Specificity Distinctions
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**Abstract**
The notion of specificity in linguistics is notoriously non-specific. We consider here various distinctions within the realm of noun phrase semantics that are relevant to specificity. The common thread uniting these distinctions is the notion of variation in value assignments for the variable introduced by the noun phrase. The distinctions concern the nature of the variation involved. The first part of the paper (Section 2) is devoted to the definite/indefinite divide and proposes a dynamic parameter of 'determinacy of reference' which attempts to capture what is common to uniqueness and familiarity approaches to definiteness. Section 3 is devoted to a typology of indefinites in terms of constraints imposed on evaluation properties of the variable they introduce. Based on properties of special indefinites discussed in the literature on Hungarian, Lillooet Salish and English, I argue that a constraint based account of special indefinites is to be preferred over ambiguity-based approaches.

## 1. Introduction

This paper is concerned with semantic noun phrase typology, focusing on the question of how to draw fine-grained distinctions necessary for an accurate account of the various subtypes of definite and indefinite DPs found in natural language. In the extensive literature on this topic, the most commonly encountered parameters of classification concern the semantic type of the denotation of the noun phrase, the familiarity or novelty of its referent, the quantificational/non-quantificational distinction (connected to the weak/strong dichotomy), as well as the question of whether the noun phrase is choice-functional or not. (For the latter distinction, see Reinhart (1997), Winter (1997), Kratzer (1998), Matthewson (1999)). The discussion that follows makes the following three general points: (i) phenomena involving the behavior of noun phrases both within and across languages point to the need of establishing further distinctions that are too fine-grained to be caught in the net of these typologies; (ii) some of the relevant distinctions should be captured in terms of conditions on how variables introduced by noun phrases are assigned values; (iii) at least some distributional and scopal peculiarities of noun phrases follow from these constraints.

Section 2 (based on Farkas (2000)), deals with the typology of definite noun phrases; Section 3 examines some of the problems raised by recogniz-

ing the rich variety of 'indefinite' noun phrases found in natural language. Common to the typologies discussed in the two sections is the issue of marking different types of variation in the interpretation of a noun phrase. In the light of this discussion, specificity turns out to be an epiphenomenon connected to a family of distinctions that are marked differently in different languages.

## 2. Definiteness and determinacy of reference

Definite pronouns, proper names and definite descriptions are often grouped together under the label of 'semantically definite DPs' because they behave in many respects as a natural class within and across languages.[1] On the other hand, within the rich realm of semantically indefinite DPs, various distinctions in terms of an ill-defined notion of specificity have been drawn, such as that between partitives and non-partitive indefinites (cf. Enc 1991). It is also well-known that 'specific' indefinite DPs in general, and partitive DPs in particular, are closer to semantically definite DPs than their non-specific or non-partitive sisters. A good illustration of this ambivalence is found in the morphology of the partitive article in Romanian. The partitive article in this language is composed of the masculine singular (unmarked) form of the indefinite article, *un*, suffixed by the definite article, which bears the inflections of gender and number characteristic for determiners in this language. I exemplify with the masculine singular form in [1]:

[1] Unul din studenţi a plecat.
   a.Def.Sg.Masc from students has left.
   One of the students left.

Evidence for the necessity of distinguishing between various subtypes of definites and indefinites is furnished by data concerning Direct Object Marking, the phenomenon of morphologically marking a certain subclass of direct objects. Aissen (2001) shows that with respect to this phenomenon DPs form the hierarchy in [2] (where I substituted *Partitive* for Aissen's *Specific*).

[2] Personal Pronoun > Proper Name > Definite > Partitive

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[1]In what follows the term DP is used for syntactic constituents traditionally known as noun phrases. I reserve the term NP for the 'descriptive content' of a noun phrase, the argument of D. Not all traditional noun phrases have an overt D. Pronouns and proper names do not, and neither do incorporated arguments. I will use the term DP for the former nonetheless, and the term nominal for the latter.

Once the relevance of this hierarchy is accepted, a question that arises is what semantic parameter is responsible for it. The answer I suggest is that what is at issue here is the question of the latitude the DP allows with respect to the choice of value for the discourse referent it introduces. In the rest of this section I give the gist of this proposal concering the typology of definites so as to have a starting point for the discussion of indefinites in the next section, which expands the left hand side of the hierachy. I am concerned here with two issues: (i) understanding the common denominator as well as the distinguishing features within the group of semantically definite DPs, and (ii) understanding the special nature of partitives relative to definiteness. I disregard here questions concerning the ranking among various types of semantically definite DPs.

In what follows I restrict my attention to full-fledged argumental DPs. Argumental DPs are associated with the argument of a predicate, unlike predicative DPs, which contribute the main predicate of a sentence. Full-fledged arguments are opposed to incorporated ones.

In line with D(iscourse) R(epresentation) T(heory) and F(ile) C(hange) S(emantics) I assume that the minimal contribution of a full-fledged argumental DP is a discourse referent, or variable, and a condition on it. The condition will be referred to below as the *value condition* contributed by the DP. The discourse referent contributed by the argumental DP unifies with the appropriate thematic argument of the predicate.[2] Truth is defined as embeddability (or satisfaction) of semantic representations in a model. Most generally, a DRS K is true in a model M iff there is an assignment function $f$ that satisfies the conditions in K. If the universe of K contains a discourse referent $x$ introduced by an argumental DP contributing the value condition C, f(x) will have to meet C if $f$ embeds K in M.[3]

A further division within DPs in these frameworks concerns the issue of whether they are quantificational or not. Quantificational DPs differ from non-quantificational ones in that they trigger a complex embeddability condition, corresponding to the complex structure associated with them at the level of semantic representation. Crucial to the complexity they are associated with is that they involve the introduction of *auxiliary assignment functions*.[4] If the immediate constituents of K involve a structure induced

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[2]See Farkas and de Swart (2001) for details on the connection between discourse referents introduced by argumental DPs and semantic arguments of a predicate.

[3]I will not deal here with the important issue of separating value conditions from conditions contributed by predicates because it is not directly relevant to present concerns.

[4]The term, and the notion, is taken from Heim (1982), who uses auxiliary sequences

by a quantificational expression, when checking whether $f$ embeds K in M, auxiliary functions $f'$ have to be considered, functions that extend $f$ with respect to the variables bound by the quantifier. Quantificational DPs will be considered here only in as much as they interact with non-quantificational ones.

In order to understand the scale in [2] and the notion of semantic definiteness one has to better understand the nature of value conditions contributed by various DP types. It is to this issue that I turn to next.

## 2.1 Definite pronouns and Proper names

A significant distinction relevant to value condition typology concerns pronouns and proper names on the one hand, and all other types of DPs on the other: proper names and pronouns do not have descriptive content, while DPs involving a lexically headed NP do. The value conditions contributed by the latter type of DPs are *predicative*, requiring the value to satisfy the predicate contributed by the NP, while those contributed by former are *equative*. Below each DP type is discussed in more detail.

*Definite pronouns*

In Kamp and Reyle (1993), the construction rule triggered by the use of an anaphoric pronoun involves the introduction of a new discourse referent $y$, and the addition of value condition of the form $y = x$, where $x$ is a discourse referent present in the DRS at the time of the introduction of $y$ and accessible to it. The DP responsible for the introduction of $x$ is the linguistic antecedent of $y$. In order to extend the treatment to deictic pronouns, one has to assume that non-linguistic contextual information may also serve as basis for the introduction of discourse referents, as done in Heim (1982). The requirement that an appropriate discourse referent be available as the right hand term of the equative condition amounts to a presupposition in the sense that it is a condition imposed by the use of a definite pronoun on the context to which it is added. If this condition is not met, the construction rule associated with the pronoun cannot be carried out. The equative condition $y = x$ amounts to the requirement $f(y) = f(x)$ imposed on any relevant embedding function f. What value one assigns to $y$ depends only on what value $f$ assigns to $x$. More generally then, the form of the value condition contributed by definite pronouns is $y = \phi$, where $\phi$ ranges over discourse referents present in the input context and accessible to the pronoun at the time of the application of the construction rule triggered by it.

*Proper names*

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in giving satisfaction conditions for quantificational formulas.

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Proper names are similar to definite pronouns in that they introduce a new discourse referent $y$ and contribute an equative condition. The crucial difference is that the condition in question requires the value assigned to the discourse referent to be equal to whatever entity the proper name names, rather than some entity given as value to another discourse referent. What entity a proper name names is not a matter of the particular context the proper name is used in, which is why Kamp and Reyle take proper names to be 'externally anchored.' Following the spirit of Kripke (1972), I assume that models come with a (partial) naming function N that associates to name and world pairs an individual in the world in question. The denotation of a proper name $S$ used in an utterance at world $w_i$ is N($w_i$, $S$), the entity N assigns to the pair < $w_i$, $S$ >. In DRT terms, this means that the value assigned to the variable $y$ contributed by a proper name $S$ is N($w_i$, $S$), no matter where $y$ finds itself in the DRS. This is what is responsible for the rigidity of reference of proper names.[5] In current terms, this amounts to claiming that the use of the proper name *Sarah* triggers the introduction of a new discourse referent $y$ and the condition $y = Sarah$, which amounts to requiring *f(y)* to equal N(*Sarah*), for any $f$ that embeds K.

**2.2 Incremental discourse change**

The framework in Kamp and Reyle (1993) differs from FCS and its descendant, C(ontext)CS in that interpretation is defined only on full discourses. In CCS truth/satisfaction conditions are defined for every stage of a discourse, and therefore one can define the C(ontexct)C(hange)P(otential) of an expression $e$. Assume $e$ is added to a discourse (or context) $c$ and the result is a new discourse $c'$. The CCP of $e$ is the sum of the changes in the satisfaction conditions of $c'$ relative to $c$.

The version of DRT proposed in van der Sandt (1992) (as well as that in Muskens (1996)) involves incremental interpretation of the type we find in CCS, where the addition of an expression $e$ to a discourse with representation K involves constructing a new discourse representation K' which results from merging $K_e$ with K, where $K_e$ is the DRS constructed on the basis of $e$. Merging two DRSs involves taking the union of their universes and their conditions. Van der Sandt's purpose in breaking up discourse interpretation in this way is to provide an account of presupposition and presupposition projection. My aim here is to characterize the CCP of expressions, i.e.,

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[5]Since modal issues are ignored here as much as possible, the world variable on N will be ignored from now on. It is, however, a significant omission, since, as Kripke shows, the reference of proper names may vary from world to world. Special to proper names is that when used in a world $w$, their value at any world is whatever the name names in $w$.

the way adding an expression $e$ to a discourse K affects the embeddability conditions of the new discourse K'.[6] The incremental nature of interpretation will be crucially used in understanding the notion of semantic definiteness.

Note that under these assumptions, the requirement on the value condition of pronouns no longer requires the variable on the right hand side of the equation to be present at the time the construction rule applies but rather, it has to be present in the universe of the input DRS K.

To illustrate, assume the discourse contains the information contributed by [3] and nothing else, and assume its DRS K is the representation in [3b]:

[3]  a. Sarah came in.

    b. $x$
       $x = Sarah$
       $came\ in(x)$

This discourse is embeddable into a model M iff there is an $f$ such that $f(x) =$ N($Sarah$) and $came\ in(f(x)) = 1$ relative to M. Assume now that one asserts [4a] relative to K and that the DRS associated to [4a] is $K_S$, given in [4b]:

[4]  a. She sat down.

    b. $y$
       $y = x$
       $sat\ down(y)$

The requirement on the value condition of the pronoun here is met by the input DRS, whose universe contains $x$. The result of merging the two DRSs is given in [5].

[5]  $x,\ y$
    $x = Sarah$
    $y = x$
    $came\ in(x)$
    $sat\ down(y)$[7]

Assume now that $f$ embeds K in M. It will embed K' in M, where K' is [5] iff $f$ has an extension $f'$ on $x$ such that $f'$ meets the conditions in [4b], namely just in case $f'(y) = f(x)$ and $sat\ down(f'(y)) = 1$ in M. More generally going

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[6]I am glossing over the important distinction between asserted and non-asserted information and therefore do not make use of van der Sandt's A-structures.

[7]Important but for now irrelevant details concerning temporal interpretation have been ignored here.

from K to K' by the addition of $K_e$ involves extending the functions that embedded K relative to M to functions that embed $K_e$ relative to M. The context change potential of an expression is made up of the requirements it imposes on this extension. In what follows, an input function $f$ refers to a function that embeds the input DRS K. An output function $f$' refers to a function that extends $f$ and satisfies K'. The context change potential of a definite pronoun introducing a discourse referent $y$ and a value condition $y = x$ is to require $f$' to extend $f$ relative to $x$ so that $f'(x) = f(y)$. The context change potential of a proper name introducing a discourse referent $y$ and a value condition $y = Sarah$ is to require $f$' to extend f relative to $y$ so that $f'(y) = N(Sarah)$. More generally, the CCP of an expression $e$ whose DRS is $K_e$ is the change in embeddability conditions of an input DRS K brought about by merging K with $K_e$.

Returning to definite pronouns and proper names, we have seen so far that they have in common the fact that they contribute equative value conditions. What distinguishes them is that the value condition contributed by definite pronouns ends up crucially involving the input function, while that contributed by a proper name does not. The reference of a definite pronoun is crucially context dependent; that of proper names is not.

### 2.3 Descriptions

Non-quantificational argumental DPs involving a lexically headed NP contribute, minimally, a discourse referent and a predicative condition whose effect is to require the values of the discourse referent to be selected from the set denoted by the NP (or, equivalently, these values have to satisfy the property denoted by the NP). To exemplify, the DRS of [6a] is [6b], where $z$ and its value condition are contributed by *a woman*.

[6]  a. A woman came in.

  b. $z$
     woman(z)
     came in(z)

Common to the DPs *a woman, the woman*, as well as to *every/most/five women* is that they involve the introduction of a discourse referent, say $z$, and the value condition *woman(z)*, requiring the function (or functions) assigning values to $z$ to choose them from the set of women. Common to the context change potential of the former two DPs is that they require any output function $f$' that extends an input function $f$ to extend $f$ relative to $z$ by giving $z$ a value among the set of women. I will call the set denoted by

the NP the *value set* of *z*. The lexically headed NP in argumental DPs then provides the value set of the variable introduced by the DP. The differences between these DPs come, in the view suggested here, from further evaluation constraints imposed on the variable by the different determiners.[8]

The question I turn to next is that of characterizing the difference between definite and indefinite argumental descriptive DPs. The traditional answers fall into two classes: (a) uniqueness approaches and (b) familiarity approaches. According to the former, the special requirement associated with definite descriptions is that they refer uniquely. In present terms this amounts to the requirement that their value set be singleton. Under this view, definite descriptions are close relatives of proper names, whose reference is also essentially unique. Uniqueness based approaches are particularly attractive in accounting for the use of the definite article with superlatives such as *the first man who landed on the moon,* with DPs referring to unique entities such as *the moon,* and with the many 'first mention' definite descriptions found normally in written texts, descriptions that usually come with a rich descriptive content. Problematic for uniqueness approaches is not only the necessity of relativizing uniqueness to context but also cases of anaphorically used definites, such as epithets.

According to familiarity approaches, the special requirement associated with definite descriptions is that they introduce a familiar discourse referent (or, equivalently, a novel discourse referent equated with a familiar one). Within familiarity approaches definite descriptions form a natural class with definite pronouns. Familiarity approaches are particularly successful in dealing with anaphoric uses of definite descriptions. Problematic for them are 'first mention' definites of various sorts.

An issue that is independent of the choice between these two alternatives is the question of how to distinguish definite descriptions from indefinite ones. Indefinites could be seen as involving a special requirement of their own, as proposed in Heim (1982), or as being unmarked, as proposed in Hawkins (1991). Here I will follow Hawkins (1991) in assuming that ordinary indefinites are unmarked, i.e., they involve no further condition besides the value set condition.[9] Languages may have a variety of special indefinites, however, which come with various further conditions. We will examine in detail some special indefinite DPs in Section 3 below.

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[8] These evaluation conditions are close in spirit to the Binding Conditions in Kamp (to appear).

[9] Nothing crucial hinges on this assumption which is why I do not elaborate on it any further.

## 2.4 Determined reference

The notion of determined reference is brought up in the present context in order to capture what is common to anaphoric and unique reference. Determined reference is a special type of uniqueness which makes crucial use of the incremental nature of interpretation. The gist of the proposal is that semantic definiteness is sensitive to the latitude of choice concerning the value assigned to the variable introduced by the DP at the time of going from an input function $f$ that embeds the input context K to an extension $f'$ on the variable in question. Semantically definite DPs are then defined as DPs for whom the choice of value is fixed, i.e., DPs in whose case when extending f on the variable they introduce so as to meet the value condition contributed by the DP, there is no choice as to what the assignment is. Proper names and pronouns share this property. Thus, if $y$ is a discourse referent introduced by a definite pronoun or a proper name, and $f$ is a function that embeds the input DRS K, every $f'$, $f''$ that embeds the output DRS K' and that extends $f$ relative to $y$ is such that $f'(y) = f''(y)$. That is, there is no choice relative to the valuation of $y$ when going from $f$ to extensions of $f$ relative to $y$ so as to satisfy the value condition on $y$. In the case of definite pronouns, there is no choice because the value condition they are associated with is of the form $y = x$, where $x$ is an element of the universe of K and therefore a variable for which $f$ is defined. This condition requires any $f'$ that extends $f$ relative to $y$ to be such that $f'(y) = f(x)$. There may be many ways of embedding both the input and the output DRS in a model relative to $x$, but for every input function f, there will be a single way of extending it relative to $y$ in accordance with the value condition of the pronoun, namely by giving $y$ whatever value $f$ assigns to $x$.

In the case of proper names, there is no choice of value because the value condition they introduce is of the form $y = Name$, which requires any function assigning values to $y$ to give it the value N($Name$). The 'no choice' property is enforced by the equative value condition but this time the uniqueness of choice is independent of the input function and therefore independent of the properties of the DRS the proper name is added to. Proper names refer uniquely if at all in virtue of the fact that the value assigned to the variable must be whatever N assigns to the name in question.

The property of determined reference characterizes the way a variable is assigned values. Its definition is given in [7].

[7] Let K' be the DRS obtained by merging the input DRS K with the DRS $K_e$, and let $x$ be in the universe of $K_e$ but not in that of K.

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The variable $x$ has determined reference iff for every $f$ that embeds K it holds that for every $f'$, $f''$ that extend $f$ and which satisfy the value conditions in $K_e$, $f'(x) = f''(x)$.

Variables introduced by definite pronouns and proper names meet the determined reference requirement in virtue of the equative value conditions they contribute. In the case of proper names, the value is fixed relative to the model (and the utterance world), while in the case of definite pronouns, the value is fixed relative to the input function.[10] Predicative value conditions, on the other hand, to not ensure determined reference. Indeed, indefinite descriptions are typically used in the absence of determined reference. Thus, assuming that [6a], whose DRS is [6b] is asserted relative to the input DRS K in [3b], the variable $z$ does not have determined reference: given a function f that embeds K relative to a model M, there are as many ways of extending $f$ relative to $y$ so as to satisfy the value condition in [6b] as there are women in M. Predicative value conditions do not necessarily fix the reference of the variable introduced by the DP the way equative conditions do.

*The definite article as a mark of determined reference*

The distinctive feature of definite descriptions now can be recast in terms of determined reference: they are descriptive DPs introducing a variable that must have determined reference. The definite article can now be seen as marking that the variable introduced by its DP has determined reference. This requirement is met in the case of descriptions if the NP denotes a singleton set (relative to the model or a contextually restricted set of entities).

If a DP introduces a variable $y$ and a descriptive condition $P(y)$ based on a singleton set denoting NP, any two functions $f'$ and $f''$ defined on $y$ and which meet the value condition on $y$ will be such that $f'(y) = f''(y)$. The NP may denote a singleton set either because of its semantics, as in the case of superlative DPs, or because of the properties of the model relative to which the discourse is interpreted, as in the case of expressions such as *the moon* or *the Queen of England,* or, as in the case of most descriptions, because the description is interpreted relative to its context, which contains a singleton salient set satisfying the description.[11] In the latter instance the description identifies a singleton set only relative to the input DRS K. What happens in the case of such contextually restricted descriptions is that the value set of

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[10] The variables introduced by first and second person pronouns have determined reference but in their case, the referent is fixed relative to the speech act.

[11] For a view of definite descriptions that relies crucially on salience in discourse, see von Heusinger (2000).

the variable introduced by the DP is restricted to the entities that serve as values to the variables in the input DRS K. This DRS meets the requirement associated with the definite article iff the description denotes a singleton set relative to these entities. If the element of the singleton set in K was just introduced in previous discourse, as in [8],

[8]  A woman and a man came in.
     *The woman* sat down.

the situation is close to the anaphoric use of definite pronouns in that we can identify the DP responsible for introducing the element of the singleton set denoted by the NP in the definite DP. If the element of the singleton set is present in the circumstances of the discourse, the situation is close to that of deictic pronouns.[12]

Descriptions then may achieve determined reference either independently of the input DRS K, in the way that proper names do, or crucially depending on it, in the way of definite pronouns. Given that they must contribute a predicative condition (and are associated with an extra equative one only in special cases), they may also not involve determined reference at all. The claim here is that the definite article marks determined reference, i.e., it contributes the requirement that the variable introduced by the DP must have determined reference relative to the input DRS.[13]

Under these assumptions, the contribution of the definite article is to mark a particular evaluation property of the discourse referent introduced by the DP, namely the property that when extending an input function $f$ to $f'$ there is no choice relative to what value $f'$ has to assign to the variable

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[12]There may be reasons to want to separate a special, truly anaphoric use of descriptions for cases where the referent of the description is established independently of the descriptive content (which therefore can be novel), as in the case of epithets like *the bastard*. For such cases, I would claim, there is an extra anaphoric value condition of the form $y = x$ on the discourse referent $y$ contributed by the DP, besides the predicative value condition contributed by the NP. Determined reference is ensured by the equative condition. I leave open here the important question of the source of these equative conditions on descriptions. They can, at least in principle, be assumed to be contributed either by the DP itself or as a result of discourse structure properties.

[13]The view of definiteness based on determinacy of reference is a variant of the uniqueness approach and as such it inherits some of its well-known problems. One of them is the use of the definite article with DPs such as *the bus* in *I will take the bus rather than walk*. Another is that of 'functional' definites such as *the woman every man loves* or *the rabbit in the hat*, used when there are several hats each containing a single rabbit. Such DPs raise interesting issues that I will not pursue here. For discussion of the latter type of DP see Löbner (1985); for discussion of the former, see der Does and de Hoop (1998).

contributed by the DP. I will assume here that the definite article contributes a mark on the variable introduced by the DP, namely !, which signals the requirement that the variable in question needs to have determined reference relative to the input DRS K. The difference between the DRSs induced by *A woman sat down* and *The woman sat down* would be only that the latter will introduce a discourse referent preceded by an exclamation mark while the former will not, i.e., the first line in [6b] is replaced by *!z.* As a result, *z* is now required to have determined reference. Under normal assumptions concerning the number of women in the model, the evaluation requirement signaled by ! will be met only in case the DRS is added to an input DRS K whose universe contains a salient singleton subset that *woman* may denote (or if such a singleton set is accommodatable). In the case of singleton set denoting descriptions no such contextual requirement is needed. Thus, DPs whose descriptive content is rich enough as to characterize a singleton set introduce variables that have determined reference independently of the properties of the context. This is true in the case of DPs such as *the idea that we should all leave* under the reasonable assumption that the descriptive content of this DP includes the noun *idea* and the content of the *that* clause.

The use of the definite article with descriptions contributes a presupposition in the sense that the requirement of determined reference contributed by the definite article must be met by the input DRS. Whether the properties of K are crucial in meeting this requirement depends on the content of the NP and the properties of the model.

Common to semantically definite DPs then is that the discourse referents they contribute have determined reference. What separates definite pronouns and proper names on the one hand, from descriptions on the other, is that the former, but not the latter, have determined reference in virtue of the nature of the value condition they contribute. Descriptions have determined reference only if the NP denotes a singleton set relative to K or if they are used anaphorically. The use of the definite article with descriptions is distinctive since the variable contributed by a description does not necessarily have to have determined reference. The use of the definite article with proper names, however, in languages where this is allowed or required, is redundant: the article contributes a requirement that is automatically met in virtue of the nature of the value condition contributed by the DP.

## 2.5 Overt partitives: between definites and indefinites

Overt partitives are special in that in their case the value set is given by the interpretation of the domain DP, the DP that occurs as the argument of the preposition *of* in English. I assume then that partitives contribute a special

value condition of the form in [9],

[9] $y \in x$

where $x$ is the discourse referent contributed by the domain DP. In cases such as *some/one/two of the students in my class*, the domain DP introduces a group level variable. In cases such as *half of the cake,* it does not. Common to both, however, is that $y$ does not have determined reference. This, however, is not a crucial requirement given the possibility of partitive DPs such as *all of the cake.* Partitive DPs then share with ordinary indefinites the property of not requiring determined reference.

What distinguishes overt partitives from ordinary indefinite DPs, however, is that a partitive condition is formally more restrictive than an ordinary predicative condition, and therefore, in principle, the latitude of value choice for the variable introduced by the partitive is smaller than that allowed by ordinary indefinites. This is so because a partitive condition restricts the value set to the value assigned to an already restricted variable, namely the variable introduced by the domain DP. The choice of referent for partitives is necessarily restricted to a subset of the value of a discourse referent and therefore is restricted relative to the discourse. Assuming that the domain of a model M is U, the values of the discourse referents in the universe of a DRS K that is embeddable in M will be a subset $U_K$ of U. The value set of an ordinary descriptive DP will be a subset of U. The value set of a partitive DP on the other hand, will necessarily be a subset of $U_K$. I claim that it is this restriction of choice of value for the referent of partitives that is responsible for their siding with definite DPs in certain respects. Choice of value for semantically definite DPs is completely determined. Choice of value for ordinary descriptions is, in principle, limited to a subset of U. Choice of value for partitives is more restricted in principle: their value set must be a subset of a subset of the domain of the model. The choice of value of ordinary indefinites is in principle freer than those of partitives.[14]

## 2.6 Conclusion

The notion of determined reference was introduced to capture what is common to semantically definite DPs (definite pronouns, proper names and

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[14]The scale in [2] and the typology of DPs that I am concerned with here concerns DP types and not DP tokens. A particular ordinary indefinite may have a description that restricts its value choice much more severly than that of a particular partitive, as for instance in *a friend of mine* as opposed to *one of the entities in the universe.* What matters here is that partitives must refer within the universe of discourse and ordinary indefinites need not, a distinction which is connected to the form rather than the content of their value conditions.

definite descriptions) and to attempt to unify familiarity and uniqueness approaches to definiteness. It was also claimed that the issue of how restricted value choice is for a discourse referent may prove useful in understanding why partitives show affinities with both definite and indefinite DPs.

The parameter of determinacy of reference can be seen as a matter of specificity in the sense that what is at stake here is the degree to which the value condition contributed by a DP restricts the choice of value for the referent of the variable introduced by the DP in question. In the case of DPs with determined reference, the value choice is fixed: in going from the input function $f$ to extensions of $f$ on the variable in question, there will be no variation with respect to the value assigned to it. In the case of DPs with non-determined reference, there is variation concerning choice of value for the variable. In the case of partitives, variation is restricted to a subset of a subset of the universe of discourse. In the next section we look at subtypes of indefinite DPs and see what sort of further variation in value assignments may (or must) be involved in their interpretation.

### 3. Types of scopal (non)specificity

The term 'indefinite' is often used as a collective name given to non-quantificational DPs that would fall on the right of partitives on a definiteness scale. Under present assumptions, common to all types of indefinite DPs is a negative property, namely that of not being required to have determined reference. The interpretation possibilities of indefinite DPs vary greatly and so do the morphological subtypes of indefinites found within and across languages. A challenging task is to account for the distribution and interpretation of the subtypes of indefinites we find within a language as well as cross-linguistically. If the discussion of definiteness in the previous section is on the right track we expect the characterization of at least some subspecies of indefinites to also make reference to evaluation properties of the variable introduced. Below I discuss some cases in which this prediction appears to be correct. Characterizing the subspecies of indefinites reviewed in this section makes crucial reference, I claim, to the properties of the assignment functions that give values to the variable the DPs introduce, and therefore are of the same general type as the determined reference requirement contributed by the definite article. The requirements we encounter below also involve the issue of variation in value assignment (or lack thereof), but of a different type than the one involved in semantic definiteness.

The hypothesis I start from is that one of the semantic functions of morphemes occurring in the Determiner area of argumental DPs is to constrain

various aspects of the function that is to give value to the variable contributed by the DP.[15] This proposal is in fact quite close to the traditional view of quantifiers. Recall that the semantic job of quantifiers in predicate calculus is to encode more or less complex instructions concerning the way one is to give values to the variable(s) they bind. (Details are given in 3.1 below.)

The evaluation instruction encoded by the existential quantifier requires one to find some value in the value set for which the Nuclear Scope is true. That is, there must be one auxiliary function $f'$ that extends the input function on $v$ and that satisfies the Restrictor which also satisfies the NS. A crucial insight of DRT and FCS is that this effect is indistinguishable from the requirement imposed on the input function by an expression with a free variable instead of the existentially quantified one. In what follows I assume the DRT/FCS view of (in)definites without going into the issue of whether existential quantificational DPs need to be recognized in addition to free variable introducing indefinites.

Below I explore the possibility that the various determiners within and across languages encode evaluation requirements and constraints of various types. The view of specificity that emerges is one in which it is seen as an epiphenomenon that breaks down into a variety of differences concerning the way variables are given values, differences that may be morphologically marked in various languages.

In the case of descriptions, there are two ways in which valuation instructions may be restricted: one may restrict the nature of the function or functions that assign values to the variable or one may place restrictions on the nature of the value set. Above, we suggested that overt partitives impose a restriction concerning the value set. The definite article, on the other hand, imposes a restriction concerning the nature of the relation between the input function and the functions that extend it relative to the variable introduced by the DP. Ordinary indefinite articles, such as *a(n)* in English, *egy* in Hungarian or *un/une* in French impose no special restrictions of any sort, beyond what follows from their number (and gender) morphology. It is this lack of restrictions that accounts for the versatility of interpretation of these indefinites. In DRS/FCS semantic terms, their only contribution to semantic representation when in argument position, is a variable and a pred-

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[15]Items occurring in the 'Determiner area' include, but are not necessarily limited to, articles, quantifiers and numerals. We will be concerned here primarily with articles and to a lesser extent with quantifiers.

icative condition on the variable in question. What function (or functions) assign values to the variable depends on the environment in which the variable finds itself. When within the semantic scope of quantifiers or operators, it is assigned values by auxiliary functions introduced by these operators. When outside the semantic scope of such expressions, it is assigned values by functions extending the input function *f*.

We will examine below special, marked indefinites that involve the lexical encoding of restrictions concerning the way the variable introduced by the DP is to be assigned values, much in the same way as quantificational determiners do. The distinction between these special indefinites and quantificational ones resides in the fact that the latter necessarily introduce auxiliary functions while the former do not.

### 3.1 Scope and functional indices

In Farkas (1994) I argued that the notion of 'specificity' has been employed as a cover term for at least three separate phenomena, partitivity, scopal specificty, and 'epistemic' specificity. Below I discuss scopal specificity in more detail and end with a brief look at epistemic specificity. The discussion is phrased in terms of a non-configuarional view of scope which does not assume a strict correlation between semantic scope and configurational properties. In line with proposals made in Peacocke (1978), Kuorda (1981), Farkas (1997a), I assume that scopal effects are the result of variation in evaluation parameters. In the case of argumental DPs, these parameters concern the assignment function that gives them values.

Scopal specificity concerns the question of whether the interpretation of a variable within a particular expression varies or not as a result of the presence of a variation inducing operator. One type of scopal non-specificity involves cases where the interpretation of a variable co-varies with (or is dependent on) the interpretation of another variable. In such cases the former variable will be called 'dependent' and the latter will be called, following Kadmon (1987), 'the boss' variable. In order for dependency to occur, the boss variable must vary, i.e., it must be given successive values within the course of the interpretation of a sentence. This may happen as a result of it being bound by a quantifier other than the existential, or as a result of it being part of a distributive predication. In what follows the case of distributive predication will be ignored.

As mentioned above, following the classical treatment of quantifiers within a dynamic framework, we can characterize the job of the existential as requiring the input function to be updated on the variable bound by the quantifier, whereas the job of other quantifiers, such as that realized by *every* or *most*

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is to introduce a set of such updates. As mentioned above, following work in dynamic semantics, and in particular that of Kamp (1981) and Heim (1982), the update required by existentials can be taken as a default operation, in which case ordinary indefinite DPs, just as definites or proper names, are non-quantificational in the sense that they simply trigger the default action, namely an update on the relevant variable. DPs such as *every student*, on the other hand, are quantificational in the sense that they trigger a complex evaluation procedure involving a set of auxiliary functions.

Assuming a tri-partite view of quantification, quantificational DPs introduce a set of auxiliary functions that extend the input function on the variable introduced by the DP, and which give it values from the value set provided by the description, which is the expression in the Restrictor. These functions are the input function relative to the expression in the NS in the sense that one has to consider extensions of these functions which meet the conditions in the NS. Particular quantificational determiners impose conditions on what the results of these extensions must be in order for the whole expression to be true (or embeddable) in a model.

To exemplify, the semantic structure of a sentence such as [10] will have the constituents in [11]:

[10]  Every student left.

[11]  $\forall_x$ [x: student(x)] [*leave(x)*]$^{16}$

A function $f$ embeds this expression in a model M iff each of its extensions em f' on $x$ such that $f'(x)$ meets the condition in the Restrictor, has a (possibly trivial) extension $f''$ that meets the conditions in the NS. The quantificational determiner *every* in *every student* is responsible for the introduction of the functions $f'$, and for the role they play in the evaluation of the NS. More generally then, quantificational DPs introduce a set of auxiliary functions which serve as input functions to the interpretation of their NS. The contribution of *every* is the introduction of the relevant functions $f'$ and the requirement that the NS be satisfied by extensions of each such function. The contribution of a determiner like *most* differs in the requirement imposed: the NS has to be satisfied by a majority of extensions of the functions introduced by the quantificational DP.[17] Below I make crucial use

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[16]Discourse referents are separated here from their value condition by a column and the quantifier is subscripted for the variable it binds.

[17]The truth conditions of expressions involving these determiners turn out to be equivalent to what a generalized quantifier analysis would give.

of the approach sketched here in that I propose evaluation constraints that make reference to assignment functions and their nature.

If an indefinite introduces a variable $x$ that is assigned values by the set of functions introduced by a quantificational expression binding a variable $v$ the indefinite will be called *dependent*. To exemplify, if *a paper about specificity* is within the scope of *every student* in [12]

[12] Every student read a paper about specificity.

the variable it introduces co-varies with that introduced by the universal. If the indefinite is independent of the universal, i.e., outside its semantic scope, it does not. In previous work I proposed a particular 'in situ' treatment of scope based on the premise that the choice of function that gives values to variables introduced by non-quantificational argumental DPs is not fully determined by the structural position of the DP. In the case at hand, the choice between wide and narrow scope for the indefinite is a matter of choosing a function that the indefinite updates from the functions made accessible by the context. What functions *are* accessible to an indefinite depends on what functions have been introduced by the point the indefinite is interpreted. Assuming that the input function $f$ is introduced initially and therefore always accessible, and assuming that the set of functions $F_v$ that are the input functions for the NS are available to variables in the NS, there are two accessible functions to the variable contributed by the indefinite in [12]: $f'$ and $F_v$. The former choice results in the 'wide scope', or independent, reading of the indefinite, under which the indefinite updates the input function f.[18] The latter choice results in the 'narrow scope', dependent, reading of the indefinite, under which it updates the functions $f' \in F_v$ introduced by the universal. In this latter case the indefinite co-varies with the variable bound by the universal. The representations of the two readings would differ with respect to the functional index assigned to the variable introduced by the indefinite, as shown in [13], where [13a] is the semantic representation of the independent (wide scope) reading, and [13b] is the representation of the dependent (narrow scope) reading:

[13]    a. $\forall_x$ [*student(x)*] [$y_{f'}$ *paper about specificity(y) read(x,y)*]

    b. $\forall_x$ [*student(x)*] [$y_{F'_x}$ *paper about specificity(y) read(x,y)*]

The contribution of the universally quantified DP is the variable $x$, the value condition *student(x)* and the quantifier binding $x$. The contribution of the

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[18]An indefinite is said to *update* a function $f$ iff $f$ has to be extended relative to the variable contributed by the indefinite.

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indefinite is the variable $y$ and its value condition, *paper about specificity(y)*. The main predication contributes the condition *read(x,y)*. The tripartite structure arises as a result of having a quantificational DP.[19]

The function $f'$ is the function updating $f$, and which has to satisfy the requirements of the whole expression. The functions $F'_x$ are the functions that extend the auxiliary functions introduced by the quantifier and Restrictor. When the functional index of $y$ is $f'$, $y$ updates the initial function f. When the index is $F'_x$, the indefinite updates the functions introduced by the Restrictor, which results in co-variation. In this case the values assigned to $y$ vary but the functions responsible for this variation are introduced by the universal. The functions that intepret such narrow scope indefinites are Skolem functions. It is assumed here that the variables introduced by ordinary indefinites are free to be interpreted by any accessible function.

Dependency then can be defined as in [14].

[14] A variable $y$ is dependent on another variable $x$ just in case the functional index of $y$ is of the form $F_x$, where $y \neq x$.

In this case $y$ updates a set of functions that give values to the boss variable $x$.

Note that the dependency parameter is independent of the question of determined reference. Whether a dependent DP has non-determined reference or not depends on whether for each value of the boss variable, the context provides a choice of values. Thus, dependency does not entail indefiniteness, which is as it should be, given that in appropriate contexts definite DPs may be interpreted as dependent, as exemplified in [15].

[15] Every student was given two poems to memorize and then had to recite *the longest poem* to the class.

In order for a dependent DP to have determined reference the context must meet a special complex condition: for every relevant value of the boss variable, the context must supply an appropriate singleton set to serve as value domain for the variable contributed by the indefinite. This is why dependent definites have close paraphrases involving a pronoun bound to the boss variable in their description (in our case, *the longest poem of the two poems assigned to him/her*). Note that the special interpretation conditions

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[19]There is an important issue here that I leave unaddressed, namely the question of whether functional indices can be dispensed with in favor of conditions that make reference directly to interpretation properties of variables. I will continue to use indices here as a matter of convenience.

imposed by proper names discussed in Section 2 render them incompatible with dependency. No matter what function or set of functions assigns value to a variable introduced by a proper name, the value will be fixed by the naming function N. The condition imposed on pronouns, on the other hand, does not rule out co-variation. The valuation properties of a variable introduced by a definite pronoun will be inherited from its antecedent.

Non-determined reference, on the other hand, is compatible with dependency under ordinary circumstances, which is why ordinary indefinite DPs participate in scopal ambiguities so readily. Such indefinites are compatible with both dependent and independent interpretations.

Variables that are given values by the initial function $f'$ will be called *scopally specific.* Those that are not will be called scopally non-specific. Dependency is a particular type of scopal non-specificity, involving valuation by a set of functions assigning values to some other variable.

**3.2 Dependent indefinites**

Some of the variation we find within the indefinite article systems of various languages concerns the possibility of dependent interpretations. Thus, in Farkas (1997b), it is argued that reduplicating the ordinary indefinite article in Hungarian marks dependency. To exemplify, the indefinite in [16],

[16]  Minden gyerek látott egy-egy filmet.
        every child see.Past a-a movie.Acc

can only receive a dependent interpretation, where movies co-vary with children. If the non-reduplicated *egy filmet* had been used, the sentence would have been scopally ambiguous with respect to the relative scope of the indefinite and the universal.

Such reduplicated indefinites are felicitous only in contexts which supply an appropriate boss variable for the indefinite to co-vary with. The condition imposed by a reduplicated indefinite article in Hungarian requires the variable to co-vary with an individual or situational boss variable. Under present assumptions, it requires the variable introduced by it to bear a subscript of the from $F_v$, where $v$ is an individual or situation variable. I assume that a reduplicated indefinite in Hungarian contributes the constraint in [17]:

[17]  The variable introduced by a DP whose article is reduplicated must be dependent on an individual or situation variable.

This condition amounts to the requirement that the functional index of the

variable be of the form $F_v$, where $v$ is an individual or a situation level variable other than the variable introduced by the indefinite.

The restriction of the boss variable to situation or individual-level variables is needed because reduplicated indefinites are not licensed by modals. They may occur in the scope of a modal only if also within the scope of an individual or situational variable:

[18]    a.   *Mari kell hozzon egy-egy csokrot.
           Mari must bring a-a bouquet.

        b.   Kell, hogy minden gyerek hozzon egy-egy csokrot.
           necessary that every child bring.Subjunctive a-a bouquet.Acc
           It is necessary that every child bring a bouquet.

        c.   Kell, hogy olykor-olykor megjelenjen egy-egy gyerek.
           necessary that occasionally appear.Subjunctive a-a child
           It is necessary that occasionally, a child make an appearance.

Assuming that modals involve quantification over worlds, a narrow scope reading for the indefinite in [18a] involves co-variation with the modal variable bound by the universal quantifier contributed by *kell* 'must'. The reduplicated form is not licensed unless an individual or situational boss variable is present, as in [18b,c].

The fact that reduplicated indefinites in Hungarian may occur only in configurations where an appropriate boss variable is present follows from the requirement imposed by the reduplicated article. Thus, the ungrammaticality of [18a] and [19] follows from the fact that no boss variable is available for the indefinite to depend on:

[19]   *Mari lát most egy-egy gyereket.
      M. sees now a-a child.Acc

Note that as formulated here, the condition imposed by a reduplicated indefinite in Hungarian is not equivalent to a condition that would require it to have narrow scope with respect to some operator or, equivalently, a condition requiring it to occur in a subordinate DRS. Consider the interaction of indefinites and negation. A sentence such as [20],

[20]   Mari is not reading an article on indefinites.

is ambiguous with respect to the scope of the indefinite relative to negation: under the wide scope reading, the claim made is that there is an article on indefinites that Mary is not reading (but there may be others that she

is), while under the narrow scope reading there is no article on indefinites that Mary is reading. This latter reading is represented in DRT with the indefinite within the subordinate box introduced by negation.

An indefinite 'within the scope' of negation has special interpretive properties. Very roughly put, the negative operator requires the expression in its scope to be false (unembeddable) under *all legitimate assignments*, i.e., all assignments that meet the conditions imposed by the expression in question. In the terminology used here, assuming that the negative operator is prefixed to a DRS K', its interpretive effect is to introduce a set of functions F' that serve as input function to the expression within the scope of the negative. These functions update $f$' relative to the free variables in the universe of K'. In the case of a sentence such as *Mary didn't leave yesterday* the set of functions in question would differ only with respect to temporal indices within the relevant interval defined by *yesterday*. If, however, the expression in the immediate scope of negation contains an indefinite, the variable introduced by this indefinite may be interpreted with respect to the set of functions introduced by the negative operator, resulting in the narrow scope reading of the indefinite, or with respect to the input function, resulting in the wide scope reading of the indefinite. In the former case the interpretation of the variable varies: the variable is interpreted by a set of functions ranging over the whole value set. In the latter case, the interpretation of the variable does not vary: it is interpreted by a single function – an update of the input function. In the former case the indefinite is scopally specific while in the latter it is not. The interpretation of an indefinite within the scope of negation varies without co-varying with another variable.

Based on the above discussion, one can identify three distinct ways in which the interpretation of a variable may vary: (i) The variable is bound by a variation-inducing quantifier. This is the case of variables introduced by quantificational DPs. (ii) The variable is dependent on another, i.e., it co-varies with a variable bound by a variation-inducing quantifier. This is the case of indefinites within the scope of universals. (iii) The variable is interpreted by a set of functions introduced by a non-quantificational operator, i.e., an operator that introduces a set of assignment functions but no special variable that it binds. This is the case of indefinites within the scope of negation. The second type of variation is compatible with determined reference, the third is not. In what follows I will use the term *quantificational DP* to refer to DPs that induce variation of type (i): they introduce a variable and a set of functions that update the input function relative to the variable in question. The determiner in such DPs encodes

instructions concerning the relation between the functions introduced by the DP and their updates relative to the NS.

Returning to indefinite article in Hungarian, if reduplication of the indefinite article signals dependency rather than simply non-quantificational variation, we expect it not to be licit within the scope of negation. That this is indeed the case is shown in [21]:

[21]  *Mari nem lát egy-egy gyereket se.
      M. not sees a-a child.Acc neg

(The morpheme *se* signals that the indefinite is within the scope of negation.)

Note that the distinction between reduplicated and non-reduplicated indefinites in Hungarian cannot be captured by making reference to type-theoretic distinctions. Assuming an ambiguity between choice-functional and non choice-functional indefinites, as proposed by Reinhart (1997), Kratzer (1998) and Matthewson (1999) would not be helpful either.[20] Reinhart (1997) assumes that choice-functional indefinites are associated with choice functional variables that may be bound by existential quantifiers in an unconstrained way, which is responsible for the free scope of such DPs. Quantificational indefinites, on the other hand, behave like universal DPs and are restricted in scope. This distinction cannot capture the requirement of co-variation associated with reduplicated indefinites. Reduplicated indefinites would have to be either special choice-functional indefinites that have to co-vary, or special co-varying quantificational indefinites.

Matthewson (1999), following Kratzer (1998), suggests that, on the contrary, choice-functional indefinites are not subject to co-variation while quantificational indefinites are. This distinction is not more helpful than Reinhart's in capturing the special requirement encoded by the reduplicated indefinite articles in Hungarian. Reduplicated indefinites would necessarily be quantificational, under this approach, but would still be subject to the co-variation condition. I conclude then that assuming an ambiguity between choice-functional and non-choice-functional DPs does not render the special condition requiring these DPs to co-vary with some other variable superfluous. A distinction in terms of occurrence in the main DRS as opposed to an embedded one, quite naturally made in DRT, is not helpful either, given the observation about negation just made, as well as the fact that modals on their own do not license reduplicated indefinites. A distinction in terms

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[20]The ambiguity proposals in Reinhart (1997) and Kratzer (1998) have their origin in Fodor and Sag (1982).

of quantificational/non-quantificational DPs would not be the right one to use in order to distinguish simple from reduplicated indefinites since both types of DPs have existential force.

I conclude then that allowing special articles (or other special nominal morphology) to restrict interpretation characteristics of variables introduced by DPs is necessary in order to account for the distribution and interpretation of reduplicated indefinites in Hungarian. The semantic import of indefinite article reduplication in Hungarian is that of imposing the co-variation restriction on the variable introduced by the DP, on a par with the various other restrictions introduced by other determiners.

### 3.3 Scopally (non)specific DPs

The question now arises whether DP properties that were captured using different parameters could not be expressed in terms of evaluation constraints. In particular, under present assumptions it is expected (or at least not unexpected) to find a language where nominal morphology would mark scopal specificity as opposed to scopal non-specificity of non-quantificational DPs without being sensitive to dependency. Scopally specific DPs would have to be interpreted by the initial function, i.e., their functional index would have to be set to $f$'. Scopally non-specific ones would have to involve variation without themselves introducing the relevant functions. These DPs would have to have a set-level functional index but would not have to co-vary with another variable, the way reduplicated indefinites in Hungarian do. In DRT terms, scopally specific DPs would hate to be introduced in the main DRS, while scopally non-specific ones would have to occur in an embedded DRS.

The two types of DPs in Lillooet Salish discussed in Matthewson (1999) appear to be of just this sort. Matthewson (1999) shows that in Lillooet Salish there are two types of non-quantificational DPs, one marked by the prefix *ku*- and the other by the prefix *ti*-. DPs marked by *ti*- may only be interpreted as having 'widest scope', i.e., as not varying or co-varying. Under present assumptions, *ti*- contributes the requirement that the variable introduced by its DP must update the input function f.[21] The prefix *ti*- contributes the functional constraint in [22]:

[22] The functional index of a variable introduced by a *ti*- marked DP must be $f$'.

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[21]Matthewson (1999) notes that *ti*- indefinites may co-vary with another variable that is bound by a quantifier just in case their description contains a pronoun bound by the quantifier in question. Note that in present terms, this means that variation in the values assigned to the variable contributed by the indefinite results from varying the value set to which the input function applies, rather than the function itself.

DPs marked by *ku-* on the other hand, must occur within the scope of another quantificational DP, modal or negation. It appears then that these DPs are marked for variation, without regard to finer distinctions concerning the type of variation involved. Such DPs contribute the functional constraint in [23]:

[23] The functional index of a variable $y$ introduced by a *ku-* marked DP must be a set-level index of the form $F_{(n)}$, where $n \neq y$.

The analysis Matthewson herself proposes is different: for her, the distinction between *ti-* and *ku-* marks overtly the choice-functional ambiguity mentioned above, that remains covert in English. From the larger perspective of cross-linguistic variation, however, it appears that the ambiguity posited by Kratzer and Matthewson addresses only one aspect among several differentiations within the realm of non-quantificational DPs, and therefore assuming such an ambiguity becomes less appealing. Extending the logic of the ambiguity approach would make us assume English indefinites to be ambiguous also with respect to whether they must co-vary or not (a distinction overtly marked in Hungarian). Ordinary indefinites in Hungarian, on the other hand, would have to be ambiguous between choice-functional and non choice-functional readings, like their English counterparts. A more parsimonious move is to assume a non-ambiguous interpretation of indefinites and allow morphology and lexical variation to place further restrictions on the interpretation properties of these DPs.

**3.4 Local scope**

So far we have seen morphology marking 'wide scope only', non-varying, indefinites, indefinites that must vary and indefinites that must co-vary. There is a further type of indefinite whose scope is restricted: indefinites that may not have wide scope relative to another DP or operator, but which need not occur within the scope of any element, i.e., they are not necessarily co-varying. English 'existential' bare plurals, exemplified in [24] obey this scopal restriction.

[24] John read poems all afternoon.

One possible analysis of these noun phrases, suggested by van Geenhoven (1996), is to treat them as 'semantically incorporated', in which case, in present terms, they would not contribute an independent discourse referent that is given values by assignment functions but be part of the predicate. The scopal properties of incorporated nominals then would follow from a more basic property, namely that they are incorporated.

Van Geenhoven extends her semantic incorporation analysis to all narrow scope indefinites. Such a move, however, would prevent us from distinguishing between ordinary narrow scope indefinites and reduplicated ones in Hungarian. Another line of analysis, explored in Farkas and de Swart, is to treat existential bare plurals as argumental DPs introducing variables and involving a null determiner that comes with the restriction of having to be interpreted by the current, most recently introduced assignment function. This type of 'local scope' DPs are the opposite of the 'widest scope' DPs exemplified by *ti-* indefinites in Lillooet Salish or *this* indefinites in English. From the point of view of scope, these DPs behave just like incorporated nominals but for a different reason. Incorporated nominals cannot scope independently of their predicate because, in effect, they are predicate modifiers. Bare plural argumental DPs, on the other hand, are limited in scope by the restriction associated with the null determiner. Hungarian has incorporated nominals as well as existential bare plurals in argument position, showing the need for all the distinctions made here.

### 3.5 Epistemic (non)-specificity

Below I suggest that epistemic specificity can be characterized in terms of variation, albeit of a special type. The question of epistemic specificity arises with respect to the interpretation of indefinites such as those in [25]:

[25]  A painting is missing from this room.
     A student in Syntax 1 cheated on the exam.

These sentences are used in contexts which do not narrow down the choice of value for the variable in question to a unique entity, and therefore the variable contributed by them does not have determined reference. The speaker may, however, have a particular individual in mind, and the context may make it clear that she does. In this case the indefinites are epistemically specific. For epistemically specific indefinites all updates relative to the variable introduced by the indefinite that are consistent with the speaker's point of view agree in the value they assign to this variable. In the case of epistemic non-specificity, there is variation with respect to the value assigned to the variable in question not only given information provided by the context as a whole but also with respect to what the context presents as information available to the speaker. In this case then, the indefinite has fixed, non-variable reference relative to the speaker but not relative to the context as a whole. In order to model the dual status of such indefinites one would have to enrich the notion of context along the lines proposed in Gunlogson (2001). The relevant proposal in Gunlogson (2001) is to assume

that Stalnaker's common ground is derived from a more basic notion of discourse commitments of a participant. Assuming a two-participant discourse, the context includes two sets of such discourse commitments, $CD_a$ and $CD_b$ each determining a context set, $c_a$ and $c_b$, defined as the intersection of the propositions in $CD_a$ and $CD_b$ respectively. In the case of epistemically specific indefinite DPs, all embeddings of the discourse in $c_a$ agree on the value they assign to the variable introduced by the indefinite (assuming the speaker is $a$).

**3.6 Conclusion and open issues**

With respect to degree of scopal independence, the indefinites we examined so far can be seen to form the scale in [26]:

[26]  widest scope only > neutral > co-varying, varying > local scope only > incorporated nominals

Lillooet Salish *ti*- indefinites illustrate the leftmost type, garden-variety indefinites such as DPs with *a(n)* illustrate neutral scope DPs, Hungarian reduplicated indefinites and Lillooet Salish *ku*- marked DPs illustrate the two subtypes on the next rung respectively, and it has been suggested that English existential bare plurals are 'local scope only' DPs. Incorporated nominals form a rich world of their own, which lies beyond the scope of this paper.

The distinctions we have discussed here fall under the rubric of constraining the assignment function involved in the interpretation of the DP. Another possible way of constraining the interpretation of a variable contributed by a DP is to impose restrictions on the properties of the value set. Subjunctive relative clauses in Romance languages for instance, can be seen as imposing a special requirement on the modal interpretation of the world parameter of the description, i.e., the question of what world or worlds the description is interpreted relative to. The property known as d-linking is also characterizable in terms of a particular restriction on the value set, namely that it should be 'discourse old'. Recent discussions of *any* in English involve the nature of the value set as well. Thus, the widening condition proposed by Kadmon and Landman (1993) is also a value set condition. Horn (1999) suggests another constraint on the structure of this set, namely that its elements should form a scale. Under this proposal, just like under Kadmon and Landman's, *any* DPs have no quantificational force of their own. Their universal flavor is a consequence of the fact that even the extreme element of the scale is an acceptable value for the variable introduced by the DP. Alternatively, one may assume that such DPs actually require successive

evaluation, but unlike universals, the evaluation is disjunctive rather than conjunctive, and, moreover, the alternative functions are not introduced by the DP itself but must be provided by its context. It is this latter property that makes them indefinite under present assumptions.[22]

Finally, note that the case of epistemic specific indefinites highlights the common thread between determinacy of reference and variation, which unites the scales in [2] and [26]. The determinacy of reference parameter concerns the issue of whether updates on the variable in question vary or not relative to the value they assign to it. Determined reference DPs have fixed values relative to each relevant input function. Non-determined reference DPs do not. The various notions of indefinites discussed under the scopal specificity rubric involved the issue of fixed or variable reference relative to different parameters. The questions discussed here lead us to examine the details of the distribution and interpretation of various types of determiners in natural languages and try to account for the variation we find.

## 4. Conclusion

There are two ideas that have been brought together here. One is that treating determiners as lexically encoding evaluation instructions concerning variables introduced by their DPs allows as to capture insights concerning the distribution and interpretation of both definite and indefinite DPs. The other is that a crucial parameter that natural language is sensitive to concerns variation of value assignments. The connection between the two ideas is that the approach to determiners proposed here leads to a characterization of the types of variation we need in order to capture generalizations about types of DPs in natural language.

The evaluation constraint approach to determiners allows us to characterize the contribution of the definite article in terms of determined reference, a notion that captures what is common to uniquely referring and anaphoric expressions. Within the realm of indefinites, this approach allows us to capture the variety of scopal non-specificity we find across DP types without having to introduce additional machinery. We have isolated here several ways in which the interpretation of a variable may vary and found that these distinctions are needed in order to account for the way particular DP types function. The approach enables us to characterize what is special with *ti*- and *ku*- nominals in Lillooet Salish, as well as what is special in

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[22]For proposals linking *any*-DPs in Romanian with disjunction, see Manea-Manoliu (1966). Giannakidou (2001) presents an analysis of *any* and its Greek relatives that is in the same vein.

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the case of reduplicated indefinites in Hungarian without having to assume ambiguity of ordinary indefinites and without having to make special, semantically driven syntactic assumptions. What is left for future work on the empirical side, is the study of the details of further definite and indefinite DPs in natural language so as to isolate the parameters most often used. On the theoretical side, the task is to come up with a theory that predicts these details. If the proposal advanced here is on the right track, such a theory will have to make room for evaluation constraints of the type we saw above.

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