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NUMBER MARKING AND (IN)DEFINITENESS IN KIND TERMS *

ABSTRACT. This paper explores the link between number marking and (in)definiteness in nominals and their interpretation. Differences between bare singulars and plurals in languages without determiners are explained by treating bare nominals as kind terms. Differences arise, it is argued, because singular and plural kinds relate differently to their instantiations. In languages with determiners, singular kinds typically occur with the definite determiner, but plural/mass kinds can be bare in some languages and definite in others. An account of singular kinds in terms of taxonomic readings is proposed, with number marking playing a crucial role in explaining the obligatory presence of the determiner. The variation between languages with respect to plural/mass kinds is explained by positing a universal scale of definiteness, with individual languages choosing different cut-off points for lexicalization of the definite determiner. The possibility of further cross-linguistic variation is also considered.

1. INTRODUCTION

There is a vast literature on the topic of kind-denoting terms that has accumulated in recent years. Although it is known that there are two types of nominals that can be used for such reference, the bare plural and the singular definite generic in English for example, research has centered mostly on the bare plural. In this paper, I focus on the role of number marking and show that taking singular as well as plural kinds into consideration

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provides fresh insight into the nature of genericity in natural language. In English, as we see, plural kind terms do not have any overt determiner while singular kinds are realized with the definite determiner. This pattern does not hold cross-linguistically. There are languages in which the definite determiner is used for both singular and plural kinds, such as the Romance languages. And there are languages such as Hindi or Russian which lack definite determiners and in which both types of noun phrases are bare. Of course, for distributional patterns to be interesting and worthy of theoretical investigation, there must be some patterns that are not attested. So far, no language is known to have a dedicated determiner for kind formation and no known language uses bare singulars and definite plurals for referring to kinds (i.e., the reverse of English). Observations such as these provide requisite controls for the study. It is obvious from even this preliminary introduction to the issues that will be explored here that a study of number distinction in kind terms will overlap with the study of definiteness. This represents something of a shift in research emphasis, since much of the recent work on generics, inspired by parallels between bare plurals and indefinite noun phrases, has been somewhat at the cost of recognizing the kinship between kinds and definite noun phrases. One of the goals of this study, then, is to re-examine the tension between reference to kinds and (in)definiteness from a cross-linguistic perspective.

Among the specific questions that this study bears on are the following: Are bare plurals, and by extension bare nominals in other languages, kind terms which yield indefinite interpretations in particular contexts, or are they systematically ambiguous between kinds and indefinites? Are definite singular kind terms in languages like English trivial variants of bare plural kinds, or is there a grammatical difference between them? And, as a corollary, if such a difference exists, do definite plural kinds in languages like French and Italian belong with the English definite singular or with the bare plural? To what extent is it possible to predict whether kind terms in particular languages will be bare or definite and what range of readings will such nominals have? To give an idea of the arguments that will be brought to bear on these questions, I will present below some facts representative of the type of empirical evidence to be discussed in the sections to follow. The data I have chosen to illustrate the nature and scope of this investigation have either not been documented before or have been insufficiently analyzed in previous accounts.

Section 2 is concerned with the well-accepted generalization that in languages without determiners bare nominals do double-duty as definites and indefinites. A plausible null hypothesis is that these bare nominals are ambiguous with respect to (in)definiteness. This could be either because

they are marked + and − definite or because they are not specified + or − definite. In the first case, bare nominals will be able to satisfy the felicity requirements for definites as well as indefinites; in the second case, the felicity requirements will not apply. In either case, both readings are predicted to be available unless a given context rules one of them out.

On the basis of Hindi and Russian data like (1) and (2), however, I argue against this null hypothesis:

(1)a. #caroN taraf cuuha hai
four ways mouse is
'The mouse/A particular mouse (the same one) is everywhere.'

b. caroN taraf cuuhe haiN
four ways mice are
'The are mice (different ones) everywhere.' *Hindi*

(2)a. #Sobaka byla vesde
dog was everywhere
'The dog/A particular dog (the same one) was everywhere.'

b. Sobaki byli vesde
dogs were everywhere
'There were dogs (different ones) everywhere.' *Russian*

As we can see above, the (a) and (b) sentences are minimal pairs which differ only in the plurality of the bare nominal. While the bare plural is able to have a plausible reading, where different mice/dogs are asserted to be in different places, the bare singular only has the implausible reading that a single entity is simultaneously in every place. This, as I will show in Section 2, argues against the possibility of treating bare nominals as bona fide indefinites. Whether indefinites are existential quantifiers or predicates subject to existential closure, difference in number morphology should not impact on what looks like a scope effect in these examples. The alternative that I will propose is that bare nominals are ambiguous between definites and kind denoting terms. Number morphology I will claim constrains the cardinality of the instantiation set of the kind in a given situation. Examples like Hindi (1) and Russian (2) involve a subgroup interpretation. The plural examples have plausible readings because the kind can be instantiated by a plurality, subgroups of which can take scope under the universal. In the singular examples (1a) and (2a), the instantiation set is at best a singleton so no meaningful subgroup interpretation is available even with the universal taking wide scope. Evidence such as this establishes, at the very least, that there are natural languages in which bare nominals are

not ambiguous between kinds and indefinites. It may suggest, as I will argue, something even stronger. The generalization that indefinite readings of kind-denoting terms are derivative on the basic kind interpretation holds cross-linguistically. Section 1, then, presents new evidence in favor of the position originally advocated for English by Carlson (1977) and extended recently by Chierchia (1998) to apply across languages.

In Section 3 the focus shifts to singular vs. plural kinds in languages like English. Although properties of definite singular generics are well-documented in the literature, they have not been subjected to the same critical scrutiny as bare plurals. Most accounts, formal or informal, approach the issue by imputing some special properties to the so-called generic definite determiner. This move is partially motivated by the fact that noun phrases formed with the definite determiner, but not those formed with the indefinite determiner, seem compatible with true kind predication (cf. Krifka et al. 1995):

(3)a. The lion might become extinct.
b. *A lion might become extinct.
except under a taxonomic interpretation

This view, however, is open to challenge. (4b), due to Guerts (2001), shows that an indefinite is fully acceptable in such contexts, provided it names a novel kind:

(4)a. Babbage invented the computer.
b. This morning Fred invented a pumpkin-crusher.

The proposal I make in connection to the definite singular generic is that there is nothing special about the determiner. It is the common noun that has two possible denotations, one in the object domain, the other in the taxonomic domain. All determiners can combine with both meanings of the common noun. In the first case they yield the familiar readings, in the second case the taxonomic readings. The singular kind is simply an instance of a taxonomic noun phrase. It is therefore to be expected that it can occur with definite as well as indefinite determiners in English, depending on its status as a familiar or a novel entity in the discourse.

This account, however, is shown to be incomplete. Mass terms, even when they denote familiar kinds, cannot occur with a definite determiner:

(5)a. Man invented (*the) steel.
b. (*The) rice is produced locally.

It is argued here that such patterns of definiteness marking can be explained on the basis of an incompatibility between singular morphology and kind formation. This conflict is repaired by treating the common noun as a grammatically atomic, though conceptually plural, entity. The explanation for the English facts is also shown to have cross-linguistic validity.

Section 4 expands the inquiry to consider possible patterns of definiteness marking in plural kind terms. Languages like English require plural kinds to be bare while Romance languages like Italian require them to be definite. German represents a mixed type in allowing plural kinds to be definite or bare:

(6)a. Dogs/*The dogs are widespread. *English*

b. I cani/* cani sono diffusi *Italian*
the dogs dogs are widespread

c. Die Pandabären/ Pandabären sind vom
the pandas pandas are facing
Aussterben bedroht *German*
extinction.

Taking plural kind formation to be the intensional counterpart of the ι-operation typically associated with the definite determiner, it is claimed that the two belong on a scale of definiteness. Cross-linguistic variation emerges because languages use different cut-off points for lexicalization. Optionality of the kind seen in German is due to interaction between the proposed scale of definiteness and principles regulating the use of covert vs. overt type shift. This section also probes the possibility of languages having optional definiteness with singular terms. On the basis of data from Hebrew, it can be shown that this optionality is qualitatively different from the one seen in German plural kind terms. While the interpretation of bare singulars in languages with determiners remains to be fully understood, some conclusions can be drawn which have obvious bearing on the cross-linguistic picture of genericity and (in)definiteness proposed here.

This brief survey was intended to convey the nature and scope of the investigation. In doing so, I tried to bring out some of the key issues I will be concerned with as well as to present some of the empirical motivations that underlie them. I turn now to a more detailed discussion of the facts.

2. Kind Terms in Languages without Determiners

2.1. *Some Background*

The goal of this section is to show that a proper understanding of the behavior of bare nominals in determiner-less languages can lead to a better understanding of the nature of genericity. Although the primary focus of the investigation is on languages like Hindi and Russian which are similar to English in morphologically encoding number distinction in the common noun, languages like Chinese that do not distinguish between singular and plural are also discussed. As is well-known, there are two main approaches that have evolved in the literature on generics (see Krifka et al. 1995). One takes English bare plurals to crucially refer to kinds (Carlson 1977, 1989; Chierchia 1998), the other takes bare plurals as ambiguous between kind terms and indefinites (Wilkinson 1991; Gerstner and Krifka 1993; Kratzer 1995 and Diesing 1992). I will argue that languages without determiners can settle the issue in favor of the first approach. As such, I will begin with a brief review of the theoretical debate about bare plurals and reference to kinds.

In his analysis of English bare plurals, Carlson made the case for reference to kinds on the basis of three sorts of arguments. He pointed out that there are predicates that cannot apply to anything but kinds, that there is a predictable variability in quantification that depends on the lexical and aspectual properties of the predicate, and that there are systematic differences between bare plurals and indefinites with respect to scope. While the first of these arguments remains unshakeable, the second was undermined by research on the parallel quantificational variability of indefinites (Lewis 1975; Kamp 1981 and Heim 1982). Under the ambiguity hypothesis, this parallelism is taken to establish the status of bare plurals as indefinites. In the kinds-based approach this insight is incorporated by making bare plurals and indefinites subject to the same mapping algorithm while preserving a difference in their denotations. Quantificational variability, then, does not help decide between the two approaches. The scope facts, however, appear to me to still present a good test case.

Consider two of the contexts Carlson noted as differentiating bare plurals from indefinites, namely negation and opacity. While indefinites may take wide scope in such contexts, bare plurals cannot:

(7)a.	John didn't read a book.	$\neg\exists$ *and* $\exists\neg$
b.	John didn't read books.	*only:* $\neg\exists$
(8)a.	John wants to meet a movie star.	*want*$>\exists$ *and* $\exists>$ *want*
b.	John wants to meet movie stars.	*only: want*$>\exists$

I will adopt, for concreteness, the version of the kinds approach in Chierchia (1998). Bare plurals, like other common nouns, start life as type <s, <e, t>> via a nominalization operation ('down'), defined as in (9a). $\cap$ is a function from properties to functions from situations to the maximal entity that satisfies that property in that situation. The function is partial in that it requires the kind term to pick out distinct maximal individuals across situations, thereby capturing the inherently intensional nature of the term.[1] This term can be a direct argument of a kind level predicate, as shown in (9b)–(9c):

(9)a. $^{\cap}$: $\lambda P_{<s<e,t>>}\ \lambda s\ \iota x\ [P_s\ (x)]$
b. Dodos are extinct.
c. extinct ($^{\cap}$dodos)

In object-level contexts, however, further operations come into play to repair the sort mismatch. As (10a) shows, this repair involves the introduction of existential quantification over the instantiations of the kind in a given situation. It draws on the inverse of $\cap$, the predicativizer or 'up' operation $\cup$, defined in (10b) to take kinds and return their instantiation sets in a given situation:

(10)a. *DKP:* If P applies to objects and k denotes a kind, then P(k) = $\exists x\ [^{\cup}k(x) \wedge P(x)]$
b. $^{\cup}$: $\lambda k_{<s,e>}\ \lambda x\ [x \leq k_s]$
c. Dogs didn't bark = $\neg$bark ($^{\cap}$dogs) = *DKP* $\Rightarrow$ $\neg\exists x\ [^{\cup\cap}dogs(x) \wedge bark(x)]$

To return to the scope facts, a sentence like (7a) has an indefinite noun phrase. Since the indefinite denotes a generalized quantifier, it can take wide or narrow scope with respect to negation. The bare plural, however, is a kind term which is a direct argument of the predicate, as shown in (10c). The existential introduced by DKP necessarily takes scope below negation.

It is, of course, also possible to account for these effects in the ambiguity approach with some auxiliary assumptions. Diesing (1992), for example, proposes that indefinites are systematically ambiguous between quantificational expressions, presupposing their domain set, and non-quantificational/weak indefinites. Bare plurals, on the other hand, are

[1] $\cap$ has to be restricted from applying to predicates like *these old shoes* whose denotation is contextually anchored to particular entities, or counterparts thereof. P_s is the extension of a property P at a situation s.

ambiguous between kinds and non-quantificational/weak indefinites. By eliminating text level existential closure, Diesing can derive the obligatory narrow scope we see above. If the domain of sentence-level existential closure is below negation, for example, the only way bare plurals can be interpreted is if they take narrow scope.[2]

While both approaches seem to handle these facts equally well, there are other contrasts discussed by Carlson that separate them. In the cases above, the bare plural lacks one of the two readings that indefinites have but in (11), where interaction is with an adverbial, the bare plural has a reading that the indefinite lacks:

(11)a. #John killed a rabbit/some rabbits for an hour. $\exists > adv$

b. John killed rabbits for an hour. $adv > \exists$

In the kinds-based approach the indefinite and the bare plural are expected to take different scope positions due to the difference in types. If we assume that the indefinite must take scope over the adverbial, we get the implausible reading in (12a). The bare plural, however, can be a direct argument of the verb and after the intervention of DKP yields an existential with narrow scope:

(12)a. $\exists y$ [rabbit(y) & $\forall t$ [within-one-hour(t) $\rightarrow$ killed-at-t(j, y)]]

b. $\forall t$ [within-one-hour (t) $\rightarrow$ killed-at-t(j, $^{\cap}$rabbits)]
DKP $\Rightarrow$ $\forall t$ [within-one-hour(t) $\rightarrow$ $\exists y$ [$^{\cup\cap}$rabbits(y) & killed-at-t(j, y)]]

For the ambiguity approach, the adverbial case appears problematic. Since the bare plural in object-level contexts is supposed to be a subtype of an indefinite, it is impossible to derive a weak reading for one while blocking it for the other. As we can see, if existential closure applies above the adverbial, as in (13a), we get the right reading for the indefinite but not the bare plural; if it applies below the adverbial, as in (13b), we have the opposite problem:[3]

[2] Diesing herself does not discuss these scope effects though they follow from her claims.

[3] This is, of course, a somewhat simplistic rendering of the issues. See Krifka (1989) for a substantively different approach to the problem of scope interaction with adverbials, which could work within the ambiguity approach. Zucchi and White (2001), however, note some problems with that approach. The solution they suggest relies on reference to kinds for bare plurals and mass terms.

(13)a. $\exists x$ [rabbit/rabbits(x) $\wedge$ $\forall t$ [within-one-hour(t) $\rightarrow$ killed at t (j, x)]]

b. $\forall t$ [within-one-hour(t) $\rightarrow$ $\exists x$[rabbit/rabbits(x) $\wedge$ killed at t (j, x)]]

The focus of most of the work in the ambiguity approach has been on explaining quantificational variability effects, where it has been undeniably successful. We have seen, however, that the scope facts present a non-trivial problem for this approach and suggest that reference to kinds must be taken as integral to the meaning of bare plurals.[4] Against this background, I turn now to issues in the interpretation of bare nominals in languages without determiners and show that the ambiguity approach is not tenable for them. They thus provide further evidence in favor of the kinds-based approach.

2.2. *A New Argument for Kinds*

Our first foray into the semantics of bare nominals in determiner-less languages seems to reveal the expected. Although some of the facts I discuss below are not unknown in the literature I repeat them here for completeness, drawing specifically on Hindi, Russian and Chinese to make the points.

As discussed in Porterfield and Srivastav (1988) and Dayal (1992, 1999) Hindi bare nominals are compatible with kind level predicates as well as object level predicates. This is also true for Russian and Chinese.[5,6]

[4] There is a third approach to weak readings of bare plurals that one might consider, namely the semantic incorporation account of Van Geenhoven (1998). See footnote 11 for a discussion of the crucial contrasts between bare singulars and bare plurals in determiner-less languages discussed below.

[5] I owe much to Sophia Malamud, Vita Markman and Bozena Rozwadowska whom participated in a reading group on Slavic Bare Nominals at Rutgers in 2001, *particularly, for making me look more closely at bare singulars with indefinite-like readings*. Special thanks to Vita Markman for follow-up discussions and judgements. Although I do not give Polish examples, what I say here is also intended to apply to Polish. The Chinese data draws on Yang (2001) as well as on information provided by Li Ping Chen.

[6] Chierchia (1998) notes that the Russian bare singular is not compatible with the kind level predicate *wymer* 'be extinct' and takes this to indicate that it is not kind referring. While it is true that this particular combination is not readily accepted, other kind level predicates do accept bare singulars. Apart from the example in (15a), bare singulars are possible in the subject position of *zashchichen zakonom* 'be protected by law' as well as in the object position of *pridumal/izobrel* 'invent'. I should add that a corpus search conducted by Sophia Malamud discovered a significant number of bare singulars with the problematic *wymer*.

(14)a. kutta aam janvar hai
dog common animal is
'The dog is a common animal.'

b. kutte yehaaN aam haiN
dogs here common are
'Dogs are common here.' *Hindi*

(15)a. chelovek proizoshel ot obez'jani
man evolved from ape
'Man has evolved from apes.'

b. Ljudi proizoshli ot obez'jan
men evolved from apes.
'Men have evolved from apes.' *Russian*

(16) Gou juezhong le
dog extinct Asp
'Dogs are extinct.' *Chinese*

With object level predicates, the most notable fact about bare nominals in these languages is that they can also function like definites. Thus (17a)–(17c) can be read as generic statements about the properties of the species or a habitual statement about particular entities salient in the discourse. The ability of bare nominals to function as definites is also illustrated by (18a)–(18c), where the linguistic context brings out their anaphoric use. In the interest of conserving space, from this point on, I do not present singular as well as plural examples for Hindi and Russian when the facts hold for both:

(17)a. kutte bahut bhau Nkte haiN
dogs lot bark
'The dogs/Dogs bark a lot.' *Hindi*

b. Slony edyat travu
Elepants eat grass
'The elephants/Elephants eat grass. *Russian*

c. Gou hen jiling
dog very smart
'The dogs/Dogs are intelligent.' *Chinese*

(18)a. kuch bacce andar aaye. bacce bahut khush the
some children inside came children very happy were
'Some children came in. The children were very happy.' *Hindi*

b. Neskol'ko devochek i malchikov byli v komnate.
Several girls and boys were in room.
Mal'chiki igrali v karty. Devochki chitali komnate.
Boys played in cards. Girls read books.
'Several boys and girls were in the room. The boys were playing cards. The girls were reading books.' *Russian*

c. Wo kanjian yi-zhi mao. Mao zai huayuan-li
I see one-CL cat. Cat at garden-inside
'I see a cat. The cat is in the garden.' *Chinese*

Setting aside the precise relation between kinds and definites for the moment, it seems clear from the above that these bare nominals are genuine kind terms as well as genuine definites. Let us turn now to their ability to function as indefinites.

It was noted for Hindi, as early as Verma (1966) and Gambhir (1981), that Hindi bare nominals can be interpreted as definites or indefinites. A similar claim for Russian is often made (see Chierchia 1998, for example). Similarly, Chinese bare nominals are also noted as having indefinite readings. (19a)–(19c) are examples of bare nominals cited in the literature as having indefinite readings:[7,8]

[7] I avoid using bare nominals in direct object position in demonstrating indefinite readings since an incorporation analysis may be applicable to them, at least in some languages (see in particular Mohanan 1995 and Dayal 1999 for Hindi). It is well known that incorporation has distinct interpretive possibilities. My goal here is to isolate contexts in which interpretive differences hinge on number marking alone. For further discussion of the role of syntactic position in promoting particular readings, see Dayal *in prep.*

[8] These readings are not restricted to existential contexts, as is shown in (i) and (ii). Note also that (19a) differs from (1) only in the nature of the locative phrase, so the difference in interpretations cannot be attributed to the nature of the predicate involved:

(i) kamre meN cuuhaa ghuum rahaa hai
room in mouse moving is
'A mouse is moving around in the room.'

(19)a. kamre meN cuuhaa hai
room in mouse is
'There's a mouse in the room'. *Hindi*

b. V komnate byli mal'chik i devocka
in room were boy and girl
'A boy and a girl were in the room.' *Russian*

c. Waimian/ Yuanchu gou zai-jiao
outside far-away dog be-barking
'Outside/Far away, dogs are barking.' *Chinese*

There is some intuitive appeal to the notion that bare nominals function as definites and indefinites in languages that do not have articles. However, the status of bare nominals as indefinites needs to be probed a bit further. If we apply the familiar diagnostics, we see that bare nominals only allow weak indefinite readings:[9]

(20)a. kamre meN cuuhee nahiiN haiN *Hindi*
room in mice not are
'There aren't any mice in the room.' *only* $\neg\exists$

b. mujhi lagtaa hai ki kamre meN cuuha ghuum rahaa hai
to-me seems that room in mouse moving around is
'It seems to me that a mouse is moving around in the room.' *only seem* $>\exists$

(ii) baahar ciRiyaa gaa rahii thii
outside bird singing was
'A bird was singing outside.'

[9] In the adverbial case, the bare plural shows the plausible narrow scope reading. However, the behavior of bare singulars in these contexts is different, as shown by Hindi (i) and (ii). Such facts are the focus of the next section:

(i) puure din kamre meN cuuhee ghuste rahee
whole day room in mice kept coming in
'Mice kept coming into the room the whole day.'

(ii) #puure din kamre meN cuuhaa ghustaa rahaa
whole day room in mouse kept coming in
'The same mouse kept coming into the room the whole day.'

(21)a. kot ne sidit na stule *Russian*
cat not sits on stool
'There isn't any cat sitting on the stool' *only* ¬∃

b. mne kazhetsja chto v komnate mysh′ *only* ¬∃
me seems that in room mouse
'It seems to me that there is a mouse in the room.'
only seem > ∃

(22)a. Waimian gou mei zai-jiao *Chinese*
outside dog not be-barking
'Dogs are not barking outside.' *only* ¬∃

b. Wo xiang waimian gou keneng zai-jiao
I think outside dogs probably be-barking
'I think dogs are probably barking outside.' *only think* > ∃

In each of the cases above, we have a narrow scope existential reading.[10] A definite interpretation is also possible with certain intonation patterns. Crucially, what is missing is a wide scope existential reading where the bare nominal picks a specific individual out of a set of like individuals. In this respect, then, these bare nominals pattern with English bare plurals and can be treated similarly. In the kinds-based approach they can be thought of as involving quantification over instances of the kind, with DKP ensuring obligatory narrow scope. In the ambiguity approach they can be thought of as non-quantificational/weak indefinites that must occur within the sentence-level existential closure in non-generic sentences to have an interpretation.

What we have seen so far of the behavior of bare nominals in determiner-less languages, then, is compatible with both approaches to genericity developed on the basis of English. The only feature in which these bare nominals differ from English bare plurals is in the possibility of

[10] An anonymous reviewer points out a potential problem with the bare singular examples. Anticipating the discussion to follow, (s)he notes that examples like (20b) should mean that there is a unique mouse such that I think it is in the room. While (20b) does have the meaning where a unique contextually salient mouse is referred to, this is not the reading of interest here. Perhaps the uniqueness presupposition does not project because bare singulars in these languages do not enforce familiarity, as discussed below. In other cases where the bare singular is in object position, an incorporation account could be given and the narrow scope reading would be predicted.

definite interpretations. However, there are differences between bare singulars and bare plurals in these languages that pose an interesting challenge to current theories. The contrasts in (1), replicated in the examples in (23), as well as (24) from Hindi are illustrative:

(23)a. #caroN taraf baccaa khel rahaa thaa
four ways child was-playing
'The same child was playing everywhere.'

b. caroN taraf bacce khel rahe the
four ways children were-playing
'Children (different ones) were playing everywhere.'

(24)a. #kamre meN bacca khel rahaa thaa aur bacca so (bhii) rahaa thaa
room in child was playing and child was sleeping (also)
'The same child was playing and sleeping in the room.'

b. kamre meN bacce khel rahe the aur bacce so (bhii) rahe the
room in children were playing and children were sleeping (also)
'Children (different ones) were playing and sleeping in the room.'

Similar differences emerge in Russian. Apart from (2), repeated below as (25), we have the contrast in (26):

(25)a. #Sobaka byla vesde
dog was everywhere
'The dog/A particular dog (the same one) was everywhere.'

b. Sobaki byli vesde
dogs were everywhere
'There were dogs (different groups) everywhere.'

(26)a. #V etoj kletke, tigr jest i tigr spit
In this cage, tiger is eating and tiger is sleeping

b. V etoj kletke, tigri jedjat i tigri spjat.
In this cage, tigers are eating and tigers are sleeping
'In this cage, tigers are eating and tigers are sleeping

These data are interesting because the only locus of difference is the number marking on the bare nominal. Neither of the two approaches to bare nominals tap into this difference to explain the facts. In the kinds-only approach, for example, we would get (27a) as the logical representation for Hindi (23), which is incorrect for (23a). The ambiguity approach would result in representations such as (27b)–(27c), depending on where existential closure applies. (27b) is correct for the plural case but not for the singular, (27c) is correct for the singular but not for the plural. The same problem arises with the Russian examples in (25):[11]

(27)a. $\forall x\,[\text{place}(x) \rightarrow \exists y\,[^{\cup\cap}\text{kid/kids}(y) \wedge \text{play-in-x}(y)]]$
b. $\forall x\,[\text{place}(x) \rightarrow \exists y\,[\text{kid/kids}(y) \wedge \text{play-in-x}(y)]]$
c. $\exists y\,[\text{kid/kids}(y) \wedge \forall x\,[\text{place}(x) \rightarrow \text{play-in-x}(y)]]$

Clearly, the interpretation of bare nominals in Hindi and Russian requires some modification of our working assumptions about genericity. Such a modification, I suggest, is naturally incorporated into the kinds-only view but not into the ambiguity view.

There are two ways in which the data under discussion can be handled under the kinds-based approach. If we take object-level predicates to apply to instantiations of kinds, one possibility is to impose the requirement that even though kinds are conceptually plural, number morphology constrains the size of the instantiation set, as shown in (28a). In Section 3.3 we will see some further evidence for such a constraint:

(28)a. For all situations s such that $^{\cup}K_s \neq \emptyset$, $|^{\cup}K_s| = 1$ if K is a singular term and $|^{\cup}K_s| \geq 1$ if K is a plural term
b. $\forall x\,[\text{place}(x) \rightarrow y\,[^{\cup\cap}\text{kid}_s(y)/^{\cup\cap}\text{kids}_s(y) \wedge \text{play-in-x}(y)]]$

The problematic contrast between singulars and plurals now becomes tractable, as shown in (28b). In the case of the singular expression, even a narrow scope existential cannot yield a plausible reading since the instantiation set of the kind in the given situation is a singleton. No such

[11] Note that the semantic incorporation account of Van Geenhoven (1998) will not help here. If we take the cue from the plural case, for example, and treat the above examples as involving incorporation, we would expect the singular to get incorporated as well. But in that case, we would incorrectly predict that the singular would have a number neutral interpretation, synonymous to the plural.

constraint holds for the plural and different subgroups can take scope under the universal, resulting in a plausible reading. It is not obvious that a comparable modification centering on number morphology can be made to the ambiguity theory, given its commitment to aligning bare plurals with singular indefinites.

Another way of dealing with the facts would be to suggest that plural and singular kinds, again due to the implicatures generated by number morphology, differ in their ability to allow access to their instantiation sets. While plural kinds are transparent with respect to the objects in their extension, singular kinds are atomic entities that do not allow semantic operations from kinds to objects. This approach leads us to modify our position on the status of bare singulars in object-level contexts. All instances of bare singulars in non-kind level contexts must now be derived without reference to kind formation. One possibility that immediately suggests itself is through the application of ι. Let us see how the sentences in (23) would be interpreted under this approach:

(29)a. $\forall x\,[\text{place}(x) \rightarrow \text{play-in-x}(\iota y[\text{kid}_s(y)/\text{kids}_s(y)]]$

b. $\forall x\,[\text{place}(x) \rightarrow \exists y\,[^{\cup\cap}\text{kids}_s(y) \wedge \text{play-in-x}(y)]]$

Consider first the singular case shown in (29a). ι in combination with singular morphology gets us uniqueness and we are left with the implausible reading, as desired. Turning to the plural case in (29a), we see that a similar implausibility arises there. It is possible to derive the available plausible reading here by appealing to DKP, which we are claiming is available to plural kind terms (29b). Thus, under either approach, reference to kinds must be taken as integral to the interpretation of kind terms in object level contexts.

This strategy is essentially the one proposed earlier in Dayal (1992) and (1999) but at that time I did not pay sufficient attention to examples like (19a)–(19b) which have bare singulars in them but are readily classified by native speakers as having *indefinite* interpretations. These examples show that in order to pursue this strategy further we must consider the issue of familiarity presuppositions typically associated with ι. If we consider the kinds of contexts where we get the judgement of indefiniteness, we can gain some insight into the problem. Crucially, speakers think of contexts where the entity referred to is not salient. Such a context for (19a), for example, could be one where the speaker hears a noise and guesses that there must be a mouse or one in which the speaker has just noticed a mouse scurrying around. In other words, the entity denoted by the bare nominal is not firmly established in the common ground. The point to note is that

these are cases in which uniqueness is not violated though familiarity is not satisfied.

To conclude this point, the claim we can safely make about singular bare nominals is that they can only denote a unique individual per situation, but this does not entail that the entity referred to be familiar. This can be accomplished by requiring singular kinds to have unique instantiation sets or by taking singular kinds to be atomic and taking object-level bare singulars to denote unique but not necessarily familiar entities. The choice between these two approaches must await the discussion of singular kinds in other languages in Section 3. To continue with our current concerns, if bare singulars are able to refer to non-familiar entities, we might well ask if they can also introduce new entities into the discourse as long as they are unique. In the next subsection we will explore this question further.

2.3. *More on Uniqueness and (Non)-Familiarity*

I have argued in previous work (Porterfield and Srivastav 1988; Dayal 1992, 1999) that bare nominals cannot introduce discourse referents, but since the judgements sometimes appear shaky it may be worth going over some of the cases. An example like (30a) shows clearly that a bare noun phrase cannot be used to pick out a novel entity from a previously introduced set. (30b) has a presentational context, and it too does not support the use of a bare nominal. (30c) shows that bare singulars do not make good antecedents for pronominal discourse anaphora. A full nominal would have to be used in the second sentence to establish coreference:

(30)a. vahaaN kaii log the. *(ek) laRkii *(ek) laRke ke-saath
there several people were. one girl one boy with
naach rahii thii. ek aur laRkii do aurotoN ke-saath baat
was dancing one more girl two women with was
kar rahii thii
talking
'There were several people there. A girl was dancing with a boy, another girl was talking to two women.'

b. bahut saal pahle, yehaaN *(ek) aurat rahtii thii. aurat
many years ago here one woman lived woman
bahut bhadur thii ....
very brave was
'Once upon a time, a woman used to live here. The woman was very brave.'

c. kamre meN #(ek) laRkii baiThii thii. us-ke saamne ek aurat
room in one girl was sitting Her front woman
khaRii thii
was standing
'A girl was sitting in the room. In front of her a woman was standing.' *Hindi*

Judgements for (30a) are as uncontroversial as judgements for the examples on which I have based my case for uniqueness, (23)–(26).[12] Although most people also agree with my judgement about sentences like (30b), there is some variation that suggests a more nuanced discussion of the facts is in order. It seems to me that bare singulars are possible in situations where uniqueness is satisfied. They also countenance absence of familiarity, as long as the entity denoted is not the primary focus of interest and not likely to be referred to in subsequent discourse. There is variation in acceptability because judgements are affected by potentially different expectations people can have about the relevance of the entity referred to in the discourse. What this state of affairs highlights is that intuitive judgements about *(in)definiteness* are made along two dimensions, *(non)-familiarity* and *(non)-uniqueness*. It is the latter, I am claiming here, that is critical in the analysis of bare singulars.

To reiterate the significance of uniqueness, let us consider one more piece of evidence. (31a), fashioned after an example in Porterfield and Srivastav (1988), when uttered in a context with more than one woman is infelicitous. The unstressed numeral *ek* 'one' needs to be used:[13]

[12] In fact, the restriction against partitive readings is so strong that bare nominals are ruled out even in direct object positions which are generally more liberal with regard to indefinite readings, due to incorporation. Thus *There were several books lying around. I picked up a book and started reading* could not be translated with a bare nominal for the underlined phrase. These issues are further explored in Dayal *in prep* where tests such as those discussed by Szabolcsi (1997) are also applied to the cases at hand.

[13] In earlier work, I had noted that bare plurals differ from bare singulars in allowing an indefinite reading in subject position. Thus (i) would contrast with (31):

(i) aurateeN Daak la rahii haiN
women mail are bringing
'Women are bringing the mail.'
(ii) $\exists x\,[^{\cup\cap}\text{women}_s(x) \wedge \text{bringing-mail}(x)]$
(iii) $\exists x\,[^{\cup\cap}\text{woman}_s(x) \wedge \text{bringing-mail}(x)]/\text{bringing-mail}(\iota x[\text{woman}(x)])$

Under the present approach, this contrast can be explained in the following way. As shown in (ii), in the plural case reference is to some subgroup of a plurality of women while in

(31)a. *(ek) aurat / AURAT Daak laa rahii hai
one woman WOMAN mail is bringing
'It's a woman who's bringing the mail.' NOT 'A woman is bringing mail.'

b. ∃x [is-bringing-mail-today(x)] *pressuposition*

c. woman(ιx [is-bringing-mail-today(x)]) *assertion*

However, Porterfield and Srivastav (1988) also note that the sentence becomes acceptable if the bare nominal bears intonational stress. This, I suggest, is because focus induces an existential presupposition and the bare nominal predicates something about the presupposed entity. The so-called indefinite reading is really a focus-dependent predicative reading, as shown in (31b)–(31c). An interesting fact about the effect of focus, pointed out to me by Vita Markman (p.c.), is that acceptability is not improved in contexts where the domain consists solely of women. Under the present analysis, the reason for this is clear. Once the presupposition is satisfied, the assertion is entailed in such contexts and the statement as a whole becomes uninformative. A close examination of the apparent counterexample to the claim of uniqueness, we see, turns out actually to be evidence in its favor.[14]

Another aspect of the present proposal that bears some discussion has to do with the setting of the situation variable on the bare nominal. Compare the following sentences:

(32)a. #V etoj kletke tigr spit i tigr jest.
In this cage tiger is sleeping and tiger is eating

b. V etoj kletke tigr spit i v toj kletje tigr jest.
In this cage tiger is sleeping and in that cage tiger is eating

c. #Sobaka byla vesde
dog was everywhere *Russian*

---

the singular case there is a unique singular individual. It is difficult for speakers to imagine contexts in which there would be a unique girl, without that girl also being salient (cf. the special contexts noted in connection with (19a)). It is relatively easier to imagine contexts which merely allow for the existence of a plurality of girls. The bare plural can then denote some subgroup of the maximal entity in this set without necessitating salience.

[14] It is worth noting that intonational focus does not redeem examples (23)–(26) and it should be clear from the account given for (31) why this is so.

(33)a. kal billii duudh pii gayii aur aaj billii khaanaa meN
yesterday cat milk drank up and today cat food in
muNh lagaa dii
mouth put
'Yesterday the cat drank up the milk and today it got into the food.'

b. #do ghante tak kamre kamre meN billi ghustii rahii
two hours till room room in cat kept entering
'For two hours the (same) cat kept entering the room'. *Hindi*

(32a), we have seen, does not have a sensible interpretation because *tigr* 'tiger' in both conjuncts draws on the same singleton set. In (32b) both conjuncts have the same temporal parameter, but they differ in location. The fact that the sentence is acceptable shows that the two bare nominals can have distinct situation indices. The impossibility of a sensible interpretation for (32c) shows that the quantification introduced by the locative does not bind the situation variable on the bare nominal. (33a)–(33b) make the same point along the temporal parameter. (33a) does not carry the necessary implication that the same cat is involved in both events, showing that there can be two distinct situations at which the instantiation sets are accessed.[15] (33b) shows, once again, that quantification induced by an adverbial phrase does not permit a similar variation in denotation, resulting in an implausible reading. Our conclusion, therefore, is that the situation index on the bare nominal is set at the sentential level and can only be manipulated by locative and temporal phrases that can function as topics. Crucial to the explanation for differences in singular and plural phrases is the fact that the existential quantification associated with bare nominals is always local. Whenever there is DKP-induced existential closure inside a quantificational structure within a situation, a difference in interpretation between singular and plural terms is predicted due to the restriction on singular kind terms.

To conclude this section, I have argued for encoding number restriction in the instantiation sets of kind terms, using contrasts between bare singulars and bare plurals in Hindi and Russian as crucial evidence. A question that legitimately arises in this connection is the status of nominals in languages like Chinese, Japanese or Korean that do not distinguish between

[15] I should note that the sentence would not be falsified if it turned out that more than one cat had been involved in each of the events. The point to emphasize is that grammatically only one entity of the relevant kind is available for predication per situation. This issue is explored further in Markman (2002).

singular and plural. Applying our diagnostics to Chinese, for example, we see that they pattern with bare plurals rather than with bare singulars:

(34)a. Gou zai meigeren-de houyuan-li jiao
dog at everyone-DE backyard-inside bark
'Dogs (different ones) are barking in everyone's backyard.'

b. zai zheli you ren zai kanshu (ye) you ren zai
at here there are people reading reading also are people
shuijiao
sleeping
'In here there are people reading and people sleeping.' *Chinese*

This plural-like behavior is not unexpected if we make the straightforward assumption that a language that does not mark number on kind terms does not impose any constraints on the size accessibility of their instantiation sets, effectively aligning it with bare plurals.

2.4. *Syntactic Restrictions and Null Determiners*

I have argued above, primarily on empirical grounds, that bare nominals in languages without determiners are only ambiguous between kinds and definites. The apparent indefinite reading arises from the intervention of DKP and is constrained by morphologically triggered number restrictions. In this and the next subsection we will examine why bare nominals are not bona fide indefinites.

It might be best if I started by making explicit my working assumptions about the syntax of bare nominals as they relate to issues of interpretation. The picture of noun phrase denotations I am working with is as given in (35) below (cf. Partee 1987; Chierchia 1998):

(35)a. $\langle e,t\rangle = (\cap, \iota, \exists) \Rightarrow$ $\langle e\rangle/\langle\langle e,t\rangle t\rangle$

b. ι: $\lambda P\, \iota x\, [P_s(x)]$

c. $\cap$: $\lambda P\, \lambda s\, \iota x\, [P_s(x)]$

d. $\exists$: $\lambda P\, \lambda Q\, \exists x\, [P_s(x) \wedge Q_s(x)]$

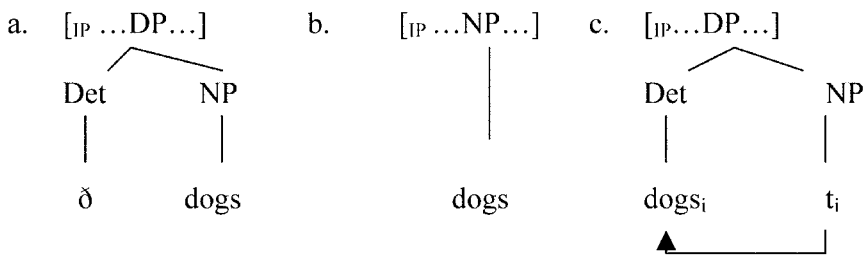
I follow the standard view that common nouns denote in the <e,t> domain, with lexical determiners encoding type shift operations required to turn them into the argumental types <e> or <<e,t>,t>.[16] In the DP analysis of

[16] Although this is the predominant view, it is by no means held unanimously. Chierchia (1998), for example allows this for count nouns only, reserving e for the basic type of mass

noun phrases, this amounts to saying that NP's are of type <e,t>, DP's of type <e> or <<e,t>t>, with determiners facilitating the requisite shift.

The syntax-semantics map is less clear in the case of bare nominals. Three possibilities that have been argued for are represented schematically below:

(36)



The option in (36a) takes there to be a null determiner, the one in (36b) assumes covert type-shift, while the option in (36c) assumes N → D raising. The first option has been argued for by Longobardi (1994, 1999) on the basis of Romance bare plurals, which occur only in certain restricted positions. Positing a null determiner accounts for their distribution, since the presence of null elements is thought to be contingent on some form of syntactic licensing. Within this line of argument, then, it would be plausible to posit a structure like (36b) for bare nominals in languages that freely allow them, as has been done by Carlson (1977) and Chierchia (1998). Longobardi, however, claims that noun phrases universally must be DP's and the reason some languages do not show syntactic restrictions is due to the fact that they have structures like (36c). Here the DP has neither an overt nor a null determiner, so distributional restrictions do not apply. It is worth noting that having null determiners or positing N→D raising addresses the issue of syntactic restrictions on the acceptability of bare plurals, but it does not directly address the issue of interpretation.[17]

Recall that in making the case for reference to kinds, I drew on bare nominals in subject position. As mentioned in footnote (7), the crucial contrasts are not really discernible in object position where bare singulars (in

nouns. Baker (in press) suggests type e for all NP's. Also, the analysis of definites and indefinites in DRT requires a somewhat nuanced application (see Partee 1987). Finally, since I do not follow Chierchia in his analysis of mass nouns as type *e* I remain neutral on the question of whether bare plurals denote only plural entities or whether their denotation includes singular and plural entities.

[17] The interpretation of such nominals as kinds, definites or indefinites remains open. It can be accomplished by means of general type shift principles or by encoding specific shifts into the meaning of the null determiner or into the N→D raised structure.

Hindi at least) may receive existential interpretations due to incorporation. Since this difference in interpretation can be classified as a subject-object asymmetry one might well ask whether a null determiner approach could also be used to explain the behavior of bare singulars. Roughly put, the explanation would go as follows. Hindi and Russian would be languages with a null ∃ determiner in bare singulars, effectively restricting bare singulars to object positions. The other option for bare singulars would be to have N→D raising which would allow them to occur in all syntactic positions. This would account for the fact that such terms have indefinite readings only in object position but definite readings in all positions. A proposal very like this was, in fact, made by Li (1997) in order to explain what appeared to be similar effects in Chinese.[18]

Appealing though this approach may seem, there are several problems with it. To begin with, the account cannot actually block the indefinite reading it is intended to block (see Longobardi for an attempt to resolve this problem by imposing ordering restrictions on interpretation and raising). We know that Chinese nominals in subject position can lend themselves to generic interpretations (cf. 17c). This means that there is a variable available for generic binding after N→D raising. It is hard to see why this variable would not be available for ∃ binding in episodic sentences. But then, of course, the difference between an indefinite reading due to a null ∃ in object position and an indefinite reading after N→D raising in subject position would be neutralized. This problem can also be demonstrated by considering bare plurals in episodic sentences. Since these do allow indefinite readings in subject position, where they presumably can occur only after N→D raising, it shows that ∃ binding of the variable contributed by the bare nominal is possible. If so, the case for blocking ∃ binding of the variable contributed by a bare singular in the same language simply cannot be made.

Finally, as Longobardi's original discussion revealed, the ban on null determiners in subject position is not absolute. For reasons that need not concern us here, a number of conditions serve to redeem an Italian bare plural in subject position. I give two of them below:

[18] Note that our discussion of Chinese here does not support the empirical generalization which Li's account was intended to capture. I follow Yang (2001) who shows that indefinite readings are, in fact, available in subject position though the propensity of Chinese for topic-oriented structures may tilt the interpretation in favor of the definite. Examples like (34a) where a definite reading is pragmatically implausible show what Yang describes as the "peeking out effect" of an available indefinite reading.

(37)a. Hanno telefonato studenti che volevano sapere la data
have telephoned students that want to find out the date
dell'esame
exam

b. Studenti e colleghi hanno telefonato
students and colleagues have telephoned *Italian*

(38)a. #caro taraf kutta jo bimaar hai so rahaa hai
four ways dog that ill is is sleeping

b. #caro taraf kutta aur bacca khel rahe haiN
four ways dog and child are playing
'Everywhere the dog and the child are playing.' *Hindi*

(37a) shows that heaviness makes an Italian bare plural acceptable in subject position, (37b) that conjunction has the same effect. If the absence of the indefinite reading in Hindi/Russian bare singulars were due to an unlicensed null determiner, we would predict similar effects. However, the modified nominal in (38a) does not have the relevant narrow scope indefinite reading, neither does the conjoined term in (38b). These facts also hold for Russian.

It seems clear, then, that for theoretical as well as empirical reasons, appealing to null determiners to explain missing readings is not tenable. I will therefore assume that null determiners can be used to explain restricted syntactic distribution of bare nominals in languages like Italian. In order to explain the restriction of bare nominals to kind, generic and definite readings in determiner-less languages we must continue to look within a semantic framework that regulates type-shifting options available to predicates in argument position.

2.5. *Blocking and Ranking Effects in Type-Shifts*

Chierchia (1998) argues for two kinds of restrictions on type shifts, given below in (39a)–(39b):

(39)a. *Blocking Principle* (Type Shifting as Last Resort):
For any type shifting operation ϕ and any X: $^{*}\phi(X)$ if there is a determiner D such that for any set X in its domain, D(X) = $\pi(X)$.

b. *Meaning Preservation*: $^{\cap}>$ {ι, $\exists$}

Consider first the Blocking Principle in (39a). The intuition behind this principle is that for considerations of economy lexical items must be exploited to the fullest by a language before covert type-shift operations are used. This explains the difference between English bare plurals and bare nominals in Hindi, Russian and Chinese with respect to the possibility of definite interpretations. The examples in (40a)–(40b) remind us of the core facts. There is no lexical definite determiner in Hindi, the reasoning goes, making ι as well as $\cap$ available options for bare nominals. In English, bare plurals can avail of $\cap$ but not ι because of the presence of the lexical definite *the*. Although in subsequent sections I will present data that will require a somewhat different approach to blocking effects, the principle in (39a) seems to work quite well for the facts considered so far:

(40)a. Some children came in. *(The) children were happy. *English*

b. kuch bacce$_i$ aaye. bacce$_i$ bahut khush lage
some children came children very happy seemed
'Some children came. The children seemed very happy.' *Hindi*

The assumption we might probe a bit, though, is how we can know that Hindi and other determiner-less languages lack lexical items of the relevant sort. That is, the Blocking Principle raises the question of an independent diagnostic for classifying determiners. For example, Hindi, Russian and Chinese are generally considered to be languages without determiners, but they typically use demonstratives in many places that English uses *the*. Similarly, we have seen that the unstressed numeral 'one' is used in many examples where English *a* would be used. It seems worth taking a moment to show that, in fact, the traditional view that these languages do not have genuine determiners does hold up under scrutiny.

Löbner (1985) proposes a diagnostic he terms *consistency* that separates true definites from demonstratives. While noun phrases with *the* in English yield only a contradictory reading when a predicate and its negation is applied to it, the Hindi *vo* readily admits a sensible interpretation:

(41)a. #The boy is sleeping and the boy is not sleeping.

b. That boy is sleeping and that boy is not. *English*

c. vo laRkaa so rahaa hai lekin vo laRkaa nahiiN so rahaa hai
that boy is sleeping but that boy not is sleeping
'That boy is sleeping but that boy is not sleeping.' *Hindi*

For indefinites, the genericity test discussed in Kratzer (1998) and Chierchia (1998) separates English *a* from the unstressed numeral *one* in

languages like Hindi and Russian. Again, I demonstrate with Hindi but the facts hold generally:[19]

(42)a. A dog barks. *Generic reading*

b. Some dog barks. **Generic reading*

c. ek kutta bhaunktaa hai
one dog barks **Generic reading*

d. #nahiiN kamre meN ek cuuhaa nahii hai
no room in one mouse not is
'No, there's one mouse which is not in the room' OR
'No, not even one mouse is there in the room.'

Furthermore, the unstressed numeral cannot be used to yield normal narrow scope interpretations. (42d), for example, cannot be an answer to the question *Is there a mouse in the room?* The numeral does not have a neutral narrow scope interpretation with respect to negation, only a scalar interpretation.

The point is significant, for if Hindi *ek* could be classified as an indefinite determiner it would provide an obvious explanation for some of the effects we have been looking at. One could say that the indefinite reading for bare singulars in languages like Hindi is due to lexical blocking by the numeral one, a possibility pointed out to me by an anonymous reviewer and Manfred Krifka. Under this view, these languages would be classified as having an indefinite determiner but not a definite determiner and the Blocking Principle would predict that bare nominals would type shift via $\cap$ and ι but not via $\exists$.[20] As we have seen, however, this line of approach is not tenable since the numeral does not have the requisite properties for blocking. The question therefore remains why bare nominals in languages like Hindi, Russian or Chinese are not able to shift via all three type shifts, $\cap$, ι and $\exists$.

This brings us to the second principle proposed by Chierchia, namely the ranking of the three type shifts, given in (39b) and repeated below. He bases it on English bare plurals that do not denote kinds, noted by

[19] The article *a* is argued by Kratzer to denote choice functions or indefinites while *some* is argued to denote only choice functions.

[20] Note that had it been possible to treat the numeral as a lexicalization of $\exists$, the question of kinds vs. ambiguity would have to be reopened. The ambiguity approach would treat these languages as a minor variant of English. That is, bare plurals would be ambiguous between kinds, definites and indefinites; bare singulars between kinds and definites only because of the presence of the numeral.

Carlson (1977) to allow scope permutations uncharacteristic of kind denoting bare plurals. (43a) shows that *parts of this machine* is not compatible with true kind predication, presumably because the definite inside the NP would force the extension of the noun phrase to be constant across worlds. (43b) shows that this bare plural can interact with negation, a diagnostic that separates indefinites from kind terms (but see Van Geenhoven 1999). The contrast is with cases like (44) where possibility of kind reference results in the loss of scope interaction. According to Chierchia, these facts follow from the ranking in (39b). In (43) $\cap$ does not apply and ι is lexically blocked, so $\exists$ becomes available. In (44), the simpler type shift $\cap$ effectively blocks $\exists$:

(39)b. *Meaning Preservation*: $\cap > \{\iota, \exists\}$
c. *Revised Meaning Preservation*: $\{\cap, \iota\} > \exists$

(43)a. *Parts of this machine are widespread.
b. John didn't see parts of this machine. $\exists\neg$ *and* $\neg\exists$

(44)a. Spots on the floor are a common sight.
b. John didn't see spots on the floor. *only* $\neg\exists$

While these facts seem to follow from (39b), there is actually an inconsistency in the application of the principle. Going back to Hindi, Russian or Chinese, note that (39b) predicts that the possibility of kind reference should block the indefinite as well as the definite reading, but we have seen that bare nominals can denote kinds as well as contextually salient entities. That both readings are readily available for bare nominals in languages without definite determiners suggests the revision in (39c). And, in fact, this revision would be justified also on the basis of the reasoning Chierchia gives for ranking $\cap$ above $\exists$. According to him, the former is simpler since it changes the type without introducing quantificational force. The same obviously applies to ι. The revised ranking now predicts that bare nominals in determiner-less languages would shift via $\cap$ and ι but not shift via $\exists$, explaining the scope effects observed in the previous subsections.

There is further evidence from Hindi in support of the proposed ranking of type-shifts. Consider the Hindi data in (45), corresponding to (43). As (45a) shows, the Hindi bare plural is not compatible with true kind predication, for the same reasons as its English counterpart. (45b) shows, however, that the bare plural does not admit a wide scope existential reading. It appears to have only the scopally frozen reading due to DKP, a puzzle if the term cannot undergo $\cap$ in the first place:

(45)a. *is mashin ke TukRe aam haiN
this machine of parts common are
'Parts of this machine are common.'

b. anu-ne is mashiin ke TukRe nahiiN dekhe
Anu-ERG this machine of parts not see-P
'Anu didn't see any/the parts of this machine.'

c. $\neg\exists x[\text{p-o-t-m}(x) \wedge \text{see}(a,x)]$ *but not* $\exists x[\text{p-o-t-m}(x) \wedge \neg\text{see}(a,x)]$

d. $x[\text{p-o-t-m}(x) \wedge \text{see}(a,x)] \Leftrightarrow \neg\text{see}(a,\iota x[\text{p-o-t-m}(x)])$

The solution to the puzzle is quite simple under the current proposal. We have already seen that ι is freely available in Hindi, and given the kinship between ι and $\cap$ we have classified it as a simpler type shift than $\exists$ for turning predicative expressions into arguments. It is then predicted that in the absence of $\cap$, the availability of ι will still block $\exists$. What we took to be the frozen existential reading is, in fact, the (non-familiar) definite reading of a sentence with negation (cf. 45d).[21,22] Thus, even in those selective cases where English bare plurals are bona fide indefinites, Hindi bare plurals are not.[23]

To conclude this section, I have presented a range of facts to show that even in the absence of determiners in a language, bare nominals cannot simply be classified as indefinites. This conclusion is supported by the parallel behavior of bare plurals and bare singulars in many contexts, but the crucial data drew on some rather unexpected differences in interpretation between terms contrasting only in the morphological encoding of number on the common noun. Adopting the neo-Carlsonian approach, I

[21] One might think that the relevant reading of (45b) is due to incorporation, not due to the blocking effect of ι That this is not the case can be shown by looking at bare plurals in subject position. The Hindi counterpart of *Parts of this machine are in the next room* differs from the English sentence in having only a definite reading.

[22] Although we have shown that Russian does not instantiate the kind of language in which ι and $\exists$ are freely available, as claimed by Chierchia, one might ask whether such a language would be permitted within the present framework. It would have to be a language with no ranking between $\cap$, ι and $\exists$, making all of them equally accessible. Certainly, cross-linguistic variation in ranking is a viable option (see Prince and Smolensky 1993 for crucial discussion). However, not all possible rankings are likely to be possible. For example, a ranking like $\exists > \iota > \cap$ does not seem to me to be in keeping with notions of markedness that form the conceptual underpinning of the proposal. I leave this question for future research. Thanks to Paul Pietroski for raising this question.

[23] Note that the difference in scopal properties of kind vs. non-kind denoting English bare plurals and the absence of such differences in Hindi would be unrelated properties if the ability to refer to kinds and objects were a case of simple ambiguity between kinds and indefinites.

have argued for a ranking among type-shifting principles that allows bare nominals in these languages to shift via $\cap$ but not via $\exists$. As further supporting evidence for this, I noted a subtle but clear difference between bare plurals in English-type languages and those without determiners in non-kind-denoting contexts. Thus the argument for a kind based approach has been made on language-internal as well as cross-linguistic considerations.

The crucial contrasts on which the argument for kinds was based left open two possible ways of approaching the issue of singular kind terms, either by taking singular number morphology to restrict their instantiation sets to singletons or by disallowing operations to instantiation sets altogether. We will return to the choice between these two approaches after the discussion in the next section.

3. Singular Definite Kind Terms

3.1. *The Problem of the Singular Generic Determiner*

In the previous section I have argued, primarily on the basis of data from Hindi and Russian, that the two type shifts from <e,t> to <e>, namely $\cap$ and ι, group together and rank above $\exists$, the type shift from <e,t> to <<e,t>t>. Examining the definitions for the two higher ranked operations, we see that they differ only in intensionality. While $\cap$ is a function whose extension we take to vary from situation to situation, ι is a constant function to a contextually anchored entity. Considering the two operations in these terms, it would be obvious, provides an explanation for the well-known fact that no natural language is known to have a dedicated generic determiner (see Krifka et al. 1995). In every attested language, kind terms are either bare or occur with the definite determiner. This is not surprising if kind formation is really just an intensional version of normal definiteness. The picture, however, is a little more complex since this view gives rise to other expectations that appear not to be borne out.

For example, one might speculate that if $\{\cap, \iota\}$ are a set of like operations, languages may choose to lexicalize neither or both. We have already looked at languages like Hindi, Russian and Chinese, which fall into the first typological class. The Romance languages that we will look at in Section 4 instantiate the second type. However, there are mixed languages in which only one of these operations, namely ι, appears to be lexicalized, English being the most familiar example of such a case. Another fact that does not immediately follow from our current conclusions is that in English singular kinds obligatorily occur with the definite determiner. In our discussion so far we have entertained the possibility that singular

kind terms are formed by the application of $\cap$, albeit with a restriction on instantiation sets. The question raised by mixed languages is why singular kinds should be accompanied by a definite determiner. If this were just a random fact about English, one might be tempted to set this question aside, but cross-linguistic generalizations are surprisingly stable. A language can have bare singular kind terms only if it allows plural/mass kind terms to be bare. Bare plural/mass kind terms occur in languages in which singular kind terms are bare (cf. Hindi, Russian, Chinese) as well as in languages in which singular kinds are definite (cf. English). The English paradigm, which we can illustrate by comparing singular and mass kind terms, is representative:[24,25]

(46)a. The dinosaur / *Dinosaur is extinct.
b. Babbage invented the computer / *computer.
c. (*The) water is becoming scarce.
d. (*The) gold is rare.

The particular question I am interested in exploring in this section is why it is that in English, and other mixed languages, it is the singular kind term that always occurs with the lexical determiner.

Although the singular definite generic has been discussed in the literature, it would be fair to say that it has not received the same attention as the bare plural. Among the formal analyses that have been proposed, two broad lines of approach can be identified. In one approach, due to Gerstner-Link (1988) and Krifka (1995), the definite determiner in this construction is treated as a formal marker of definiteness and is therefore expected to be compatible with names of kinds. Krifka, for example, accounts for the definite generic by treating the definite determiner as an identity function $\lambda x.x$, which combines with kind-denoting common nouns such as *dinosaur*^{k}. The analogy drawn is with proper names that require a definite determiner, namely *the Sudan* or *the Sahara*. He accounts for bare mass terms by positing a syntactic rule from NP→N (DP→NP in current terms) but he does not address the problem of interest here. Mass terms, we know, can occur as complements of DET to form well-formed

[24] Thanks to Richie Kayne and Manfred Krifka for bringing up the issue of mass kind terms and definiteness marking. Their questions led to much rethinking of my position on this question.

[25] Although mass terms have sometimes been referred to as singular terms due to verb agreement, I do not follow that convention. I only refer to count nouns as (morphologically) singular or plural, taking mass terms to be (morphologically) neutral.

noun phrases. If the definite determiner has the option of denoting an identity function and mass terms the option of denoting kinds, the possibility of the two combining in a structure like $[_{DP}\ the^{\lambda x.x.}\ [_{NP}\ water^{k}\ ]]$ remains, but this meaning is unavailable. Something more has to be said to force the definite determiner in such structures to exclusively denote ι.

A second approach to the definite generic that has been proposed in the literature starts with the normal meaning of the definite determiner, namely ι, but builds in special operations that override the uniqueness requirements imposed by singular morphology on the common noun. Ojeda (1991) and Chierchia (1998) can be characterized in these terms (see also Dayal 1992, 1999). Under this approach, too, it is unclear why ι should not apply to plural/mass kinds. After all, in the absence of singular morphology, ι should combine quite happily to yield the desired meaning.

These approaches, we can see, touch upon the semantic properties of the singular definite generic but they do not address the question of interest here, namely the difference between singular and plural/mass kind terms with respect to definiteness marking. I would like to approach the problem of the singular definite generic with an eye to explaining the differential status of definiteness marking on singular vs. mass kind terms. I will begin by focusing on the properties of definite singular generics in the next two subsections. In Section 3.2 I will propose that the singular definite generic is formed by combining the normal meaning of the definite determiner with a taxonomic common noun, and in Section 3.3 I will show that the singular definite generic does not allow free access to instantiations of the kind, returning to issues we had discussed in relation to Hindi/Russian. The differential status of definiteness marking is the focus of Section 3.4. The conclusions we come to in this connection set the stage for the discussion to follow in Section 4.

3.2. *The Singular Definite Generic and Taxonomic NPs*

In trying to get a better understanding of the nature of the singular definite generic, we might begin by looking at sentences like (47)–(49), which Krifka et al. (1995) analyze as involving quantification over sub-kinds. The relevant domain of quantification draws on taxonomic hierarchies like the one shown in (50):[26]

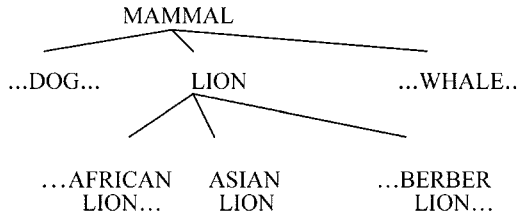
(47)a. Every/a/one (kind of) lion is extinct.
b. Two/three/most (kinds of) lions are extinct.

[26] I use capitals to indicate the taxonomic domain, while reserving lower case for kinds associated with bare plurals.

(48)a. Every/a/one lion is majestic.
b. Two/three/most lions are majestic.

(49)a. Every/a/one lion roars (when it is hungry).
b. Two/three/most lions are majestic.

(50)



(47) shows quite clearly that the domain of quantification has to be sub-kinds of the species *lion* since the predicate is kind-level. With individual level predicates, too, we get taxonomic interpretations, as in (48)–(49).[27] Now there are two ways of deriving the taxonomic interpretation, either by building an ambiguity into the denotation of the common noun or into the determiner. Common nouns, under the first approach, would systematically denote properties of ordinary individuals or properties of sub-kinds, and standard determiners would combine compositionally with the latter to yield taxonomic readings. Alternatively, determiners could be ambiguous between the familiar functions built on properties of individuals and functions that would take properties of individuals but map them onto the taxonomic domain before building up the relevant meanings. For convenience, I will adopt the first approach, though the proposal I want to make regarding definite generics does not hinge on this choice (see Krifka et al., 1999 and references cited there for further discussion). All we need to keep in mind is that a taxonomic domain has to be recognized as relevant in the interpretation of English noun phrases. Given what we have seen so far, it seems reasonable to ask if noun phrases with the definite determiner also allow for taxonomic readings. Since every natural language determiner is able to combine with properties of kinds, there is no reason why the definite determiner, in the singular or the plural case, should not also be

[27] The availability of such readings may be affected by the choice of particular predicates or by overt reference to kinds *type/kind/sort of lion*. For example, *one lion is majestic* is easily interpreted as an object level statement, which may obscure its taxonomic interpretation, but I assume that the taxonomic interpretation is potentially available in all cases.

able to do so. In fact, it is easily verified that plural definite noun phrases lend themselves to taxonomic readings:[28]

(51)a. The crustaceans evolved simultaneously.
b. The dinosaurs became extinct at various points in time.

(52)a. The lion is likely to become extinct.
b. The whale is a mammal.

The kind level predicates in (51) must clearly apply to sub-kinds of crustaceans and dinosaurs. If all determiners, including the definite determiner combining with a plural common noun, can denote at two levels, it seems plausible to assume that the definite determiner would be able to do so also in combination with a singular common noun.[29,30] In fact, it is quite

[28] Wilkinson (1991) notes that (51a) would be unacceptable without the definite determiner. Note, however, that it is possible to omit the determiner if the aspect supports a generic interpretation: *Crustaceans can evolve simultaneously*. While the plural definite in (51a), which is an episodic statement, denotes the sum of the sub-kinds in the actual world, the bare plural would be a function from possible worlds to possibly different maximal kind entities.

[29] The view that the definite generic in English is a taxonomic definite has been independently suggested by Graff (2001) and by Zamparelli (1998). See also Zucchi and White (2001).

[30] Singular definite generics are sometimes thought to be restricted to well-established kinds, as shown by the contrast between *Green bottles have long necks* and *#The green bottle has a long neck*, due to Partee (Carlson 1977). Or *#The airport is a busy place* vs. *Airports are busy places*. However, Dayal 1992 showed that contextual manipulation can render such definite generics acceptable:

(i) The factory produces two kinds of bottles, a green one for medicinal purposes and a clear one for cosmetics. The green bottle has a long neck. The clear bottle . . .

(ii) Of all the places I am forced to spend time waiting during my numerous commutes, the airport is my least favorite. At least from the train station, it is possible to go out into the town.

The perceived restriction may have to do with the conditions under which a noun phrase can denote a (unique) sub-kind. Kay 1971 argues that an entity qualifies as a sub-kind iff it belongs in a contrast set. That is, for x to be a taxonomic entity, there must be a $y \neq x$ and a $z \neq x$ and y, such that x and y can be considered sub-kinds of z. Any common noun can thus denote a singular kind, given an appropriate context. According to Linsky and Pelletier (2000) perhaps only a common noun like *being* would not be a felicitous singular kind. It would be impossible to invoke the relevant taxonomic structure because it is unclear what entity it would be in a contrast set with. I take the propensity of singular kind terms for well-established kinds to be a pragmatic effect, rather than an inherent restriction on singular kind formation.

unclear what principles one could appeal to in blocking a reading that is generally available in the language in just a single case. If so, what else could that reading be but the one we associate with the definite generic?

Suppose we take the definite determiner to have a generic denotation analogous to its standard denotation. That is, $\lambda P\ \iota X\ [P(X)]$, where X ranges over entities in the taxonomic domain. The uniqueness requirement of the ι-operator in combination with a singular common noun will be satisfied if the domain of quantification does not include sub-kinds of the relevant type. (52a) could be interpreted as (53a). If the domain of quantification is the set of taxonomic entities in (53b), the extension of the predicate *LION* will be as in (53c), and we will get the relevant interpretation. (54) illustrates the case of a more standard taxonomic statement. Here the quantificational domain includes sub-kinds of lions. I am assuming here that context determines what level of the hierarchy will be relevant to the interpretation in a particular case, allowing us to include one or more individuals in the denotation of the singular predicative term *LION*:

(53)a. Become-extinct (ιX[LION(X)])
b. U_C = {LION, WHALE, DOG}
c. *LION'* = {LION}

(54)a. The African Lion is a lion.
b. lion (ιX [AFL(X)])
c. *LION'* = {AFL, ASL, BL}[31]

(55)a. The lions are becoming extinct.
b. becoming extinct (ιX [{AFL + ASL+BL, AFL+ASL, AFL+BL, ASL+BL, AFL, ASL, BL}(X)])

It may be worth looking at (55) to see how plurality plays out in the taxonomic domain. The nodes in the hierarchy in (50) do not represent sum individuals.[32] Rather, the singular-plural distinction is interpreted using the lattice structure familiar to us from the regular domain. Thus the plural predicate *LIONS* denotes the closure under sum formation of the sub-kinds being discussed, the choice of which is determined by context. If there are

[31] A reviewer notes that the statement *The Lion is a lion* is a true predicative sentence, suggesting that the denotation of the taxonomic common noun LION must include not only the sub-kinds but also the generic kind LION.

[32] The plural taxonomic entity AFL+ASL, for example, does not belong in the hierarchy in (50). It is not a sub-kind of the kind *lion*, and *AFL* and *ASL* are not sub-kinds of the plural kind, just its individual parts.

three basic lion-kinds, we will have the denotation given in (55b), and ι will pick out the unique maximal entity in that set, namely AFL+ASL+BL.

If the definite generic is derived compositionally from the meaning of the definite determiner combining with a common noun denoting a set of taxonomic entities, a question that one might ask is why it is not intuitively recognized as being a taxonomic noun phrase. Let us consider some concrete examples containing instances of the definite generic as well as noun phrases readily identified as involving taxonomic readings:

(56)a. The (kind) lion comes in several varieties, the African lion, the Asian lion ...

Some (kinds of) lions are in danger of becoming extinct.

b. One (kind of) mammal, namely the whale, is in danger of becoming extinct.

There are two levels of the taxonomic hierarchy that are used in interpreting the underlined NP's. As we saw already, in the case of *the lion* in the first sentence of (56a) uniqueness is satisfied if the determiner combines with the set of taxonomic entities among the mammals {LION, DOG, WHALE ...} that satisfies the predicate LION, but in the second sentence, the quantification refers to the set of lion sub-kinds {AFL, ASL, BL, AFL+ASL ...}. Our normal understanding of the term *taxonomic noun phrase* seems to be tied to cases in which the other members of the set share the same generic name. This does not happen in the case of singular definites unless the common noun is modified, as in *the African lion*. The point to emphasize is that the definite generic cannot be formally differentiated from other taxonomic noun phrases. This comes out quite clearly in (56b).

The argument I have presented for the view that the singular definite generic is the regular definite determiner quantifying over a domain of taxonomic entities is based on parsimony. I will now turn to empirical arguments for this claim. A generally accepted fact about kind-level terms is that bare plurals and singular definites are true kind terms while indefinites are not (Krifka et al. 1995):[33]

(57)a. The dinosaur is extinct.

b. Dinosaurs are extinct.

c. A dinosaur is extinct. **except on the taxonomic reading*

[33] For reasons that are not well understood at the present time, bare plurals are not possible under the relevant reading in the object position of 'invent', so the passive is used for demonstration.

(58)a. The computer was invented by Babbage.
b. Computers were invented by Babbage.
c. A computer was invented by Babbage.
except on the taxonomic reading

Although this contrast appears quite robust, recall from Section 1 that it has recently been challenged by Guerts (2001), on the basis of the following. (59), with an indefinite in the object of a kind-selecting predicate, is fully acceptable:

(59) This morning Fred invented a/*the pumpkin crusher.

The adverb highlights a context with no previously existing pumpkin crushers. The indefinite in this sentence would not typically be classified as having a taxonomic reading, given that the context does not support the existence of various types of pumpkin crushers. At the same time, the nature of the predicate *invent* requires a kind term as argument. The indefinite is required in this context because it denotes (the property set of) a novel entity, albeit a kind entity. This example is particularly significant because it shows quite clearly that the same principles govern the distribution of determiners in the kind domain as in the ordinary domain and is in keeping with the view proposed here that the definite generic is not a special kind of noun phrase.

Finally, there is a cross-linguistic argument for the claim that the definite singular generic is derived compositionally from the regular definite determiner plus a common noun under its taxonomic guise. A survey of different languages shows that if a language uses a lexical determiner to refer to contextually salient entities or for anaphoric functions, it uses that very lexical determiner to express the singular kind term. If in a language bare nominals can be anaphoric or refer to contextually salient entities, the bare singular will also have a kind meaning. The Germanic and Romance languages are examples of the first, languages like Chinese, Russian or Hindi, of the second. A striking confirmation of this generalization is presented by languages like Hebrew, which have lexical definite determiners, but unlike the Germanic languages allow bare singulars. In such languages the bare singular neither admits a contextually anchored/anaphoric reading nor a kind reading. The following sentences from Hebrew illustrate this point:[34]

[34] There is one context, discussed in Section 4.4, where bare singulars have kind readings. It is also worth pointing out that the bare NP's in (61) are acceptable under a sub-kind interpretation, as expected. Note that the bare singular would also have a regular kind

(60) hi natna li sefer. karati *(et ha)-sefer ve-natati la oto
she gave to-me book read-I Acc the-book and-gave-I to-her
xazara
Acc-it back
'She gave me a book. I read the book and gave it back to her.'

(61)a. *(ha) kelev nadir be-arceynu
the dog rare-sg in-our-country
'Babbage invented the-computer.'
b. babag himci *(et ha)-maxSev
Babej invented-m-sg Acc the-computer
'Babbage invented the-computer.'

We will return to the issue of cross-linguistic variation in the next section, but even this brief demonstration underscores the fact that the correlation between means of expressing standard definiteness, namely familiarity/anaphoricity, and singular kind formation in so many languages could not be an accident. The claim that the definite generic noun phrase is nothing more than a taxonomic version of the definite, we see, has language-internal as well as cross-linguistic plausibility.

3.3. *The Singular Definite Generic and its Instantiations*

Before returning to the question we started with, namely the differential status of singular and plural/mass kind terms with respect to definiteness marking, let us establish one further property of the definite singular generic, namely the nature of its relationship to its members.

I will take as my starting point, the view expressed in Dayal (1992) that there is a tension between the requirement of singularity enforced by singular morphology and the notion that the kind can only denote a singleton set per situation. The most obvious problem, one that I did not focus on in the discussion of bare singular kinds in Section 2, is to derive an interpretation for sentences like (62):

(62)a. The tiger is common in these parts.
b. The lion gathers near acacia trees when it is tired.

interpretation in the Hebrew translation of (59). As we will see in Section 4.4, Hebrew bare singulars can pattern with indefinite NP's in English, so this is not surprising. What is relevant for present purposes is the fact that the pure kind reading of the bare NP's is missing in these contexts and that this correlates with the impossibility of bare singulars having anaphoric readings. I am indebted to Ron Artstein, Michal Barak, Edit Doron and Daphna Heller for judgements and discussion of the Hebrew facts.

(63)a. Tigers are common in these parts.
b. Lions gather near acacia trees when they are tired.

The lexical meaning of *be common*, indicating a sufficiently large number of instantiations of the kind, would seem to clash directly with the proposal that singular kinds are determinate in size. Similarly, the plural predicate *gather* would seem to require a plural subject. Yet the definite singular is as acceptable as the bare plural in these contexts. The solution to this puzzle, also suggested in Dayal (1992) and briefly mentioned in Section 2, is that singular kind terms while semantically plural are grammatically atomic. They can therefore simultaneously fulfill the requirement of singularity imposed by number morphology and remain conceptually true to the notion of a kind. The analogy one can draw in the ordinary domain is with collective nouns:

(64)a. The team is playing right now.
b. The committee voted.

(65)a. The team members are playing right now.
b. The committee members voted.

Barker (1992) and Schwarzschild (1996) have argued that collective nouns differ from plural definites in being group-like rather than sum-like, in the sense of Link (1983) and Landman (1989). Since groups and sums, conceptually associated with the same set of entities, can be shown to differ in their relation to these entities, a number of effects separating collective nouns and plural definites can be explained. Crucial to our purposes is the view that the relation between sums and their atoms is semantically transparent to predication while the relation between groups and their members is closed in this respect.

Taking our cue from collective vs. plural definites, I would like to pursue the idea that singular kinds differ from plural/mass kinds in not having a semantically transparent relation to their instantiations. To see this, we need to compare the behavior of singular and plural kind terms in object level contexts. Episodic as well as generic statements reveal differences between them. The singular definite generic is considered unacceptable in episodic contexts unless the statement is somehow applicable to the whole species, as can be seen by comparing (66) with (67). The examples in (70) also make the point that there is no absolute ban on the definite singular generic in episodic statements:

(66)a. Dogs are barking.
b. The dog is barking. *Intended* ∃ *interpretation unavailable*

(67)a. Rats reached Australia in 1770.
b. The rat reached Australia 1770.

(68)a. This is the lion.
b. We photographed the grizzly on our trip.

(68a), for example, would be acceptable in a context where a parent is showing a child around in the zoo and there is no presumption of familiarity with a contextually salient lion. It is worth noting that there is, however, a subtle uniqueness effect. The sentence would not be felicitous if the child had just seen a lion in another cage. Contrast *Those are lions and these are lions too vs. #That is the lion and this is the lion too*. Thus even though the singular definite generic can be used in episodic contexts, it does not appear to be able to pick out members of the instantiation set the way a bare plural can. One is led to conclude that the definite singular generic does not have plural instantiation sets.

Turning now to generic statements, singular kinds are generally thought to be acceptable in such contexts, as shown by canonical examples like (69). Looking beyond such cases, subtle but clear differences between singular and plural terms show up. The contrast in (70) is due to Edwin Williams (p.c.), the one in (71) from Dayal (1992):[35]

(69)a. Dogs bark when they are hungry.
b. The dog barks when it is hungry.

(70)a. Rutgers Professors seem to be born on weekdays.
b. #The Rutgers Professor seems to be born on a weekday.

(71)a. Yesterday between 3 and 4 whenever thieves entered the house, the police caught them.[36,37]

[35] An anonymous reviewer wonders if the unacceptability of (70b) does not go against the claim that context can render any definite noun phrase an acceptable generic, as discussed in ft. 30. The problem with (70b) is not that we cannot think of *the Rutgers Professor* as a well-established type. The problem is that we cannot predicate *being born on a weekday* of this entity, even in contexts where every actual Rutgers professor may have been born on a weekday.

[36] Again, in response to a reviewer's comment that an indefinite like *some thieves* in this position would also license the relevant reading, I should note that the examples in (71) are not intended to show special scope properties of bare plurals vs. indefinites. Rather they are intended to show that the singular cannot contribute an individual variable here that can be quantificationally bound.

[37] This point was already made in Dayal (1992) but I add the Russian (ia)–(ib) and Chinese (ii) examples below since they were not discussed in the earlier work. Occasion-

b. #Yesterday between 3 and 4 whenever the thief entered the house, the police caught him.

(70), with a bare plural, could be uttered in a situation where all the Rutgers professors happen to have been born on weekdays. The corresponding statement with the definite singular would not be acceptable in the same situation (see also Greenberg 1998 and Cohen 1998 for related discussion). A similar contrast emerges in (71) where the quantification expresses an accidental rather than an essential fact.

Given this set of facts, it becomes clear that generic readings of the definite singular cannot be derived simply by quantifying over instances of the kind. For one thing, allowing such quantification for generic sentences, as in (72a) would incorrectly predict the availability of existential readings in episodic contexts of the kind shown in (72b). More significantly, definite

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ally, speakers allow for the plausible reading for (ia) where different thieves are caught, but once they are given a context where no alternatives to thieves are available, they get the contrast indicated below. See Section 2.2 for the role of contrast in such cases and Section 4.2 for the situation in languages where both singular and plural kinds are definite:

(i)a. #Vchera, mezhdu 3-mya i 5-yu, kazhdyi raz kogda vor zaxodil v dom, polizia arrestovyvala ego.
'Yesterday, between 3 and 5, every time the thief/a thief (same one) entered the house, the police arrested him.'

b. Vchera, mezhdu 3-mya i 5-yu, kazhdyi raz kogda vory zaxodili v dom, polizia arrestovyvala ix.
'Yesterday, between 3 and 5, every time thieves entered the house, the police arrested them.'

(ii) zuotian 5 dian dao 6 dian, zei yi jin zhe jian fangzi, jingcha jiu zhuazhu tamen.
yesterday 5 o'clock to 6 o'clock thief whenever enter this CL house, policemen catch them
'Yesterday between 5 and 6, whenever thieves entered, the police caught them.'

generics would also be predicted to be acceptable in generic statements expressing accidental generalizations, as in (72c):[38]

(72)a. Gen s x [$^{\cup\cap}$ DOG_s (x) $\wedge$ hungry(x)][bark(x)]

b. $\exists$x [$^{\cup\cap}$ DOG_s (x) $\wedge$ is-barking-at-s(x)]

c. $\forall$t [[between-3-4(t) $\wedge$ $\exists$x $^{\cup\cap}$ $THIEF_s$ (x) $\wedge$ enter-house-at-t(x)] $\rightarrow$ catch(p,x)]

There are a number of alternatives for capturing the right set of facts. Here I will simply suggest that the singular kind term is an atomic entity which does not allow distributive predication to entities we intuitively associate with it. That is, it is an atomic term whose only instantiation set, when available, includes perhaps a representative or prototypical object. Generic quantification would have to be derived directly by ensuring that the property set of this representative object includes only those properties we associate with the species itself.[39] While I am well aware that this is a non-trivial task, I believe there is enough evidence to justify the general approach. I will therefore leave this complex and interesting question for future research (see Fine 1985 and Landman 1986 for related discussion). In concluding this discussion, I should note that the view espoused here is not particularly radical. It goes back to Jesperson (1927) who suggested that the singular generic term "denotes the kind itself" while the plural denotes "the members of the species".

3.4. *Back to Definiteness Marking*

The last two subsections were devoted to demystifying the definite singular generic in English. In doing so, we established that the definite determiner used in this construction has the properties standardly associated with the definite determiner. As always, it picks the unique (maximal) entity out of a set, a set of ordinary individuals in the standard case, a set of taxonomic entities in the generic case. We also established that the resulting

[38] This, we might note, is reminiscent of the situation with collective nouns. Compare (i) and (ii) from Schwarzschild (1996). The point of the comparison is that a collective noun is infelicitous with certain distributive predicates:

(i) #The members of group A live in different cities.

(ii) Group A lives in different cities.

[39] Kleiber (1990) presents a position very similar to the one proposed here. See also Krifka et al. (1995) and Zucchi and White (2001). Chierchia (1998) also treats the singular definite generic as a collective noun. However, he does not restrict predication to singletons or to representative/prototypical objects.

kind term has a different character than the bare plural kind term in English. Specifically, it is an atomic group individual rather than a plural sum individual.

Against this background, we might ask ourselves if there remains any issue with regard to the occurrence of a definite determiner with English singular kinds. After all, it is only to be expected that the definite determiner will occur when the taxonomic entity is familiar. That the problem does not disappear becomes evident once we look at mass (and plural) kinds, which are obligatorily bare. Note the parallelism between the singular count and the mass cases in every other respect:

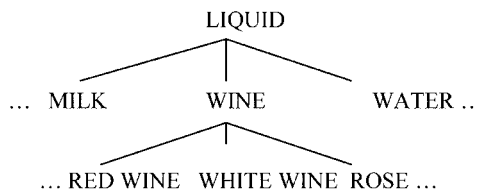
(73)a. The lion comes in several varieties, the African lion, the Asian lion ...

b. One kind of mammal, namely the whale, is in danger of becoming extinct.

(74)a. (*The) Wine comes in several varieties, (*the) red wine, (*the) white wine and (*the) rose.

b. One kind of grain, namely (*the) rice, is produced locally.

c.



We have come back to the problem noted in Section 3.1. Mass terms have taxonomic interpretations and have taxonomic hierarchies like (74c) on a par with singular terms, but they cannot occur with the definite determiner. If the definite determiner simply encodes the ι-operation and freely applies to the taxonomic domain, one would expect it to be able to occur with mass terms as well. *Wine, red wine* or *white wine* in (74a) and *lion, African lion* or *Asian lion* in (73a) both equally satisfy uniqueness and familiarity.

We can make some headway on this question if we take the semantics of number to play a crucial role in the creation of atomic kinds.[40] As suggested in Dayal (1992), we can say that an atomic kind is created under pressure from singularity presuppositions contributed by number morpho-

[40] Thanks to some pointed comments from Gennaro Chierchia, which forced me to give up an alternative way of approaching the problem of differential marking and return to an old idea about atomicity in singular kind formation.

logy and plurality conceptually associated with kinds. The situation under this view can be demonstrated with the following:

(75)a. Pre_K ($^{\cap}$lion) = $^{*\cap}$(SING) $\Rightarrow$ Pred_K (ιX[LION(X)])

b. Pred_K ($^{\cap}$wine)

Given this perspective on taxonomic readings, mass nouns will not undergo the same fate since $^{\cap}$ is defined for it.[41] Once the taxonomic reading of the singular common noun is forced, normal requirements associated with determiners can apply. The definite determiner will be felicitous if the set denoted by the taxonomic common noun has a unique maximal entity that is also familiar. Otherwise, the indefinite determiner will be appropriate.

The proposal here is compatible with the one in Chierchia (1998) to the extent that $^{\cap}$ is considered undefined for singular terms. It departs from that proposal in allowing for a shift to the taxonomic domain as a repair option. This not only solves the puzzle regarding the occurrence of the definite determiner with singular but not mass kind terms in English, it also makes slightly different cross-linguistic predictions. While Chierchia's proposal can be taken to rule out bare singular kinds in all languages, the present proposal allows for the cross-linguistic patterns of definiteness marking noted in Section 3.2.[42] Since we are not appealing to a "definite generic determiner" but rather to conflict resolution between morphology and semantics, the creation of atomic kind terms should be possible in any language that has singular terms. Whether a particular language will express the resulting kind term as bare or definite will simply depend on whether ι is lexically encoded in that language or whether it is available as a covert type-shift.[43]

There are other cross-linguistic predictions that this approach leads to, but before exploring them, let me return to a question that was left open in our discussion of singular kind terms in determiner-less languages. The data in object level contexts, we had suggested, could be explained by

[41] Of course, mass nouns can be coerced into count nouns by the presence of plural morphology or specific determiners (see Pelletier and Schubert 1989 for discussion).

[42] It is worth pointing out that it is not a necessary consequence of Chierchia's proposal that bare singular kinds be ruled out in all languages. For example, one could propose that in determiner-less languages bare singular kinds are possible because the operation associated with definite singular kinds (whatever analysis one adopts for them) is available covertly. Chierchia's own discussion of Russian, however, does not admit this possibility and I have often encountered this construal in other discussions.

[43] Note that mass terms can occur with a definite if anaphorically linked to an antecedent, even if such anaphoricity leads to kind reference, as in (i). In cases like (ii) where the anaphoric link cannot be established, definiteness is ruled out. Or to put it differently,

taking singular kinds to allow singleton instantiation sets or by treating them as atomic entities and allowing object level interpretations to be due to absence of familiarity requirements. Given that we have now suggested correlations between singular kinds across languages, the latter seems to be a preferable option. If familiarity presuppositions are attached to lexical items, it should come as no surprise that a language that does not have a lexical definite determiner will not enforce familiarity presuppositions. We therefore get the situation in Hindi and Russian where a singular common noun shifts to type <e> via ι, preserving uniqueness, but in special contexts can be taken to be an indefinite by native speakers. The opposite tack, which takes determiner-less singular kinds to have singleton instantiation sets, begs the question of why the following do not have the same interpretations:

(76)a. kamre meN cuuhaa hai
room in mouse is
'A mouse is in the room.' *Hindi*

b. The mouse is in the room. *English*

The decision in Section 2 to retain the idea of singular kinds having instantiation sets restricted in size was prompted by the fact that it is a plausible option as far as the discussion of those languages is concerned and has some intuitive appeal for people working on them. It is also possible that a different explanation for the difference between (76a)–(76b), one that relies on the possibility of instantiation sets for singular kinds in determiner-less languages, might emerge when further insight into these topics become available.

4. The Limits of Cross-Linguistic Variation

4.1. *A Typology of Definiteness Marking*

We have, on the basis of fairly close examination of the data, made proposals about number marking and (in)definiteness in kind terms in languages

the only possible reading for a definite in (ii) would be the anaphoric one, leading to the infelicitous interpretation that *the food the patients need* is scarce:

(i) Patients need medicine and food. (The) medicine fights the disease and (the) food builds up strength.

(ii) Patients need medicine and food. A limited amount of medicine is available but (*the) food is scarce.

with and without determiners, namely Russian/Hindi and English. In this final section we will expand the cross-linguistic predictions of the system by paying attention to three other language types, each of which calls for some adjustment of the system. The first type we look at are the Romance languages which formally mark plural kinds as definite. Our goal here will be to ascertain whether plural kind formation in Romance and in English/Hindi/Russian is the same. We next look at German, which allows both plural definites and bare plurals to function as kinds. Our goal here will be to see if German is a problem for the *Blocking Principle*. Finally, we look at languages in which definite singulars and bare singulars are both attested. Our discussion in this section, though limited in scope, is designed to underscore the fact that more variations can be expected in natural language. At the same time, it will preserve the central insight that variation is constrained in a principled way and it is possible to make predictions about what kind of languages we would not expect to see attested.

Let me recap briefly the key pieces of the account we are exploring. We are taking the following as established on the basis of previous discussion:

(77)a. $\langle e,t\rangle \rightarrow e/\langle\langle e,t\rangle,t\rangle$

$\cap$: $\lambda P\, \lambda s\, \iota x\, [P_s(x)]$

ι: $\lambda P\, \iota x\, [P_s(x)]$

$\exists$: $\lambda P\, \lambda Q\, \exists x\, [P_s(x)\ \&\ Q(x)]$

b. *Meaning Preservation*: $\{\cap, \iota\} > \exists$

c. *Blocking Principle*: For any type shifting operation π and any X: $^*\pi(X)$ if there is a determiner D such that for any set X in its domain, $D(X) = \pi(X)$.

d. $^* \cap (P_{SING}) \rightarrow \iota X\, [P_{TAXONOMIC}(X)]$

The starting point of our discussion here is the view that cross-linguistically $\cap$ need not be a covert type shift. However, if it is lexically encoded, it will be encoded as the determiner encoding ι, the two operations being the same except for intensionality. As stated before, this explains the observation that there are no languages that have a special determiner for kind terms. A further elaboration of this idea is that the two operations are ordered with respect to definiteness, ι being higher on the scale than $\cap$. Though this gradation in definiteness is universal, cross-linguistic variation emerges because different languages choose different points in the scale as the cut-off for lexicalization. Variation is constrained by the fact that no language can lexicalize $\cap$ which is lower on the scale without first lexicalizing ι which is higher. Our first step, then, is to show

that a unified account of the lexical definite can be given for languages where plural kind terms are definite.[44]

4.2. *Kind Terms in the Romance Languages*

Let us begin by looking at the pattern of definiteness marking in Romance. We can take the Italian facts below as representative. We see that singular and plural definites can refer to kinds, as in (78). They can also have generic or habitual readings, as in (79):[45]

(78)a. Il cane / * cane é diffuso
The dog is widespread

b. I cani / * cani sono diffusi
The dogs are widespread

(79)a. Il cane / *cane abbaia
The dog barks.

b. I cani / *cani abbaiano
The dogs bark.

That plural and singular kinds are marked definite follows from the proposal that Italian lexicalizes both ι and $^{\cap}$. Although this account of the Romance plural definite generic is appealing in its simplicity, it is not complete. There are two claims that have been made in the literature that bear some discussion. The first has to do with the nature of the definite singular generic, brought up by Vergnaud and Zubizarreta (1992). According to them, the Romance definite determiner, in the singular or the plural case, is ambiguous between a contentful determiner encoding normal definiteness (i.e., ι) and an expletive. Their basic claim is that syntactic NP's (noun phrases without determiners) denote types while DP's with a definite determiner denote tokens. Under this view, the difference between English and Italian reduces to the fact that English *the* always

[44] I should clarify that I am not claiming to give a unified account of all occurrences of definite determiners. Though I am sympathetic to attempts such as Löbner (1985) to do so, my goal here is more modest. I am concerned simply with accounting for a cross-linguistically stable generalization about definiteness marking in kind terms, a question which has so far escaped theoretical attention.

[45] Bare plurals in French are not acceptable while in Italian and Spanish they are allowed in certain restricted positions. I follow Longobardi and Chierchia in assuming the presence of a null determiner in these contexts. I will not have much to say about Romance bare plurals here (see Dayal *in prep* and Robinson *forthcoming*). Note that (80b) can also have taxonomic readings.

picks out a familiar/unique entity while the Romance definite does so only optionally. The definite allows for kind interpretations when it is semantically vacuous.[46] They further claim that Romance singular kinds differ from English singular kinds in not being restricted to well-established kinds. For them, French (80a) is completely acceptable while English (80b) requires a special context to make it so (see footnote 30 for discussion of the situation in English):

(80)a. Le tigre blessé est dangereux.
b. #The wounded tiger is dangerous.

In my own fieldwork I have been unable to confirm these judgements. As we know, it is not difficult to accommodate singular definite generics even in English, and it is possible that a *wounded tiger* may not be hard to accommodate within a taxonomic hierarchy, especially in the context of a predicate like *be dangerous*. Testing accommodation across speakers of different languages seems to me to be somewhat tricky. I therefore think it may be more reliable to base our conclusions on contrasts between singular and plural terms within a single Romance language, where intuitions of a single speaker can be tested. The Italian data in (81) show the same contrast as their English counterparts when the sentences are uttered out of the blue:[47]

(81)a. #La tigre a tre zampe è facile da cacciare
The tiger with three legs is easy to hunt
b. Le tigri a tre zampe sono facili da cacciare
The tigers with three legs are easy to hunt

The following Italian data from Dayal (1992) further establish behavior parallel to English:

(82)a. #Ieri tra le 4 e le 9 ogni volta che il ladro è entrato, la polizia lo ha arrestato
'Yesterday between 4 and 9, each time the thief entered, the police arrested him.'

[46] There are several arguments that V&Z make to motivate their claims. Here I confine myself to a discussion of those aspects of their analysis that bear on issues of direct concern in this paper. Thanks to Maria Luisa Zubizarreta for initial discussion of these questions. I have not had a chance to share with her, at this point, the conclusions I have drawn here.

[47] Note that in a context like the following, the singular would become fully acceptable in either language: *Due to an accident in genetic engineering, a new species of tigers with only three legs has evolved. The three-legged tiger is easy to hunt* .... Thanks to Monica Billotta, Ivano Capnigro, Gennaro Chierchia, Frida Morelli and Roberto Zamparelli for help with the Italian facts and to Philippe Schlenker for discussion of the French data.

b. Ieri tra le 4 e le 9 ogni volta che i ladri sono entrati, la polizia li ha arrestati
'Yesterday between 4 and 9, each time thieves entered, the police arrested them.'

As discussed in connection with English, it is not possible to use the singular kind term in predications involving accidental properties while it is quite easy to do so with plural kind terms. Based on these facts, I conclude, contra Vergnaud and Zubizarreta, that no real difference exists between singular kind terms in English and Romance and no revision of our current assumptions is called for.

Let us turn now to the second property of Romance plural kinds that calls for some discussion. Romance and English plural kinds, which have so far displayed parallel behavior, part company in certain contexts. Consider the English and Italian pairs below:

(83)a. Dogs are barking.
b. I cani stanno abbaiando
'The/*Some dogs are barking.'

(84)a. Dogs run across my lawn every day.
b. *I cani corrono sul mio prato ogni giorno *Under intended* ∃ *reading*

Laca (1990) notes that Spanish (85a), which has two definites, can only have a contrastive reading for the verb. Krifka et al. (1995) conclude that Romance definites can be interpreted in the restrictor of a quantificational structure but not in its nuclear scope. They take the Romance plural definite to be a 'theme marker' that formally indicates the position of a semantically indefinite NP. Accounts treating the Romance plural definite as optionally expletive cannot explain why the expletive meaning is not available in these contexts, without somehow blocking DKP in the nuclear scope:[48]

(85)a. Los arquitectos construyen las casas (y los decoradores de interiores las arruinan).
'Architects BUILD houses (and interior decorators RUIN them).'

[48] The construction that allows for the existential reading in Italian is the bare partitive discussed in Chierchia (1998), among others. It is also discussed in Dayal (*in prep*) and Robinson (*forthcoming*).

b. GEN s x y [$^{\cup\cap}$architects$_s$ (x) $\wedge$ $^{\cup\cap}$houses$_s$ (y)] [build-in-s(x,y)]

c. *GEN s x y [$^{\cup\cap}$architects$_s$ (x)] $\exists$y [$^{\cup\cap}$houses$_s$ (y) $\wedge$ build-in-s(x,y)]

Clearly, something more needs to be said to derive this difference between bare nominals and plural definites. If we take them to have the same denotation, the distinction would have to do with the presence vs. absence of a lexical determiner. A lexical definite determiner, we can say, carries at the very least a weak presupposition of existence. This means that it cannot be used to assert existence, explaining why it can occur in the restrictor but not the nuclear scope. Since this is a property of lexical items, bare nominals would not show the same sensitivity. We can thus derive the relevant results in a principled manner.

4.3. *Optional Definiteness in German Kind Terms*

Our survey of definiteness marking has so far focused on languages where there is a clear cut-off point in lexicalization between ι and $\cap$ that can be identified.[49] However, there are languages in which definiteness marking is optional. Krifka et al. (1995) give the following examples to show that German allows bare and definite plurals/mass terms for kind reference:

(86)a. (Die) Pandabären sind vom Aussterben bedroht.
'Pandas are facing extinction.'

b. (Das) Gold steigt im Preis.
'Gold is getting more expensive.'

[49] There are cases where English *the* seems to allow for intensional readings. The following, based on an example by a reviewer, is worth noting: *I know that my friend John owns a lot of books, but I neither know each single book nor do I know the exact number of the books owned by John. Nevertheless I can truthfully assert: "I will surely never read all the books John owns, but I always try to read the books that he recommends to me"*. Although this is arguably an intensional reading, *the* is possible (though not obligatory). I cannot go into this in detail here but note that such cases only arise when there is relative clause modification on the noun. Whatever be the reason for this, my claim is that the typology at issue is based on core cases involving unmodified noun phrases. In this connection, let me point to two other cases where relative clause modification has unexpected licensing effects. One is the case of Free Choice *any* discussed in Dayal (1999): *I read any book * (I saw)*; the other is the case of Italian bare plurals mentioned by Longobardi (1994) and Chierchia (1998) and cited in Section 2.4: *Studenti *(che volevano sapere la data dell'esame) hanno telefonato* = Students who want to find out the date of the exam have phoned. The Italian case has not so far been explained. Also, relevant in this context are functional bare plurals which alternate with definites, discussed in Condoravdi (1997), and role NP's like *the president, the senators* or *the temperature* which cannot be bare even though there are no problems with singular implicatures with them. These issues are discussed further in Dayal *in prep*.

The optionality of the German definite determiner with plural and mass kind terms poses a challenge to the *Blocking Principle*. Before we address this challenge, however, it is worth noting that similar optionality is not possible for singular kind terms in German, nor is it possible in anaphoric or familiarity contexts. This, once again, confirms that cross-linguistically, definiteness marking clubs together singular kind terms and familiar/anaphoric terms as higher in definiteness than plural/mass kind terms:[50]

(87)a. Der Pandabär / *Pandabär ist vom Aussterben bedroht.
'The Panda is facing extinction.'

b. Der Hund / *Hund bellt.
'The dog is barking.'

This, I argue, is evidence that the *Blocking Principle* does hold, even in German. What we need to incorporate into our system, however, is a distinction between canonical and non-canonical functions of the definite determiner. Taking our cue from the scale of definiteness, ι would represent the canonical meaning and $\cap$ the non-canonical meaning of the definite determiner in a language that lexicalizes both ι and $\cap$. Once this is done, the *Blocking Principle* can be restated to be able to apply only to canonical meanings of lexical items. Under this view, German would use the same cut-off point as the Romance languages, i.e., $\cap$, for lexicalization. However, it would differ from Romance in enforcing the *Blocking Principle* for the canonical function of the determiner only. This would explain why bare nominals are blocked from having anaphoric, familiarity or singular kind readings. Since blocking would not apply to the non-canonical meaning of the definite determiner, it would explain why plural/mass kind readings would be available either through the lexical determiner (aligning German with Romance) or through covert type-shift (aligning German with English).

To conclude this point, the ranking of ι and $\cap$ on a scale of definiteness does not replace the Blocking Principle. Rather, it provides a principled account of what meanings definite determiners may encode. Once a distinction between canonical and possible non-canonical meanings is made, the interaction between the scale and the *Blocking Principle* straightforwardly accounts for the range of languages and phenomena we have considered so far.

[50] Thanks to Alex Zepter for discussion of the German data.

4.4. *'Optional Definiteness' in Singular Terms*

The German data raises a further question. Is it possible for languages to allow optionality in definiteness marking for singular terms as well? The situation in German and English, which has definite singulars but not bare singulars, does not hold universally. Languages like Hungarian, Brazilian Portuguese and Hebrew, for example, are known to have singular definites as well as bare singulars. In this sub-section we will see that the variation in singular terms does not represent the kind of optionality we saw in connection with German plural terms. I should say at the outset that the discussion here is quite speculative since there remains some unclarity with respect to the data. I hope, however, to at least outline the nature of the problems encountered in trying to fit the phenomenon of bare singulars in languages with determiners into the picture of cross-linguistic variation sketched here.

Let us begin by probing the reason for the absence of bare singulars in languages like English. The operations relevant to bare singulars are given below:

(88)a. $\{^{*} \cap (P_{SING} \rightarrow \iota x\,[P_{TAXONOMIC}(X)], \iota)\} > \exists$

These operations all happen to be lexicalized in English. The repair operation for the undefined kind formation involves ι, which we know is lexicalized by *the*, and $\exists$ is lexicalized by *a*. Bare singulars can arguably be ruled out because there is no available type-shift that can apply to them (cf. Chierchia 1998). This suggests that if a language has a definite determiner but no indefinite determiner, it would allow $\exists$-shifted bare singulars, and there is some initial evidence to suggest that Hebrew exemplifies this option.

As noted earlier, Hebrew patterns with English with respect to definiteness marking for kind terms. Further evidence for this is given in (89), where asterisks indicate unacceptability under the intended reading. The bare singular is obviously acceptable under a taxonomic reading, much like an indefinite in English is:[51]

[51] Doron (2003), which we discuss below, allows for plural definite kinds. For her, then, both versions of (89b) are acceptable on a non-taxonomic reading. I do not focus on this difference here since this could easily be accommodated in the present approach by classifying Hebrew with German instead of English.

(89)a. ha-livyatan / * livyatan yikaxed bekarov im lo yagenu alav
the whale whale will-die out soon if not will-protect on-him
'The whale will die out if it is not protected.'

b. *ha-livyatanim/ livyatanim yikaxadu bekarov im lo yagenu aleyhem
the whales whales will-die out soon if not will-protect on-them
'The whale will die out if it is not protected.'

In other contexts, too, Hebrew bare singulars seem to align with English indefinites:[52]

(90) ha-miStara tafsa ganav /ganavim be-meSex Sa'atayim
the police caught-sg.f thief /thieves in-duration two-hours
'The police caught a thief (the same one) for two hours.' $\exists >$ *adv for bare sing*
'The police caught thieves for two hours.' *adv* $> \exists$ *for bare pl*

(91)a. dan roce lifgoS koxav kolno'a
Dan wants to-meet star cinema
'Dan wants to meet a movie star.' $\exists >$ *want & want* $>$ *exists*

b. dan roce lifgoS koxvey kolno'a
Dan wants to meet stars cinema
'Dan wants to meet movie stars.' *want* $> \exists$ *only*

(92)a. etmol beyn arba le-xameS, kol pa'am Se-nixnas ganav ha-miStara tafsa oto
'Yesterday between four and five, every time a thief (not necessarily the same one) entered, the police caught him.'

[52] Bare singulars and plurals are, of course, both acceptable in generic sentences:

(i) kelev/klavim bederex klal noveax/ novxim
dog/dogs usually bark-pres-sg-m bark-pres-pl-m
'A dog usually barks'/'Dogs usually bark.'

b. etmol beyn arba le-xameS, kol pa'am Se-nixnasu ganavim ha-miStara tafsa otam
'Yesterday between four and five, every time thieves (not necessarily the same one) entered, the police caught them.'

In (90) and (91) we see the bare singular can take wide scope while the bare plural takes obligatory narrow scope with respect to the time adverbial or the matrix verb.[53] In (92), a context where English bare plurals and indefinites behave alike, Hebrew bare singulars and bare plurals do too. These facts are not *a priori* expected. Recall that in similar contexts Hindi and Russian bare singulars did not pattern with English indefinites. The data suggests that Hebrew bare singulars, unlike Russian/Hindi bare singulars, shift via ∃. We have said that this could be because Hebrew has a lexical definite determiner encoding ι but no indefinite determiner encoding ∃ (cf. Glinert 1989).

The proposal under consideration has been challenged recently by Doron (2003). She notes that Hebrew bare singulars can denote kinds, but only when they are subjects of categorical statements, in the sense of Kuroda (1972). Compare (93a) and (93b):

(93)a. babej himci *(et ha)-maxSev
Babbage invented-m-sg Acc the-computer

b. (ha-) maxSev babej himci
the computer Babbage invented
'Babbage invented the computer.'

Doron's conclusion is that the categorical subject position is special in that it can interpret properties as kind individuals. When bare singulars occur in other positions, they are incorporated (cf. Van Geenhoven 1998).[54]

Note that Doron's position does not, in fact, contradict the claim that Hebrew bare singulars do not refer to kinds. According to Kuroda's discussion, individual denoting terms can participate in thetic as well as categorical statements, so if Hebrew bare singulars could denote kinds,

[53] Note that the ambiguity approach would face a problem here since it would, as in the Hindi/Russian case, predict parallel behavior between the bare singular and the bare plural. The interesting thing is that the nature of differences between the singular and the plural in the two language types is radically different.

[54] Doron notes, however, that incorporation in Hebrew yields a singular rather than a number-neutral interpretation. This is different from what has been claimed for incorporation in other languages.

they would not be ruled out from thetic statements. This is contrary to what we observe. What Doron's data calls for is an account of how the categorical subject position accomplishes the task of creating a kind individual out of bare singulars. I do not have a firm answer to this, but one possibility is that the categorical subject position coerces singular terms into mass interpretations. Kind formation would then be defined for these massified singulars and we would derive the optionality we see in the categorical subject position.[55]

While it is possible to reconcile the data with the view that bare singulars only undergo kind formation via the repair operation involving taxonomic kinds, the behavior of non-kind denoting bare singulars in Hebrew proves difficult to settle. We demonstrated above in (91) that the bare singular takes variable scope, motivating the view that it shifted via ∃. Doron, however, gives the example in (94) to show that bare singulars obligatorily take narrow scope:

(94) lo noveax kelev
not barks dog
'No dog is barking.'

(94) contradicts the conclusions based on (91), which Doron (p.c.) accepts. The data, it appears, are neither consistent with the view that bare singulars are shifted via ∃ nor with the view that they are incorporated indefinites.[56]

Even apart from the Hebrew-internal problems, there is reason for not making analyses of bare singulars in these languages hinge on the presence or absence of the indefinite determiner. Hungarian, like Hebrew, has only a definite determiner but unlike Hebrew does not allow bare singulars, except in the preverbal position where it can incorporate with the verb (Farkas and de Swart, 2003). And Brazilian Portuguese, like English, has definite and indefinite determiners but still allows bare singulars (Schmitt and Munn 1999; Müller 2001).[57] Although the issues here are clearly rel-

[55] To make this suggestion concrete one might need to adopt a framework like Optimality Theory, which I suspect would be needed anyway to account for the types of cross-linguistic differences noted in this sub-section.

[56] Doron (p.c.) further points out that bare singulars and plurals both have opaque and transparent readings in sentences like the following, which further complicates matters:

(i) dan roce lehazmin Soter/Sotrim la-yomuledet Selo
Dan wants to invite policeman/policemen to his birthday party

[57] There is disagreement about the ability of bare singulars in Brazilian Portuguese to denote kinds. Schmitt and Munn (1999) argue that they can while Müller (2001) claims that they cannot.

evant, I will have to leave them for future research. We can, however, come to some conclusions on the basis of the facts that are uncontroversial.

The first claim we can make with confidence is that the availability of bare singulars and definite singulars in a language does not invalidate the *Blocking Principle*. In none of these languages is the bare singular able to have familiarity/anaphoric readings, suggesting that the principle holds for some functions associated with the definite determiner in every language.

Another conclusion we can safely draw is that the standard way of expressing singular kind terms in these languages is through a definite. Bare singular kinds are either ruled out or, if available, subject to restrictions. This suggests that kind formation is indeed undefined for singular terms and $^{*}(^{\cap}(P_{SING})) \rightarrow \iota X\,[P_{TAXONOMIC}(X)]$ retains some validity even in languages that allow bare singulars alongside definite singulars.[58]

5. CONCLUSION

In this paper, we have looked at a number of languages, focusing on the morphology, syntax and interpretation of kind-denoting terms. Using number morphology as a window into the problem, we have discovered a number of facts that were not previously known. We have also been able to account for a number of cross-linguistic generalizations that were not explained in earlier approaches. As mentioned at the outset, cross-linguistic explanations are of value only if they also constrain the range of possible variations. Let me end by listing three types of languages that the current theory predicts to be impossible.

Languages without Determiners: A language in which bare plurals have more restricted existential readings than bare singulars. 'Hindi-in-reverse' is predicted to be non-existent because atomic kind formation, resulting in the absence of plausible sub-group readings, is triggered by singular morphology on the common noun. Sub-group interpretations are predicted to be possible with bare plurals since they would denote maximal plural entities at the relevant situation.

Languages with Definite Determiners: A language that forms plural kind terms with the definite determiner while allowing singular kind terms to be bare. 'English-in-reverse' is ruled out because ι universally ranks higher than $^{\cap}$ on the scale of definiteness. Singular morphology forces singular kind to shift via ι. A language can only use the lexical determiner for plural kinds if it also uses it for singular kinds.

[58] Note that Romance bare plurals, whether they are kind terms or not, do not have familiar/anaphoric readings. If they are analyzed as having null determiners, it would suggest that the *Blocking Principle* also applies to null elements.

Languages with Optional Definiteness: A language that requires definite determiners on plural and mass kind terms but admits optionality for anaphoric/familiar/singular kind readings. 'German-in-reverse' is ruled out because such a language would be one that lexicalizes both $\cap$ and ι and enforces the *Blocking Principle* for the former but not the latter. That is, it enforces the principle for a non-canonical meaning of the determiner without also enforcing it for the canonical meaning.

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