

Indefinites

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0.1 Introduction

Work on the semantics and pragmatics of indefinite nominals has grown in the last thirty years to form a subfield of its own within the already focused field of nominal semantics. In this area of study, clearly circumscribing the domain of inquiry amounts to giving a theory of its object. Defining indefinites, therefore, cannot be a first step in a chapter like the present one, whose aim is to provide an overview of some of the solutions developed to the semantic and pragmatic problems they raise. Instead of attempting a definition of indefinites, then, we begin with a quick empirical tour of the type of nominals that are uncontroversially or arguably indefinite, after which we outline the issues the rest of the chapter focuses on.

As a first step, we can divide DPs into definite and indefinite based on whether they are headed by a definite or an indefinite D(eterminer). In English then, the expressions in (1) count as indefinite while those in (2) count as definite.

- (1) Mary visited *a garden, some garden(s), some of the gardens, a certain garden.*
- (2) Maurice visited *the / this garden, these gardens / the capital of Albania / the largest museum in the world.*

Within formal semantics, rooted in Aristotelean logic, the italicized DPs in these examples share the interpretive property of being existential, a property that distinguishes them from universal DPs such as *every garden* or *each garden*. Definite existentials are distinguished from their indefinite sisters in that their referent is supposed to be uniquely identified somehow, either because it is familiar or unique in context, or because it is inherently unique.

Classifying further types of nominals as definite or indefinite is intimately connected with analytic choices. Staying again with English, the italicized nominals below are uncontroversially accepted among the indefinite group even though *this* is a definite D and the plural in (4) is bare.

- (3) We visited *this splendid garden in Suzhou* that was offered to a Chinese scholar by his disciples.
- (4) Muriel visited *gardens* when she traveled to France this summer.

This classification is based on the fact that these DPs share the interpretive properties characteristic of uncontroversial indefinites in (1). Thus,

the referent of the DP in (3) is assumed to be novel relative to the interlocutor and thus not uniquely identifiable in context. Similarly, in (4), the interpretation of the bare plural is existential and its referent is not uniquely identifiable.¹

Next, note that the class of uncontroversial indefinites is heterogeneous. We illustrate with some differences in distribution. What we refer to here as an u(n)marked-indefinite, i.e., a DP whose D is *a(n)*, may occur in an argument position with an ordinary existential interpretation, as in (5), or with a generic interpretation, as in (6), or it may occur in a predicative position, as in (7):

- (5) Susan visited *a garden*.
- (6) *A madrigal* is polyphonic.
- (7) This is *a madrigal*.

Bare plurals in English have predicative and generic-like uses as well, as exemplified in (8) below, but the other indefinite DPs in (1) do not, as shown in (9) and (10), where the stars mark attempted readings in which the italicized DP is generic or predicative.

- (8) *Madrigals* are polyphonic. / These are *madrigals*.
- (9) **A certain* / **Some madrigal* is polyphonic.
- (10) *These are *some madrigals*.

We briefly mention two controversial cases of DPs that are sometimes, but not always, treated as indefinites: DPs headed by the ‘free choice’ determiner *any* and DPs headed by the negative determiner *no*.

- (11) Max can describe *any garden* in this city.
- (12) Pauline visited *no garden* during her trip.

The analytical choice here is between a treatment of the relevant DPs as indefinite existentials interpreted within the scope of a quantificational operator or simply as quantificational DPs. Thus, *any garden* can be treated as an indefinite existential interpreted within the scope of the modal *can* or as a wide scope universal that must have a modal in its scope. Similarly, *no garden* can be treated as an existential within the scope of an implicit sentential negation operator or as a negative

¹ For the earliest work on indefinite *this*, see Prince (1981) and for a more recent approach Ionin (2006). The classic work on bare plurals is Carlson (1977a,b); see also Carlson & Pelletier (1995).

quantifier. The choice between analyses is guided by a complex web of theoretical considerations and empirical concerns having to do with accounting for distributional restrictions as well as for cross-linguistic patterns.

We will focus here on the uncontroversial indefinites in (1). In the rest of this section we attempt to put in perspective some of the general problems indefinite nominals raise and then turn to the particular concerns we focus on in the rest of the chapter.

The semantic and pragmatic properties of indefinites have driven much of the theorizing in the field in the last thirty years. Consequently, giving a balanced and comprehensive review of the problems they raise is well beyond the scope of this section or indeed, this chapter. Instead, we mention here just some of the issues that have been at the forefront of research in this area.

Indefinites were first systematically studied in formal semantics as a sub-type of generalized quantifiers – an approach to nominal semantics rooted in Montague’s work and developed in Barwise & Cooper (1981) and Keenan & Stavi (1986) (among many others). This approach was successful in capturing the compositional properties common to the syntactic constituents known as NPs (or DPs), such as all the italicized nominals above, as well as *bona fide* quantificational DPs such as *every student* or *most students*. In the generalized quantifier view of DP denotation, the quantifier (or D) expresses a relation between sets, and different quantifiers differ with respect to the (type of) relation they express.

This approach was somewhat less successful, however, in capturing the fine and less fine grained distinctions between types of DPs in such a way as to delineate linguistically natural classes. To differentiate so-called ‘weak’ quantifiers, which arguably form the *indefinite* group, from ‘strong’ ones, one had to resort to properties such as ‘existential import’ and ‘presupposition’ that are not naturally connected to formal properties of generalized quantifiers.

A different line of inquiry is found in Kamp (1981); Kamp & Reyle (1993) and Heim (1982) – the works that initiated the ‘dynamic turn’ in formal semantics. The starting point of this line of research is the insight in Karttunen (1976) that the main job of indefinite DPs (when in argument position, e.g., *A student left early*) is to introduce a new ‘discourse referent’, while the job of a definite DP is to refer back to an already introduced or otherwise familiar discourse referent. Discourse

referents, in this view, are to be understood as theoretical constructs mediating between linguistic expressions and entities in the world.

Early work in dynamic semantics draws a sharp distinction between ‘existential’ DPs and *bona fide* quantificational DPs. In Kamp’s work, as well as in Heim (1982, ch. 3), ‘existential’ DPs (whether definite or indefinite) are treated as free variables and existential force *per se* is contributed by the interpretive process. Thus, the interpretive effect of ‘existential’ DPs is simply to update the input assignment function on the variable they introduce.²

Bona fide quantificational DPs on the other hand have a more complex interpretive effect: they update the input assignment function repeatedly on the variable they introduce by looping through the set of individuals denoted by the sister of the D. For each individual in this set, the assignment resulting from updating the input assignment function with that individual is then used as the input assignment for the interpretation of the remainder of the sentence, i.e., for the interpretation of the nuclear scope of the quantificational DP.

Within the tradition of dynamic semantics then, there is a fundamental distinction between definite and indefinite ‘existential’ DPs on the one hand and *bona fide* quantificational DPs on the other, with the former being essentially simpler semantically than the latter. This fundamental insight is preserved in much of current work in nominal semantics, in one way or another, and will be assumed in this chapter as well.

Within the class of ‘existentials’, the characterization of the difference between definite and indefinite DPs has wavered between novelty/familiarity theories and uniqueness accounts of various types. Semantically based classifications should treat as definite not only DPs headed by a definite article but also proper names and definite pronouns.³ We come back to the definite/indefinite divide in Section 0.2 below.

The focus of early work in dynamic semantics was to capture well-known differences between existentials and *bona fide* quantificational DPs, differences that involve scope in various ways. Thus, as exemplified below, (in)definites may have discourse scope, that is, they may

² Henceforth we take the terms ‘variable’ and ‘discourse referent’ to be synonymous.

³ Note, however, that the existence of weak definites (Poesio 1994 among others) and various analyses of proper names (e.g., see Kamp & Reyle 1993) cast doubt on a clear-cut categorization as definites for certain uses of some DPs on the definite branch.

serve as antecedents to a definite pronoun in discourse. In contrast, the scope of *bona fide* quantifiers, at least when the anaphoric pronoun is morphologically singular, does not normally extend into the discourse.

(13) A_x woman walked in. She_x sat down.

(14) $Every_x$ woman in the room stood up. $She_{*x/\surd y}$ walked out.

Another issue that involves scope at the sentential level is the ability of indefinite DPs to bind a pronoun outside the domain that delimits the binding potential of *bona fide* quantifiers. This is exemplified by ‘donkey sentences’ such as (15), discussed by philosophers since medieval times:

(15) Every farmer who owns a_x donkey feeds it_x .

Given the configurational properties of (15), the indefinite *a donkey* should not be able to bind the pronoun *it*, and yet this is exactly what happens in the most natural interpretation of this sentence. That *bona fide* quantificational expressions do not have this ability is exemplified in (16), which does not allow an interpretation in which the universal binds the pronoun:

(16) A reporter who liked $every_x$ actress in this movie interviewed $her_{*x/\surd y}$.

Various versions of dynamic semantics developed over the last thirty years have provided solutions to this pair of problems rooted precisely in the non-quantificational/quantificational distinction mentioned above.

Indefinite DPs have attracted a lot of attention due to another intrasentential scopal property, namely that of being able to take scope freely over operators no matter how deeply embedded under such operators the indefinite might be. Thus, consider the contrast between the two examples below:

(17) Joan wrote to every senator who voted on an important bill.

(18) Joan wrote to a senator who voted on every important bill.

In (17), the indefinite can be interpreted within the scope of the universal, in which case the sentence would be true iff Joan wrote to every congressman such that there was an important bill the senator voted for. Here then the reference of the indefinite is allowed to covary with the values given to the variable bound by the universal. Example (17) also has an interpretation in which the indefinite scopes outside the universal, in which case the sentence claims that there is some important bill and

Joan wrote to every senator who voted for it. Under this interpretation, the reference of the indefinite is fixed relative to that of the universal.

In contrast, (18) is unambiguous: the only possible interpretation it has is one where the indefinite scopes over the universal, and thus where the referent of the indefinite does not covary with that of the universal. Crucially missing is an interpretation where the universal outscopes the indefinite and where such covariation would be allowed. Indefinites then have free ‘upward’ scope in their sentence while the ‘upward’ scope of *bona fide* quantifiers is clause bound.⁴

A popular solution to this problem in static semantics is to treat indefinites as non-quantificational expressions just like in dynamic semantics. Their semantics is assumed to involve a choice function which itself is either freely bound by an existential or is contextually provided. Early dynamic solutions to this problem are essentially configurational, allowing indefinites to introduce a variable at any level of the discourse representation, a type of freedom not enjoyed by *bona fide* quantifiers. We return to this issue in Section 0.3.

Work on indefinites in the 21st century has focused on the differentiation of indefinite DPs within a single language as well cross-linguistically. Staying within the confines of singular indefinite DPs in English we should distinguish the versatile u(nmarked)-indefinite, *a garden*, from the motley class of marked indefinites such as *a certain garden*, *some garden*, the use of *this garden* exemplified in (3), *some of these gardens* and arguably *any garden* and *no garden*. If one leaves the confines of English, the variety of indefinite DPs becomes bewildering. It also becomes clear, however, that there are systematic properties that differentiate further subtypes of indefinites.

The following two related questions arise with some urgency from this perspective:

- (i) what are the basic parameters that underlie the rich variety of indefinites we find within a language as well as cross-linguistically?
- (ii) what is the fine semantics of each subtype of DP?

Answering them should shed light not only on the typology of indefinites but also on the definite/indefinite divide and thus provide a basis for an account of the distribution and interpretation of various subtypes

⁴ By ‘upward scope’ we mean the ability of an expression e_1 to scope over an expression e_2 in a configuration where e_2 occupies a structurally higher position than e_1 .

of existentials. While these questions are at the heart of the whole discussion that follows, they are addressed more specifically in Section 0.4. In Section 0.5 we conclude by reviewing some questions that have been answered as well as some that are still open.

0.2 The definite / indefinite divide

In the rest of this chapter we follow the tradition of treating indefinites as a subtype of existential expressions and follow the dynamic tradition in assuming that existential interpretation is essentially different from the interpretive procedure triggered by *bona fide* quantifiers.

Common to all existential DPs (whether definite or not) is that they have existential force. If the existential DP is headed by a D, we assume that the nominal sister of this D denotes a set that functions as the domain from which witnesses are to be found, i.e., the domain of possible values for the variable introduced by the DP.⁵ Working with First Order Logic (FOL) with restricted quantification for the sake of simplicity, the translation of (19) is as in (20), with the Restrictor in square brackets and the Nuclear Scope in round brackets:

(19) A_x woman left.

(20) $\exists x[woman'(x)] (leave'(x))$

The variable bound by the existential quantifier is the discourse referent introduced by the D. The interpretation of the expression in the Restrictor delimits the domain from which witnesses / values for the variable bound by the quantifier may be chosen. In a dynamic approach, the existential force comes from the definition of truth in a model rather than an explicit existential quantifier.

In the rest of this section we briefly consider approaches that distinguish definite DPs from indefinites. In doing so we will concentrate on setting up two parameters across which DPs can differ and which will form the background for the discussion of indefinite DPs in the sections that follow.

Even this minimal setup allows us to distinguish the following two theoretically valuable parameters along which existential expressions can

⁵ Whether the existential force involved is due to the contribution of the D or to default interpretation of free variables is a matter we will not discuss here. Nor do we go into the details of the interaction of indefinites and genericity, since that would require a chapter of its own.

be further refined: (i) further constraints on how the witness is chosen (*witness choice constraints*) and (ii) further constraints on properties of the domain of the existential (*domain constraints*). Witness choice constraints have already been invoked when distinguishing existential from *bona fide* quantificational expressions but further refinements within each type are to be expected. Domain constraints, on the other hand, may target DPs with descriptive content and thus cut across existential and *bona fide* quantificational DPs.

The two main contenders for the property distinguishing definite DPs from indefinite ones exemplify each of these parameters. We will briefly discuss each in turn but first note that under either view, one can have a symmetric or an asymmetric account of the definite/indefinite contrast. Under the symmetric account, both definites and indefinites are required to obey a constraint – uniqueness / familiarity for definites, non-uniqueness / novelty for indefinites. Under the asymmetric account, definites are required to obey a constraint (uniqueness or familiarity) while indefinites, or at least u-indefinites (unmarked, ‘ordinary’ indefinites like *a garden*), are not constrained in any particular way. We assume here an asymmetric approach, where definites have a special requirement while u-indefinites are, as their name suggests, unmarked.⁶ U-indefinites differ from their definite and marked indefinite sisters in that these last two subclasses are indeed subject to further witness choice or domain constraints.

The uniqueness approach to definites is rooted in Russell’s work. In essence, it reduces to the requirement that the set denoted by the Restrictor of definite descriptions be a singleton for singular definites and maximal for plural ones. Under this view, the DPs in in (2) repeated below are definite because their domain is a singleton either in absolute terms or because of assumed contextual restrictions.

- (21) Maurice visited *the / this garden, these gardens / the capital of Albania / the largest museum in the world*.

How to extend this constraint to cover proper names and definite pronouns as well is not obvious given that these DP types do not have a clear domain that can be restricted. Discussing this issue would take us too far afield into the realm of definite DPs, so we simply note that formulated this way, the uniqueness requirement is quite transparently a domain constraint.

⁶ See Farkas (2006) and Abott & Horn (2013).

The other popular approach to the definite / indefinite distinction is to require the variable introduced by the definite to be familiar relative to its input context. This view, advocated in early dynamic approaches (Karttunen 1976; Kamp 1981; Heim 1982), can be seen as a witness choice constraint because it amounts to constraining the way one chooses the value given to the variable introduced by the DP. The familiarity approach is quite natural for definite pronouns and proper names as well as for anaphoric uses of definite descriptions but is problematic when it comes to definite DPs that are unique in virtue of the content of their descriptive content. These DPs are felicitous even in contexts where their referent is not familiar or easily accommodated. In (22), for instance, the definite is appropriate even in a context that does not entail that there is or will be someone who will prove the Riemann hypothesis.

- (22) The first person to prove the Riemann hypothesis will be justly famous.

Dynamic semantics allows us to characterize uniqueness in such a way that we can capture the advantages of both approaches sketched above. It rests on a view of context as a set of world-assignment function pairs that satisfy whatever constraints are placed on them by the information contributed by the previous part of the discourse, and by background assumptions. Under this view, the class of definite DPs as a whole can be characterized as imposing the requirement that at the time the input context is updated with the variable introduced by the definite, the set of allowable choices be a singleton. As a result, in the output context, the set of world-assignment function pairs will agree on the value they give to the variable in question.⁷

This version of the uniqueness theory of definites promises to be able to account both for what is common across the class of definite DPs and for capturing finer-grained distinctions between them. Thus, ordinary definite descriptions achieve dynamic uniqueness if their domain is singleton relative to the input context. This condition can be met either because the content of the description assures it, as in (22) or, as in most cases, because the context provides a singleton salient domain. In the case of definite pronouns, on the other hand, the constraint is met because of the essential anaphoric requirement on witness choice in their

⁷ This constraint can be conceptualized as a 'determined reference' constraint requiring there to be no choice with respect to the value of the relevant variable as one goes from the input context to the output context. See Kadmon 1990 and Farkas 2002b.

case. Proper names, whether treated as descriptions or as a special type of DP, would fulfill the determined reference requirement in virtue of their semantics.

We will assume then that definite DPs require determined reference while u-indefinites do not, and leave open the possibility that special, marked indefinites impose further constraints on their domain or on their witness choice, constraints that may require variation of values across particular sets of world-assignment pairs. We also assume that domain and witness choice constraints may be part of the non-at-issue meaning of indefinite Ds, just as they are usually taken to be part of non-at-issue meaning for definite Ds. But unlike for definites, where these constraints are usually taken to be presuppositional, the status of the same constraints on indefinites is less clear – it could be presuppositional (e.g., Geurts 2000), appositive/parenthetical-like (e.g., Wang et al. 2005) and / or postsuppositional (e.g., Farkas 2002a, Brasoveanu 2013).

While definites are marked for determined reference, u-indefinites obey no special restrictions. U-indefinites are semantically unmarked because they have the widest distribution and lend themselves to the widest scale of interpretations. The basic property of u-indefinite Ds then is that they impose no special interpretive constraint, and as a result DPs headed by them enjoy the widest freedom of scope and interpretation among indefinite DPs. Other languages that are like English in that they rely heavily on articles and exhibit a robust definite/indefinite contrast also have unmarked indefinite determiners: the determiner *egy* in Hungarian, *uno/una* in Spanish and Italian, *un/une* in French and *un/o* in Romanian. The semantics of u-indefinites may differ in finer details, partly due to differences in the whole D system of each language, but they are always freer in distribution and interpretation than other indefinite Ds the language may have.

The lesson we draw from this brief discussion of the issue is that under the view of definites as marked for determined reference, definiteness is treated as a witness choice constraint requiring fixed reference. This is a crucial observation for us because in our view, a fundamental distinguishing factor between semantic types of nominals in general and subtypes of indefinites in particular concerns precisely the question of stability vs. variation of values across particular components of the (local) context of semantic evaluation. We will suggest in Section 0.4 that requirements of constancy / stability across particular such sets are essential when it comes to distinguishing among various subtypes of indefinites.

Before discussing marked indefinites, however, we turn in the next

section to the problem of the freedom of scope exhibited by u-indefinites. We will see that there too, the issue of stability vs. variation of witness choice across sets of assignment functions plays a crucial role.

0.3 The free scope of indefinites

This section is devoted to the problem of the unlimited upwards scope of indefinites introduced in Section 0.1, a problem that has been at the center of work on indefinites since the early eighties (see [Farkas 1981](#), [Fodor & Sag 1982](#), [Abusch 1994](#) among many others). We first briefly characterize the problem and then outline two classes of proposed solutions.

0.3.1 The problem of too much freedom

Matters of scope always involve two expressions, e_1 and e_2 ; e_2 is said to be within the semantic scope of e_1 if the interpretation of e_2 is affected by the semantic contribution of e_1 ; e_2 is said to be outside the semantic scope of e_1 if its interpretation is unaffected by the semantic contribution of e_1 . (See [Westerståhl 1989](#); [Peters & Westerståhl 2006](#); [Szabolcsi 2011](#); [Steedman 2011](#) for extensive discussion.)

A worthwhile goal to pursue is to attempt to predict scopal relations from independently needed constraints on the semantics of the two expressions involved and the syntactic configuration they occur in. This is what the present section focuses on with respect to u-indefinites in English which, we assume, carry no special extra constraints of any sort and therefore have the freest distribution, scope and interpretive possibilities. The extent to which other types of existentials behave in a parallel fashion depends on the specific interpretive constraints they impose in addition to the existential force associated with u-indefinites; we will return to this in the following section.

The issue we turn to now, in a nutshell, is that u-indefinites can take scope over any operator in their sentence, independently of what semantic or syntactic material intervenes between the indefinite and that operator – in particular, independently of intervening clausal and even syntactic island boundaries. This unlimited freedom contrasts with the constrained scopal freedom of quantificational Ds such as *every*, *each* and *most*, the ‘upward’ scope of which is limited to their own clause. The

contrast is illustrated below, where determiners are subscripted with the variable they introduce:

- (23) a. Amanda bought every_{*x*} album that was praised by a_{*y*} famous Hungarian photographer.
 b. $\forall x[\text{album}'(x) \wedge \exists y[\text{fHph}'(y)] (\text{praise}'(y, x))] (\text{buy}'(a, x))$
 c. $\exists y[\text{fHph}'(y)] (\forall x[\text{album}'(x) \wedge \text{praise}'(y, x)] (\text{buy}'(a, x)))$
- (24) a. Amanda bought an_{*x*} album that was praised by every_{*y*} famous Hungarian photographer.
 b. $\exists x[\text{album}'(x) \wedge \forall y[\text{fHph}'(y)] (\text{praise}'(y, x))] (\text{buy}'(a, x))$
 c. $*\forall y[\text{fHph}'(y)] (\exists x[\text{album}'(x) \wedge \text{praise}'(y, x)] (\text{buy}'(a, x)))$

In (23a), the indefinite *a_y famous Hungarian photographer* may be inside or outside the scope of *every_x album*. If outside, the sentence claims that there is a famous Hungarian photographer (say, Lucien Hervé) such that Amanda bought every album he praised. In this case there is no possible covariation between values given to *x* and values given to *y*, and thus the interpretation of the indefinite is not affected by the universal.

If the indefinite is inside the scope of the universal, the sentence claims that Amanda bought every album that has the property that a famous Hungarian photographer or other praised it. Under this reading, covariation between values given to *x* and values given to *y* is possible, and Amanda is claimed to have bought a large number of albums – all the albums praised by Kertész, all the albums praised by Moholy-Nagy, all the albums praised by Brassai etc. In this case, the interpretation of the indefinite is affected by interpretation of the universal: variation in values of the indefinite is made possible precisely because of the presence of the universal.

In contrast, (24a) is scopally unambiguous: its only interpretation is the one that mirrors the surface order of the quantifiers, i.e., this sentence can only be interpreted as claiming that there is an album Amanda bought such that every Hungarian photographer praised it. The missing interpretation is the one where the universal were to scope over the indefinite, in which case the sentence would be interpreted as claiming that for every famous Hungarian photographer, there is an album that he/she praised and that Amanda bought.⁸ The FOL formulas repre-

⁸ The example in (23a) was chosen so that its surface, wide-scope-universal reading entails its inverse, narrow-scope-universal reading – in opposition to the case below:

- (1) Every_{*x*} student read a_{*y*} paper.

senting the relevant readings for both examples are given above, with the unavailable interpretation marked by * and with complex nominal restrictions abbreviated.

The fact that universals can take inverse scope over a preceding and c-commanding u-indefinite as long as the two are clause-mates is shown by (25) below. This sentence has two possible interpretations: if the universal takes scope over the indefinite, covariation between representatives and meetings is possible; if the indefinite is outside the scope of the universal, such covariation is ruled out.

- (25) A_x representative of our group attended every $_y$ caucus meeting.

The special upward scoping properties illustrated for indefinites in (23a) above carry over to definite DPs such as *the book*, as well as to plural DPs (*the books*, *some books*, *three books*), as long as these plurals are interpreted collectively rather than distributively.

- (26) Amanda bought every album that was praised by the famous Hungarian photographer I visited yesterday.
- (27) Amanda bought every album that was praised by three / some famous Hungarian photographers.

In the definite case, the conditions imposed on definite DPs amount to requiring non-covariation between albums and photographers, i.e., the definite is normally taken to have wide scope. Narrow scope readings are, however, possible in special contexts that allow uniqueness to be relativized to values given to the universal, as in the simple case in (28):

- (28) Every participant was given a cookie and an apple. Every participant ate the cookie first.

If the plural indefinites in (27) have a collective interpretation, the sentence is scopally ambiguous: the indefinite plural can take both narrow and wide scope relative to the universal. However, if the plural DPs are distributively interpreted, their scope is restricted to their own clause just as in the case of universals.⁹

There are two interconnected questions that arise at this point:

The point is to show that an indefinite taking inverse scope over an universal does not always yield a stronger reading, i.e., that it is not possible to maintain that all sentences in which an indefinite occurs in the syntactic scope of a universal have only one semantic / logical form representation, namely the one that is associated with their surface form.

⁹ For discussion of this latter point, see Ruys (1992).

- (29) *Existentials vs. universals*: Why do indefinites (and existentials more generally) contrast with distributive quantifiers with respect to upward scope?
- (30) *Upward scopal freedom*: What accounts for the freedom of scope of existentials, and in particular, for their disregard of the syntactic structure intervening between the existential and the higher quantifier(s) the existential may scope over?

The upward scopal freedom that existentials enjoy is problematic for syntax-based accounts of semantic scope because such accounts assume that an expression e_1 takes semantic scope over an expression e_2 iff e_1 c-commands e_2 . Inverse scope, i.e., cases where surface c-command does not match semantic scope, are dealt with by assuming covert quantifier raising, which results in configurations where c-command and semantic scope match. The problem then is that existentials have to be allowed to raise freely and exceptionally (given that syntactic islands are otherwise barriers for movement), leading to the question in (30). At the same time, the raising of universals and other distributively interpreted DPs is clause-bounded, a contrast that leads to the question in (29).

The following two subsections review some of the answers to these questions grouping them depending on whether they take the apparent upward scopal freedom of indefinites to be a manifestation of scopal behavior or not.

0.3.2 Exceptional upward scope is an illusion

Most approaches to the problem of exceptional upward scope of indefinites treat it as an illusion, i.e., not as an instance of true scopal behavior. They differ with respect to where exactly the source of the illusion is located: lexical ambiguity (Fodor & Sag 1982), the special lexical meaning of indefinites, which are taken to contribute choice functions (Reinhart 1997, Winter 1997, Kratzer 1998 among many others) or, finally, pragmatic contextual restrictions that narrow the restrictor set of indefinites to a singleton (Schwarzschild 2002). We summarize these approaches in turn.

An early and influential answer to both questions posed in (29) and (30) above is given in Fodor & Sag (1982). The starting point is the claim that indefinites on their own are lexically ambiguous between a ‘referential’ and a ‘quantificational’ (or existential) interpretation. Under the referential reading of (31),

(31) A_x student in Semantics 1 cheated on the exam.

the indefinite is a deictic-like expression whose value is some particular individual the speaker has in mind. The interpretation of a referential indefinite, just like that of a deictic expression or a proper name, is fixed and therefore such expressions remain unaffected by operators that c-command them. On the other hand, under their existential interpretation, indefinites are quantificational just like universals, and they are given scope in the same way and subject to the same constraints as universal DPs.

Under this account, the contrast in scopal restrictions described in (29) above is an illusion: indefinites, when quantificational, are clause-bounded in their upward scope just like universals. The illusion rests on their possible referential reading, which is equivalent to a ‘widest scope’ existential interpretation simply because the reference of referential indefinites is fixed and therefore independent of any other variable. Thus, the ‘wide scope’ interpretation of the indefinite in (23a) above is due to *a famous Hungarian photographer* being interpreted as a referential expression, rather than to the existential taking exceptional wide scope.

This solution answers (30) above as well: referential expressions do not ‘scope over’ any material; they are interpreted *in situ* but their interpretation is independently fixed and thus immune to covariation, giving the illusion of ‘widest scope’ interpretation. The only relevant difference between indefinites and universals then is that the former are ambiguous between a quantificational and a referential reading while the latter have only the quantificational interpretation.

There are two issues this otherwise attractive proposal raises. First, u-indefinites are claimed to be lexically ambiguous. This conjecture is theoretically problematic in view of the cross-linguistic persistence of this ambiguity and of the fact that other indefinite expressions, such as *three candidates*, *some candidate(s)* and *a certain candidate* would have to be analyzed as exhibiting a parallel ambiguity because they too are susceptible to exceptional wide scope as well as to covarying interpretations, as we will see below.

The second problem is empirical. Since referential indefinites are treated on a par with deictic expressions and quantificational indefinites are treated on a par with universals, the account predicts that *intermediate* exceptional scope readings for indefinites are not possible, as Fodor and Sag note. The problematic scope configuration is schematized in (32) and illustrated in (33):

- (32) $Q_1x \dots Q_2y \dots [S \dots \exists z \dots]$,
 where $\exists z$ takes semantic scope between Q_1x and Q_2y
- (33) Every_{*x*} committee member read every_{*y*} paper that a_{*z*} job candidate submitted.

Fodor & Sag (1982) predict that the indefinite *a_z job candidate* is either quantificational, in which case it must have narrowest scope, covarying with both *y* and *x*, or referential, in which case it would give the illusion of widest scope because no covariation whatsoever between *z* and either *x* or *y* is possible.

The reading predicted not to exist is the intermediate scope reading in which the values of *z* covary with *x* but are fixed relative to *y*. In this case, for each committee member, there is some job candidate such that the committee member read every paper submitted by that candidate. This reading is ruled out because the interpretation of the indefinite covaries with *x*, so we have to be dealing with a quantificational rather than a referential indefinite. But then the indefinite should also covary with *y* given that it should be scopally trapped within the restrictive relative clause.

Farkas (1981) and Abusch (1994) among others argue that such intermediate readings do in fact exist and once these readings are accepted, we are left with a questionable ambiguity and without clear answers to our two questions.¹⁰

Fodor and Sag's ambiguity hypothesis was subsequently picked up by Reinhart (1997), which relies on the notion of *choice function*, introduced in the linguistic literature on indefinites by Egli (1991). For Reinhart, indefinites are lexically ambiguous between a quantificational (existential) interpretation and a choice functional (rather than referential) interpretation. When quantificational, the scope of indefinites is the same as that of universals. When choice functional, the indefinite introduces a choice function variable *in situ* whose argument is the restrictor of the existential; the variable is then bound by an existential quantifier that can be freely inserted at any point in the interpretation process.

¹⁰ However, Fodor & Sag's analysis of referential indefinites could be the right analysis for *this*-indefinites (Prince 1981), exemplified in (1) below (from Prince 1981, 233). *This*-indefinites have a demonstrative form and flavor, but they are still indefinites in that they introduce a new but highly topical discourse referent.

- (1) I work in electronic and auto shows. Companies hire me to stay in their booth and talk about products. I have this speech to tell.

We obtain the widest scope interpretation of (33) if the choice function variable is bound by an existential inserted at the highest point in the structure of the sentence. The intermediate interpretation is obtained by inserting such an existential between the two universal quantifiers.¹¹

This account rests on the ‘unselective binding’ proposal in Heim (1982, Ch. 2), where existentials are treated as free variables unselectively bound by an existential quantifier with scope over the entire sentence or only over the nuclear scope of quantifiers. In Heim’s proposal, existentials are bound by the first c-commanding quantifier in the structure in which they occur, an assumption that leaves the problem of the special scope of indefinites open. Reinhart solves it by assuming an unprecedented freedom of binding choice function variables at any distance by existential quantifiers inserted for the sole purpose of binding them.

In Reinhart (1997) then, the answer to the first question above is that indefinites but not universals can be (and for Winter 1997 must be) treated as choice functional. The answer to the second question is that choice functional variables can be bound by existential closure operators inserted at any point in the structure. The major drawback of this approach is that the exceptional scope potential of choice functional expressions remains a stipulation.

Kratzer (1998) and Matthewson (1999) solve this problem by assuming that the value of the choice function variable is a unique, contextually-provided choice function, thus reviving the essence of Fodor and Sag’s referential account of indefinites. They account for widest scope readings of indefinites in examples like (33) above or (34) below without the need for wide scope existential operators of any sort.

- (34) Every_{*x*} linguist that studied every_{*y*} solution that *some problem* might have has become famous.

In order to account for intermediate scope readings, Kratzer enriches choice functions with implicit arguments so that under the intermediate scope interpretation of (34), *some problem* is interpreted by the contextual choice function *f* implicitly relativized to the variable *x* (effectively changing *f* into a Skolem function), which results in possible covariation between values assigned to *x* and the value that the *x*-parametrized choice function gives when applied to the interpretation of *problem*. We now can have different problems relative to different linguists.¹²

¹¹ In Winter (1997), the ambiguity part of this proposal is given up: indefinites and existentials more generally are uniformly treated as choice-function introducing expressions.

¹² See Chierchia (2001) and Schwarz (2001) for more discussion of the problems

In sum, the choice-function based family of solutions to the problem of the exceptional upward scope possibilities of unmarked indefinites rests on the insight that existential quantification is essentially different from universal quantification. A Kratzer-style choice functional approach is in principle superior to its predecessors because it does not posit an unmotivated ambiguity characterizing indefinite expressions nor does it assume special binding properties of the choice-functional variable that effectively stipulate its special scope properties. But such an approach rests on assuming a special device, namely choice functions, introduced for the sole purpose of accounting for existentials. In addition, choice functions are assumed to sometimes have implicit arguments (which partly brings back the ambiguity problem), an assumption needed to capture intermediate scope interpretations.

Fodor and Sag’s idea that the exceptional scopal properties of existentials are an illusion is picked up in [Schwarzschild \(2002\)](#). The proposal is radically simple: existentials are unambiguously quantificational and their scopal properties are the same as those of universals or other distributive quantifiers. The illusion of exceptional wide scope is due to the pragmatics of the context, which narrows down the denotation of the restrictor of the existential to a singleton. In (35), for instance,

- (35) Every_x student had read most_y of the reviews that were written about *a_z movie that Phil said was his favorite*.

the existential is interpreted *in situ*, but the illusion of widest scope is due to the restrictor set of the indefinite being interpreted as a singleton. Because we assume there is only one movie that Phil said was his favorite, there is no possible covariation between reviews and movies or students (and reviews) and movies, which results in the neutralization of the contrast between narrow and wide scope readings. For intermediate scope cases, one has to assume that the restrictor set is singleton relative to varying values of some other variable. The insight here is the reduction of semantic scope to possibility/impossibility of covariation independently of the syntactic position of the existential.

Leaving the whole work up to the assumed pragmatics of the situation seems, however, unjustified given that widest and intermediate scope interpretations are possible even in the absence of pragmatic pressure towards a singleton restrictor. In (36),

faced by the approach in [Kratzer \(1998\)](#), particularly when indefinites occur in downward entailing contexts.

- (36) Tom has decided to buy every album that *some famous Hungarian photographer praised*.

the indefinite can be interpreted as having widest or intermediate scope (within *decide* but outside *every*) even in contexts where it has been established that there are many famous Hungarian photographers. It is true that once a widest or intermediate scope reading is assumed, the restrictor of the existential can be pragmatically narrowed down to an absolute or relative singleton set precisely because such readings involve a choice of witness whose value is fixed absolutely (in case of widest scope) or relative to each world that conforms to Tom's decision, in the case of intermediate scope.¹³

0.3.3 Exceptional upward scope is real

We turn now to approaches that take the exceptional semantic behavior of indefinites (and existentials more generally) to truly be a scopal matter and thus be an effect of the different ways semantic evaluation can unfold in sentences that contain both indefinites and *bona fide* quantifiers.

There are two main classes of approaches. One of them, pursued most clearly in [Abusch \(1994\)](#), is to attribute the exceptional scopal behavior of indefinites to the free way they can enter semantic composition. Abusch offers an account of exceptional scope that uses a quantifier (Cooper) storage mechanism allowing for the delayed interpretation of indefinites. Therefore, semantic composition does not need to mirror syntactic structure and thus there is no need for exceptional covert movement of existentials. This account leaves open, however, the question of why existentials scope differently from other quantifiers since the delayed interpretation mechanism is not tied to any particular semantic property of existentials.

The other class of approaches attributes exceptional scope to the ability of indefinites to control the way semantic interpretation unfolds. This ability is tied to their existential meaning, i.e., to the fact that unlike *bona fide* quantifiers, their semantic contribution is characterized as witness choice. (In)Dependence Friendly Logics ([Hintikka 1973, 1986](#);

¹³ For another pragmatic account, see [Geurts \(2000\)](#) who suggests that existentials contribute a presupposition that can be accommodated globally (for widest scope interpretations) or more locally (for intermediate or narrow scope interpretations). The presuppositional nature of indefinites that this account rests on has not been sufficiently motivated, however.

Sandu 1993; Hintikka & Sandu 1996; Hodges 1997; Väänänen 2007) develop a logical framework that expresses this basic difference directly. The account in Brasoveanu & Farkas (2011) relies on it to propose an analysis of the unbounded upward scope of u-indefinites that answers our two questions without relying on ambiguity or special devices to derive intermediate scope readings.

The earliest proposal along these lines on the linguistic side is Farkas (1997a), where the semantic scope of existentials is determined by what evaluation indices c-commanding expressions have introduced up to the point when the existential is interpreted. An existential then is free to choose any evaluation parameter, including the initial one, which results in freedom of upward scope. A problem with this account is that the relevant evaluation parameters are assignment functions. Wide scope readings of existentials are not compositional as a result: to obtain them, one has to backtrack and ‘rewind’ the semantic evaluation to an earlier assignment function.

In Brasoveanu & Farkas (2011), this problem is solved by making reference directly to constraints on variation/stability of reference relative to previously introduced variables. The reader is referred to this work for discussion of its antecedents within the tradition of Independence Friendly Logic and within linguistic semantics, as well as for a full formal account. We outline it here as an approach that takes variation vs. stability of witness choice as a primary notion rather than one derived from configurational properties. This notion is at the heart of the typology of indefinites to which we turn in the next section.

(In)Dependence Friendly Logic analyzes scopal relations directly as relations among variables. Recall that in essence, $\exists y$ is in the semantic scope of $\forall x$ if the values for y are allowed to covary with those of x , and outside the scope of $\forall x$ if they are not. Such dependence/independence relations between variables are captured directly without the intermediary of configuration. For Brasoveanu & Farkas (2011), syntactic configuration is relevant only in deciding which potential variables an existential could in principle covary with. The essence of the proposal is that in a sentence like

(37) Every _{x} professor recommended every _{y} paper to a _{z} student.

the indefinite is interpreted *in situ* but because it is in the syntactic scope of two universals, it can be interpreted in three different ways depending on its relation with the variables x and y bound by the universals. One possible choice for the indefinite is to be interpreted independently of

these two variables, in which case its values are fixed relative to them, resulting in the widest scope interpretation. The second possibility is for the indefinite to be interpreted as covarying with x but as being fixed relative to y , resulting in the intermediate scope interpretation. The third possibility is for the indefinite to be interpreted as covarying with both x and y , resulting in the narrowest scope reading. Syntax provides the variables with which an indefinite may in principle covary, and the indefinite chooses whether to avail itself of these possibilities or not.

To formalize this account, Brasoveanu & Farkas (2011) enrich classical FOL semantics in two ways. First, formulas are evaluated relative to *sets* of assignments G, G', \dots instead of single assignments g, g', \dots (see Hodges 1997, Väänänen 2007 among others). This is needed in order to be able to talk about *varying* values of x relative to the values of y .

The second formal innovation is that the index of evaluation for a quantifier is taken to contain the set \mathcal{V} of variables introduced by the previously evaluated, i.e., syntactically higher, quantifiers or operators. Thus, the interpretation function has the form $\llbracket \cdot \rrbracket^{\mathfrak{M}, G, \mathcal{V}}$. (From now on we leave the model \mathfrak{M} implicit.) This is needed to capture the syntactic side of scopal relations, namely the fact that an existential may only covary with the previously introduced variables.

When an indefinite is interpreted, a subset \mathcal{V}' of the set \mathcal{V} of previously introduced variables is chosen, as shown below. The members of \mathcal{V}' are variables relative to which the values of the witness for the existential may covary. The choice of witness for the existential has to be fixed relative to the other variables in \mathcal{V} , i.e., relative to the complement set of variables $\mathcal{V} \setminus \mathcal{V}'$.

- (38) Existential quantification:
 $\llbracket \exists^{\mathcal{V}'} x [\phi] (\psi) \rrbracket^{G, \mathcal{V}} = \mathbb{T}$ iff $\mathcal{V}' \subseteq \mathcal{V}$ and $\llbracket \psi \rrbracket^{G', \mathcal{V} \cup \{x\}} = \mathbb{T}$, for some G' such that
- a. $G'[x]G$; intuitively, the new set of assignments G' differs from the old one at most with respect to the values assigned to x
 - b. $\llbracket \phi \rrbracket^{G', \mathcal{V}' \cup \{x\}} = \mathbb{T}$; intuitively, all the values of x in the new set of assignments G' satisfy the restrictor formula ϕ
 - c. $g(x) = g'(x)$, for all $g, g' \in G'$ that are \mathcal{V}' -identical (g and g' are \mathcal{V}' -identical iff for all variables $\nu \in \mathcal{V}'$, $g(\nu) = g'(\nu)$)

The crux of the matter with respect to (non-)covariation is the final clause (38c). Intuitively, this clause requires the choice of witness for the variable x contributed by the existential to be fixed relative to the

variables in $\mathcal{V} \setminus \mathcal{V}'$. In contrast, the subset \mathcal{V}' contains the variables relative to which the values of the witness for the existential may covary.

To connect this intuition and the formal characterization in (38c), consider the case in which $\mathcal{V}' = \emptyset$, i.e., when the existential does not covary with any of the previously introduced variables stored in \mathcal{V} . Then, any two assignments $g, g' \in G'$ are vacuously \mathcal{V}' -identical, so condition (38c) effectively requires $g(x) = g'(x)$ for all $g, g' \in G'$. That is, it requires the value of x to be fixed in absolute terms.

Formally then, an existential that is in the syntactic scope of a quantifier binding a variable x is also in its semantic scope iff x is in \mathcal{V}' . If $\mathcal{V}' = \emptyset$, the variable introduced by the existential is fixed absolutely, resulting in the widest scope reading. If $\mathcal{V}' = \mathcal{V}$, the variable introduced by the existential can covary with all the previous variables, resulting in the narrowest scope reading. Choices intermediate between \emptyset and \mathcal{V} result in intermediate scope readings. Thus, in the absence of additional constraints, u-indefinites are predicted to occur freely within or outside the semantic scope of any quantifier that has syntactic scope over them. This accounts for their freedom of distribution and interpretation.

For concreteness, consider the example in (39) and its semantic representation in (40).¹⁴

(39) Every _{x} student read every _{y} paper that a _{z} professor recommended.

$$(40) \quad \forall x[\textit{student}'(x)] \\ (\forall y[\textit{paper}'(y) \wedge \\ \exists^{\emptyset/\{x\}/\{x,y\}} z[\textit{professor}'(z)] (\textit{recommend}'(z, y))] \\ (\textit{read}'(x, y)))$$

The existential has three possible choices for \mathcal{V}' , i.e., for the set of variables with which it can covary: \emptyset , $\{x\}$, and $\{x, y\}$.

The choice $\mathcal{V}' = \emptyset$ results in the widest scope interpretation of the indefinite, where the values of z do not covary with either x or y , i.e., there must be some professor such that every student read every paper recommended by that professor. The choice $\mathcal{V}' = \{x\}$ results in the intermediate scope reading, where the values of z covary with x but not with y , i.e., for each student x we choose a professor z and require x to have read every paper that z recommended. Finally, the choice $\mathcal{V}' = \{x, y\}$ results in the narrowest scope interpretation, where professors

¹⁴ For the semantic clause for universals and for other details of the formal system, see Brasoveanu & Farkas (2011).

covary with both students and papers, and therefore the students read every paper such that some professor or other recommended it.

In this approach, existentials are not ambiguous and are interpreted *in situ*. Moreover, there is no need to introduce choice functions or to further assume that choice functions may have implicit arguments. But just like in approaches based on choice (or Skolem) functions, the non-configurational approach sketched above treats the difference in scope potential between existentials and universals in terms of an essential difference in interpretive procedure: existentials, but not universals, require the choice of a witness at a particular point in the interpretation and the existential is free to choose this witness relative to previously introduced interpretive parameters.

It is this fundamental difference between existentials and *bona fide* quantifiers, i.e., witness choice vs. relations between sets of entities, that is responsible for the difference in their scope-taking potentials – and this is the answer Brasoveanu & Farkas (2011) provide for question (29) above. Unlike choice-function approaches, however, Brasoveanu & Farkas (2011) build witness choice and the fact that it can be freely parametrized – i.e., their answer to question (30) above – into the very process of semantic interpretation and into the way indefinites can take advantage of richly structured semantic evaluation contexts.

This non-configurational, independence-friendly framework allows us to impose fixed or variable reference requirements directly without the intermediary of syntactic configuration while at the same time capturing the sensitivity of variable reference to syntactic factors. In the next section, we turn to marked indefinites and show how this framework can account for marked indefinites that add constraints to the very free witness-choice semantics associated with u-indefinites.

0.4 Towards a typology of indefinites

In this section we pick up the thread of indefinite classification from the end of 0.2 to discuss some of the parameters along which marked indefinites vary. The approach will rely heavily on the notion of variation/stability of values across a set of assignments at the core of the non-configurational approach to free upward scope of u-indefinites that we just discussed.

0.4.1 Two types of marked indefinites

From the discussion so far we expect marked indefinites to impose either domain restrictions or witness choice restrictions. Furthermore, these restrictions may result in either stability or variation of values assigned to the relevant variable across a set of assignment functions. Stability requirements are associated with specificity, while variation requirements are associated with non-specificity. (See [Farkas 2002b](#) for discussion.) To render these considerations concrete, consider partitives (whether implicit or explicit), exemplified below:

- (41) Some children ran into the room. *A child / Some of the children* was/were dressed up.

What distinguishes partitive indefinites from u-indefinites is a domain constraint requiring their Restrictor to be discourse familiar. This constraint results in an anti-variation requirement relative to u-indefinites since the domain of the partitive is necessarily restricted while that of a u-indefinite doesn't have to be. This domain constraint, however, is compatible with any semantic scope configuration and thus we correctly predict that with respect to scopal properties, partitives will behave like u-indefinites.

On the other side of the variation/stability divide, domain constraints have been invoked in work on free choice DPs by [Kadmon & Landman \(1993\)](#) for instance, who impose a widening constraint on the domain of such items. This constraint can be reformulated as a witness choice constraint requiring each element of the domain to be a value for the variable in question under the relevant set of assignment functions. Either way, the result is that possible variation of values of the variable in question is maximized, and thus it amounts to a pro-variation requirement. The scopal requirements free choice items are subject to should, ideally, follow from the details of the variation constraint they introduce.

At the highest level of generality then, we propose that a fundamental parameter along which marked indefinites differ is as in (42) below:

- (42) a. *Pro-variation* marked indefinites obey a constraint that leads to (relative) variability of values for the variable introduced by the DP.
 b. *Anti-variation* marked indefinites obey a constraint that leads to (relative) stability of values for the variable introduced by the DP.

In these terms, all definite DPs obey a strong anti-variation constraint while u-indefinites are neutral. Assuming that the property of stability vs. variability of reference underlies the many versions of specificity, pro-variation DPs will count as non-specific and anti-variation DPs will count as specific. What subtype of specificity is involved in each case depends on the details of the special constraint the DP imposes. In the case of indefinites, special, often morphologically complex Ds are responsible for introducing such pro-variation or anti-variation requirements. We assume that variation vs. stability of reference targets values given to the relevant variable across a set of assignments, or alternatives. Further distinctions can be drawn within pro- and anti-variation DPs depending on the details of the constraints they contribute.

Within the group of Ds marked for anti-variation are overt partitives, *a certain* indefinites in English and their close though not quite identical relatives in other Indo-European languages, such as German *ein gewiss/bestimmt*, Romanian (*un NP anume*), or French (*un NP particulier*), as well as *this* indefinites in English. Such anti-variation Ds within a language and across languages differ with respect to where and how (relative) stability of reference is required. Thus, for partitives, relative stability of reference results from circumscribing their domain to a discourse familiar set. They allow variation within this set (which is what makes them indefinite), but this variation is limited to the subset in question and therefore all possible witnesses share the property of being members of this subset. In the case of *a certain* and its relatives, the parameter involves identifiability of the witness, a matter that we turn back to in Section 0.4.3.

Within the group of pro-variation Ds, we can distinguish *internal* and *external* pro-variation inducing Ds. The former require variability of reference relative to alternatives introduced within the sentence the DP occurs in. External pro-variation Ds require variability of reference relative to contextual alternatives. Internal pro-variation Ds have to occur within the semantic reach of the item that introduces the relevant alternatives, while external pro-variation Ds will simply have to occur within general contexts compatible with their requirement. Examples of internal pro-variation Ds are the group of dependent or distributive indefinite DPs in Hungarian, Romanian and many other languages, as well as the Romanian ‘epistemic’ *vreun* indefinites (Farkas 1997b, Fălăuş 2010). Negative indefinites and free choice indefinites fall under internal pro-variation Ds as well. The particular constraints these Ds impose differ across Ds and across languages but the common denominator is that the result

requires variation of values assigned to the variable introduced by the DP across assignments that serve as input to the DP in question. External pro-variation Ds are exemplified by English singular *some* (Farkas 2002a) and Spanish *algún* indefinites (Alonso-Ovalle & Menéndez-Benito 2010), and arguably German *irgend* indefinites (Kratzer & Shimoyama 2002, Kratzer 2005, Aloni & Roelofsen 2011 a.o.). Again, the details of the constraints may vary but their common denominator will involve a requirement of variation of values that can be met across contextual alternatives.

When it comes to anti-variation Ds then, the relevant question to ask is what particular stability requirement they involve and what variation they tolerate. When it comes to pro-variation D, one has to establish what the crucial variability parameter is and what stability of reference they are compatible with. Answers to these questions should predict what scopal properties these special indefinites have. In the next two subsections we exemplify with one D from each subtype.

0.4.2 Pro-variation Ds: the case of dependent indefinites

Recall that pro-variation indefinites are marked indefinites that impose further conditions requiring variation of chosen witness values across a particular set of alternatives. In this subsection we turn to a class of pro-variation DPs, namely *dependent indefinites* (Farkas 1997b, 2007). This class of indefinites is marked by special morphology signaling a requirement of covariation with a licenser. The licenser is an individual or event/situation variable that must also vary across its domain, in the simplest case because it is contributed by a *bona fide* quantifier.

We exemplify below with Hungarian (43), where dependent indefinites are marked by reduplication, and with Romanian (44), where they are marked by the special morpheme *cîte*:

- (43) Minden vonás **egy-egy** emlék.
 every feature *a-a* memory
 ‘Every feature is a memory.’
- (44) *Fiecare băiat* a recitat **cîte** un poem.
 every boy has recited *cîte* a poem.
 ‘Every boy recited a poem.’

In (43), the reduplicated indefinite must covary with the variable bound by the licenser of the dependent indefinite, namely the universal determiner *minden* ‘every’. The variable bound by the universal ranges over

a non-singleton set of features and each such feature must be associated with a memorable event. The reduplicated indefinite article *egy-egy* requires that there be some variation across these memories and thus rules out a situation in which each feature is associated with the same memory. Similarly, the addition of the morpheme *cîte* to the simple indefinite *un* in (44) imposes the requirement that there be covariation between boys and the poems they recited.

In both languages, such sentences contrast with sentences that are identical except for the replacement of the dependent indefinite by a simple one (the non-reduplicated u-indefinite article *egy* in Hungarian and the u-indefinite article *un/o* in Romanian). While the witnesses of the dependent indefinite have to covary with those of the licenser, the simple indefinite allows both a covariation and a wide-scope/fixed-value interpretation, just like their English translations.

We now sketch how the account in Brasoveanu & Farkas (2011) extends to dependent indefinites. Recall that the independence-friendly account of u-indefinites has two crucial ingredients: (i) the superscript on the existential that stores the set of parameters relative to which the indefinite may covary, and (ii) the fixed-value constraint that makes use of this superscript and that constrains the values of the indefinite stored in the resulting ‘output’ set of variable assignments. We therefore expect the existence of special indefinites that target the same superscript and enforce further constraints on the ‘output’ set of assignments.

Dependent indefinites can be seen as doing exactly this: while u-indefinites contribute a fixed-value condition relativized to their superscript, dependent indefinites add a non-fixed value condition relativized to the same superscript. The interpretation rule for dependent indefinites is provided in (45) below. It is identical to the interpretation rule for u-indefinites in (38) above except for the last clause in (45d), which is contributed by the dependent morphology.

- (45) $\llbracket \mathbf{dep}\text{-}\exists^{\mathcal{V}'} x[\phi](\psi) \rrbracket^{G,\mathcal{V}} = \mathbb{T}$ iff $\mathcal{V}' \subseteq \mathcal{V}$ and $\llbracket \psi \rrbracket^{G',\mathcal{V} \cup \{x\}} = \mathbb{T}$, for some G' such that
- a. $G'[x]G$
 - b. $\llbracket \phi \rrbracket^{G',\mathcal{V}' \cup \{x\}} = \mathbb{T}$
 - c. $g(x) = g'(x)$, for all $g, g' \in G'$ that are \mathcal{V}' -identical
 - d. $g(x) \neq g'(x)$, for at least two $g, g' \in G$ that are not \mathcal{V}' -identical

The clause in (45d) requires covariation because it requires the set of

variables \mathcal{V}' that contains parameters of possible covariation to be non-empty: there have to be at least two assignments $g, g' \in G'$ that are not \mathcal{V}' -identical, which means that \mathcal{V}' must be non-empty. Furthermore, there has to be at least one variable $\nu \in \mathcal{V}'$ such that $g(\nu) \neq g'(\nu)$. This ensures that the licenser of the dependent indefinites has to introduce multiple values for the same variable.

The example in (44) is represented as shown in (46) below, where we indicate that the empty set \emptyset is not a possible superscript for the existential by starring it, and that the singleton set $\{x\}$ is a possible superscript for the existential by adding a check mark.

$$(46) \quad \forall x[boy'(x)] (\mathbf{dep}\text{-}\exists^{*\emptyset / \check{\{x\}}y[poem'(y)] (recite'(x, y)))$$

The evaluation proceeds as follows. First, the restrictor of the universal introduces the set of all students and stores it in the variable x . We then evaluate the dependent existential. If the existential is superscripted with the empty set \emptyset , we fail to satisfy the variation condition (45d) contributed by the morpheme *cîte*: the variable y introduced by the existential has a unique value, which makes any variation or covariation impossible; moreover, any two assignments $g, g' \in G$ are (vacuously) \emptyset -identical. Hence the dependent existential can only have the superscript $\{x\}$. This makes it *possible* for the variable y introduced by the existential to covary with the variable x introduced by the universal. The variation condition (45d) contributed by *cîte* requires this covariation to *actually* be realized.¹⁵ Finally, the nuclear scope of the indefinite checks that each x -student read the corresponding y -paper.

¹⁵ It might be possible to weaken (45d) and simply require that there should be at least two $g, g' \in G$ that are not \mathcal{V}' -identical. The extra requirement that $g(x) \neq g'(x)$ might simply be a (default) pragmatic inference. This would account for the example in (1) below from Brasoveanu (2011), which is felicitous and true in a situation in which there are several marbles in the bag that are indistinguishable from each other and Linus happens to take the same marble out of the bag, over and over again.

- (1) Din cînd în cînd, Linus scotea cîte o bilă din pungă,
 from when to when, Linus take.out.impf.3.sg *cîte* a marble out bag,
 se uita la ea cu atenție, după care o punea la loc.
 REFL look.impf.3.sg at it with care, after which it put.impf.3.sg at place.
 ‘Every now and then, Linus would take out a marble from the bag, look at it carefully, then put it back.’

0.4.3 Anti-variation Ds: the case of *a certain* indefinites

In this final section, we turn to the class of anti-variation indefinites, i.e., indefinites that impose conditions restricting variation in witness choice. We exemplify with English *a certain* indefinites.

Consider the examples in (47) and (48) below based on Hintikka (1986) (for reasons of space, we examine only extensional cases). As Hintikka observes, *a certain* indefinites take wide scope (forced by the continuation ‘the Queen’ in (47)), or if they take narrow scope, they tend to have a functional interpretation (forced by the continuation ‘his mother’; see Schwarz 2011 for a recent overview and discussion).

(47) Every Englishman adores a certain woman—the Queen / his mother.

(48) A certain sum of money will be paid for each quantity of this commodity.

Kratzer (1998), Chierchia (2001) and Schwarz (2011) note that the functional interpretation of these indefinites must have widest scope. To see this, consider example (49) below from Schwarz (2011) under the reading in which *his* is bound by *no boy*, forcing the *a certain* indefinite to take narrow scope.

(49) No boy talked with a certain female relative of his about girls.

The indefinite has narrow scope, but it does not have a regular ‘narrow scope existential’ interpretation: (49) cannot be interpreted as saying that no boy talked with any female relative of his about girls. Under the narrow-scope functional interpretation, sentence (49) is true if no boy talked about girls with his mother, for example, even if there are boys who talked about girls with their aunties.

Schwarz (2011, 890-891) compares two kinds of analyses of such functional readings, namely a free Skolem function variable analysis along the lines of Kratzer (1998), and an existentially-bound choice function variable analysis along the lines of Winter (1997), and argues that a free variable approach is empirically more adequate. Furthermore, a free variable approach is theoretically and formally simpler, so we will follow its main insight and capture the specifier nature of *a certain* indefinites by means of the semantic clause in (50) below. The only difference between this and the clause for u-indefinites in (38) above is (50c), which strengthens the clause in (38c) by further constraining / specifying the kinds of witnesses the indefinite can choose.

- (50) $\llbracket \text{certain-}\exists^{\mathcal{V}'} x[\phi](\psi) \rrbracket^{G, \mathcal{V}} = \mathbb{T}$ iff $\mathcal{V}' \subseteq \mathcal{V}$ and $\llbracket \psi \rrbracket^{G', \mathcal{V} \cup \{x\}} = \mathbb{T}$,
for some G' such that
- $G'[x]G$
 - $\llbracket \phi \rrbracket^{G', \mathcal{V}' \cup \{x\}} = \mathbb{T}$
 - $g(x) = g'(x) = \mathcal{F}(g(\mathcal{V}'))$, for all $g, g' \in G'$ that are \mathcal{V}' -equivalent with respect to some suitable function \mathcal{F}
- (51) Two assignments g and g' are \mathcal{V}' -equivalent with respect to a suitable function \mathcal{F} iff $\mathcal{F}(g(\mathcal{V}')) = \mathcal{F}(g'(\mathcal{V}'))$.^{16, 17}

Under this account **certain- \exists** is an anti-variation determiner because it imposes a restriction that requires a particular type of identity of value across assignments. It does that by invoking a suitable function \mathcal{F} and using it relative to the same two semantic ingredients that are crucial for our analysis of u-indefinites: the superscript \mathcal{V}' and the fixed-value condition $g(x) = g'(x)$. In particular, the function \mathcal{F} specifies the witness that has to be chosen relative to the values of the variables in the set \mathcal{V}' .

For example, consider the two scopal possibilities for the indefinite in example (47) above, represented in (52).

$$(52) \quad \forall x[\text{englishman}'(x)] (\text{certain-}\exists^{\emptyset / \{x\}} y[\text{woman}'(y)] (\text{adore}'(x, y)))$$

If the superscript is \emptyset , then the indefinite has wide scope, i.e., we choose one absolutely-fixed witness and in addition, we have to have a suitable function \mathcal{F} whose only value is that witness. ‘Suitable’ means that the domain of \mathcal{F} consists of sets of n individuals, where n is the cardinality of the set of variables superscripted on the existential. Since the superscripted set has cardinality 0 in this case, the suitable function \mathcal{F} is simply an individual (a ‘degenerate’ function), for example, the Queen.

If the superscript is $\{x\}$, then the indefinite has narrow scope, which means that we can choose possibly different values for the variable y if the corresponding x -values are different. But the values for y are highly constrained: we have to have a suitable function \mathcal{F} that provides these values (in this case, ‘suitable’ means that \mathcal{F} is a function from singleton

¹⁶ For a set of n variables $\mathcal{V}' = \{\nu_1, \dots, \nu_n\}$, a variable assignment g and a function \mathcal{F} from sets of n individuals to individuals: $\mathcal{F}(g(\mathcal{V}')) := \mathcal{F}(\{g(\nu_1), \dots, g(\nu_n)\})$.

¹⁷ To show that clause (50c) entails clause (38c), assume that G' satisfies clause (50c), in particular, that $g(x) = g'(x)$, for any two assignments $g, g' \in G'$ that are \mathcal{V}' -equivalent with respect to \mathcal{F} . Now take two arbitrary $g, g' \in G'$ that are \mathcal{V}' -identical. In order to show that G' satisfies clause (38c), we have to show that $g(x) = g'(x)$. By definition, $g, g' \in G'$ are \mathcal{V}' -identical iff for all variables $\nu \in \mathcal{V}'$, $g(\nu) = g'(\nu)$. Therefore, we have that $\mathcal{F}(g(\mathcal{V}')) = \mathcal{F}(g'(\mathcal{V}'))$. But then by the definition in (51), g and g' are \mathcal{V}' -equivalent with respect to \mathcal{F} , and given our hypothesis that G' satisfies clause (50c), we have that $g(x) = g'(x)$.

sets of individuals to individuals). That is, for any given value α for the variable x , the corresponding value for the variable y has to be $\mathcal{F}(\{\alpha\})$. For example, \mathcal{F} could be the MOTHER function: given (the singleton set whose only member is) an individual, this function returns the mother of that individual as its value.

Thus, the narrow scope reading for the *a certain* indefinites in example (47) is more *specific* than the narrow scope reading for a u-indefinite, e.g., *Every Englishman adores a woman*. The u-indefinite places a milder constraint on the set of assignments G' : any two assignments $g, g' \in G'$ that assign the same value to x , e.g., $g(x) = g'(x) = \text{BOB}$, have to assign the same value to y , e.g., $g(y) = g'(y) = \text{JANE}$. But if we have an assignment g'' that assigns a different value to x , e.g., $g''(x) = \text{TOM}$, the corresponding value of y can be the same, e.g., $g''(y) = \text{JANE}$, or it can be different, e.g., $g''(y) = \text{MARY}$.

The anti-variation *a certain* indefinite places stricter constraints on the set of assignments G' : for any assignment $g \in G'$, $g(y) = \text{MOTHER}(g(x))$. In particular, if we have two assignments $g, g' \in G'$ such that $g(x) = g'(x) = \text{BOB}$ and Bob's mother is Jane, then we have to have $g(y) = g'(y) = \text{MOTHER}(\text{BOB}) = \text{JANE}$. If in addition we have a third assignment g'' such that $g''(x) = \text{TOM}$ and it so happens that Tom is Bob's (maternal) brother, then the specifier indefinite requires that $g''(y) = \text{JANE}$ even if Tom also adores Mary.

The formalization above captures the idea that *a certain* indefinites are anti-variation Ds, i.e., they constrain witness choice by means of a functional dependency, but it glosses over certain details that would need to be captured in a fuller account. First, instead of being contextually provided, the constraining functional dependency \mathcal{F} should be introduced by the indefinite itself (possibly by the adjective *certain*) and made available for further specification in subsequent discourse. This is what happens in Hintikka's example in (47) as well as in (53) below. The role of the context is to constrain the domain of functions thus introduced, in much the same way that the context restricts quantificational domains in general.

- (53) Every man forgot a certain date. Matt the birthday of his wife,
Bert the birthday of his daughter and Sam his wedding anniversary.

Second, note that explicitly invoking a functional dependency \mathcal{F} , as *a certain* indefinites do, is not a necessary requirement to capture functional readings in general. In this framework, all indefinites – u-indefinites

included – implicitly have functional readings whenever their superscript is non-empty. That this is correct is shown by *Every Englishman adores a woman—his mother*.

The role of the functional dependency for *a certain* indefinites is to require the chosen witness to be in principle identifiable in the sense of Farkas (2002a). That is, since the functional dependency is introduced in discourse, it is implicated that it is non-trivial. Furthermore, subsequent conversation may further elaborate on it and zoom in on a particular witness identification procedure (which the function \mathcal{F} is intended to encode) but does not have to.

It has often been noted in the literature that the functional dependency introduced by *a certain* indefinites has a doxastic flavor (see Kamp & Bende-Farkas 2006 among others). This is predicted by the above account since this dependency is intended to act as a witness identification procedure: $g(x) = g'(x) = \mathcal{F}(g(\mathcal{V}))$. But nothing in the account requires the speaker, or anyone else for that matter, to be able to fully provide the identifying information, which is a welcome result. Finally, note that *a certain* indefinites are predicted to be as free in taking upward scope as u-indefinites are. Their ability to scope under particular operators will depend on whether such narrow scope remains compatible with the special constraint they introduce or not.

0.5 Conclusion

We hope to have shown in this chapter that indefinite DPs raise a rich and varied array of empirical challenges that have inspired major theoretical proposals. We have argued that within nominal semantics, what is common to all DPs is that they introduce a variable, or discourse referent, and restrict the way values for this variable are to be chosen. Existential DPs as a class are essentially simpler than *bona fide* quantificational DPs because their effect on the input state is the simplest possible effect, namely an update of the input assignment function on the variable they introduce. Within existentials, u-indefinites are the simplest, which accounts for their versatility.

The rich variety of indefinites we find within a language as well as cross-linguistically is due to the possibility of further constraints that marked indefinites are subject to. These constraints can target their domain (domain constraints) or the way the values are chosen (witness choice constraints).

A common type of witness choice constraint targets variation vs. stability of values for the variable contributed by the indefinite across a particular set of assignment functions. We have argued here that this is an underlying parameter relative to which existential DPs differ. There is hope that the major as well as the minor variations we find in the complex scopal patterns exhibited by various subtypes of indefinites will follow from an adequate characterization of the domain and witness choice constraints they impose, coupled with the right account of the operators they interact with.

In this respect, work on the semantics of indefinites is in its infancy. There are two major open avenues of research: *(i)* on the empirical side, we have to better understand the parameters of variation across subtypes of marked indefinites, within a language as well as cross-linguistically; *(ii)* on the theoretical side, we have to match these with the appropriate formal semantics framework. Based on current research, a significant number of subtypes of indefinites we find across languages are sensitive to whether their values are stable or vary across particular sets of assignment functions. The open issue is to characterize the relevant sets and understand how they interact with semantic composition.

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