2004). La contribució principal d'aquest article és argumentar que les expressions que fan referència a classe i que són morfològicament singulars són sintagmes nominals sense nombre gramatical. Dit amb altres paraules, argumentem que la millor manera d'analitzar aquestes expressions, a les quals ens referim amb el terme de classes definides, seguint la proposta terminològica de Borik i Espinal (2012, 2015), és postulant unes estructures nominals que no tenen Nombre ni sintàctic ni semàntic. Basem la nostra anàlisi en el postulat teòric que, semànticament, el Nombre és un *operador* que *realitza* propietats de classes en propietats d'objectes i que les classes definides

no activen aquest operador. Mostrem de quina manera l'anàlisi que proposem per a les classes definides també permet d'explicar les peculiaritats en l'ordre de mots que trobem en rus en les expressions que fan referència a classes modificades.

Paraules clau: referència a classes; nombre; rus

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1. Introduction

The main goal of this paper is to carefully examine the role of Number in building kind-referring expressions in a language, based on data from Russian. As is well known from the literature, Russian morphologically singular nominal expressions can have various readings, including the kind reading exemplified in (1):

(1) a. *Kit*   naxoditsja na grani isčeznovenija.
         whale.NOM.SG is.found   on verge extinction.GEN
         'The whale is on the verge of extinction.'

     b. *Poezd*   kak sredstvo peredviženija   očen' udoben.
         train.NOM.SG as   means   transportation.GEN very convenient.SG
         'The train as a means of transportation is very convenient.'

Morphologically plural nominals can also have a generic/kind interpretation, as exemplified in (2):

(2) a. *Kity*   naxodjatsja na grani isčeznovenija.
         whale.NOM.PL are.found   on verge extinction.GEN
         'Whales are on the verge of extinction.'

     b. *Poezda*   kak sredstvo peredviženija   očen' udobny.
         train.NOM.PL as   means   transportation.GEN very convenient.PL
         'Trains as a means of transportation are very convenient.'

This paper aims at achieving a better understanding of the internal structure of kind expressions of the type exemplified in (1), which we refer to as definite kinds,

following the terminology of Borik & Espinal (2015).[1] We concentrate on the role of number in the syntactic and semantic composition of these kind expressions, focusing our attention on the status of the morphological singular marking of the nominals in italics in (1).

As a point of departure, we take two opposing views in the literature. On the one hand, Dayal (2004) proposes that singular number plays a crucial role in the analysis of 'singular' kinds because number is responsible for coercing 'conceptual plurality' underlying kind reference into a 'taxonomic' interpretation. On the other hand, Borik & Espinal (2015) in their analysis of definite kinds in Spanish defend the hypothesis that these expressions are numberless, that is, there is no syntactic or semantic number involved in the composition of definite kinds. In fact, they argue that these expressions are not built on conceptual plurality either.

Drawing on empirical data from Russian, this paper supports the claim that number morphology does not always get interpreted semantically (Pereltsvaig 2011, 2013, a.o.), and argues that the syntactic representation and the denotation of the "singular" kind nominal expression in (1) does not, in fact, include a grammatical category of Number. We present several arguments which all point to the conclusion that an analysis of definite kinds in Russian which is *not based on Number* should be adopted.

Note, however, that the analysis we propose for kind expressions in (1) does not exclude the existence of plural kind expressions such as those illustrated in (2). We will not elaborate on the syntactic and semantic composition of plural kind expressions in this paper, acknowledging their existence and adopting, for now, the analysis proposed in Chierchia (1998) for plural kind nominals in English, in which they are semantically derived by the down operator $\cap$ that applies to plural properties. In other words, we assume that there are different compositional analyses to be associated with definite kinds in (1), on the one hand, and with plural kind expressions in (2), on the other. This line of reasoning naturally leads to adopting a hypothesis that there is more than one way of building a kind expression in a language.

The rest of the paper is organized as follows. In Section 2, we explain our assumptions about Number, which we adopt as a point of departure for our analysis. Section 3 is devoted to the question of definiteness of the kind expressions of the type exemplified in (1). The question is not trivial for a language like Russian, which lacks an overt (obligatory) morphological realization of the category of definiteness, so we consider it important to explain how definite kinds are derived, given the lack of overt definite articles. In Section 4, we provide some basic facts about Number in Russian and show that this language exhibits some clear discrep-

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1. We are aware of the fact that it might appear misleading to call the generic expressions in (1) as definite kinds, since in Russian these expressions contain no overt expression of definiteness. We address this question in Section 3. We also find it misleading to refer to definite kinds as singular definite generics (cf. Gerstner-Link & Krifka 1993) or singular generics (Chierchia 1998), since, as we argue, they do not specify any sort of syntactic and semantic Number. Note also that Carlson (1977/1980) refers to the English expressions *the panda* and *the train* in the glosses in (1) as definite generics.

ancies between morphological number marking, on the one hand, and syntactic Number that is semantically interpreted, on the other. We present our arguments for an analysis of Russian definite kinds that does not include Number, and discuss the differences between numberless kind nominals and number neutral nominal expressions. In Section 5 we suggest an explanation for a non-canonical position of adjectives in definite kinds. Section 6 concludes the paper.

2. The role of grammatical Number in nominal expressions

The main goal of this section is to present our assumptions on the role of Number in the syntactic and semantic composition of nominal expressions. We begin by explaining the theoretical analysis of Number adopted in this paper, following Borik & Espinal (2015), and then move on to show how it can be implemented in the analysis of definite kinds.

Semantically, we take Number to be a realization operator that turns properties of kinds into properties of individuals (cf. Carlson 1977/1980; Déprez 2005). In other words, Number is a semantic operator of the type $\langle\langle e^k,t\rangle\langle e^o,t\rangle\rangle$. Conceptually, this operator is reminiscent of Carlson's realization operator R (Carlson 1977: 76), which was introduced as a two-place asymmetric, irreflexive, transitive relation that holds between stages and individual objects. A formula like R(a,b) in Carlson's proposal means that a is a stage of the individual b.

Espinal & McNally (2007) hypothesize that the function of Number in languages with number marking is to convert properties of kinds, the denotation of common nouns, into properties of token objects (either singular or plural). Note that this analysis of Number becomes more and more common in the literature.[2] Following this literature, we assume that the meaning of Number can be represented as in (3), where x is a variable over kind entities and y is a variable over object entities.[3]

(3) $[\![Num]\!] = \lambda P.\lambda y^o.\exists x^k[P(x^k)\ \&\ R(y^o,x^k)]$

In the case of plural, Number provides sums of objects that instantiate a given kind, i.e. plural properties:

2.   See, for instance, Gehrke & McNally (2015) and McNally & de Swart (2015), who build their formal proposals on the assumption that common nouns denote properties of kinds and Number turns them into properties of objects. See also Grimm & McNally (2016) for the distinction between event types and event tokens at the VP-layer, and for the suggestion that an R operator associated with Tense is responsible for a type shifting from event types to event tokens (i.e., R(e^o,e^k), where e stands for events). Thus, Tense in the verbal domain would parallel to what we postulate for Number in the nominal domain.
3.   Crucially, the theory of Number adopted here parts from the assumption that common nouns denote properties of kinds and the realization operator is needed to convert properties of kinds into properties of objects. As a reviewer pointed out, there is a different trend of dealing with Number (see, for instance Harbour 2014), where it is assumed that Number projection hosts grammatical Number related features (like ±*atomic, *±*minimal, *±*additive*), but nothing is said about the realization operator.

(4)   a. $[_{NumP}$ Num^{+PL} $[_{NP}$ N $]]$

  b. $[\![$Num^{+PL} N$]\!] = \lambda y^o.\exists x^k[N(x^k)$ & R(y^o,x^k) & y$^o \in$ Sum$]$

In the case of singular, Number yields atomic entities that instantiate a given kind, i.e. singular properties:

(5)   a. $[_{NumP}$ Num^{-PL} $[_{NP}$ N $]]$

  b. $[\![$Num^{-PL} N$]\!] = \lambda y^o.\exists x^k[N(x^k)$ & R(y^o,x^k) & y$^o \in$ Atom$]$

A full DP in languages like English is formed by a D element that can apply to either a bare noun or a noun specified for Number. It has been generally assumed that D shifts the input expression to a proper argument type, deriving either an entity or a quantifier type of expression, depending on the nature of D.

(6)   a.   [D [N]]

  b.   [D [Num [N]]]

Now, suppose that D in (6) is a definite article. In this case D expresses the semantics of the iota operator.[4]

(7)   a. $[\![$D$_{DEF}$ N$]\!] = \iota x^k[P(x^k)]$

  b. $[\![$D$_{DEF}$ Num N$]\!] = \iota y^o.\exists x^k[P(x^k)$ & R(y^o,x^k)$]$

Following Borik & Espinal (2015), we claim that the function of the definite D in (7a) is to turn a property of kinds into the unique individual kind having that property. The representation in (7a) reflects the syntax and semantics of the definite kind expression in (8).

(8)   *The lion* inhabits grasslands and savannas but is absent in dense forests.[5]

As has been pointed out in the literature (e.g., Krifka et al. 1995), only definite nominals in English can have a 'proper' kind reading, as other types of determiners invariably lead to other types of interpretation.[6] This is one of the main reasons why we use the term 'definite kind' to refer to kind expressions as those exemplified in (8).

In the case of the semantic representation in (7b), D applies to a nominal constituent specified for Number, whose semantic role, as we have shown in (3), is

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4.   Although see Coppock & Beaver (2015) for differentiating between the semantics of iota and the semantics of the definite article. This discussion, however, is also valid for their analysis, as they take an iota operator to derive all definite descriptions found in argument position. See Section 3 for more detail on definiteness.

5.   Taken from Wikipedia <https://en.wikipedia.org/wiki/Lion>, accessed 27.09.2019.

6.   To the best of our knowledge, there is no real explanation for this phenomenon proposed in the literature yet.

to turn properties of kinds into properties of objects. The formula in (7b) does not specify whether Number is singular or plural. According to the semantics of singular and plural definite descriptions (see Sharvy 1980; Link 1983) adopted in most of the literature, in the former case (i.e., [D Num^{-PL} N]) reference is made to a unique atomic entity, whereas in the latter case (i.e., [D Num^{+PL} N]) the resulting expression refers to a (contextually restricted) maximal sum of entities that satisfy the descriptive content of the property denoted by the Noun. Both cases are illustrated in (9).

(9) a. In the jungle, the mighty jungle, *the lion* sleeps tonight.[7]

    b. *The lions* are hunting in the valley.

Another way to refer to kinds, as we have pointed out earlier, is by means of plural nominals. The properties of bare plurals in English have been extensively discussed in the literature at least since Carlson (1977/80). As has already been pointed out, we follow a prominent semantic analysis of Chierchia (1998), and assume that the denotation of plural kind referring nominals is derived by a down operator $\cap$, which applies to plural properties and yields expressions of the type exemplified in (10).

(10) *Lions* and *spotted hyenas* occupy a similar ecological niche.[8]

This means that in (10), the kind referring expressions are assumed to be marked for Number both syntactically and semantically, whereas $\cap$ intensionalizes the structure in (4b) by referring to the sum of all instances of the corresponding kind (i.e., lions and spotted hyenas). Extending the analysis in terms of a down operator $\cap$ to plural properties for Russian means that the plural nominal expressions exemplified in (2) are derived in the same way.

We believe that the two types of kind referring expressions illustrated in (8) and (10) reflect different linguistic ways of building kind expressions and probably even different ways of conceptualizing kinds in natural languages. In the next section, we address the question of how definite kinds in Russian are derived in the absence of an overt definite article.

3. On the definiteness of preverbal bare nominals in Russian

The main focus of this paper is definite kind expressions in Russian, which were exemplified in (1) above. We assume that in languages like English, definite kinds of the type exemplified in (8) express D-genericity (cf. Krifka et al. 1995) and are composed by applying the iota operator ι to the denotation of a common noun, which denotes properties of kinds (see Borik & Espinal 2012, 2015 for an analysis

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7. Taken from Wikipedia <https://en.wikipedia.org/wiki/The_Lion_Sleeps_Tonight>, accessed 04.10.2019.
8. Taken from Wikipedia <https://en.wikipedia.org/wiki/Lion>, accessed 30.09.2019.

of definite kinds in Spanish). This proposal might be conceived as a universal principle, no matter whether the languages considered have overt articles (such as English or Spanish) or not (such as Russian). However, the main difference between the two types of languages is rather obvious: in English, ι is encoded by the definite article, whereas in Russian this operator lacks an overt realization. Borik & Espinal (2019) argue for this type of analysis, provide arguments that definite kinds in Russian are, indeed, syntactically definite, and adopt the structures we introduced in (6a) and (7a) also for Russian.

The specific proposal for definite kinds that we advocate rests on a number of assumptions about definiteness. For the sake of concreteness, we adopt the uniqueness theory of definiteness (Frege 1892), probably the most popular one in the formal semantic literature. Semantic definiteness of nominals in argument position is standardly associated with the contribution of the definite article itself, represented by the ι (iota) operator (Partee 1987). The iota operator shifts the denotation of a common noun from $\langle e,t \rangle$ to $\langle e \rangle$ (from a predicate type to an argument type) (see Heim 2011: 998), and the definite article, thus, denotes a function from predicates to individuals (Elbourne 2005, 2013; Heim 2011).[9]

(11) $[\![the]\!] = \lambda P:\exists x \forall y[P(y) \leftrightarrow x = y].\iota x.P(x)$,
     where ιx abbreviates 'the unique x such that'

The meaning of the definite article, as represented in (11), shows the property of uniqueness, which is considered to be a presupposition associated with definite nominals (Strawson 1950): the existence of exactly one (contextually relevant) entity in the extension of the NP satisfying the description.

Some other recent approaches to definiteness distinguish between the semantics of the definite article itself and the iota operator, which contributes the presupposition of uniqueness. However, as has already been mentioned (see footnote 4), for nominals in argument position Coppock & Beaver's (2015) approach makes the same empirical predictions, as the iota operator applies to these descriptions as well, giving rise to uniqueness presupposition, just as in classical approaches to definiteness.[10]

As for languages without articles, there is a growing body of research on the semantics of definiteness in Russian and other articleless languages, which claims that what is perceived as a definite description in a language with no articles might not have the same definiteness properties as a definite description in a language with overt articles. In particular, it has been recently argued for Russian that nominals that are perceived as having a 'definite' reading lack a presupposition

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9. We abstract away from predicative uses of definites. They can either be derived from argumental ones (Partee 1987; Winter 2001, i.a.) or taken as basic ones (Graff Fara 2001; Coppock & Beaver 2015).

10. Another important deviation from standard uniqueness approaches to definiteness that Coppock & Beaver (2015) argue for is that the definite article itself only has a weak existence presupposition, the claim that we do not agree with and will not discuss in this paper, whose main focus is, actually, not on definiteness, but on Number.

of uniqueness, which is standardly associated with the semantic contribution of the iota operator that derives definiteness in languages with articles like English, independently of whether the iota is associated with or dissociated from the article itself. This claim has been defended from both a theoretical (Seres & Borik to appear; Seres 2020) and an experimental (Šimík & Demian 2020) perspective. These analyses argue that there is no uniqueness/maximality presupposition effects triggered by definite nominal phrases in Russian, and conclude that if there is a category of definiteness in Russian, then at least it cannot be characterized in familiar uniqueness/maximality terms, but might be inferred pragmatically.

In practice, this means that if there is no iota operator in Russian, then (7a) cannot be maintained as a representation of Russian definite kinds. Both Seres & Borik (to appear) and Šimík & Demian (2020) argue that semantically, all nominals in Russian are indefinite, following Heim's (2011) indefiniteness hypothesis for languages without articles, whereas definiteness effects are achieved by pragmatic strengthening mechanisms. In particular, Seres & Borik (to appear) argue that there are at least three factors that are responsible for triggering definiteness effects in Russian: ontological uniqueness, topichood and anaphoricity.

If the indefiniteness hypothesis is correct, a semantic representation of definite kinds for Russian may look like (12), rather than (7a).

(12) $\exists f\,(CH(f)\ \&\ f(P)(x^k))$

    where P corresponds to a descriptive content of a noun.

The representation in (12) is based on the choice function analysis of indefinite nominals (cf. Reinhart 1997; Winter 1997; Kratzer 1998) and states that there is a function f that is a choice function and, applied to a predicate P, yields a member satisfying this property.[11,12] Thus, to derive the denotation of the kind referring nominal *kit* 'whale' or *poezd* 'train' in (1), a choice function would apply to a kind predicate denoted by *kit* or *poezd* and yield an element having this property, that is a whale kind entity or a train kind entity. Crucially, there will always be only one kind-entity satisfying the corresponding kind property, i.e. a kind property of being a *kit*/*whale* is satisfied only by the kind entity *kit/whale*.

The single entity analysis of kinds is the reason why a choice function (semantic indefiniteness) analysis gives the same empirical result as an iota operator (semantic definiteness) analysis: in both cases an operator will apply to a non-empty property to yield the only entity that has this property at the output. This also illustrates

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11. More generally, to capture *all types* of indefinite nominals in Russian, the representation in (11) may have to be complemented by the familiar quantificational representation of indefinites, as in (i), although in some semantic analyses the choice function is argued to be the only mechanism that is supposed to derive indefinites (see, most notably, Winter 1997):

    (i) $\exists x[P(x)\ \&\ Q(x)]$

12. The representation in (12) is based on the definition given in Winter (1997: 410):

    (i) *The choice condition*: A function f is a choice function (i.e. *CH(f)* holds) *only if* for every non-empty predicate P, $f(P)$ is defined and it is in the extension of P (i.e. *P(f(P))* holds).

that definite kind expressions of the type exemplified in (1) cannot really constitute an argument in a more general debate about what kind of analysis, definiteness-based or indefiniteness-based, should be adopted for bare nominals in Russian (and potentially in other languages without articles), since as far as definite kinds are concerned, both analyses are basically equivalent. The only perceptible difference between the two semantic operators lies in the presuppositions they generate: a choice function does not in and by itself trigger any presuppositions, although it can only apply to a non-empty set, so the existence presupposition is satisfied as an input condition for applying a choice function analysis. The iota operator, however, is associated with the uniqueness presupposition in all major analysis of definiteness, so the iota-based analysis of definite kinds in Russian would predict that the definite kind expression in this language is associated with a uniqueness presupposition. This is a very difficult prediction to test empirically (but see Seres & Borik to appear for an attempt), and exploring the predicted difference in detail lies outside the scope of this paper, which does not so much focus on semantic definiteness, but on the absence of Number in definite kinds expressions.[13]

In principle, the semantic options discussed above do not necessarily have straightforward repercussions for the syntax. It could be the case that a certain semantic operator (an iota or a choice function) acts as a type shifter to shift a property into an entity but is not associated with a particular (or with any) syntactic head. Vice versa, if there is a D head universally, it does not have to have universal semantics across languages, as there are various types of determiners, and although they all act as type shifters, different D-heads can yield both definite and indefinite readings. In this paper, we assume that just like in English, where articles and other determiners are overt, there is a functional layer in the structure of Russian definite kinds corresponding to a semantic operation of deriving an entity, even though we abstain from precisely defining the nature of this functional category and call it FP.

(13) a. $[_{FP}$ F $[$ N$]]$

b. $[_{FP}$ F $[$Num $[$ N$]]]$

Semantically, FP is a projection whose function is to convert a nominal expression into an argument type (cf. Longobardi 1994; Ramchand & Svenonius 2008). This function is similar to D in languages with articles (Longobardi 1994), but we refrain from calling it D because at this point it is still unclear what other semantic properties can be associated with this projection in Russian and whether it can perform a determiner-like role in languages without articles. Note that in the absence

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13. Note also that the iota type analysis of definite kinds in Russian would make Russian definite kinds similar to the English ones in all relevant respects, apart from the presence of the overt article. This is a position taken in Borik & Espinal (2019), but further research on the semantic properties of Russian nominals in a broad sense might call for adjusting that position. Finally, let us mention that the choice function analysis is not an option for English because of the blocking mechanism (Chierchia 1998; Dayal 2004) that block indefinite operators from applying when definiteness conditions (i.e., uniqueness) are satisfied.

of this projection and the semantics that we attribute to it, the nominal expression would have a predicate type denotation and would be syntactically represented as a 'real' bare [NP]. The distinction between FP and NP corresponds to a distinction between an argument type (i.e., ⟨e⟩ type) nominal, on the one hand, and a nominal that denotes a property (i.e., ⟨e,t⟩ type), exhibits number neutrality and combines with the predicate via modification rather than functional application, on the other. In (13a) above, FP applies directly to a common noun, which denotes properties of kinds, but it can also combine with a NumP to derive an ⟨e⟩ type expression from a predicative noun that ranges over properties of objects, as in (13b). In this sense, the possible derivations that we postulate for Russian is parallel to (6a,b) for English.

The question that remains is the one of the misleading terminology, mentioned in footnote 1: is it adequate to call nominal expressions in (1) definite kinds if it is not clear that they are, given the absence of overt definite articles? For the purposes of this paper, which actually focuses on Number and not on definiteness, we will not change the terminology and keep referring to the nominals in (1) as definite kinds. If the indefiniteness hypothesis for Russian turns out to be correct, this does not necessarily mean that there is no definiteness at all in this language, it just means that definiteness is not conceived in terms of an iota operator or associated with the uniqueness presupposition. We keep the term definite kinds bearing in mind that in some languages definiteness is encoded by means of an overt definite article (Spanish, English), while in other languages definiteness is triggered pragmatically by a set of factors specified in the discourse or inferred from the context (Russian).

To sum up, so far we have presented the fundamental theoretical postulates concerning the syntax and semantics of Number and our main considerations about the definiteness status of nominal kinds in Russian, a language with no overt articles. We will now move on to a more detailed discussion of the properties of Number in Russian.

4. Morphological number, syntactic/semantic Number, and number neutrality

In Section 2 we presented our general view of the role of the grammatical category Number in nominal expressions. Following previous studies (Déprez 2005; Espinal 2010, a.o.), we take Number to correspond semantically to a *Realization Operator* that turns properties of kinds into properties of objects. Apart from this, the semantic operator that corresponds to Number is sensitive to a [± atomic] distinction, at least in languages like Russian (and English).

This section is devoted to the discussion of Number in definite kinds. As has been mentioned before, our main claim is that definite kinds lack syntactic/semantic Number, and in this section, we develop our arguments to support this claim. We first review the claims and empirical evidence previously made in the literature that morphological number (singular or plural) is not always interpreted semantically. We extend the empirical landscape with one more case: definite kinds. We will argue that even though definite kinds bear singular morphology, this morphological marking does not have a syntactic/semantic correlate in the structure of definite

kinds themselves. Our arguments will be based on two empirical phenomena: the lack of access to individual entities with definite kinds (as discussed for English by Carlson 1977; Krika et al. 1995, a.o.), and the impossibility to use actualizers with definite kind expressions in Russian. After having argued that definite kinds do not have syntactic/semantic Number, we will move on to make yet another empirically relevant distinction, i.e. we show that definite kinds, despite the fact that they lack Number, are not number neutral. Therefore, in this section we make a tripartite distinction between atomic singular nominals with individual denotation, which do have a Number projection, definite kinds, which denote kind entities but do not have Number, and number neutral nominals which denote properties and are truly 'bare' nominals (i.e., syntactically NPs).

4.1. Number morphology in Russian

From a typological perspective, Russian is one of the standard examples of a language with inflectional Number morphology which exhibits the following properties: (i) it shows obligatory plural marking when it refers to a set of individual entities; (ii) nominal Number triggers obligatory agreement inside the nominal expression (i.e., with adjectival modifiers) and between the subject and the verb; (iii) in compounds, the first part is usually invariable and cannot be inflected, although (exceptionally) some compounds allow plural marking on both components of a compound (e.g., *vagony-restorany* 'dining cars'); and (iv) it does not exhibit plural marking inside derivational morphology.

Another important characteristic of nominal inflection in Russian is that any nominal expression is overtly specified not only for number but also for case and these two specifications are conflated in one single morpheme, i.e. come as a cluster, as is characteristic of morphologically synthetic languages.[14] What we intend to show below is that morphological number (both singular and plural) does not always reflect an ontological distinction between one vs. more than one object, i.e. is not always interpreted semantically (see Ionin & Matushansky 2006; Pereltsvaig 2013, for similar claims).

If we first consider morphologically plural expressions, there are various studies that point out the existence of Russian nominals specified for plural that do not entail semantic plurality. Rather, they denote one or more than one object. Pereltsvaig (2013: 302) claims that: "in Russian number-neutral nominals are found

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14. A default CASE.NUMBER cluster has also been postulated in the literature for Russian definitional generic sentences of the sort exemplified in (i).

   (i) a. Gippopotam –   èto begemot.
            gippopotam.NOM.SG.M that hippopotamus.NOM.SG.M
            'The/a gippopotam is the/a hippopotamus.'
      b. Gippopotam –   èto (tolstokožee) mlekopitajuščee   (živuščee v Afrike)
            gippopotam.NOM.SG.M that thick-skinned mammal.NOM.SG.N living   in Africa
            'The/a gippopotam is the/a (thick-skinned) mammal (living in Africa).'

    See Seres & Espinal (2019) for details of the analysis of this type of sentences at the syntax-semantics interface.

as complements of intensive reflexives (cf. Tatevosov 2006; Kagan & Pereltsvaig 2011), as in (14); as complements of the preposition *v* 'into' in the *v-prezidenty* construction (cf. Bailyn 2002; Pereltsvaig 2006), as in (15); and as complements of syntactic compounds (cf. Trugman 2008; Pesetsky 2013), as in (16)". In all these examples the nominals are morphologically plural, but do not necessarily reflect semantic plurality.

(14) Lena najela-s' *kotlet*.
Lena ate.REFL cutlet.GEN.PL
'Lena ate her fill of cutlets.' (= Lena ate (one or more) cutlets & Lena doesn't want to eat (one or more) cutlets anymore)

(15) Medvedeva vybrali v *prezidenty*.
Medvedev elected.3PL into presidents.NOM
'Medvedev has been elected president.'

(16) klonirovanie *zivotnyx* / remont *avtomobilej*
cloning animals.GEN / repairing cars.GEN
'animal cloning', 'car repair (shop)'

Although this option was not explicitly contemplated in the previous literature, it can be suggested that the plurals in the examples above are instances of the so-called 'inclusive' plural,[15] commonly related to downward entailing contexts[16] (see, for instance, Krifka 1989; Farkas & de Swart 2010), i.e., cases where plural morphology does not necessarily express plurality but rather has the meaning of 'one or more'.

It might also be the case that the three sentences above exemplify different theoretical phenomena. For instance, given (14), we cannot be certain if Lena ate one or more cutlets, and similarly, in (16) we can refer to cloning of one or various (different) animals and the repair of one or many cars, or no cars at all (in a so-called dispositional reading). (16) exemplifies syntactic compounds (Pereltsvaig 2013), which can probably be analysed as a case of pseudo-incorporation, which commonly displays number neutrality on a pseudo-incorporated noun (Borik & Gehrke 2015).[17] In contrast, *v presidenty* in (15) may be structurally closer to bare

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15. One of the classical examples for inclusive plural in English is the plural nominal *children* in *Do you have children?* The question can be successfully answered by *Yes, I have one*, but not by #*No, I have one*. There is extensive literature on the topic. See Sauerland et al. (2005) as a representative publication.

16. None of the examples in (14), (15) and (16) introduce downward entailing environments. See Farkas and de Swart (2010) for a critical discussion of downward entailing environment as a factor for an inclusive plural reading.

17. Syntactic compounds, however, are not the same as morphological N-N compounds in English. Thus, in the examples in (16) both a head noun and its complement are inflected separately, the head noun assigns case to its complement, so they really do not show any properties of a morphological compound. This is why an analysis along the lines of noun incorporation (Geenhoven 1988) does not seem to be a plausible option.

PPs of the type *in hospital* (cf. Stvan 1998 for English), where the nominal itself is not assigned case by the preposition and most likely denotes a property, like in bare predicative constructions of the type *Jane is chair of the department* in English. While it is outside the scope of this paper to analyse the specific properties of the constructions above, the point that we wish to make is simple: plural morphology does not necessarily correspond to plural (more than one) interpretation.

Another example is presented in (17), where a morphologically singular nominal object *galstuk* has a number neutral interpretation: (17a) is acceptable independently of whether Petja wears/wore always one and the same or various ties on one or more occasions (17b) vs. (17c).[18]

(17) a. Petja nosit/nosil *galstuk*.
       Petja wears/wore tie.SG
       'Petja wears/wore a tie (is/was a tie-wearer).'

   b. Petja nosit *galstuk*, ja odin raz   videla ego na rabote v kostjume
       Petja wears tie.SG   I one time saw   him on work in suit
       i   galstuke.
       and tie
       'Petja does wear a tie, I saw him once at work in suit and tie.'

   c. Petja nosit *galstuk*, ja vse vremja vižu ego na rabote v   kostjume
       Petja wears tie.SG   I all time   see   him on work   in suit
       i   galstuke.
       and tie
       'Petja does wear a tie, I see him at work in suit and tie all the time.'

In (17), a morphologically singular expression seems to have an interpretation which does not necessarily refer to an atomic entity. The phenomenon illustrated in (17) is reminiscent of number neutrality (see van Geenhoven 1998; Farkas & de Swart 2003; Espinal 2010; Dayal 2011; Espinal & McNally 2011), which means that a morphologically singular nominal can have a 'one or more' interpretation. We will discuss number neutrality in relation to definite kinds in more detail in section 4.3 below, whereas now the only point that we wish to illustrate is that there are cases where morphologically singular nominals do not necessarily have a singular semantic interpretation.

To sum up, we have shown in this section that singular or plural number morphology does not always go hand in hand with a corresponding semantic interpretation. This makes definite kinds, which, as we argue in the next section, lack syntactic and semantic Number, not a unique case where morphological number does not directly correlate with the presence of Number in the syntactic/semantic representation of a nominal.

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18. For the semantic number neutrality of bare nominals see Kallulli (1997) for Albanian, Borthen (2003) for Norwegian, Farkas & Swart (2003) for Hungarian, Espinal & McNally (2011) for Catalan and Spanish.

4.2. Numberless kinds

In this section, we take a closer look at Russian definite kind expressions and argue that the best analysis for these nominals is the one that does not include Number in their syntactic or semantic structure.

4.2.1. Lack of access to individual entities

Let us first consider a familiar contrast between definite kinds and kind-referring bare plurals. While the latter allow access to individual representatives of the kind, a definite kind never licenses access to an individual entity (Carlson 1977 for English). Plural marking introduces an important syntactic and semantic difference between the kind referring nominal expressions in (1) vs. (2). Thus, whereas the plural marking on the bare NPs in (2) encodes a plurality of individuals, instantiations of the kind, in the case of the bare NPs in (1), singular marking does not encode reference to a singular atomic individual.

    The most common strategy that languages use to refer back to entities is the use of pronouns. In order to support our claim about the lack of syntactic/semantic Number in definite kinds, we are going to look at the behavior of the 3rd person pronoun in Russian. This pronoun, in principle, has a very wide distribution, agrees with its antecedent in number and gender and can have both an individual and a kind as its antecedent, as illustrated below in (18a) and (18b), respectively.[19]

(18) a. V zooparke zabolela *panda*.   *Ona*   poka
         in zoo   got.sick panda.NOM.SG.FEM she.NOM.3SG.FEM still
         naxoditsja pod   nabljudenijem.
         is.found   under observation
         'A panda got sick in the zoo. It is currently under observation.'

     b. *Panda*   otnositsja k otrjadu xiščnikov, hotja   faktičeski
        panda.NOM.SG.FEM belongs   to clade   carnivora although factually
        ona   pitaetjsa bambukom.
        she.NOM.3SG.FEM feeds.on bamboo
        'The panda belongs to the clade carnivora, although it feeds mostly on bamboo.'

    We are going to use this pronoun to show that definite kinds do not allow for access to individual entities in the following way. In the examples below, we use a kind referring antecedent, a definite kind in (19a) and a plural kind in (19b). In the second sentence of each example, a 3rd person pronoun is used in an episodic sentence, which means that what a pronoun must pick up is not a kind antecedent itself, but a representative (or representatives) of the kind.

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19. Examples where a personal pronoun picks up a kind as an antecedent will also be discussed in section 4.3.

(19) a. *Panda*   naxoditsja na grani isčeznovenija.
        panda.NOM.SG.FEM is.found   on verge extinction.GEN
        #Ona   živet v zooparke v special'nom vol'ere.
        she.NOM.3SG.FEM lives in zoo   in special   enclosure
        'The panda is on the verge of extinction. #It lives in a special enclosure in
        a zoo.'

   b. *Pandy*   naxodjatsja na grani isčeznovenija.
        panda.NOM.PL are.found   on verge extinction.GEN
        Oni   živut v zooparkax v special'nyx vol'erax.
        they.NOM.3PL live in zoos   in special   enclosures
        'Pandas are on the verge of extinction. They live in special enclosures in
        zoos.'

Example (19a) shows that we cannot establish a discourse semantic relationship
between the personal pronoun *ona* 'she.NOM.3SG.FEM' and its potential antecedent,
a representative of the kind *panda*, whereas in (19b) the plural pronoun *oni* 'they.
NOM.3PL' can refer to a plurality of individual pandas that live in zoos and that
instantiate the antecedent *pandy*.[20] Both examples in (19) are set up to test whether
it is possible to shift from a kind to an object denotation. While the bare plural in
(19b) allows for such shift and the second sentence sounds perfectly natural, the
definite kind expression in (19a) blocks it and the second sentence is anomalous,
thus showing that the only possible antecedent for the pronoun in this discourse
(i.e., *panda*) cannot give access to an individual denotation.

This result is perfectly compatible with our expectations: given that we take
Number to *realize* a kind property as an object property, the definite kind expres-
sion cannot license any access to object denotations, including atomic entities,
if it does not include Number. Thus, by claiming that there is no Number in the
composition of the definite kind we actually account for the contrast in (19a) vs.
(19b). In other words, we have shown that the relevant difference between definite
kinds and bare plural kinds in Russian consists in that definite kinds do not allow
access to individual entity (or entities) that instantiate the kind, which we interpret
as supporting the hypothesis that definite kinds do not have syntactic Number.

Now consider (20) with demonstrative pronouns.

(20) a. *Ėta*   *panda*   rodilas' nedavno.
        this.NOM.SG.FEM panda.NOM.SG.FEM was.born recently
        Ona   živet v zooparke v special'nom vol'ere.
        she.NOM.3SG.FEM lives in zoo   in special   enclosure
        'This panda is on the verge of extinction. It lives in a special enclosure in
        a zoo.'

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20. For the sake of uniformity, in examples with singular antecedents all nominals are used in singular,
    and in examples with plural antecedents in plural, to eliminate agreement as a potential factor that
    can influence grammaticality judgment.

   b. *Ėti*   *pandy*   rodilis'   nedavno.
      this.NOM.PL.FEM panda.NOM.PL.FEM were.born recently
      Oni   živut v zooparkax v special'nyx vol'erax.
      they.NOM.3PL live   in zoos   in special   enclosure
      'These pandas are on the verge of extinction. They live in special enclo-
      sures in zoos.'

As should be expected, both (20a) and (20b) are perfectly fine because in this case a singular third person pronoun in (20a) simply picks up an individual atomic referent from the previous discourse. A plural antecedent in (20b) presents no problem either. The minimal contrast between (19a) and (20a) shows that definite kinds are, indeed, different from singular nominals marked for Number. Hence, the evidence presented in this section supports our hypothesis that definite kinds lack syntactic and semantic Number.

4.2.2. The ban on 'actualizers'

Under the assumption that syntactic Number is what introduces reference to individual objects, another piece of evidence for the absence of Number in definite kinds has to do with the distribution of various items (such as demonstrative pronouns, quantifiers, numerals, specificity markers, etc.) that combine with nominal expressions in Russian.

In more traditional analyses of Russian nominals the observation has been made that definite kinds are incompatible with the presence of overt morpho-syntactic *actualizers* (Padučeva 1985), i.e. the elements that, in the absence of articles, reflect some referential properties of the referent of a common noun. This is illustrated in (21) with the demonstrative pronoun *ėtot* 'this' in (21a) and an unstressed indefinite specifier *odin* 'some/a' in (21b). The only possible interpretation for the subject in (21a) is that corresponding to a subkind, since the verb it combines with denotes a k-level predicate. By contrast, *odin kit* 'some/a whale' in (21b) can have a subkind or an object denotation, as it is combined with an i-level predicate.

(21) a. *Ėtot*   *kit*   isčez   v   XX veke.
       this.NOM.SG whale.NOM.SG disappeared in XX century
       'This whale disappeared in XX century.'

     b. *Odin*   *kit*   obitaet v xolodnyx vodax.
       one.NOM.SG whale.NOM.SG lives   in cold   waters
       'Some/A whale lives in cold waters.'

Note also that if *odin* 'some/a' in (21b) bears stress, it is interpreted as the numeral 'one' and the acceptability of the example decreases significantly, the point we return to in the discussion of (23b) below. The examples in (21) clearly illustrate that if there is an actualizer in a nominal expression, this expression can be interpreted as referring to a subkind or an object entity, but can never have a pure kind interpretation.

We propose the following explanation for the ban on actualizers in combination with definite kinds. The term *actualizer* is a cover term for a number of expressions of different syntactic types (numerals, demonstratives, pronominal elements, indefinite adjectival pronouns such as *nekotoryj* 'some', etc.). The only thing that they have in common is that they all indicate the referential status or overtly specify the referential characteristics of a nominal expression they combine with (i.e., definite/anaphoric vs. indefinite, specific vs. non-specific, deictic, etc.). Most nominal expressions that appear 'bare' in Russian can, in principle, have a range of interpretations, depending on various syntactic and discourse factors. The speaker can choose to use an actualizer to explicitly disambiguate the interpretation of a nominal phrase in a given sentence. For instance, by using an unstressed version of *odin* 'some/a', the speaker signals that the nominal expression has to be interpreted as a specific indefinite (Ionin 2013). The use of a demonstrative *ėtot* 'this' signals a deictic base restriction. Thus, actualizers help to determine the type of reference of a nominal expression. But definite kinds are not ambiguous and do not 'compete' with other interpretations, so there is no need to use an actualizer with a definite kind.

Another reason for the observed empirical restriction on the appearance of actualizers with definite kinds is that actualizers are most likely to be elements that can only combine with nominal expressions specified for Number. The empirical data (as well as traditional grammatical descriptions) suggest that actualizers specify a referential status of an *individual* expression. If Number corresponds to a semantic function that relates properties of kinds to properties of instantiations of the kind, then actualizers can indeed appear only in those configurations where Number (i.e., the instantiation function) is involved. If definite kinds do not include Number, we do not expect any of the actualizers to be compatible with them. In other words, the empirical facts seem to be in accordance with the hypothesis that definite kinds are not built on Number. We hence attribute the following structure to nominal phrases in Russian that include one or multiple actualizers:

(22) $[_{FP} \ldots$ Actualizer*$\ldots [_{NumP}$ Num $[_{NP}$ N$]]]$

The details of this syntactic structure can be spelled out for each particular type of actualizer, but we will not be concerned with this specification in the present paper. The crucial point for us is that the structure in (22) includes Number, and we take this to be a common property of all the structures including actualizers.

Let us now consider one particular group of 'actualizers', namely cardinal numerals. Consider the contrast in (23).

(23) a. *Kit*   naxoditsja na grani isčeznovenija.
          whale.NOM.SG is.found   on verge extinction.GEN
          'The whale is on the verge of extinction.'

     b. *#Dva kita*   naxodjatsja na grani isčeznovenija.
          two   whale.PAUCAL are.found   on verge extinction.GEN
          'Two whales are on the verge of extinction.'

Example (23b) illustrates that in Russian numerical expressions are anomalous with the argument of a k-level predicate.[21] There is a lot of variation concerning the acceptability of (23b) among the speakers that have been consulted, and many of them consider it plainly ungrammatical. For those who (sometimes marginally) accept the example, the only possible way to give a reasonable interpretation to *dva kita* is to interpret 'two whales' as referring to two subkinds of whales which are on the verge of extinction. However, this interpretation is not easy to get, since a subkind interpretation in Russian strongly favors (or even requires) the use of specific lexical items like *vid* 'sort' or *tip* 'type', as shown in (24).

(24) *Dva   vida   kitov   isčezli   /isčezlo*
      two.M type.PAUCAL/GEN.SG whale.GEN.PL disappear.PL/disappear.NEUT.SG
      s   lica   zemli.
      from   surface of.earth
      'Two types of whales have become extinct.'

The basic question, however, is what constitutes the difference between (23a) and (23b). In other words, what is the semantic role of the cardinal? We assume Ionin and Matushansky's (2006, 2018) hypothesis that the lexical NP that combines with a cardinal is semantically singular, and that true plurals cannot combine with cardinals because different pluralities (e.g., whales) do not necessarily have the same cardinality. Instead, in 'two whales' the lexical NP is semantically singular, denoting a set of atomic entities, all of which by definition have the same cardinality. Thus, a member of the set denoted by 'two whales' is a plural individual consisting of two atomic whales; and, in combination with a k-level predicate, 'two whales' has to be construed as a plural individual consisting of two subkinds of whales.

The atomicity requirement postulated by Ionin & Matushansky, which is a semantic selectional requirement of the cardinal itself (i.e., this requirement is rooted in the lexical properties of cardinals), finds direct empirical support in those languages where cardinal numerals combine with NPs that are morphologically singular (e.g., Finnish, Hungarian, Turkish, or Welsh). In languages like English, it is well-known that cardinals beyond 'one' combine with morphologically plural

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21. Note that example (23b) makes explicit that the cardinal numeral *dva* 'two' assigns PAUCAL case to the nominal in complement position. For different case assignments by cardinals, see among others Ionin & Matushansky (2006, 2018). "In Russian the cardinals 'two', 'three', and 'four' assign paucal case to the lexical NP, while 'five' and higher assign genitive case" (Ionin & Matushansky 2018: 52). See also this study for discussion of the nominal vs. adjectival status of different cardinals cross-linguistically, and for their mixed behavior in Russian: if they are merged as heads, their case-assignment properties can be explained, while if they are merged as adjuncts or specifiers we do not expect them to assign case.

   Example (23b) is also interesting because it shows that English and Russian clearly differ in the compatibility with numerals: 'Two whales are on the verge of extinction' is perfectly fine in English with a subkind reading. We do not have an account for this cross-linguistic difference other than suggesting that maybe cardinals have a different status in the two languages, a conjecture that we would like to explore in future work.

NPs. However, according to Ionin & Matushansky, this plural marking does not reflect semantic plurality but is rather a result of semantic agreement between the numeral and the noun: the plural marking in cardinal-containing NPs is a result of agreement.

We agree with the claim that the nominal expression headed by a cardinal denotes a set of atoms, but in the analysis we propose here, we distinguish between the presence of Number, whose semantic function is the one of a *Realization Operator*, and the presence of a Cardinal, whose semantic function is to count the individual entities. We therefore assume that a) case-assigning numerals in Russian occupy the head position of a Cardinal Phrase that takes a Noun specified for Number as a complement; and b) cardinal numerals combine with lexical expressions that denote sets of atoms. Consider the structure in (25), which follows Borer (2005) in assuming that cardinals are an instantiation of Quantity.[22]

(25) $[_{CARP}$ Card $[_{NUMP}$ Num $[_{NP}$ N $]]]$

Furthermore, just as Ionin & Matushansky (2006, 2018) propose, we hold that cardinal numerals behave as semantic modifiers of type $\langle\langle e,t\rangle\langle e,t\rangle\rangle$ (or, more precisely, type $\langle\langle e^o,t\rangle\langle e^o,t\rangle\rangle$), since they are functions that take properties of individual objects as input and give properties of individual objects as output.

Coming back to the contrast between (23a-b), what is relevant for us is that only the presence of the cardinal entails atomicity. *Dva kita* is a plural individual divisible into two non-intersecting atomic subindividuals, each of which is a member of the set of whales. By contrast, *kit* refers to a undivisible entity, the kind whale, with no instantiation into atomic individuals of any sort.

To sum up, we adopt the central claim of Ionin & Matushansky (2006, 2018) that cardinal numerals combine with nominal expressions denoting atomic entities. In our terminology, this requirement translates into the following statement: case-assigning cardinals as heads of CardP select for nominal complements specified for Number, which denote properties of atomic objects. If cardinal numerals can only combine with those nominal expressions to which the semantic Number operator has been applied, then a complex nominal expression like *dva kita* in (23b) could in principle only refer to two atomic whales.

Now, when we proceed to combine this nominal expression with a kind level predicate such as *naxodit'sja na grani isčeznovenija* 'to be on the verge of extinction', we obtain a semantic mismatch, due to the fact that the predicate requires its argument to have a kind reference, but the nominal argument preceded by a cardinal encodes object reference. Kind level predicates do not easily combine with nominal phrases referring to objects (or properties of objects), unless some semantic operation saves their semantic composition. In the best scenario, the subject in (23b)

22. See Landau (2016) and Alexiadou (2019a) for discussion of the idea that across languages there are two agreement zones divided by cardinal numerals: in the zone below numerals CONCORD (morphological, non-semantic) agreement takes place, whereas in the zone above numerals INDEX (semantic) agreement applies. We do not take a commitment on this hypothesis.

is coerced into a subkind denotation to satisfy the selectional requirements of the predicate (Borik & Espinal 2015, 2019).

From this discussion, we can draw the following conclusion. If definite kinds do not involve Number either syntactically or semantically, the claim that we defend in this paper, it follows directly that they cannot combine with cardinal numerals and (23b) does not need any further explanation. One could argue that there might be an independent reason of why numerals are incompatible with kind expressions. For instance, kinds cannot be easily counted because they cannot be divided.[23] In this case, however, we would expect at least the expression 'one whale' (where 'one' is a numeral and not an indefinite marker) to be acceptable with a kind reading, but it is not, as we pointed out in the discussion of (21b). This means that once again, our hypothesis that there is no Number in the denotation of definite kinds neatly conforms to the observed facts.

In the last two sections we have discussed that definite kinds show morphological number without conveying reference to individual entities, either atomic or non-atomic individual objects. Lack of access to individual entities and the ban on combining with actualizers support the hypothesis that definite kinds have no syntactic/semantic Number. In the next section we argue that numberless definite kinds are not number neutral.

4.3. Lack of number neutrality in definite kinds

Number neutrality has been considered one of the main characteristics of noun incorporation and noun pseudoincorporation (see Kallulli 1997 for Albanian; Borthen 2003 for Norwegian; Farkas & de Swart 2003 for Hungarian; Dayal 2011 for Hindi; Espinal & McNally 2007, 2011; and Espinal 2010 for Catalan and Spanish). Cross-linguistically, morphologically singular (pseudo-)incorporated nominals are claimed to be semantically number neutral, which means that the referent of the nominal itself can be atomic or non-atomic, that is, the meaning of the (pseudo-)incorporated nominal is compatible with both a singular or a plural interpretation.

In the literature the number neutrality of the noun has been presented as a flagship test for the absence of the Number projection in syntax, since it is one of the clearest cases where morphological number specification lacks a semantic interpretation. The question we have to address at this point is whether definite kinds (*kit* and *poezd* in (1)), which are morphologically singular, are number neutral or not. In what follows we show that the nominals in (1) are not number neutral and develop an argument based on relativization (Borik & Espinal 2019) to show the contrast between singular nominals with Number, definite kinds and what we consider to be the best example of number neutral nominals in Russian. But if definite kinds are shown to be not number neutral, and number neutrality signals the absence of Number, one might arrive at the conclusion that definite kinds should, hence, contain Number (i.e., should be specified for singular). However, in Section 4.2 we

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23. Note that in those analyses where kinds are only built on pluralities (Chierchia 1998; Dayal 2004), this ban on numerals would be more difficult to justify.

argued against the alleged singularity of definite kinds and hence we will conclude that definite kinds are different from both number neutral nominals and nominals specified for singular.

In Section 4.1 we discussed example (17), repeated here as (26), as a rather strong example of number neutrality, where a morphologically singular nominal object *galstuk* is interpreted as conveying a number neutral reading: Petja wears/ wore one or various ties on one or more occasion.

(26) Petja nosit/nosil   *galstuk*.
    Petja wears/wore tie.ACC.SG
    'Petja wears/wore a tie (is/was a tie-wearer).'

Consider now the relativization strategies that different types of Russian nominals use. Let us begin with definite kinds: the antecedent of a relative pronoun can be a definite kind expression such as *kit* and *poezd* in (1), as illustrated in (27).

(27) a. *Kit*,   *kotoryj* naxoditsja na grani isčeznovenija, zanesen
        whale.NOM.SG which is.found   on verge extinction.GEN appointed
        v   Krasnuju knigu.
        in Red   book
        'The whale, which is on the verge of extinction, is in the Red List of Threatened Species.'

    b. *Poezd*,   *kotoryj* javljaetsja očen' udobnym   sredstvom
        train.NOM.SG which appears   very convenient.INSTR means.INSTR
        peredviženija,   postepenno zamenjaet avtobus.
        transportation.GEN gradually   replaces   bus
        'The train, which is a very convenient means of transportation, is gradually replacing the bus.'

As pointed out in Borik & Espinal (2019), relative clauses that modify kind referring expressions in examples like (27) are always non-restrictive. This follows directly if the property of kinds corresponding to a particular description (i.e., whale kinds or train kinds) is always represented by one single element satisfying the description, as proposed in Section 3: a restrictive relative would have to restrict the antecedent, whereas with definite kinds this option does not exist.

Unlike (27), the example in (28) shows that number neutral nominals cannot be proper antecedents of relative pronouns.

(28) Katya nosit   *jubku*,   (**kotoruju* ona pokupaet sama).
    Katya wear.IMP skirt.ACC.SG which   she buys.IMP self
    'Katya wears a skirt (is a skirt-wearer).' (Intended meaning: that she buys herself)'

Now let us look at the relative clause modifying a singular individual denoting nominal, as in (29).

(29) Katya vstrečaetsja   s   podrugoj,   kotoraja nedavno otmetila
      Katya meets.IMP.PRES with girlfriend.INSTR which   recently celebrated
      den' roždenija.
      birthday
      'Katya is meeting a girlfriend that recently celebrated her birthday.'

This example is fully grammatical, unlike the one in (28), but has a restrictive interpretation, unlike the one in (27). The relative clause here modifies an indefinite *podrugoj* 'girlfriend', restricting the denotation to the one that recently celebrated her birthday.[24]

We consider the differences in relativization strategies illustrated for definite kinds (27), number neutral nominals (28) and singular individual denoting nominals (29) significant in several respects. First and foremost, we think that the observed differences are in line with a widely accepted analysis of number neutral nominals, according to which they are bare NPs that have a property denotation (see Borik & Gehrke 2015 for an overview of theoretical analyses) and cannot combine with descriptive modifiers. This is confirmed for Russian, given the ungrammaticality of relative clauses with number neutral nominals. Secondly, definite kinds and singular nominals specified for Number, although accept relative clauses, exhibit an important difference in the interpretation of relatives. Definite kinds only allow for a non-restrictive interpretation of a relative clause, whereas relative clauses modifying singular nominals specified for Number can easily have a restrictive interpretation. This difference, once again, illustrates that definite kinds should be treated differently from nominals specified for Number.

Furthermore, we also think that the properties illustrated in (27) through (29) constitute some evidence that the syntactic structure of a number neutral nominal (a true bare nominal) and a definite kind should not be the same. In particular, definite kinds should not be represented as bare NPs in syntax, and therefore we postulated a syntactic structure (see (13a) in Section 3) where a functional layer is projected on top of NP.

To sum up, in this section we have discussed the difference between morphological and syntactic/semantic Number, and provided two empirical arguments against postulating syntactic Number (with a singular number specification) for definite kinds in Russian. The first argument is based on access to individual entities, which is blocked in definite kinds. The second argument is built on the ban on actualizers with definite kind expressions, which can also be accounted for by the absence of syntactic Number. Finally, we have discussed empirical evidence based on relativization that supports the conclusion that definite kinds, in spite of being numberless (no syntactic/semantic Number) are not number neutral.

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24. This is not to say that non-restrictive relative clauses cannot be used with singular individual denoting nominals. This option is, of course, allowed. The point is that such nominals admit *both* restrictive *and* non-restrictive modification.

5. The position of adjectives and reference to kinds

The final issue we address in this paper is whether the position of adjectives in 'complex' kind expressions in Russian may provide an additional argument for the absence of Number in definite kinds. First, consider the examples in (30).

(30) a. *Savannyj slon*   naseljaet prostory ravnin.[25]
      savannah elephant inhabits spaces   plain.GEN
      'Savannah elephant inhabits spacious plains.'

   b. *Provanskoe maslo* obladaet   celebnymi svojstvami.
      Provance   oil   possesses healing   properties
      'Olive oil (from Provence) has healing properties.'

    The subjects in (30a,b), as arguments of a k-level and an i-level predicate, allow for a kind reading of the same type as the reading of the subjects in (1a,b), i.e., in all these cases, the nominal expressions in subject position are interpreted as referring to kinds and denote definite kinds. In (30), however, the head nouns *slon* 'elephant' and *maslo* 'oil/butter' are modified by adjectives *Savannyj* 'savannah' and *Provanskoe* 'Provence'. We refer to this type of kind expressions as *modified kinds* (a term coined in Borik & Espinal 2015).

    As already pointed out by Trugman (2009, 2011, 2013), the Russian modified kinds illustrated in (30) exhibit an interesting property concerning the order of constituents within the kind referring nominal phrase. The canonical word order in Russian nominal phrases places the A(djective) before the N(oun). A modified kind interpretation is available with this canonical A-N order in combination with k- and i-level predicates, but in combination with s-level predicates a nominal expression composed by an A plus an N has a default interpretation according to which reference is made to an individual object. This dichotomy is illustrated in (31a), which can be interpreted either as a statement about a kind or as a statement about a particular African elephant, for instance, in a zoo. The A-N order, however, can be reversed and this change is accompanied by narrowing the range of the interpretations available for the nominal phrase. Thus, when the nominal expression is composed by a noun followed by a modifying adjective, the N-A order, this nominal expression can only get a kind interpretation, as illustrated in (31b) (from Trugman 2013: 326, exs. (1b,c)).

(31) a. *Afrikanskij* slon   est travu.   kind/object reference
      African   elephant eats grass
      'The African elephant eats grass/is eating grass.'

   b. Slon   *afrikanskij* est travu.   kind/#object reference
      elephant African   eats grass
      'The African elephant eats grass.'

25. From <https://simple-fauna.ru/wild-animals/afrikanskij-slon/>, accessed 28.10.2019.

Trugman (2013) takes the nominal expressions with an N-A word order to be lexically derived, as opposed to those nominal phrases that have an A-N order, for which she hypothesizes a syntactic derivation. We do not find the lexical vs. syntactic divide well-justified, and furthermore it does not really explain the various readings associated with different N/A word orders. As an alternative, we would like to suggest a structural explanation for the pattern illustrated in (31).

Let us start with those cases where a nominal phrase (i.e., a N in combination with an A) gets a kind reading. In this case, as can be seen from the examples, the A can either precede or follow the head N. In our analysis, there is no Number projection in a syntactic structure associated with definite kinds. Accordingly, in a structure with no NumP, an A, interpreted as a modifier of type $\langle\langle e^k,t\rangle,\langle e^k,t\rangle\rangle$, can freely adjoin to the N in the NP either on the right or on the left. This possibility is represented in the structure below, where the modifier can occur in either a specifier or an adjunct position in the NP. Notice that (32) reproduces (13a) with an A.

(32) $[_{FP}$ F $[_{NP}$ (A) N (A)]]

However, when the Noun is specified for Number (either singular or plural), the Noun, first of all, no longer denotes properties of kinds (type $\langle e^k,t\rangle$) but it denotes properties of objects (type $\langle e^o,t\rangle$). Secondly, the noun projects an extended functional structure where various elements, including adjectives (but also actualizers of various types) merge. An A that modifies a Noun specified for Number can only modify properties of individual objects, be a modifier of type $\langle\langle e^o,t\rangle,\langle e^o,t\rangle\rangle$, and merge into the structure that holds the Noun specified for Number. Crucially, in this scenario, an A always precedes a noun. The structure in (33) below represents a canonical order of a modified Noun specified for syntactic Number.[26] Notice that (33) is similar to (22) with an A.

(33) $[_{FP}$ F $[_{NumP}$ (A) $[_{Num'}$ Num $[_{NP}$ N]]]]

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26. A possible alternative explanation of the N-A/A-N order depending on the interpretation of the NP could be given in terms of N-to-D movement (Longobardi 1994). First of all, this option is based on the presence of a D projection in the structure of Russian nominals, which is something we do not necessarily commit to. Secondly, we reject this option for the following reason: we cannot find any empirical evidence that supports the existence of N-to-D movement in any other syntactic environment, and, in particular, with proper names. Consider the examples from Italian in (i) (based on Longobardi 2005: 8-9) and Russian in (ii) below:

(i) Gianni mio/*Mio Gianni/Il mio Gianni ha finalmente telefonato.
     Gianni my/ my Gianni/the my Gianni has finally   called

(ii) Moj Ivan/*Ivan moj ušel.
     my Ivan/ Ivan my left
     'My Ivan left'.

In Italian, the classical example of N-to-D movement, a possessive follows a proper name and only if the article is present a possessive can precede the proper name. In Russian, by contrast, a possessive has to precede a proper name (with the notable exception of vocatives of the type *Drug moj!* Lit. 'friend my'). If a possessive follows the proper name, the example is ungrammatical. Thus, we judge N-to-D movement in Russian to be an ad-hoc solution for kinds.

A question that might arise at this point is what kind of adjective can appear in a modified kind expression. We think that potentially any adjective can modify a kind (Borik & Espinal 2015, 2019), although the whole expression can be subject to additional pragmatic constraints, such as, for instance, the well-established kind restriction (see Krifka et al. 1995). We hypothesize that, like verbal predicates, adjectives can be of three types: k-level, i-level and s-level.[27] Although some adjectives are invariably of one type, as, for instance, *železnyj* 'made.of.iron', which is i-level, or *aktual'nyj* 'current', which is s-level, the majority of adjectives are quite flexible in having i-level or s-level meanings, just like verbal predicates.[28] By more general assumptions, all i-level predicates can take kind referring expressions as arguments, and therefore we postulate that all adjectives that can be used as i-level can be used as modifiers in modified kind expressions.

Different types of adjectives in Russian have been discussed in the previous literature, for instance, in the work by Kagan and Pereltsvaig (2013), who propose that adjectives can appear in three structural positions within the nominal phrase: in the NP area, in the NumP/QP area and in the DP area.[29] Even more importantly, these authors show that adjectives in distinct syntactic positions receive different interpretations. Their claims are based on comparing the properties and interpretation of various types of adjectives that appear either before or after a numeral in a nominal phrase. According to them, the canonical position of the adjective is the lowest one, i.e., below the numeral, as illustrated in (34) (from Kagan & Pereltsvaig 2013: 163, ex. (2)).

(34) a. pjat' umnyx   mal'čikov
         five clever.GEN boys.GEN
         'five clever boys'

     b. desjat' bol'šix gorodov
         ten   big.GEN cities.GEN
         'ten big cities'

This word order is directly predicted by our structure in (33), slightly modified as in (35):

(35) [$_{CarP}$ Card [$_{NumP}$ (A) [$_{Num'}$ Num [$_{NP}$ N]]]]

It should be noted that one important difference between our analysis and the one by Kagan and Pereltsvaig (2013) is exactly in the importance of the presence/

27. Languages differ with respect to the availability of k-level adjectives. The English *extinct* is a good example of a k-level adjective, but in Russian this type of adjectives does not seem to exist.
28. Nominal predicates, by contrast, invariably denote properties of kinds, i.e., are all k-level. At this moment we cannot explain why it is so (or argue that it is, indeed, so). Thus, this issue remains open for future research.
29. The underlying assumption in Kagan and Pereltsvaig's (2013) work is that the syntactic structure of a nominal phrase in Russian includes a DP layer.

absence of Number in the nominal structure. Kagan and Pereltsvaig's account is based on the standard assumption that a Noun denotes a property of objects. However, in our analysis, we make a crucial distinction between properties of kinds (i.e., the denotation of a common noun) and properties of objects. What adjectives in (34) appear to modify is, indeed, properties of objects, since the whole nominal expression in (34a) refers to five individual clever boys and not five kinds of clever boys. Similarly, what is counted in (34b) are particular big cites, not kinds of big cities. We consider the analysis of Kagan & Pereltsvaig (2013) to be fully compatible with our analysis of Russian nominals with one important proviso: the lower adjectives in our analysis merge into a nominal structure specified for Number, as Number yields a property of objects from a property of kinds denoted by a common noun. Apart from that, the fact that low adjectives of the type exemplified in (34) are object modifiers and appear between a cardinal and a head noun follow from both analyses.

To sum up, in the analysis of modified kinds that we have proposed in this section, the syntactic position of an A correlates with the semantic interpretation attributed to it. Adjectives that modify properties of objects are merged into a nominal structure specified for Number and thus always precede a head noun, whereas adjectives that modify properties of kinds merge into nominal configurations without Number and freely adjoin to the head noun on the left or on the right. This means that we derive both A-N and N-A order for nominal expressions with a kind reference (as represented in (32)), but only an A-N order for nominal expressions with individual reference (as represented in (33)).

6. Conclusions

In this paper we provided an analysis for definite kind expressions in Russian, based on the absence of syntactic or semantic Number in this type of expressions. We have argued that morphologically singular kind expressions are, in fact, numberless nominal phrases that are not number neutral. We have provided several arguments for the lack of Number. In particular, we have shown that definite kinds cannot license access to individual entities, and are incompatible with actualizers, among them cardinal numerals. We have also accounted for the different meanings associated with various N/A word orders in modified nominals, namely the object vs. kind reading, depending on the position of an adjective within the NP spine. We have hypothesized that modified kinds are built by freely adjoining an A to the N within the NP, while those adjectives that modify nouns specified for Number occur in Spec,NumP.

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