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Unexpected Wide-Scope Phenomena

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1 Introduction

It has long been known that quantificational expressions in natural language do not all have the same scope properties. While the scope of some expressions is closely related to their observable, ‘surface’ position in syntactic structure, other expressions display a remarkable degree of freedom with respect to the relative scope that may obtain between them and other expressions in the structure. Compare (1) and (2):

(1)  a. Some girl watched every movie.
    b. Some girl will be happy if every movie is shown.

(2)  a. Every girl watched some movie.
    b. Every girl will be happy if some movie is shown.

(1a) is ambiguous: it can be read as involving a girl who has seen all the movies, but is also judged true when each movie was seen by a different girl; the latter reading may be described by saying that every movie takes wide scope relative to some girl. (1b), on the other hand, does not allow wide scope for every movie relative to some girl; its truth requires that there be (at least) one indefatigable girl who will be happy if all the movies are shown. Thus, while the scope of every movie is not exactly fixed at its observable position – witness the ambiguity of (1a) – neither is it completely free. When every movie is embedded in an if-clause, as in (1b), it cannot take scope over another expression that is not so embedded. See chapters 53, and 64. The restriction observed in (1b) does not, however, apply to all NPs, as we find in (2), where the positions of the two NP types are reversed. The indefinite NP some movie can escape the scope of every girl not only in (2a), but also in (2b), regardless of the if-clause. Thus, (2b) can be understood as stating that there is a particular movie, such that every girl will be happy if it is shown.

This chapter focuses on the scope properties of NPs such as some movie in (2b), which, following tradition, we will refer to as being specific on the intended reading.1 Section 2
provides a little historical background, and introduces two opposing views that underlie much of the literature on the subject. Section 3 describes the properties that make the scope of indefinites exceptional in several respects. Section 4 discusses the issue of ‘intermediate island-escaping scope’, which has featured prominently in the literature since Fodor and Sag (1982). Section 5 goes into some detail in describing an approach that started to be developed in the late 1990’s, which holds that a semantic choice function mechanism is to be held responsible for the exceptional wide-scope readings found with specific NPs; section 6 discusses a refinement of this approach in connection with intermediate island-escaping scope, in terms of so-called parametrized choice-functions. Section 7 presents Schwarzschild’s (2002) account in terms of *singleton indefinites*. Finally section 8 discusses some of the, mostly tentative, work that has been devoted to delineating the class of indefinite NPs that show exceptional wide scope. Section 9 offers a short conclusion.

Our aims are mostly descriptive throughout. We will refrain from attempting to summarize the wide variety of (mainly semantic) theories that have been proposed in explanation of the specificity phenomenon. We will merely attempt to establish the reality of the phenomenon, describe some of its attendant properties and preconditions, and present some of the main approaches to the phenomena as they emerge from recent research in semantics.

## 2 Specificity: a binary ambiguity?

This section introduces the specificity phenomenon. It provides some historical background, and along the way it presents some of the basic observations, and describes two prominent approaches to the analysis of specificity. The first approach says that indefinite NPs show an inherent binary ambiguity: they may be interpreted as quantificational expressions (non-specific) or as something else (specific). The second approach holds that indefinites are always quantificational expressions, and that the specific vs. non-specific ambiguity is a scope ambiguity.
By way of introduction to the binary ambiguity approach to specificity, consider the following examples adapted from Karttunen (1968) (see also Baker 1966 for the observation regarding (4b)):

(3) Mary has a car. It is blue.

(4) a. *Mary doesn’t have a car. It is blue.
    b. *John wants to catch a fish. You can see it from here.
    c. *All the boys in this town are in love with a girl in this town. She is very pretty.

In (3), the pronoun it can be felicitously used to refer to a car owned by Mary. This option is due to the appearance of the indefinite a car in the first sentence of the discourse, which, Karttunen claimed, introduces a discourse referent that the pronoun refers to. The pronouns in (4), on the other hand, cannot be so used. For instance, it in (4a) cannot be taken to refer to the car that Mary doesn’t have. The generalization that apparently governs these facts is that in (4), the indefinite NPs are embedded in the scope of some other expression (not, want, all the boys in this town); this prevents the introduction of a discourse referent.

In many cases, however, some slight adjustment in the example will allow discourse anaphora even in the structures of (4):

(5) a. Mary doesn’t own a car she drives. She rents it instead.
    b. John wants to catch a fish he spotted today. You can see it from here.
    c. All the boys in this town are in love with a redheaded gogo-dancer who works at the Moonlight Inn. She is very pretty.

Apparently, the indefinites in (5) do manage to introduce a discourse referent, despite the presence of a higher scoped element. Karttunen’s (1968) description of these facts stated that indefinites are ambiguous between a specific and non-specific reading. He took this binary ambiguity to reside in the interpretation of the indefinite itself. The non-specific ones in (4), which do not introduce a discourse referent from a scopally embedded position, are
interpreted as existentially quantified expressions; the specific ones in (5), which introduce a discourse referent even from a scopally embedded position, function semantically as name-like referential expressions. This description provides no answer to the question why the non-specific readings are strongly favored in (4), whereas slight lexical and structural variations bring out the specific readings in (5) (a question that still goes unresolved; in fact, speakers generally allow a specific reading, and discourse anaphora, in (4) as well, albeit less readily than in (5); see section 8). The proposed quantificational/referential ambiguity does, however, point toward an explanation for the different discourse anaphora options along the following lines.

If the indefinites in (3) and (4) are associated with existential quantifiers, then we expect them to be sensitive to the presence of other scopal expressions in the structure. From a more modern DRT perspective, the sentences in (3) and (4) might then be roughly represented (Heim 1982-style) as in (6) and (7):

(6) \[ T \exists x [S \text{car}(x) \land \text{Mary has } x]. [S x \text{ is blue}]. \]

(7) a. ?\[ T \exists x [S \text{NEG} \exists x [\text{car}(x) \land \text{Mary has } x]]. [S x \text{ is blue}]. \]
   b. ?\[ T \exists x [S \text{John wants} [\exists x [\text{fish}(x) \land \text{PRO catch } x]]]. [S \text{You can see } x \text{ from here}]. \]
   c. ?\[ T \exists x [S \forall x [\text{boy}(x) \rightarrow \exists y [\text{girl}(y) \land x \text{ loves } y]]]. [S y \text{ is very pretty}]. \]

Here, consecutive sentences are thought of as being attached to a single T(ext) node. Discourse anaphora can come about when an existential quantifier takes scope at T level, binding a variable in one sentence, and subsequently binding a pronoun, translated as the same variable, in the next sentence. Thus, the indefinite in (3), even if it is non-specific and interpreted through existential quantification as in (6), may antecede the pronoun because the existential quantification in question takes place at Text level, and this quantifier takes scope over the second sentence and binds the pronoun. The non-specific indefinites in (4), on the other hand, are associated with a lower existential quantifier in scope, which does not scope over, and hence does not bind, the pronoun; even if there is a Text-level (default) existential
quantifier introducing the same variable, it binds nothing in the first sentence (due to the presence of another existential quantifier introducing the same variable lower in the structure) and cannot relate the pronoun in the second sentence to the indefinite.

If, furthermore, the specific indefinites in (5) are indeed ‘name-like’ expressions, as Karttunen claimed, then we expect them to be insensitive to scope effects and to license discourse anaphora from any position, just like proper names. For instance, (5a) is expected to bear a close semantic resemblance to (8):

(8) Mary doesn’t own Fido. She is looking after him for the weekend.

Karttunen’s (1968) view of specific indefinites exemplifies an approach to specificity that plays an important role in the literature to this day – namely, that the phenomenon derives from a binary ambiguity residing in the indefinite NP itself: an indefinite may be interpreted through a quantificational or a referential mechanism.3

Around the same time, work by Heringer (1969) and Fodor (1970) on the interpretation of specific and non-specific indefinites in opaque contexts provided evidence against this view, and in favor of the view that indefinites are invariably quantificational expressions, involved in scope ambiguities. Fodor discussed several different effects that reveal the ambiguity that obtains when an indefinite is embedded in an intensional context. First, such contexts block existential entailments:

(9) a. John has a car ⇒ there is a car.
   b. John wants to marry a witch =/= there is a witch.
   c. John wants to marry a witch he met last week ⇒ there is a witch John met last week.

When an indefinite is not embedded, the proposition it occurs in is judged to allow the entailment that the noun-set of the indefinite is not empty, as indicated in (9a). When the
indefinite is embedded in an opaque context, a de re/de dicto ambiguity arises. The de re reading, prominent in (9c), says that there is a particular witch that John wants to marry; this reading entails that there is such a witch. The de dicto reading, favored in (9b), can be paraphrased as saying that John wants to marry any witch at all, a wish he may well entertain even if there exist no witches; hence, the entailment does not hold. Similar entailment observations can be made with respect to the other embedding contexts illustrated in (4) and (5) above.

Another ambiguity obtaining in opaque contexts relates to whether or not the description in the indefinite may be replaced by any extensionally equivalent description without changing the truth-value of the sentence. Such substitution is valid when the indefinite is not embedded, as the intuited equivalence (given the specified context) between (10)a and (10)b illustrates:

(10) Context: the people allowed to vote are exactly the people who are more than 18-years old, but this fact is not known to Mary.
   a. Mary met someone who is allowed to vote.
   b. Mary met someone who is more than 18-years old.

When the indefinite is embedded in an opaque context, however, an ambiguity arises. On the de dicto reading, which is quite prominent in (11), replacing the description of an indefinite NP with a co-extensional description does not guarantee that the two resulting sentences have the same truth-value:

(11) Context: the people allowed to vote are exactly the people who are more than 18-years old, but this fact is not known to Mary.
   a. Mary wants to meet someone who is allowed to vote.
   b. Mary wants to meet someone who is more than 18-years old.
There is however an equivalence (given the background knowledge that the two descriptions are co-extensional) on the de re readings, which can be made more prominent by adding a relative clause as in “someone who is allowed to vote that you mentioned the other day” and “someone who is more than 18-years old that you mentioned the other day”.

These ambiguities have been traditionally described by assuming that indefinites are interpreted as existential quantifiers, which may take narrow or wide scope relative to the intensional verb (see, e.g., Bach 1968: 107, but also Quine 1956). The narrow-scope reading corresponds to the de dicto reading; the wide-scope reading to the de re reading. (12) illustrates this:

(12) John wants to marry a witch.
   a. John wants [∃x [witch(x) ∧ PRO marry x]].
   b. ∃x [witch(x) ∧ John wants [PRO marry x]].

In (12b), the existential quantifier takes wide scope relative to want (so that the sentence is about a particular individual (witch), and existential entailment is valid), and so does the description witch (so that that particular individual is asserted to be a witch in the world in which the sentence as a whole is evaluated, or ‘according to the speaker’ – hence, substitution salva veritate is allowed). In (12a), both quantifier and description take narrow scope; hence the sentence is not about a particular individual, and both the existence of such an individual and the description witch need only hold in those worlds that conform to John’s wishes; the description is not the speaker’s responsibility, it is John who wants to marry any individual ‘under the description of’ her being a witch. (12b) logically allows the existential entailment and the substitution; (12a) does not.

(12) exemplifies a view on specific indefinites that opposes Karttunen’s (1968) proposal. There is no binary ambiguity in the indefinite; rather, the indefinite is always interpreted with an existential quantifier. The observed ambiguities reflect the various scope positions available for the quantifier. Indeed, Karttunen (1971a) adopted this view and argued that it
explains the discourse anaphora facts in (3–5) as well: the specific indefinites in (5) are existential quantifiers that escape the scope of the other operators, and therefore allow discourse anaphora just like the indefinite in (3) (cf. (6)). Much of the literature on specificity since then has revolved around the pros and cons of these two opposing views.

Fodor presented several observations that argue against a binary referential/quantificational ambiguity. One such observation is that the analysis in (12) is not fine-grained enough. There is no strict correlation between the existential entailment and substitution effects; with an effort, we can observe a four-way ambiguity according to these two parameters. (13) approximates the two additional readings for (12), where the scope of the existential quantifier and the scope of the description do not coincide:

(13) John wants to marry a witch.

a. ?? witch(x) ∧ John wants [∃x ∧ PRO marry x].

b. ?? ∃x John wants [witch(x) ∧ PRO marry x].

Some context can help to bring out the intended readings. Suppose, first, John wants to marry any old lady wearing a pointed hat who flies a broomstick, but believes these are called ‘airline-hostesses’. Then we can truthfully utter (13); but the description witch is the speaker’s responsibility (John’s desires do not relate to that description) whereas there is not one particular such individual that John wants to marry – something like (13a) seems to be called for. Suppose, next, that John hallucinates the existence of several witches, and wants to marry a particular one among them. (13) is again true, but this time scope relations are reversed: John’s desire is particularized to an individual (de re: wide-scope existential), but the description witch is not the speaker’s responsibility; we end up with something like (13b).

These two additional readings for indefinites have received relatively little attention in the literature; partly, no doubt, because the readings are more elusive than those in (12), partly because their analysis is so problematic. We will henceforth ignore them – the reader
is referred to Farkas (1997) for an analysis that teases apart the scope of the restriction and the quantifier in a way that seems promising; see also Abbott (1993) for an insightful discussion. The observed four-way ambiguity does, however, indicate that a simple binary ambiguity of indefinite NPs does not provide sufficient descriptive latitude.

Another observation by Fodor, and one which allows of analysis by more conventional means, also argues against a simple ± specific ambiguity. When more than one intensional verb c-commands an indefinite, more than two readings, corresponding to more potential scopal positions for the quantifier, are observed (the same observation, relating to definite NPs as well, is made in Karttunen 1971a; Jackendoff 1972: 281; Kripke 1979; the oldest version of this argument that we are aware of is due to Bach 1968: 107). Consider (14) (from Kripke):

(14)  Hoover charged that the Berrigans plotted to kidnap a high American official

a. . . . but he said they couldn’t decide which one (to kidnap).

b. . . . but he didn’t know which one (they plotted to kidnap).

c. . . . guess which one (he charged they plotted to kidnap).

a’.  Hoover charged (the Berrigans plotted (∃x [Hi.Am.Off.(x) ∧ PRO kidnap x])).

b’.  Hoover charged (∃x [Hi.Am.Off.(x) ∧ the Berrigans plotted (PRO kidnap x)]).

c’.  ∃x [Hi.Am.Off.(x) ∧ Hoover charged (the Berrigans plotted (PRO kidnap x))].

(14) allows three readings, brought out by the three sluices in (14a–c), and corresponding to three scope positions for the existential quantifier associated with a high American official as indicated in the primed formulae. An analysis of specificity which holds that indefinites show a binary ambiguity between a referential reading, and a reading as an existential quantifier that is interpreted in its position in overt syntax, fails, in particular because it cannot account for the ‘intermediate scope’ brought out by (14b). Here, a high American official is not referential (Hoover’s charge is not about a particular individual, and there need not even exist any American officials for this reading to be felicitous and true). But if the
indefinite is quantificational, the position of the quantifier here does not coincide with the surface position of the indefinite. Hence, it must be assumed that an indefinite may be interpreted by means of an existential quantifier that may be dislocated with respect to the indefinite’s surface position. But if that much is assumed, the wide-scope reading (14c) and the other specific readings discussed above follow automatically, and no motivation for assuming a referential reading in addition to the quantificational reading of indefinites seemed to remain. What did remain, of course, was the question of how to account for the fact that an indefinite can be so freely associated with different scope positions.

Before we can turn to this question, there is a potentially confounding issue that needs to be addressed. We have so far assumed that the examples under discussion are truly ambiguous, not merely vague. This is an analytical assumption that is sometimes difficult to justify. Consider (15):

(15) Every girl saw some movie.

a. \( \forall x \ [\text{girl}(x) \rightarrow \exists y \ [\text{movie}(y) \land \text{saw}(x,y)]] \)

b. \( \exists y \ [\text{movie}(y) \land \forall x \ [\text{girl}(x) \rightarrow \text{saw}(x,y)]] \)

When we claim some movie in (15) can be specific or non-specific relative to every girl, we attribute to the sentence two different readings that can, for instance, be represented as in (15a) and (15b). However, as the two alleged readings are not logically independent, this might well be unnecessary. (15b) entails (15a), so that the situations in which (15b) comes out as true are just a subset of the situations in which (15a) is also true. We judge (15) true when some particular movie is seen by every girl, but to explain this we need not assume that (15) can mean that there is some movie that was seen by every girl, as (15b) states; if (15) just means (15a), we expect the same judgment.\(^5\) We might conclude that (15) is ambiguous if we found we could confidently judge it false when every girl saw some movie, but a different one – that would indicate we had ‘chosen’ reading (15b). But readings that render a
sentence false are usually, for pragmatic reasons, difficult to detect when a reading that renders it true, as (15a) would in this situation, is also available. For these reasons, it is wise to concentrate on examples where the two purported readings are logically independent, and one is not just a special case of the other:

(16) Every girl but one saw some movie.

We judge (16) true when every girl saw Brazil, but every girl but one saw 2001 – a narrow-scope construal of some movie does not allow that, but a wide-scope construal does. Below, we will be careful to point out the logical independence of the readings that we attribute to our examples.

3 The scope of indefinites and QR

Assume that the ambiguity of structures containing indefinite NPs reflects not some inherent binary ambiguity, but the different scope positions that may be taken by some (existential) quantifier involved in the interpretation of the indefinite, as suggested by the multiple ambiguity of (14). Then what explains this variation in scope? An obvious answer, and one that will function as a straw-man theory from here on, is that the indefinite itself denotes an existential quantifier, and that the indefinite is subject to a general scope-shifting rule. Such rules have been proposed to be operative in semantics (e.g., Cooper’s 1983 storage, which ‘separates’ a QNP’s denotation from the denotation of the structure it is contained in, and then recombines the two; see Abusch 1994 for a similar approach geared specifically to indefinites) and in syntax as well – notably, Quantifier Raising (see chapter 53). The literature provides considerable evidence that this approach to specificity will not work. The present section reviews the evidence; we will concentrate mainly on the feasibility of explaining specificity as an effect of syntactic movement.
3.1 Island-escaping scope

Consider once more a simple example:

(17) Almost every girl saw a movie.
   a. \([i_p \text{Almost every girl}, [i_p \text{a movie}, [i_p \text{t}, [v_p \text{saw t}]]]]\).
   b. \([i_p \text{A movie}, [i_p \text{almost every girl}, [i_p \text{t}, [v_p \text{saw t}]]]]\).

Supposing that QR associates (17) with the two LFs (17a) and (17b) (and perhaps more), familiar techniques yield the wide-scope and narrow-scope (specific and non-specific) readings for a movie, in the same way they derive the ambiguity of (1a) when QR applies to every movie.

There exist, however, strong indications, put forward most forcefully by Fodor and Sag (1982), that treating indefinites on a par with other, especially universally quantified NPs in this manner is undesirable. Their scope properties are very different. First and foremost, while QR as it applies to such NPs as every movie is subject to a wide array of familiar constraints on movement, and may even be essentially clause-bounded, the scope of indefinites seems, at least superficially, to be insensitive to such constraints. Consider (18) (cf. Fodor and Sag 1982):

(18) a. If a relative of mine dies, I will inherit a fortune.
   b. IF a relative of mine dies THEN I will inherit a fortune.
   c. A relative of mine x [IF x dies THEN I will inherit a fortune].
   d. (18b) \(\leftrightarrow\) I have relatives.
   e. (18c) \(\Rightarrow\) I have relatives.
   f. IF a relative of mine dies THEN I will inherit a fortune \([= (18b)]\)
      & John is a relative of mine
      \(\Rightarrow\)
      IF John dies THEN I will inherit a fortune.
g. A relative of mine x [IF x dies THEN I will inherit a fortune] [ = (18c)]

& John is a relative of mine

\[\Rightarrow\]

IF John dies THEN I will inherit a fortune.

Sentence (18a) is ambiguous between a narrow-scope and wide-scope reading for a relative of mine; the two readings are paraphrased schematically in (18b) and (18c). According to the first, I will inherit a fortune if any one of my relatives dies; according to the latter, I will become rich if one particular relative of mine dies. Neither supposed reading, furthermore, entails the other, so that no problems of the type described in section 2.1 arise. First, (18c) entails that I have at least one relative (see (18e)), whereas (18b) does not (see (18d)). So (18b) does not entail (18c), as it would then share all entailments of (18c). Second, in combination with the premise that John is a relative of mine, (18b) allows the conclusion that I will inherit if John dies (see (18f)). (18c) does not allow this reasoning; John may just not be the particular relative whose death will put me in clover (cf. (18g)). So (18c) does not entail (18b), or it would also allow the conclusion about John.

Since we judge the sentence true even if my indigent uncle John will not leave me a fortune, we need in particular to posit the wide-scope reading (18c); the narrow-scope reading (18b) is false in that situation. Under the QR hypothesis, obtaining the wide-scope reading involves extracting the indefinite from the if-clause:

\[
(19) \text{?}[\text{A relative of mine, [[if } t \text{ dies} [\text{I will inherit a fortune}]].]
\]

However, this type of movement is generally disallowed as an Adjunct Condition violation; e.g., wh-expressions cannot be extracted from an if-clause (see chapter 64). And indeed, a universally quantified NP undergoing QR cannot escape this, or any other extraction island (see chapter 53):
If every woman gave birth to John, then he has a nice mother.

a. + IF for every woman x, x gave birth to John THEN he has a nice mother.

b. - every woman x [IF x gave birth to John THEN he has a nice mother].

[‘+’ indicates that the formula next to it is a possible interpretation of the sentence, and ‘-’ that it is not.]

(20), adapted from Winter (1998), can only be understood in the pragmatically odd way paraphrased in (20a): if John has as many mothers as there are women, then he has a nice mother. This is the reading that corresponds to narrow scope of every woman inside the if-clause. Pragmatics thus pushes us toward a, much less odd, wide-scope reading (20b): whoever John’s mother, she would be a nice mother. The fact that this reading is nevertheless unavailable shows very clearly that every woman cannot be QRed out of the extraction island. This observation constitutes a major obstacle to semantic treatments of quantifier scope such as Cooper storage; it is equally problematic for a QR treatment of the scope of the indefinite in (18).

Other Ross islands (Ross 1986; and see chapter 64) provide similar examples:

(21) a. Mary dates every man who has met a producer I know.

b. \( \forall x \left[ \left[ \text{man}(x) \land \exists y \left[ \text{producer}_I\_know(y) \land x \text{ met } y \right] \right] \rightarrow \text{Mary dates } x \right] \).

c. \( \exists y \left[ \text{producer}_I\_know(y) \land \forall x \left[ \left[ \text{man}(x) \land x \text{ met } y \right] \rightarrow \text{Mary dates } x \right] \right] \).

d. (21b) =/= I know a producer.

e. (21c) \rightarrow I know a producer.

f. (21b) & John is a producer I know

\( \rightarrow \)

Mary dates every man who has met John.

g. (21c) & John is a producer I know

=/=>

Mary dates every man who has met John.
(21) is ambiguous between a narrow- and wide-scope reading for *a producer I know*,
shown in (21b) and (21c). As before, neither reading entails the other. 6 (21d) and (21e) show
that the narrow-scope reading does not entail the wide-scope reading, and, more
significantly, (21f) and (21g) show that the wide-scope reading is not a special case of the
narrow-scope reading. We can judge (21) true even if John is a producer I know, but Mary
does not date every man who knows John. Hence, the wide-scope reading is well-motivated;
but deriving it through QR would involve a Complex Noun Phrase Constraint (CNPC)
violation. Compare (21) with (22):

(22) Mary dates a man who has met every producer I know.

(22) is not ambiguous, and only allows narrow scope for *every producer I know*, as we
expect from the syntactic movement properties of QR.

It therefore seems unlikely that the same rule can be held responsible for the scope
options of both indefinites and other types of quantificational NPs. Furthermore, any
syntactic movement rule seems an inappropriate device for describing the scope of
indefinites, as one would need to exempt such a rule from all normal constraints on
movement. On the other hand, semantic devices for lifting an indefinite NP denotation out of
its context would need to be prevented from applying to other quantificational NPs as well.

Nonetheless, let us continue to assume that indefinite NPs unambiguously denote
(existential) quantifiers, and let us now assume also, for the sake of argument, that for the
purpose of scope assignment they can be dislocated from their observable position by some
unrestricted mechanism which is somehow insensitive to the usual scope and movement
islands – say, ‘island-free QR’. This describes the observations in the present section. The
following section presents arguments to the effect that these, already highly questionable,
assumptions are still not sufficient to describe all scope properties of specific indefinites.
3.2 Against ‘island-free QR’

This section takes as its point of departure a straw-man ‘island-free QR’ theory of specificity: indefinite NPs unambiguously denote quantifiers, which may be assigned wide scope regardless of the usual island constraints on movement and scope taking. Several types of observations argue against this approach: it both overgenerates and undergenerates readings. Fodor and Sag (1982) pointed out that on the island-free QR approach, one expects indefinites to be able to scope out of islands without necessarily having the widest scope in the structure; they claimed this is not the case (section 3.2.1). Fodor and Sag argued further that if indefinites are always quantifiers, they disregard not only island conditions, but also conditions on free variables in VP-deletion contexts (section 3.2.2). Ruys (1992) pointed out that if indefinites freely take wide scope, one naturally expects plural indefinites to freely take wide, distributive scope as well; he claimed this is not the case (section 3.2.3).

3.2.1 Intermediate readings

Having established the point made above in section 3.1, Fodor and Sag (1982) presented an empirical argument against an ‘island-free QR’ hypothesis. Consider (23):

(23) Every professor overheard [\(s_p\) the rumor [\(c_p\) that a student of mine had been called before the dean]].

a. + Every professor \(x\) [\(x\) overheard the rumor [that a student of mine \(y\) [\(y\) had been called before the dean]]].

b. – Every professor \(x\) [a student of mine \(y\) [\(x\) overheard the rumor that [\(y\) had been called before the dean]]].

c. + A student of mine \(y\) [every professor \(x\) [\(x\) overheard the rumor that [\(y\) had been called before the dean]]].

The indefinite \textit{a student of mine} is embedded in an extraction island (the complex NP \textit{the rumor that . . .}); this NP itself is c-commanded by yet a higher quantifier, the matrix subject
every professor. If the scope of indefinites were indeed unbounded, one would expect a student of mine to be able to remain within the complex NP that contains it in overt syntax (as in 23a), or to leave the complex NP and land below the matrix subject (23b), or to take widest scope (23c). Fodor and Sag claimed that just the (b)-reading is unavailable. The unavailability of such ‘intermediate island-escaping readings’ for specific indefinites seems virtually impossible to describe with any ‘free-scope’ mechanism: if the indefinite is able to move all the way up to a position outside the scope of the matrix subject, then surely it should be able to move less far, and land outside the complex NP but below the matrix subject. Therefore, Fodor and Sag returned to the hypothesis, rejected by Fodor (1970) and others, that specificity is due to a binary ambiguity in the indefinite NP itself. An indefinite can be a quantifier, in which case it may undergo local QR but not leave an island: (23a). Or it can be a referential expression, in which case it is insensitive to all scope effects and yields a reading nearly equivalent to (23c).

Fodor and Sag’s elegant demonstration has been the subject of considerable debate in the literature. Many counter-examples to the supposed impossibility of island-escaping intermediate readings have been put forward; we will turn to these in section 4.

3.2.2 VP ellipsis

Fodor and Sag (1982) presented one more imaginative argument in favor of a binary, quantificational/referential ambiguity in indefinites, based on a generalization from Sag (1980) and Williams (1977) concerning VP-deletion examples such as the following ((24a) from Fodor and Sag, (24b) from May 1985, (24c) from Fiengo and May 1994):

\begin{align*}
(24) \quad & a. \quad \text{Someone \([_{VP1}\text{ loves}\ everyone]\). Chris knows that someone does \([_{VP2}\text{ e}]\).} \\
& b. \quad \text{Some student \([_{VP1}\text{ admires}\ every\ professor]\), but John doesn’t \([_{VP2}\text{ e}]\).}
\end{align*}
c. Some student \([_{\text{VP1}} \text{hit everyone}]\), and Max did \([_{\text{VP2}} e]\), too.

The observation is that the italicized direct object may not scope over the subject in this context, in which VP1 functions as antecedent for the elided VP2. The Sag/Williams generalization was (roughly) that a VP containing a free variable may not function as antecedent for an elided VP. This explains the observation: for the italicized NP to scope over the subject, it must move out of VP1, thereafter binding a variable in VP1; VP1 then contains a variable that is free in VP1; hence VP1 can no longer function as antecedent for VP2.

Now consider (25) ((25b) is from Fox 1995b):

(25) a. Sandy thinks that every student in our class \([_{\text{VP1}} \text{plays chess better than a guy I beat this morning}]\). Chris thinks that every student does \([_{\text{VP2}} e]\) too.

b. Exactly half the boys \([_{\text{VP1}} \text{admire a certain professor}]\), and Mary does \([_{\text{VP2}} e]\) too.

(26) A certain professor x \([_{\text{VP1}} \text{admire x}]\), and a certain professor x \([_{\text{VP2}} \text{admire x}]\) too.

In (25), the italicized indefinite in VP1 may be interpreted outside the scope of the quantificational subject. For instance, (25b) may involve one particular professor whom exactly half the boys admire. This cannot be due to a quantificational reading of the indefinite, as that would involve a variable free in the antecedent VP1 – this is illustrated for (25b) in (26). Hence, indefinites must possess some other means of creating the impression of a wide-scope construal. This is the referential reading of indefinites.

Fodor and Sag’s assumptions do allow for a potential escape from this conclusion, but its correctness depends on subtle and undecided intuitions. The Sag/Williams generalization comes with an exception clause: a VP containing a free variable may antecedent an elided VP, provided that the same quantifier instance binds both variables. This is exemplified in (27) (Williams 1977: (85)): 
(27) a. John saw everyone before Mary did [VP e].
    b. Everyone x [John [VP₁ saw x] before Mary [VP₂ saw x]].

One of the readings of (27a) is given in (27b): here each of the antecedent and elided VPs contains a free variable, but both variables are bound (outside VP) by the same instance of everyone. Given this option, the indefinite in (25) might be interpreted through wide-scope quantification, provided that the quantifier takes scope over both conjuncts, and binds two variables Across-the-Board, as illustrated in (28) for (25b):

(28) A certain professor x [[exactly half the boys [VP₁ admire x]], and [Mary does [VP₂ admire x] too]].

However, unlike the proscribed structure (26), the ATB structure (28) is associated with a maximal-scope reading by which the same professor is admired by exactly half the boys and by Mary. Fox (1995b: fn. 44) reports that speakers’ intuitions are unclear on whether this is indeed the only available reading. It is not clear to me from their discussion which of the two wide-scope readings Fodor and Sag perceived to be available; but their treatment of indefinites is such that the two instances of the indefinite may have different referents, suggesting that they would not be satisfied with a restriction to (28). It is possible also that Fodor and Sag did not envisage the option that a quantifier might take cross-sentential scope, as an ATB analysis of their example, (25a) above, would require. Under DRT and related dynamic approaches to semantics, however, the option of cross-sentential quantification cannot be ruled out. So, a quantificational approach to the wide scope of indefinites is still conceivable; but the cross-sentential case (25a) does rule out a description in terms of syntactic movement.

Quite apart from the possible ATB analysis of (25), the Sag/Williams generalization that Fodor and Sag rely on has itself not remained unchallenged. Hirschbühler (1982) presented examples such as (29) that contradict it ((29b) and (29c) from Fox 1995b; (29d) from Fiengo and May 1994):
(29) a. A Canadian flag was \([\text{VP}_1\text{ hanging in front of each window}]\), and an American one was \([\text{VP}_2\text{ e}]\) too.

b. One guard is \([\text{VP}_1\text{ standing in front of every building}]\), and one policeman is \([\text{VP}_2\text{ e}]\) too.

c. Some boy \([\text{VP}_1\text{ admires every teacher}]\) and some girl does \([\text{VP}_2\text{ e}]\) too.

d. Some student \([\text{VP}_1\text{ hit everyone}]\), and some professor did \([\text{VP}_2\text{ e}]\), too.

Further counter-examples are due to Lappin (1992, 1993) ((30a) cited from Fox 1995b; (30b) cited from Fiengo and May 1994):

(30) a. At least one MP \([\text{VP}_1\text{ attended every committee meeting}]\), and Bill did \([\text{VP}_2\text{ e}]\), too.

b. A guide \([\text{VP}_1\text{ accompanies every tour of the Eiffel Tower}]\), and Jeanne does \([\text{VP}_2\text{ e}]\), too.

In each of these examples, the italicized NP may take wide scope. Furthermore, the examples in (31) are incompatible with an Across-the-Board analysis as considered in (28) ((31a) from Hirschbühler; (31b) from Fiengo and May; (31c) from Fox):

(31) a. A Canadian flag was \([\text{VP}_1\text{ hanging in front of most windows}]\), and an American one was \([\text{VP}_2\text{ e}]\) too.

b. A Canadian flag was \([\text{VP}_1\text{ hanging in front of many windows}]\), and an American flag was \([\text{VP}_2\text{ e}]\), too.

c. A guard is \([\text{VP}_1\text{ standing in front of many buildings}]\), and a policeman is \([\text{VP}_2\text{ e}]\) too.

For instance, no building needs to have both a guard and a policeman standing in front of it for the wide-scope reading of (31c) to be true. So the Williams/Sag generalization requires modification. Fox (1995b) suggests that the correct generalization is this: the inverted scope order is allowed in the antecedent structure just in case inverting the order in the elided structure will also have some semantic effect; if not, economy forbids QR in the elided
structure, and then the parallelism requirement on deletion forbids QR in the antecedent structure as well. QR is disallowed in, say, (24b) because whether every professor takes wide or narrow scope relative to John makes no semantic difference. In (29) and (31) the right-hand conjunct has a quantified subject; crossing it will have a semantic effect, hence we obtain a wide-scope reading for the objects in both conjuncts. If this is the correct generalization, then the specific reading of a certain professor in (25b) still argues against a QR explanation of specificity. But if we manage to derive a quantificational wide-scope interpretation for the indefinite by some mechanism, other than QR, that is insensitive to this type of economy, then economy is not violated here and we may still avoid a referential/quantificational ambiguity. See the references cited above for further discussion.

3.2.3 Distribution and scope

So far, we have considered only singular number indefinites. When we take plural indefinites into account, an additional problem arises for an ‘island-free QR’ approach to specific indefinites, as pointed out in Ruys (1992). Consider first (32):

(32)   a. Three relatives of mine wore a tie.

        b. \( \lambda P \left[ \left[ \text{relative_of_mine}' \cap P \right] \geq 3 \right] (\lambda x \exists y [\text{tie}'(y) \land \text{wear}'(y)(x)]) \)

The natural interpretation of (32a) is a ‘distributive’ (as opposed to ‘collective’) one: my three relatives did not together wear one and the same tie, but each his own. How this distributive reading for three relatives of mine is achieved depends, among other things, on the semantic treatment of plurals. We obtain the distributive effect for free with the simplest Generalized Quantifier (GQ) interpretation of the subject, as in (32b). Alternatively, if the subject basically denotes a plural individual (see, e.g., Link 1983), a distributivity operator needs to be applied in order to obtain this reading. In any case, whatever the analysis, we observe that three relatives of mine must be granted a distributive interpretation.

Keeping this simple observation in mind, consider (33).
(33) a. If three relatives of mine die, I will inherit a house.

b. [three relatives of mine, [[if t_i die] I will inherit a house]].

c. \( \lambda P \left[ \left( \text{relative_of_mine}' \cap P \right) \geq 3 \right] \lambda x_i \left[ \text{IF } x_i \text{ dies THEN I will inherit a house} \right] \).

d. \( \exists X \left[ X \subseteq \text{relative_of_mine}' \wedge |X| = 3 \wedge \text{IF X die THEN I will inherit a house} \right] \).

Suppose, as before, that NPs such as \textit{three relatives of mine} may undergo island-free QR. Then we derive the LF (33b), and we expect the interpretation represented in (33c). That is, we expect \textit{three relatives of mine} to allow a distributive reading with scope over the \textit{if}-clause, which says that there are three relatives of mine such that, if \textit{any one} of them dies, I inherit a house. But this reading is not available. That is not to say that plural NPs such as \textit{three relatives} cannot be specific. There is a reading on which \textit{three relatives of mine} escapes the \textit{if}-clause, but only the one roughly stated in (33d): there are three relatives of mine, such that if they \textit{all} die, I inherit a house. In other words, while existential quantification over (sets of) relatives of mine can take scope outside the extraction island (so that we find the entailment properties illustrated for (19c) above), the distributivity that the NP normally allows cannot scope over the island.\(^{17}\)

Consider some examples from Winter (1998) that illustrate this further:

(34) \#Every artist who was born in \textit{three cities} became famous.

(35) \#If \textit{three women} gave birth to John then he has a nice mother.

To begin with, (34) has an odd narrow-scope reading for \textit{three cities}, which attributes fame to every artist with a triple birthplace. The sentence also has the (equally odd) specific reading that there is a set of three cities, such that every artist born in all three of them became famous. The wide-scope distributive reading (there are three cities \(x\), such that every artist born in \(x\) became famous) would not share this oddity; hence we would expect it to be highly prominent if it were available. As we find (34) to be odd, the wide-scope distributive reading must be impossible; similar observations apply to (35). (36) and (37) provides further evidence ((36) from Ruys 1992):
(36) John overheard the rumor that some friends of mine had been called before the dean.

(37) I met a man who wore three neckties with red polka dots.

(36) allows an island-escaping specific reading for the plural indefinite, but it is necessarily about one single rumor. (37) is not ambiguous (the wide-scope non-distributive reading and the narrow-scope reading happen to be equivalent here) and entails the existence of a man wearing three neckties – if the indefinite could both take wide scope (as we know it can) and distribute, the sentence should allow for different men wearing each of those ties.18

It follows from these observations that positing a simple-minded ‘island-free QR’ predicts readings that are in fact not available. If a plural indefinite can be lifted out of an island, as illustrated in LF (33b), then how do we prevent the interpretation (33c), assuming that the NP denotes a simple GQ? And if we take the more sophisticated view that indefinites start out with a collective interpretation, then how do we prevent the usual mechanisms for deriving distributivity from applying once the NP is outside the island?

One option that springs to mind is that, perhaps, ‘island-free QR’ may apply only to collectively interpreted NPs to begin with – but this maneuver is easily blocked:19

(38) If three workers on our staff have a baby soon, we will have to face some hard organizational problems.

a. \( \exists X \ [X \subseteq \text{workers'} \wedge |X| = 3 \wedge [\text{IF } \forall x \in X \ (x \ has \ a \ baby) \ THEN \ we \ face \ problems]] \).

b. \( \exists X \ [X \subseteq \text{workers'} \wedge |X| = 3 \wedge \forall x \in X \ [\text{IF } (x \ has \ a \ baby) \ THEN \ we \ face \ problems]] \).

(38) allows a specific reading for three workers on our staff (without distribution over the if-clause), but on this reading each worker may still have her own baby. Schematically: although (38b) is not allowed (wide-scope existential, wide-scope distribution), (38a) is
(wide-scope existential, narrow-scope distribution). There is distributivity associated with specific NPs, but it is island-restricted.

So far, we have looked at plural specific NPs in islands, and observed that they may not scope and distribute over those islands. We conclude that an ‘island-free QR’ analysis of specificity faces severe problems. But a similar point can be made on the basis of much simpler examples (Ruys 1992). If it were really the case that indefinite NPs undergo QR so easily, and with such greater freedom than other quantifiers do as the initial specificity data seem to suggest, then we certainly expect them to take wide scope with supreme ease when no islands intervene. And indeed, an indefinite in object position, as in (18), effortlessly escapes the scope of a quantifier in subject position. But when the specific object-NP is plural, we find that it allows a distributive reading with wide scope over the subject only with great difficulty, if at all. Consider (39):

(39) Two boys read three books.
   a. [three books, [two boys read t]].
   b. \( \lambda P [\text{books} \cap P \geq 3] (\lambda x, [two \text{ boys read } x]). \)

Given the supposed exceptional wide-scope propensity of indefinites, we would expect LF (39a) with the interpretation (39b) to be most readily available. This is not the case. The boys may not vary with the books: for (39) to be judged true it is not sufficient that each of three books was read by a different set of two boys, or it is only marginally so. Evidence has been available since at least the mid-1970s, and consensus growing since the early 1990s, that weak plural NPs take inverse wide scope in this sense much less easily than strong quantificational NPs such as every friend of mine (cf. Ioup 1975b; Verkuyl 1988; Liu 1990; Ruys 1992, 1997; Beghelli 1993, 1995; Kamp and Reyle 1993; and references cited there). Consider also structures with inverse linking, in which strong quantifiers preferably take inverse scope (May 1977):
(40) a. Een paar mensen in iedere stad hadden de luchtballon gezien.
    a few people in every city had the hot-air balloon seen
b. Een paar mensen in drie steden hadden de luchtballon gezien.
    a few people in three cities had the hot-air balloon seen

(41) a. Two pictures of every senator were on sale at the gift shop.
    b. Two pictures of three senators were on sale at the gift shop.

In Dutch, (40b), unlike (40a), is interpreted as making a statement about a few people each of whom were in three cities. Similarly, (41b) is about two ‘three-senator pictures’, not (or only marginally) about three times two ‘single-senator pictures’, in contrast with (41a), which easily allows wide scope for every senator. Consider finally (42):

(42) a. Everyone believed that three friends of mine had been called before the dean.
    b. A professor believed that three friends of mine had been called before the dean.
    c. Three friends of mine, [a professor believed that t₁ had been called before the dean].

If the wide-scope, specific reading of three friends of mine relative to believed and everyone in (42a) were due to non-clause-bounded QR, we would equally expect (42b) to have the LF (42c). But the evidence is against this, as three friends of mine cannot take wide distributive scope over a professor.

We seem to be faced with a contradiction. When we look at one set of data, such as presented in section 3.1, which show island-escaping specificity, we want to allow indefinites unlimited, ‘island-free’ QR. But to explain the absence of wide-scope distributive readings for indefinites outside islands, and even locally, we want to prevent indefinites from undergoing QR altogether. There are several ways of resolving the contradiction.

One option is to give up the assumption that specificity is due to wide-scope quantification, and to follow Fodor and Sag (1982) in returning to a
referential/quantificational ambiguity in indefinites. Apparent wide scope is then due to the referentiality option, and we can, without contradiction, attempt to explain the limited distributive scope of indefinites in terms of limited QR. This option is discussed in section 4.

Another option is to describe the interpretation of indefinite NPs in terms of one mechanism for existential quantification over plural or singular individuals, and a separate mechanism for distributivity. We must then ensure that existential quantification can take unlimited scope, while the domain of application of the distributivity operator is kept very local. If we pursue this option, an approach that manages to assign an indefinite its wide existential scope without displacing the indefinite itself is preferred, as the in-situ distributive properties of the indefinite are then likely to follow automatically. We will discuss such an approach in section 5. In contrast, an approach that does, through syntactic movement or some other means, displace the indefinite in order to derive its existential scope must define and motivate some way of separating the distributive mechanism from the indefinite and ensure that it does not acquire unbounded scope. To appreciate some of the difficulties such an approach would have to overcome, note that it must, all the same, allow distributive readings for plural weak NPs that are displaced in overt syntax through A-movement or A-bar-movement, as in (43) and (44), and even wide-scope distributive readings in certain examples that appear to be due to QR, as in (45b) (from Reinhart 1997):

(43) Fifty US senators appear to at least one supreme court judge to have violated the constitution.

(44) Three languages are spoken by over a billion people.

(45) a. Which men did some woman love?

b. A guard is standing in front of two buildings.

For instance, (44), where *three languages* c-commands *over a billion people* only after A-movement, allows wide distributive scope for *three languages*: it is true if each of three
languages is spoken by a different set of over a billion people. (45a) can be answered by providing a set of men each of whom was loved by a different woman.

We want to mention briefly another popular account of structures containing specific indefinites (as in (17), (39), etc.) which avoids island-free QR and diagnoses them as instances of branching quantification (see, e.g., Liu 1990; Ruys 1992), as illustrated for (39) in (46):

(46) Two boys read three books.
    a. \[ \begin{array}{c}
        \text{three books } y \\
        \\xrightarrow{\text{x read } y} \\
        \text{two boys } x
    \end{array} \]

The usual interpretation for branching quantification structures such as (46a) is that the value for a quantifier on one branch does not vary with the value for quantifiers on other branches.\(^{21}\) So, *three books* in (46a) is not in the scope of *two boys* (wide ‘existential’ scope for *three books*), but neither is *two boys* in the scope of *three books* (no ‘distributive’ wide scope for *three books*) – this seems to be exactly what we need.\(^{22}\) The crucial problem, of course, is how to (compositionally) derive (a denotation equivalent to) (46a) given the syntactic structure of the sentence. Another problem is that a quantifier on one branch cannot bind a variable in the restrictive clause of a quantifier on another branch, which is what we would need if we wanted to use a branching quantification structure to represent the specific reading of a quantifier A relative to B when A is contained in B. So the representational mechanism does not work in cases such as (40b) and (41b) (‘inverse linking’), or for island-escaping examples such as (18) and (21).

A syntactic description of specificity might, however, build on the ‘branching quantification’ insight by attempting to encode ‘branching’ relations among quantifiers in syntactic representations. Now, the desired type of ‘upward branching’ cannot be directly encoded in tree structures (in any sensible syntactic representation of (46), either *two boys* c-commands *three books* or vice versa). So to implement this idea, syntactic representations
must be enriched with a diacritic mechanism with which the relative scopal dependence or independence of any two quantifiers (or other scoped expressions) can be encoded. This is not an attractive prospect, unless considerable independent evidence for such a diacritic mechanism can be adduced. Furthermore, the problem of compositional interpretation of such ‘scope-marked’ syntactic representations is not at all straightforward.

In conclusion, an analysis that assigns wide scope to indefinites by raising them to a scope position across an unlimited distance (be it a syntactic ‘island-free QR’ or an unrestricted semantic storage mechanism) is not the optimal description (let alone explanation) of specificity effects. Such an analysis is likely to predict unattested wide-scope distributive readings for indefinites, unless special precautions are taken to prevent this. An analysis that does not predict such distributive readings is to be preferred.

3.3 ACD and specificity

We might look for syntactic clues to determine whether the island-escaping scope of indefinites is due to syntactic movement, but we don’t expect to find much evidence either way. QR does not, for instance, appear to feed Binding Theory in general (see chapter 54). One small piece of evidence, however, comes from Antecedent Contained Deletion. If ACD resolution is generally due to QR (see, e.g., May 1985; Fox 1995a; Kennedy 1997a), then a syntactic ‘island-free QR’ hypothesis would lead us to expect wide-scope indefinites to license unlimited ACD. We cannot look directly at island-escaping specificity, though:

\begin{enumerate}
\item a. Mary [VP1 dates every man who knows a producer OP Sue does [VP2 e]].
\item b. [IP [NP a producer OP Sue does [VP2 e]], [IP Mary [VP1 dates every man who knows t]]].
\item c. *[IP [NP a producer OP, Sue does [VP2 date every man who knows t]], [IP Mary [VP1 dates every man who knows t]]].
\end{enumerate}
d. *There is a producer x such that Sue dates every man who knows x, and such that Mary dates every man who knows x.

(47a) does not allow VP1 to antecede the empty VP2: the reading given in (47c), paraphrased in (47d), is not available. But this does not in itself entail that LF (47b) is not derived. If it were, matrix ACD resolution should still be out because the relation between the relative pronoun OP and the trace inside the copied VP, VP2′, violates the CNPC in (47c). Consider, however, (48), from Kennedy (1997a):

(48) John \[VP1 believed that Bill [VP2 had seen a certain film that I did [VP3 e]]].

(48), according to Kennedy, has a de re reading with a certain film that I did specific relative to believed, but even on this matrix-scope reading, only VP2 may antecede the empty VP. Wide-scope specific readings apparently do not feed ACD resolution. This accords with our observation in section 3.2.3 that if indefinites undergo QR, QR must be (very) local.

3.4 Conclusions

In this section, we have investigated the option of analyzing the specific/non-specific ambiguity as a scope ambiguity. Several conclusions may be drawn from this section. First, if the scope of indefinites is to be determined in syntax, it cannot be through a rule of movement; that hypothetical rule would exhibit such extraordinary properties as to render its characterization as a syntactic movement rule vacuous. As a corollary, nothing can be learned about QR by observing the scope of singular indefinite NPs, as in everyone loves someone. Second, if specificity is a scope phenomenon, and not due to a referential reading on indefinites, then the mechanism responsible for the scope of indefinites cannot be just the same one that also assigns scope to other quantificational NPs. QR is not a viable option; neither is a semantic storage mechanism that applies to all quantifier types. Third, if
specificity is due to scope, not referentiality, then the mechanism that determines the scope of indefinites, be it syntactic or semantic, must distinguish two scope properties: free existential scope and scopally restricted distribution. This is likely to be easier when the indefinite itself is not displaced. Again, QR is not indicated, and neither is semantic storage. In section 5, we discuss one theory on the scope of indefinites that satisfies these requirements.

Several other issues have arisen that require further discussion. As we observe that not only singular indefinites but also plurals allow specific readings, we want to delineate the exact class of NPs that come with this property. Until we turn to that task in section 8, we will simply speak of ‘indefinite NPs’ as the relevant class. More urgently, we want to ascertain whether Fodor and Sag’s ‘intermediate reading’ argument indeed provides conclusive evidence for a binary ambiguity in the indefinite, and against the scope ambiguity approach. This is the subject of the next section.

4 Intermediate readings

In section 3.2.1 above we outlined Fodor and Sag’s (1982) claim that a specific indefinite cannot take island-escaping intermediate existential scope: a student of mine cannot scope above the rumor but below every professor in (23). If true, this implies that an indefinite does itself not denote an (existential) quantifier that is somehow interpreted at an arbitrary distance from its surface position. We subscribe to this conclusion. But there is a stronger implication. Specificity cannot involve quantification at all, unless one can define some quantificational mechanism that can take island-escaping maximal scope, but not island-escaping non-maximal scope. As they see no non-stipulative way of accomplishing this, Fodor and Sag return to the binary ambiguity position: indefinites are interpreted either through local quantification, or as referential expressions. Must we adopt this conclusion as well? This section outlines the case against it.
The weak point in Fodor and Sag’s claim is that it involves subtle intuitions on complex examples containing at least three scope elements: the indefinite; the scope island from which it escapes; and the higher scoped expression below which the indefinite may or may not remain. Even before Fodor and Sag’s paper had appeared in *Linguistics and Philosophy* in 1982, counter-examples to their generalization had been presented. The following is from Farkas (1981):

(49) Each student has to come up with \[\text{NP three arguments which show that some condition proposed by Chomsky is wrong.}\]

It is fairly easy to obtain an intermediate scope reading for the italicized NP, saying that each student has some (different) condition assigned to her, and must come up with three arguments regarding that particular condition. Unfortunately, as pointed out by Reinhart (1997), the wide-scope reading of the italicized NP relative to the complex NP entails the narrow-scope reading, so that we may just be considering a special case of the narrow-scope reading here, not a separate reading (cf. section 2.1). But this is easily fixed:

(50) a. Each student has to come up with \[\text{NP exactly three arguments which show that some condition proposed by Chomsky is wrong.}\]

b. Each student \(x\) [some Chomsky-condition \(y\) \(x\) has to come up with exactly three arguments which show that \(y\) is wrong]].

There is a fairly strong intuition that (50a) has the reading schematized in (50b). If so, this is a reading that cannot be attributed to QR, for reasons outlined in the previous section, or to a referential reading of the indefinite, as the choice of problem varies with each student. It now appears that intermediate island-escaping readings are possible, so that Fodor and Sag’s argument collapses.

Many other authors have taken up Fodor and Sag’s challenge and constructed examples which display intermediate readings; see, e.g., Partee and Rooth (1983), King (1988),
Ludlow and Neale (1991), Ruys (1992), Abusch (1994), and Reinhart (1997) for elaborate discussion of Fodor and Sag. We shall not go into all the details or discuss all the examples. We will present a few representative cases and consider ways of making the relevant intuitions more secure. Below are some more simple cases, from Abusch (1994) and Reinhart (1997):

(51) a. Every gambler will be surprised if one horse wins.

    b. Most linguists have looked at every analysis that solves some problem.

In both cases, the narrow-scope reading runs counter to our knowledge of the world; in (51b), the maximal-scope reading does so as well. This favors the intermediate-scope reading, which is felt to be available.

Ruys (1992) investigates several ways of rendering intermediate readings more easily detectable by suppressing the other two readings. The wide-scope reading can be eliminated by placing a pronoun bound by the higher quantifier inside the indefinite ((52b) is from Abusch):

(52) a. Every professor, will rejoice if a student of his, cheats on the exam.

    b. Every professor, rewarded every student who read a book he, had recommended.

In these examples, only two potential scope positions for the indefinite are left (given that we choose a bound reading for the pronoun) – the intermediate reading thereby becomes more prominent. Combining this with a mechanism that strengthens the specific reading (although such mechanisms are hard to find and ill-understood, as we will see later (section 8), we obtain examples where the intermediate reading is strongly favored:

(53) a. Every professor, will rejoice if a certain student of his, cheats on the exam.

    b. Every professor, rewarded every student who read a particular book he, had recommended.
Another method for isolating intermediate readings employed in Ruys (1992) requires some introduction. Recall from section 2 Karttunen’s (1968) observation that an indefinite structurally embedded below a scope-taking expression may nonetheless introduce a discourse referent if it is interpreted specifically. Island-escaping specificity licenses discourse anaphora as well:

\[(54)\]
\begin{itemize}
  \item a. If a relative of mine dies, I will inherit a fortune. He got lucky on the derivatives market.
  \item b. Mary dates every man who has met a producer I know. She wants to talk about him all the time.
\end{itemize}

We may use this property to influence the scope of an indefinite, provided that we control for two exceptions to Karttunen’s generalization. First, a plural pronoun may be used to pick up the collection of all verifying values for an indefinite in the scope of a quantifier: in (55a), they may be taken to refer to all the girls the boys brought to the party. Second, when the pronoun is in the scope of a quantifier as well, it may have a functional reading relating it to the indefinite narrow-scope antecedent (cf. note 2); see (55b). (For work on such issues see Kamp and Reyle 1993, Chierchia 1995a, and references cited there; see also chapter 9.)

\[(55)\]
\begin{itemize}
  \item a. Every boy brought a girl to the party. But they/*she got bored quickly.
  \item b. Every boy brought a girl to the party. And every boy took her home as well.
\end{itemize}

Given this background, we can use donkey anaphora structures to elicit wide-scope readings. The principle is illustrated in (56):

\[(56)\]
\begin{itemize}
  \item a. He often reads a book about linguistics.
  \item b. [Anyone who often reads a book about linguistics] understands it well.
  \item c. [Anyone who often reads a book about linguistics] understands them well.
  \item d. [Anyone who often reads a book about linguistics] usually understands it well.
\end{itemize}
The ambiguity of (56a) shows that in structures such as this, the indefinite *a book about linguistics* may take wide or narrow scope relative to the adverbial *often*. Next, when we embed the structure in such a way that the indefinite becomes the antecedent for a donkey anaphor, we observe the same effects that occur with discourse anaphora, only one ‘scope level’ down. A singular indefinite may antecede a singular donkey anaphor provided that the indefinite is not scopally embedded, except of course relative to the universal quantifier which also takes scope over the pronoun. In other words, the indefinite must occur in the immediate scope of the ‘unselective binder’ *anyone*. Thus, there is only a wide-scope reading relative to the adverbial for the indefinite in (56b). If we want to achieve narrow scope for the indefinite, we must either use a plural pronoun, as in (56c), cf. (55a), or use a similar adverbial to take scope over the pronoun, as in (56d), cf. (55b).

By placing the donkey antecedent in a scope island, we can now force an island-escaping intermediate-scope reading:

(57) a. Every critic who reviews each and every book that *some author* writes quickly grows sick of *him*.
   b. Every country whose security is threatened if *a building* is attacked by terrorists protects *it* well.
   c. Whenever Beatrix overhears the rumor that *some politician* is corrupt, *the poor slob* loses his job.

We observe that the pronouns in (57) can function as donkey anaphors, with their antecedents taking intermediate island-escaping scope. In (57a), for instance, *some author* cannot be referential, since it is in the scope of *every*, but it must scope outside the embedded complex NP or it could not antecede a singular donkey pronoun. (57c) is interesting in that it allows an intermediate reading even though its structure mirrors that of Fodor and Sag’s example (23). See Ruys (1992: 213ff.) for examples with other island and donkey anaphora types; see also Abusch (1994: 93).
There may be yet another, more theory-internal argument for the existence of intermediate island-escaping specificity. Recall from section 3.2.3 that the mechanism responsible for specificity does not yield distributive wide-scope readings. Consequently, distributive wide scope must be the effect of some other scope mechanism, e.g., (island-bound) QR. We found that in most structures, including simple SVO configurations such as (46), plural indefinites take distributive inverse wide scope with great difficulty, if at all. That would entail that (almost) any structure is a QR-island for indefinites; in particular, one might suppose that such NPs are never subject to QR. If so, any scope position that does not match the indefinite’s syntactic surface position is ‘island-escaping’ and must be due to the specificity mechanism. And any such scope taking would falsify Fodor and Sag’s claim if it were non-maximal. Consider (58) (cf. Ruys 1992 for a similar example):

(58) I doubt that every senator will accept a proposal endorsed by Obama.

(58) supports a reading paraphrasable as ‘I doubt that there will be a proposal endorsed by Obama which every senator will accept’. On such a reading, the indefinite a proposal endorsed by Obama takes scope over the universal QP every senator, be still below doubt. But if this reading is a case of specificity, specificity cannot be due to referentiality (which can only give rise to apparent maximal scope). If this line of reasoning is valid, we could conceivably even recycle one of the original arguments against a binary, referential/quantificational ambiguity of indefinites, namely the intermediate reading in examples such as (14).

When we accept the findings reported in this section, Fodor and Sag’s main argument for a binary referential/quantificational ambiguity in indefinites no longer holds. Instead, we have again a version of the argument against such a binary ambiguity, such as resulted from the work of Fodor (1970) and others, as discussed in section 2. Since intermediate-scope readings sometimes arise, as in (14), we need to assume a quantificational mechanism whose scope need not reflect the surface position of the indefinite. Since intermediate island-escaping scope readings sometimes obtain, as we now find, we need to assume that this
quantificational mechanism is insensitive to scope islands. Hence, there is no need to assume a referential interpretation of indefinites as well, since the ‘maximal-scope’ readings that would result from that also follow from the required quantificational mechanism.

The next section discusses two approaches that are able to derive intermediate readings, and how the mechanisms posited by such approaches need to be constrained to avoid overgeneration.

5 Choice functions

We find ourselves with the following desiderata for a theory of specificity. It must specify a quantificational mechanism that is involved in the interpretation of indefinites, which can take any scope without being sensitive to scope islands, and which allows no distributive specific readings. Several quantificational mechanisms for indefinites have been proposed that meet these requirements to some degree (see, e.g., Ruys 1992; Abusch 1994; Farkas 1997; Kratzer 1998). It would not serve the purposes of our discussion to consider them all and compare their relative merits; empirical differences falling within the purview of this chapter are slight and not always essential. We will first outline one treatment of the scope of indefinites, which was proposed by Tanya Reinhart in (1997) and earlier work, and refined and developed further in Winter (1997, 1998).

We concluded in section 3.4 that a description of the scope of indefinites is more likely to meet the empirical requirements if it does not involve movement, especially syntactic movement, of the indefinite itself. This entails that we must assume that the quantifier whose scope determines the existential import of the indefinite is not part of the interpretation of the indefinite itself; e.g., some does not denote the existential quantifier. The obvious alternative is to make use of the mechanism of default existential closure familiar from DRT (Kamp 1981a; Heim 1982; Kamp and Reyle 1993). But it is well known (see, e.g., Heim 1982) that existential quantification over individuals will not work for our purposes, as (18a), repeated as (59a), shows:
(59)  a. If a relative of mine dies, I will inherit a fortune.

   b. \( \exists x \text{ IF relative_of_mine}(x) \land \text{die}(x) \) THEN I will inherit a fortune.

DRT holds that the indefinite *a relative of mine* is interpreted as an open sentence \( \text{relative_of_mine}(x) \); default existential closure binds the variable. If we now allow a default quantifier at matrix level to bind that variable in (59b), we have matrix scope but not the correct meaning, as the descriptive content of the indefinite is still interpreted inside the *if*-clause. (59b) does not state there is a relative of mine with such-and-such property, but that there is an individual such that *if* he is a relative of mine, I inherit. This comes out true if there exists any individual who is not a relative of mine. The reason is that we can then pick as a value for \( x \) any individual not a relative of mine; this will render the antecedent clause false; hence the implication should be judged true. We want to solve this problem without extracting the indefinite from the *if*-clause. Reinhart’s solution to this puzzle, which occurs also when we want to interpret *wh*-expressions in situ (see chapter 77), was to use default existential quantification over choice function variables instead.

We will use the provisional definition of choice function, \( \text{CF} \), in (60):

\[
(60) \quad \text{CF} =_{df} \lambda f \langle e, t \rangle. \forall P \langle e, t \rangle [P \neq \emptyset \rightarrow P(f(P))]
\]

A choice function is a function which, when applied to a non-empty set, yields as its value a member of this set. (we briefly address the empty set case at the end of this section). Reinhart assumed that the free variable that DRT postulates in the interpretation of an indefinite is not of type \( e \) (individual) but of the type of \( \text{CF} \). This free function variable takes the set denoted by the descriptive content of the indefinite as its argument; the resulting individual is the denotational value of the indefinite DP. The function variable is bound through default existential quantification. For example, (61a) is interpreted as (61b):

\[
(61) \quad \begin{align*}
   & a. \quad \text{A woman entered the room.} \\
   & b. \quad \exists f [\text{CF}(f) \land f(\text{woman}) \text{ entered the room}].
\end{align*}
\]
(61b) paraphrases as: ‘there is some manner of choosing, such that the woman chosen in that manner entered the room’; in other words: ‘some woman entered the room’. Given these assumptions, (59) now comes out correctly, as shown in (62):

\[
\begin{align*}
(62) & \quad \text{a. IF } \exists f [\text{CF}(f) \land f(\text{relative_of_mine}) \text{ dies}] \text{ THEN I will inherit a fortune.} \\
& \quad \text{b. } \exists f [\text{CF}(f) \land \text{IF } f(\text{relative_of_mine}) \text{ dies THEN I will inherit a fortune}].
\end{align*}
\]

A relative of mine is interpreted, in situ, as \(f(\text{relative_of_mine})\); default existential closure states that there is a \(f\) with the indicated property. If closure applies immediately, as in (62a), we get just the narrow-scope reading for the indefinite. We obtain specificity of the indefinite relative to the \(\text{if}\)-clause when default existential closure takes place outside this clause, as in (62b). (62b) paraphrases as ‘there is a way of choosing an individual from a set, such that if the person we choose from my relatives in that way dies, then I inherit a fortune’. This does not fail in the way (59a) did, as it cannot be rendered trivially true by picking some individual that is not a relative of mine. Supposing that I have relatives, \(f\), being a CF, is guaranteed to pick a relative of mine when applied to relative of mine. (62b) then comes down to the statement that there is a relative of mine that we can pick, such that if he dies, I will inherit.

To see that this analysis has the required properties, we want to look again at the entailment properties of (59a) that we discussed in section 3.1 (see reading (18c)). We will ignore the existential entailment property (see end of this section), and concentrate on the weakening effect of wide scope in this context: the reasoning in (63) should not be valid:

\[
\begin{align*}
(63) & \quad \exists f [\text{CF}(f) \land \text{IF } f(\text{relative_of_mine}) \text{ dies THEN I will inherit a fortune}]. [\Rightarrow (62b)] \\
& \quad \& \text{John is a relative of mine.} \\
& \Rightarrow \Rightarrow \\
& \text{IF John dies THEN I will inherit a fortune.}
\end{align*}
\]
This reasoning is indeed not valid; if there is some way of choosing a relative of mine that renders the implication true, that does not entail that choosing any relative, such as John, will render the implication true.

Other observed properties of specific indefinites also follow. As existential closure is not directed by syntax and may take place wherever a quantifier can bind the CF variable, intermediate readings are generated – we have decided in section 4 that this is desirable. This is illustrated in (64) (from Winter 1998: ch.3, (89)):

(64) Every country’s security will be threatened if some building is attacked by terrorists.
    a. Every country x IF ∃f [CF(f) ∧ f(building) is attacked by terrorists] THEN x’s security will be threatened.
    b. Every country x ∃f [CF(f) ∧ IF f(building) is attacked by terrorists THEN x’s security will be threatened].
    c. ∃f [CF(f) ∧ [every country x IF f(building) is attacked by terrorists THEN x’s security will be threatened]].

(64b) gives the intermediate reading: it allows a different choice (of building) to be made for every country. As for specificity in VP-deletion contexts, the CF hypothesis conforms to our conclusion in section 3.2.2 that this construction militates against a QR treatment of wide-scope indefinites, but not against a quantificational treatment per se. As no syntactic movement is involved in existential closure, an account of the restrictions on wide-scope quantification in VP-deletion antecedents in terms of economy constraints on syntactic movement will not affect the scope of indefinites, as pointed out by Fox (1995b). We derive wide scope for a certain professor in (25b), repeated as (65), as indicated in (65a):

(65) Exactly half the boys [VP₁ admire a certain professor], and Mary does [VP₂ e] too.
    a. ∃f [CF(f) ∧ Exactly half the boys admire f(professor)] AND ∃f [CF(f) ∧ Mary admires f(professor)].
b. \( \exists f [\text{CF}(f) \land [\text{Exactly half the boys admire } f(\text{professor}) \text{ AND Mary admires } f(\text{professor})]]. \)

A potentially troubling situation would arise if it turned out that only the maximal-scope Across-the-Board reading (65b) is available. We would then need to rule out (65a), by returning, e.g., to the Sag/Williams ban on free variables in elided VPs, which allows only (65b). But this would leave us without an account of the examples in (29–31) and other problems: see section 3.2.2 and references cited.

An important advantage of the CF hypothesis is that it explains the observations reported in section 3.2.3 above, as pointed out by Reinhart (1997) and Winter (1997, 1998). Indefinites may have unlimited existential scope, but the distributive scope of a plural indefinite is quite limited. Consider again example (33a), repeated as (66a):

\[(66) \quad \text{a. If three relatives of mine die, I will inherit a house.} \]
\[
\text{b. } \exists f [\text{CF}(f) \land \text{IF } f(\text{three relatives of mine}) \text{ die THEN I will inherit a house}].
\]

The observation was that \textit{three relatives of mine} may scope, \textit{qua} existential import, outside the \textit{if}-clause, but may not be understood with distributive wide scope over the \textit{if}-clause. This follows automatically from the CF mechanism, which yields the specific reading of (66a) given in (66b). The reason is that the descriptive content of the indefinite, and in particular the cardinality information (\textit{three}) associated with it, remains inside the \textit{if}-clause. Taking wide scope over the \textit{if}-clause is only the existential quantifier over CFs; no plurality is available there with respect to which distribution might take place.

For the CF mechanism to work with plural indefinites, we need to assume that these do not (always) denote generalized quantifiers. Instead, \textit{three relatives of mine} must denote a set of plural individuals. Taking plural individuals to be sets, \textit{three relatives of mine} then denotes the set of all sets that contain three relatives of mine; the CF \( f \) chooses one such set. (66b) then paraphrases as ‘there is a way of choosing, such that if the three relatives of mine chosen in that way die, I inherit a house’. This gives us the required wide-scope reading.
Still, as with any similar approach to the semantics of plurals, we must account for the fact that plural indefinites can be interpreted distributively in a local domain, as in three relatives of mine wore a tie ((32) above). Reinhart (1997) leaves open the option that indefinites are ambiguous and that in such examples three relatives of mine denotes a (distributive) generalized quantifier (with local scope), local distributivity in (66a) being due to a lexical property of the predicate die. But this is not sufficient, in view of our example (38), repeated as (67):

(67) If three workers on our staff have a baby soon, we will have to face some hard organizational problems.

On the intended reading, three workers on our staff in (67) is specific, hence not a generalized quantifier, but must take distributive wide scope relative to a baby. We can posit, as is standard, that a distributivity operator DIST can be applied to the predicate ‘have a baby’ in order to derive this reading, so that when DIST(have a baby) is applied to the plural individual X chosen by the CF, the resulting meaning is ‘every atomic member of X has a baby’. Given such a distributivity operator, we need not assume that indefinites ever denote in any other way than through the CF mechanism (see Winter 1997, 1998). More importantly, while the indefinite and the distributivity operator may move, covertly or overtly, within a local domain (see (44), (45)), there is no obvious way such a mechanism (covert movement within a local domain) could derive island-escaping distributivity for (66a) or (67), under an analysis such as (66b), which is the desired outcome.

Nevertheless, the advantage gained by adopting the CF approach lies in its explanatory value, not just in its descriptive adequacy. We can see why this is so by comparing the present hypothesis with that put forward by Abusch (1994). Abusch proposes a semantic storage mechanism which may ‘lift’ an indefinite (a description applied to a free variable, as in DRT, and the associated cardinality information) out of islands. At any level, an existential closure rule may ‘reattach’ the indefinite and bind its free variable. The variable that gets bound with wide scope may range over plural individuals, and a distributivity
operator is assumed that may apply to such a variable and pick out its members. Abusch especially stipulates that the distributivity operator may be syntactically deep-generated anywhere, so as to derive island-escaping distributivity (which she felt was possible; cf. note 18) without movement. It does not appear too problematic to adopt the reverse stipulation and allow the distributivity operator to be generated only close to the indefinite’s syntactic position. This would lead to a system that is empirically hard to distinguish from the CF system. However, this merely demonstrates that Abusch’s approach to indefinites does not predict that wide-scope distributivity is impossible; the basic approach allows one to shift the predictions in any desired direction. The CF approach, on the other hand, predicts that there will be no wide-scope distribution, as the numeral and descriptive content information never leave the island and are not available for any wide-scope distributivity operator one might wish to employ. The system would require significant stipulative modification in order for it to make the wrong prediction in this respect.

The CF Hypothesis performs well with regard to the properties of specific indefinites mentioned so far. There is, furthermore, accumulating independent evidence that NL semantics makes use of the CF mechanism. For instance, Reinhart (1992) has argued that wh-in-situ is likewise interpreted through existential quantification over CFs, and Reinhart (1997) argues they can be profitably employed in the description of sluicing (see chapter 60); Ruys (1997) suggests that quantification over CFs might be used to resolve some of the semantic problems associated with the Move-Spec/Move-F analysis of Quantifier Raising proposed in Chomsky (1995c) (see chapter 53) (see also Von Heusinger 1999).

We do not discuss here how a CF-based theory of specific indefinites can deal with the issue of the de re readings in intensional contexts, discussed in section 2 (see Reinhart 1997 and Winter 1997 for a proposal in terms of intensional choice functions), or the donkey anaphora facts discussed in section 4 (see, e.g., Peregrin & von Heusinger 1995 and von Heusinger 1999 for a proposal about how the choice-function approach to indefinites can be implemented within a dynamic semantics framework which can deal with donkey anaphora).
Before ending this section, we need to address a technical issue about choice functions that we have so far left aside. When applied to a non-empty set, a choice function returns a member of that set. But, given the definition we used in (60), when applied to an empty set, a choice function is allowed to return any individual. As a result a sentence such as (68a), if analyzed as in (68b), happens to be true in our world, because there is no unicorn and someone, say Barack Obama, lives in the USA.

\[(68)\]
\[\begin{align*}
\text{a. A unicorn lives in the USA} \\
\text{b. } & \exists f \ [\text{CF}(f) \land f(\text{unicorn}) \text{ lives in the USA}]
\end{align*}\]

Take a function that maps every non-empty set to a member of this set and the empty set to Barack Obama. Such a function \(f\) is a choice function according to the definition in (60), and, given that the denotation of unicorn is empty, it satisfies the formula ‘\(\text{CF}(f) \land f(\text{unicorn})\) lives in the USA’ (since Obama lives in the USA). So (68a) fails to entail the existence of a unicorn, in contrast with what a standard analysis in terms of existential quantification. In order to solve this problem, Reinhart (1997) and Winter (1997) revise the definition of a choice-function so that, when a CF is applied to the empty set, the value will be something that gives falsehood for every predicate. Winter’s (1997) revised definition is as follows:

\[(69)\]
\[\begin{align*}
\text{CF} = & \lambda \ell_{\forall \subseteq D, \forall \subseteq D, D} \cdot \begin{align*}
\ell(\emptyset, D) & = \emptyset \forall \ell_{\forall \subseteq D, D} \cdot [\forall P \subseteq D, P \neq \emptyset \to \exists x [P(x) \land f(P) = \lambda R \subseteq D, R(x)]]
\end{align*}
\end{align*}\]

By this definition, a CF applied to a non-empty set yields the Generalized Quantifier corresponding to some member of the set, but when applied to the empty set, it yields the empty GQ, which is false of every predicate. This means that the formula in (68b) now comes out false if there are no unicorns, because now \(f(\text{unicorn})\) has to denote the GQ which is false of every predicate, hence the subformula \(f(\text{unicorn}) \text{ lives in the USA} \) if false for every
possible choice of \( f \). The empty-set case gives rise to a number of other subtle puzzles which we will not address in this paper, not all of which are solved by Winter’s revised definition. See Winter (1997), Ruys (1999, 2006) for discussion. For all the examples in the remainder of this paper, we will always assume that we are in a context in which the restrictor of a given indefinite is known to be non-empty, which will allow us to ignore the ‘empty-set problem’.

The next section presents and discusses a refinement of the choice-function approach, namely the parametrized choice-function approach.

6 Parametrized choice-functions vs. intermediate existential closure

Consider again the following example which was used to illustrate the phenomenon of *intermediate readings*:

(70) Each student has to come up with \( \text{[NP exactly three arguments which show that} \) \text{some condition proposed by Chomsky} \text{is wrong}. \)
In Reinhart’s approach, the relevant reading is obtained when the existential quantifier over choice-functions is introduced below Each student and above the NP [exactly three arguments...]. Kratzer (1998), drawing on Hintikka (1986), suggests however a different approach (see also Winter 1998). As we will see, both the mechanism of intermediate existential closure and Kratzer’s alternative mechanism appear to be necessary to account for the full range of facts. Let us start with a somewhat more simple case:

(71) Every student found every solution that some problem could have.

(71) has a reading where ‘some problem’ takes intermediate scope, thus escaping a scope-island: ‘For every student x, there is a problem y such that that x found every solution that y could have’. In Reinhart’s approach, this reading comes about thanks to existential closure of the choice-function variable just below ‘every student’. Kratzer suggests another approach, in which there is no existential quantification over choice-functions, but where choice-functions can be parametrized, i.e. relativized to individuals (parametrized choice-functions are also called Skolem functions). On this view, an indefinite does not necessarily denote a choice-function as defined above, but can also stand for a function that takes two arguments, namely an individual x and a set of individuals E, and returns a member of E if E is not empty (and the empty generalized quantifier otherwise, cf. end of section 5). When the individual argument is a variable bound by some higher quantifier, the ‘intermediate reading’ is derived:

(72) Every student, found every solution that f(x, PROBLEMS) could have.

Suppose that for any x, f(x, PROBLEMS) is the unique problem that x worked on. Then (72) is equivalent to ‘Every student found every solution that the problem he worked on could have’. Assume that we don’t know what parametrized choice-function the speaker has in mind, but we parse the sentence according to the representation in (72). What we can infer
is that for *some* parametrized choice-function $f$, every student $x$ is such that $x$ found every solution that $f(x, \text{PROBLEMS})$ could have, i.e. (72) ends up being interpreted as follows:

(73) \( \exists f (f \text{ is a parametrized CF & Every student, found every solution that } f(x, \text{PROBLEMS}) \text{ could have}) \)

It turns out that, in a context where it is known that the denotation of *problems* is not empty (so that we can ignore the difficult empty-set case that we briefly discussed at the end of section 5),\(^{31}\) (73) is provably equivalent to the following, i.e. to the intermediate reading.

(74) For every student $x$, there is a problem $y$ such that $x$ found every solution that $y$ could have

First let us show that (73) entails (74). Suppose (73) is true. Then for every student $x$, there is a problem $y$, namely $y = f(x, \text{PROBLEMS})$, such that $x$ found every solution that $y$ could have – i.e. (74) is true. Now let us show that (74) entails (73). Suppose (74) is true. Then let us consider a parametrized choice-function $f$ such that for every individual $x$, $f(x, \text{PROBLEMS})$ is a problem such that $x$ found every solution that $f(x, \text{PROBLEMS})$ could have. The truth of (74) ensures that such a function exists. By definition of $f$, then, every student $x$ solved every solution that $f(x, \text{PROBLEMS})$ could have, which makes (73) true. (The equivalence between (73) and (74) is an instance of the equivalence, in predicate logic format, between $\forall x \exists y \phi(x,y)$ and $\exists f \forall x \phi(x,f(x))$, where $f$ is a variable ranging over functions from individuals to individuals)

Note that on Kratzer’s view, the parametrized choice function variable is a free variable whose value depends on what the speaker has in mind, rather than an existentially quantified variable. A variant of her proposal consists in assuming representations where the parametrized choice-function is interpreted *in situ* but is bound by an existential quantifier at
topmost level. What is important is that no intermediate existential quantifier is needed in order to derive the intermediate reading. The intuition behind this approach amounts to viewing indefinites as similar to definite descriptions which can contain a bound variable. This intuition goes back to Hintikka (1986), who first introduced this approach, and is supported by the following type of example:

(75) According to Freud, every boy wants to marry a certain woman – namely, his mother.

In (75), 'a certain woman’ seems to be interpreted as standing for a certain function from boys to women that the speaker has in mind. The parenthetical ‘namely, his mother’ is a way of disclosing what this function is.

So we now have two approaches which seem to be equally able to generate intermediate readings: a) Reinhart’s approach in which an indefinite is viewed as a variable ranging over non-parametrized choice-functions that can be bound by an existential quantifier at any site, and b) Kratzer’s approach where an indefinite is a variable ranging over parametrized choice-functions which cannot be bound by an existential quantifier at an intermediate site. The b) approach has itself two variants, depending on whether the choice function variable is a free variable or is bound by an existential quantifier at topmost level.

Can we adjudicate between these two views on an empirical basis? As we will see, the mechanism of parametrized choice-functions happens to predict readings that Reinhart’s approach does not predict, and these readings seem to be available. However, it will turn out that an approach based on parametrized choice-functions both undergenerates and overgenerates (cf. Chierchia 2001, Schwarz 2001, 2011). In some cases, intermediate existential closure seems to be necessary to generate some attested readings. In other cases, parametrized choice-function variables predict unattested readings if we allow these variables to be existentially bound rather than free. We are thus led to conclude that we need both Reinhart’s mechanism of intermediate existential closure and Kratzer’s parametrized
choice functions, and we further need to posit some constraints on both mechanisms. Specifically, we will see that even if parametrized choice-function variables are needed, we should not allow for unrestricted existential quantification over such variables – i.e., as in Kratzer’s initial proposal, such variables should remain free.

Schlenker (2006) discusses the following type of example, for which Kratzer’s approach predicts a reading that Reinart’s approach doesn’t, and argues that the relevant reading exists. Consider the following scenario: Sue, Jill and Mary are students about to take a syntax exam. Sue hasn’t understood what wh-movement is; Jill is unfamiliar with WCO, and Mary with Principle C. In order for the exam to be a success, each of them should study the topic she is unfamiliar with. With this in mind, one could describe the situation as in (8)a, or more explicitly, as in (8)b:

(76) a. If every student studies a certain topic, the exam will be a success

b. If every student studies a certain topic --namely, the one she is unfamiliar with--,

the exam will be a success

On the intended reading, topics vary with students, but not arbitrarily. For the exam to be a success, it is not sufficient that every student studies whatever topic she likes; rather, each student should study the topic she is unfamiliar with. Existential closure à la Reinhart below every student only gives us (77)a, which is equivalent to (77)b, and is therefore clearly too weak.

(77) a. If for every student x, there is a choice-function f such that x studied f(topic), the exam will be a success.

b. If for every student x, there is a topic that x studied, the exam will be a success.
What needs to be captured is the fact that while topics vary with students, which topic each student should study depends on the student in a specific way. The intended reading is paraphrased in (78):

(78) There is a salient way of associating each student S with a topic T_s such that if every student S studies T_s, then the exam will be a success.

Now, this is in fact an informal paraphrase of the reading predicted by the parametrized choice-function approach, when the individual argument of the parametrized choice-function is bound by the universal quantifier each student:

(79) If every student x studies f(x, TOPIC), then the exam will be a success

So this example seems to provide decisive evidence for the parametrized choice-function approach. Since this approach also allows us to account for the intermediate readings we discussed without positing a mechanism of intermediate existential quantification over choice-functions, we might conclude that the best theory incorporates parametrized choice-functions but no mechanism of intermediate existential quantification over choice-functions.

This conclusion, however, is premature. Schwarz (2011) discusses an argument, based on a suggestion made in Ruys (2006) (the previous version of this paper), for the view that we should allow existential quantification over choice functions even if we have at our disposal the device of parametrized choice-functions. The argument is based on the following type of sentence (we have modified Schwarz’s example to make sure that the indefinite occurs in a scope island, namely a relative clause):

(80) John wasn’t examined by every professor who is competent on some problem.
(80) has a reading amounting to: ‘It is not the case that there is a certain problem \( x \) such that John was examined by every professor competent on \( x \)’. On this reading, the indefinite takes intermediate scope, between negation and the universal quantifier. A QR approach is not plausible in this case, because the indefinite would have had to covertly move out of a relative clause, which is an island for QR. But there is no way to derive this reading by means of a parametrized choice-function, because negation, not being quantificational, cannot bind any variable. So this is a case where we would need an existential quantifier over choice functions just below negation, as in the informal LF given in (81):

\[
\text{(81) } \text{NOT}(\exists f (\text{CF}(f) \& \text{John was examined by every professor who is competent on f(problem)})).
\]

Even on the basis of cases where parametrized choice-functions may help us dispense with intermediate existential closure, as with (71), it is possible to construct more complex cases where existential quantification at an intermediate site is needed to capture an attested reading. Chierchia (2001) offers an argument based on the interpretation of the negated versions of sentences which exhibit intermediate readings, such as (71). Consider for instance the following (the negation of (71)):

\[
\text{(82) It is not the case that every student found every solution some problem could have}
\]

Chierchia observes that (82) can be interpreted as expressing the logical negation of the intermediate reading of (71). On this reading, (82) asserts that there is no way of associating every student to a problem such that the student in question solved every solution that this problem could have. In other words, (82) asserts (on this reading) that for at least one student \( x \), there is no problem \( y \) such that \( x \) found every solution that \( y \) could have. Chierchia gives a detailed and convincing argument that this reading exists. The important point is that this
reading cannot be generated by means of parametrized choice-functions without a mechanism of intermediate existential closure. Let us see why. If intermediate existential closure is not an option, then the only way we could derive an intermediate reading would be as follows:

(83) \[ \exists f (\text{It is not the case that every student } x \text{ found every solution that } f(x, \text{PROBLEM}) \text{ could have}). \]

What (83) says is the following: there is a way of associating every student \( S \) to a problem \( P_S \) such that not every student \( S \) found every solution to \( P_S \). This is a very weak statement: it just says that, given a certain student \( S \), you can always find a problem \( P \) such that \( S \) did not find all the solutions that \( P \) could have, which is equivalent to saying that not every student found every solution that every problem could have. This statement could be true even if the intermediate reading of (71) is true as well, i.e. is not equivalent to the negation of the intermediate reading of (71). Even if the theory countenances parametrized choice-function, it turns out that the intended reading has to be based on one of the two following representations (where (84)a makes use of a parametrized choice-function variable, and (84)b uses a standard, non-parametrized CF à la Reinhart)

(84) a. It is not the case that (\[ \exists f (f \text{ is a parametrized CF } & \text{ every student } x \text{ found every solution that } f(x, \text{PROBLEM}) \text{ could have}). \]

b. It is not the case that (every student \( x \) (\[ \exists f \text{ is a CF } & x \text{ found every solution that } f(\text{PROBLEM}) \text{ could have})). \]

In both cases, existential quantification over a (possibly parametrized) CF variable is needed at an intermediate level. So we might conclude that the right theory should include both mechanisms, i.e. should allow indefinites to represent (possibly parametrized) choice-
function variables and allow existential quantification over such variables at intermediate scope sites. This is the conclusion reached by Chierchia (2001) and Schwarz (2011).

The empirical landscape, however, is unfortunately even more complex. Not only does the parametrized CF-approach undergenerate, it also overgenerates if we allow parametrized CF variables to be bound by an existential quantifier. To see this, we can simply notice that in such a theory the representation in (83) should correspond to a possible reading (though of course not the only one) for (82). But such a reading does not in fact seem to be available. This is an instance of a more general problem, which can be illustrated by a much more simple sentence:

(85) No student is believed to have solved some problems

According to the theory we are considering (one where CFs can be parametrized and where parametrized CF variables can be bound by a topmost existential quantifier), a possible representation for (85) is the following:

(86) \exists f (\text{No student, is believed to have solved } f(x, \text{PROBLEMS}))

Now, this is equivalent to ‘there is a way of associating every student S with one or several problems P_S such that no student S is believed to have solved P_S’. This is in turn equivalent to ‘No student is believed to have solved every problem’. Clearly, this is not an available reading for (85). The general observation, due to Schwarz (2001, 2011), is that a system which allows for existential quantification, at matrix level only, over parametrized choice functions, tends to generate unattested readings in cases where the indefinite occurs in a downward-entailing context. In fact, this can be shown on the basis of a variation of Schlenker’s examples (Schlenker’s example involves conditional sentences, and in this case the precise predictions of the system depend on how the semantics of conditionals is treated).
Every student who studied a certain topic passed

Intuitively, (87) licenses a functional reading of the type Schlenker discusses, paraphrasable as 'there is a way of associating every student $S$ with a topic $T_S$ such that every student $S$ who studied $T_S$ passes. This would correspond to the following representation:

(88) $\exists f (f \text{ is a parametrized CF } \& \text{ Every student }_x \text{ who studied } f(x, \text{TOPIC}) \text{ passed})$

It can be proven, however, that given a standard semantics for every, (88) is equivalent to the following, which does not correspond to an intuitively accessible reading:32

(89) Every student who studied every topic passed.

However, there does seem to be a functional interpretation of 'a certain topic’ in the case (87). Informally, this reading can be described in terms of what it allows us to infer regarding the speaker’s state of mind: ‘the speaker has in mind a certain specific association of students with topics such that every student who studied his associated topic passed’. The key point is that this is not equivalent to saying that the speaker simply believes that for some way of associating students with topics, every student studied his associated topic (this would be equivalent to believing (89)). The conclusion is that while we do not want to allow for unrestricted existential quantification over parametrized choice-functions variables, we need to allow for representations that include free variables ranging over parametrized choice-function, as in Kratzer’s original proposal.33

Let us take stock. The existence of intermediate readings has motivated the view that choice-function variables can be existentially quantified at an intermediate scope-site (Reinhart). However, the availability of functional interpretations for indefinites suggests
another approach to intermediate readings, in terms of parametrized-choice functions. This approach, however, has two problems. First, as argued by Chierchia in relation to examples such as (82), parametrized choice-functions do not remove the need for existential quantification over (parametrized) CF-variables at intermediate levels in order to get certain attested reading. Second, unrestricted existential quantification over parametrized choice-functions, even at matrix level, gives rise to unattested readings. So while the functional interpretations of indefinites undeniably exist (as shown in particular by Schlenker 2006), such interpretations are best captured in terms of free variables over parametrized choice-functions (as in Kratzer 1998), and we should not allow for unrestricted existential quantification over such variables. On this basis, Schwarz (2011) reaches the conclusion that we need to allow for existential quantification over non-parametrized choice-functions at intermediate sites, and at the same time allow for free parametrized CF-variables. Schwarz (2001, 2011) furthermore argues that parametrized CF-variables should only be used for indefinites modified by the word certain. He presents the following minimal pair:

(90)  a. No boy tried every dish that a certain female relative of his had made.
    b. No boy tried every dish that a female relative of his had made.

Schwarz focuses on intermediate readings. Consider now a situation where no boy tried every dish made by his mother, but some boys tried every dish made by their sisters. According to Schwarz, while it is possible to judge (90)a true in such a situation, (90)b is unambiguously false. He concludes that this is because the word certain in (90)a allows for a functional reading which is impossible in (90)b. Judgments are however not entirely clear (Schlenker 2006, for instance, reports cases where a functional reading is available in the absence of `a certain').

In any case, what can be concluded from the current literature is that we seem to need both a mechanism of existential closure (possibly at intermediate scope sites) of non-
parametrized CF variables and a way of deriving functional readings, possibly by means of
free parametrized CF variables.

7 The singleton-indefinite approach (Schwarzschild 2002)

This survey would not be complete without mentioning another quite influential
approach, namely Schwarzschild’s singleton indefinite approach (Schwarzschild 2002),
which can be viewed, to a certain extent as a reinterpretation of the approach based on
(possibly parametrized) choice functions.

Schwarzschild (2002) offers a new perspective on wide-scope indefinites, in a proposal
that captures some of the original intuitions of Fodor & Sag (1982), while taking into
account the advances made by choice-functional approaches. Schwarzschild starts from the
observation that in some cases the restrictor of an indefinite article is known to be satisfied
by at most one individual, in which case the relevant DP is expected to be ‘scopally inert’ for
purely logical reasons, and hence to behave similarly to a referential expression. Here is one
of Schwarzschild’s examples:

(91) Everyone at the party voted to watch a movie that Phil said was his favorite

In such a case, it is quite natural to assume that there is only one movie such that Phil
said it was his favorite movie. If this assumption is common knowledge, it turns out that a
movie that Phil said was his favorite is scopally inert in (91), in the sense that both the
construal where it takes narrow-scope with respect to the subject and the wide-scope
construal are contextually equivalent. In such a situation, where the restrictor of the
indefinite (movie that Phil said was his favorite) denotes a set with just one element,
Schwarzschild calls the indefinite a singleton indefinite. Schwarzschild’s contention is that
all cases of apparent exceptional wide-scope of indefinites involve singleton indefinites. At
first sight, this might seem to be a non-starter. After all, in the examples used to illustrate
exceptional wide-scope, there is generally no underlying assumption that the restrictor of the
indefinite can be true of at most one object. Schwarzschild’s second move is to exploit the
fact that, quite generally, quantified noun phrases come with implicit so-called *domain
restrictions*. For instance, a sentence such as *Every student came*, uttered by a professor who
just gave a lecture, does not mean that every student in the world came. Rather, it means that
every student in some contextually salient class came. So while the determiner *every* is
explicitly restricted by *student*, it also also *covertly* restricted by some additional property.
Schwarzschild furthermore argues that the content of the covert restriction might well be
known only to the speaker. Specifically, he argues for a *privacy principle*, according to
which “it is possible for a felicitous utterance to contain an implicitly restricted quantifier
even though members of the audience are incapable of delimiting the extension of the
implicit restriction without making somehow reference to the utterance itself”. With this in
place, it is always possible to assume that an indefinite is covertly restricted to a singleton
set, which makes it scopally inert and creates the illusion of a maximally wide-scope reading.
To illustrate, consider the following sentence (a variation on a standard example discussed
by Schwarzschild):

(92) If a relative of mine dies tomorrow, I will inherit a fortune

Upon hearing this sentence, one can reflect that on a narrow-scope reading the sentence is
very likely to be false unless all of the speakers’ relatives are rich. So it is quite natural to
consider the possibility that the speaker intends the indefinite to be restricted to a particular
relative of his, even though we have no way of specifying the precise content of the
restriction. But then, if we make this assumption, we derive the inference that there is a
relative of the speaker that the speaker has in mind, such that if this person dies, the speaker
will inherit a fortune.

Schwarzschild goes on to argue that this proposal is more parsimonious than one in
which the indefinite takes wide-scope, because the device of covert restriction is required
anyway even in competing analyses. He points out that on a number of reasonable assumptions regarding the meaning of conditionals, the wide-scope construal of a relative of mine in (92), without any covert restriction, comes out true as soon as one of the speaker’s relatives will not die tomorrow. This is so because such a relative makes the antecedent of the conditional false, thereby making the whole sentence trivially true (in an analysis where conditionals are treated in terms of material implication). So the resulting reading is very weak. Schwarzschild shows that the very same conclusion holds for other, possibly more realistic approaches to the semantics of conditionals. Schwarzschild’s conclusion is that in order to get reasonable truth-conditions in an analysis where indefinites can take maximally wide-scope (or any other analysis that achieves the same result, for instance by means of existential quantification over choice-functions), it will be necessary to assume that the indefinite is covertly restricted to specific relatives of his that the speaker has in mind. Given that the device of covert domain restrictions is needed in any case, a theory that does not need any other device (such as, e.g., quantification over choice-functions) is to be preferred.

This analysis, however, can only deal with indefinites that take apparently maximal scope. Unless more is said, it is not equipped to deal with intermediate and functional readings, which we discussed in section 5. Schwarzschild’s strategy for intermediate readings is to mirror the effect of the parametrized choice-function approach by allowing implicit domain restrictions to be parametrized, i.e. relativized to individuals. Here is an example used by Schwarzschild to argue that parametrized domain restrictions are independently motivated:

(93) Every farmer remembers at least one year where every crop failed

The point is that (93) is meant to be interpreted as saying that every farmer x remembers at least one year where every crop x used failed, i.e. the set of relevant crops depend on the farmer. That is, every crop is implicitly restricted not by a property, but by a function from individuals to properties. To make this clear, let us now append to every determiner a
variable R standing for a covert domain restriction – R is a free variable ranging over possible domain restrictions. Furthermore, this variable can be parametrized, in which case we will write R(x), where x ranges over individuals. In such a case, R is a variable over functions from individuals to sets of individuals. So (93), on the intended interpretation, will have the following logical form:

\[
(94) \quad \text{[Every farmer], remembers at least one year where [every R(x) crop] failed}
\]

\[
\text{‘Every farmer } x \text{ remember at least one year where everything that is a crop and belongs to R(x) failed’}.
\]

When R is understood as standing for the function that maps every individual farmer to the set of crops he used (and every other person to whatever sets you like), we get the intended interpretation. Now, in the absence of a functional reading, singleton indefinite are just indefinites whose covert restriction R denotes a singleton set. Functional readings arise when the indefinite is, so-to-speak, a *functional singleton*, i.e. has a parametrized covert restriction R(x) which maps every individual to a singleton set. Let us illustrate both cases:

\[
(95) \begin{align*}
\text{a. } & \text{If a } R \text{ relative of mine dies tomorrow, I will inherit a fortune} \\
\text{b. } & \text{Every student } x \text{ found every solution that a } R(x) \text{ problem could have}
\end{align*}
\]

In (95), if R is understood to stand for a singleton set, we obtain the wide-scope, specific reading of the indefinite. In (95), the indefinite can be interpreted as a functional singleton. When this is the case, it means that for every student x, the unique problem R(x) is such that x found every solution to this unique problem. This is, of course, the functional reading we discussed in section 5.

The singleton indefinite approach is able to derive exactly the same readings as an approach based on (possibly parametrized) choice function variables where the variables are not existentially quantified. To the extent that the parametrized choice function approach is
not able to account for the full range of intermediate readings (as we discussed in section 6),
the singleton indefinite approach runs into the same problem. One possibility that could be
considered is that covert domain restriction variables might be existentially quantified,
possibly from an intermediate site. Such a strategy, however, encounters two types of
objections. First, there is no clear evidence that covert domain restrictions are generally
subject to existential closure. So Schwarzschild’s argument from parsimony (namely that the
singleton indefinite approach does not introduce any mechanism that isn’t independently
motivated) would no longer be valid. Second, as we discussed in section 6, unrestricted
existential closure of (possibly parametrized) choice-function variables leads to a problem of
overgeneration. An account where (possibly parametrized) covert restriction variables can be
existentially quantified over would face the same problem.

8 How to create a specific NP

In this final section we return to more basic empirical concerns, and ask what are the
factors that contribute to specificity and discuss some properties of indefinites that favor or
disfavor a specific reading.

The literature abounds with descriptions of types of indefinites, and contexts containing
indefinites, that allegedly induce ‘specificity’. In many cases, as noted, the property so
identified is not the wide-scope property under examination here, but some other supposed
semantic property of the indefinite, e.g., some sort of ‘D-linking’ (see chapter 77). In many
cases, authors simply state that a given indefinite in a given context is ‘specific’ without
detailing the semantic intuitions that lead them to this characterization, making it impossible
to determine the relevance of the statement for any particular line of research, given the
existing terminological confusion. But such distractions apart, the crop of necessary and sufficient conditions for specificity still remains meager.

Fodor and Sag (1982) provide a useful list of factors that help or hinder what they consider (see sections 3.1, 3.2, 4) a referential reading on indefinites – i.e., the reading that we have diagnosed as involving wide-scope quantification over CF. For instance, increasing the ‘descriptive content’ of the indefinite (adding modifiers, adding relative clauses, especially appositive ones) contributes to this reading. The pragmatic rationale seems to be that a speaker who can provide such details apparently has a particular person in mind when using the indefinite; and, furthermore, that adding information to the indefinite that does not seem directly relevant to the truth of the intended assertion invites the inference that the information is added in order to single out a particular individual that verifies the assertion. It seems to me that these observations remain relevant, even though we do not adopt Fodor and Sag’s contention that this individual the speaker has in mind is also, semantically, the referent of the indefinite; it still seems correct that wide-scope indefinites are often used in order to make a statement about a particular individual, who for some reason we cannot or would not identify more directly, e.g., by using a proper name. Nonetheless, what we describe here is only a tendency: indefinites endowed with considerable descriptive content, and even appositive relative clauses, may still be interpreted with narrow scope. Some reliable wide-scope-inducing modifie rs are positive polarity items – e.g., Catalan indicative relative clauses, or the German IV2 relative clause discussed by Gärtner (2000); unfortunately, none of these can be employed in a wide enough range of contexts for them to be a helpful tool in examining many of the empirical questions addressed in previous sections. Syntactic contexts that favor ‘specific’ readings as intended here have also been widely discussed (see, e.g., Kerstens 1975, Reuland 1988, and Rullmann 1989 on Dutch VP-external subjects; Kerstens 1975, de Hoop 1992, and Diesing 1992b on Germanic scrambling; see also chapter 43; and many references cited there) – but again, wide-scope readings are rarely the only readings available for indefinites in such contexts.
Measures for inducing narrow scope, although less useful for the kind of research reported here, are often somewhat more reliable. Indefinites containing bound variable pronouns take narrow scope relative to their binders (but see later in this section), as do indefinites containing polarity items, or subjunctive mood relative clauses, relative to their licensors. Bare plurals are rarely interpreted with wide scope, and neither are indefinites in predicative position (but see Winter 1998), adverbial indefinite NPs, and certain indefinite pronominals (e.g., Dutch wat ‘something’). Other syntactic contexts disfavoring ‘specificity’ typically include there-insertion sentences, but again this is only a tendency (see, e.g., Fodor and Sag 1982; De Hoop 1992). In addition, the explanation of many of these tendencies remains obscure.

However, since the early 1990s, evidence has accumulated that one factor systematically determines whether an indefinite may be specific in our sense: the choice of determiner. Liu (1990), Beghelli (1993, 1995), and Beghelli and Stowell (1997) conducted research on the scope properties of different NP types, distinguished by determiner (see chapter 71), which, although it was aimed at local (within-clause) scope phenomena, was relevant to our subject matter for the following reasons. We have found in section 3.2.3 that, in order to explain island-escaping, non-distributive wide scope (specificity), we need some interpretive mechanism that allows an indefinite to ‘escape’ the scope of any higher operator, but without scoping (distributing) over that operator. The CF mechanism explained in the previous sections is such a mechanism. Now, even though we needed examples of island-escaping scope to motivate such a specificity mechanism, now that we know it exists, we must assume that it can operate in a local domain as well. Consider therefore an indefinite in object position, and its scope relative to the (local) subject. If the indefinite seems to escape the scope of the subject, this may reflect any of a number of mechanisms in operation: e.g., non-distributivity of the subject, local QR of the indefinite object, or specificity. Indeed, when we find that the ‘non-narrow’ scope of the indefinite object in such a configuration can be described by the specificity mechanism (e.g., CF), then we should not look for another explanation, e.g., in terms of movement, as the specificity mechanism is needed
independently to explain the phenomena in the previous sections (see note 22). More significant is the reverse situation: suppose we find that the indefinite object cannot escape the scope of the subject in a way that can be described by the specificity mechanism. Then we must conclude that the specificity (CF) mechanism cannot apply to this particular indefinite. Liu and Beghelli found several such cases:

(96)   a. Fewer than five girls saw more than five movies.
        b. Every girl saw fewer than six movies.
        c. $\exists f [\text{CF}(f) \land \text{fewer than five girls } x \ [x \text{ saw } f(\text{more than five movies})]]$.
        d. $\exists f [\text{CF}(f) \land \text{every girl } x \ [x \text{ saw } f(\text{fewer than six movies})]]$.

In these examples, it is impossible for the object to escape the scope of the subject: there is no ‘independent’ scope reading, in Liu’s terms. For instance, (96a) does not have the reading that there was a particular set of more than five movies, such that fewer than five girls saw each of those movies; likewise, (96b) does not have a reading according to which there is a particular set of fewer than six movies, such that every girl saw those movies. Yet these are exactly the readings that would obtain if the specificity mechanism were to apply to the indefinite object; i.e., the readings that we do not find are exactly the readings given by wide-scope existential quantification over CF, as indicated in (96c) and (96d): a choice from the object is made independently of values of the subject, but the object does not show distributive scope over the subject.

Much more can be said about these examples. One point is that, apparently, a ‘collective’ interpretation for the subject is impossible here, as well, since that would presumably lead to an interpretation very much like the interpretation we expect from specificity of the object (see especially Szabolcsi 1997b and Winter 1998 for discussion of what property of the subject is responsible for this). Furthermore, a wide-scope distributive reading for the indefinite object (which could not result from the specificity mechanism, see section 3.2.3, but might conceivably result from QR of the object), is also missing. Beghelli and Beghelli
and Stowell explain this by separating the (collective) indefinite from a syntactically fixed distributivity operator, and then allowing just the indefinite to move (Quantifier Raise) to a higher position. However, since such movement will never lead to island-escaping specific readings, so that some specificity mechanism that generates wide scope without movement is needed independently (as Beghelli confirms), it is unclear what purpose is served by assuming that these indefinites may move at LF at all (see section 3.2.3). The only readings we do find in (96) are wide-scope distributive readings for the subject, and possibly a ‘cumulative’ reading for (96a).

For our purposes, the relevant observation is that specificity is not an option for the italicized indefinites in (96). The class of weak NP determiners that show this behavior, according to Liu and Beghelli, are all modified numerals, and all determiners that are not monotone increasing. In other words, specificity is reserved for simple monotone increasing weak determiners: *a, several, some, three*, etc. These observations, based initially on local scope phenomena, are confirmed by the absence of island-escaping wide scope with other than simple increasing DETs:

(97)  

a. If fewer than three relatives of mine die, I will inherit a house.  
b. If more than three relatives of mine die, I will inherit a house.

Neither (97a) nor (97b) has a specific reading for the italicized indefinite. The same observation was made independently in Corblin (1997) for French:

(98)  

a. Chaque professeur a récompensé *[NP chacque étudiant [CP qui a lu un roman]]*.  
(Three readings)  
‘Every professor has rewarded every student who has read a novel.’  
b. Chaque professeur a récompensé *[NP chacque étudiant [CP qui a lu au moins/au plus/exactement un roman]]*. (One reading)  
‘Every professor has rewarded every student who has read at least/at most/exactly one novel.’
(98a) has three possible scope positions for *un roman* (including an island-escaping intermediate-scope reading; cf. section 4); the modified numerals in (84b) allow only a narrow-scope reading.

All monotone decreasing (and non-monotone) weak NP determiners are included here in the set of determiners that resist specific readings. That the specificity (CF) mechanism must not be allowed to apply to NPs with such determiners is also apparent from much simpler examples:

(99) a. Fewer than six boys arrived.
    b. Exactly six boys arrived.
    c. $\exists f \left[ \text{CF}(f) \land f(\text{fewer than six boys})(\text{arrived}) \right]$. 
    d. $\exists f \left[ \text{CF}(f) \land f(\text{exactly six boys})(\text{arrived}) \right]$. 

The CF analyses for (99a, b) given in (99c, d) describe adjectival readings for *fewer than six* and *exactly six*. For instance, (99c) states there is some way of choosing fewer than six boys, such that those boys arrived; allowing that many other boys may also have arrived. Such monotone increasing readings for these determiners are not attested unless under very special circumstances. Hence, we know that these NPs do not allow CF readings; the same holds of other specificity mechanisms we are aware of.

Explaining the Liu/Beghelli bifurcation is another matter. Beghelli and Stowell (1997) and Szabolcsi (1997b) distinguish the two types of weak NPs in terms of morphosyntactic features as well as semantically. But this is hard to achieve other than by stipulation. Reinhart (1997) proposes a distinction on the basis of DP-internal syntax, inspired by Danon (1996). Unmodified numerals may occupy the D head position, leaving the spec, DP position free for a covert CF variable, whereas modified numerals cannot, for obvious reasons, occupy $D^0$; these are in Spec,DP. This approach requires further elaboration. For instance, a separate stipulation is needed to prevent a CF reading for unmodified monotone decreasing determiners (*no, few*). Furthermore, syntactic considerations indicate that modified numerals
may occur more deeply embedded in DP; they may, e.g., be preceded by demonstratives, definite and universal determiners, and possessive phrases. More research on this topic is required, but the progress that has been made in identifying at least one necessary condition for specificity is promising.

9 Conclusion

The phenomenon of existential wide-scope indefinites has played an important role in the history of generative syntax, as it raised serious problems for a QR-based theory of scope. The appeal of the QR-based theory of scope is that it reduces (at least in part) configurational constraints on scope-taking to independently known constraints on movement (islands). In the relevant configurations, however, indefinites appear take scope out of an island. A natural strategy for syntacticians has been either a) to explain away the phenomenon by showing it to be illusory, or b) to rely on an independent scopal mechanism in order assign scope to the relevant indefinites, at least in certain configurations. The first strategy (Fodor and Sag 1982) was based on the idea that apparently island-escaping indefinites (specific indefinites) are in fact referential expressions. This strategy fails to the extent that we can find cases where an indefinite takes scope out of an island without taking maximal scope. There is now a consensus that such ‘intermediate readings’ are sometimes available. A second strategy, initiated by Reinhart (1997), consists in positing a special scopal mechanism for indefinites, based on choice-functions. A number of semanticists have developed this idea, and also showed the need to use parametrized choice-functions (also called Skolem functions or skolemized choice-functions) in order to capture certain readings. While these works have enormously improved our understanding of the semantics of indefinites, the resulting theoretical landscape, is, as we discussed in section 6, fairly complex. Without specific restrictions on these mechanisms (quantification over possibly parametrized choice-functions), the resulting theory might both undergenerate and overgenerate readings. Such restrictions are discussed in the current literature, but no completely satisfying picture has
emerged yet. Schwarzshild (2002) proposed an alternative approach that incorporates most of the insights of the choice-functional approaches, based on the idea that indefinites carry a covert restriction which, in some cases, can be reduced to a singleton. It is not clear, however, that this approach can account for all intermediate readings in a motivated way. Finally, another important question is why only some indefinites can take exceptionally wide scope. Indefinites based on comparative numerals (*more than* *n*), for instance, do not give rise to such readings. This is again a domain in which further research is indeed.

To conclude, there are good reasons to believe that when an indefinite takes scope out of an island, QR is not involved, and there are serious, well developed proposals that posit a specific scopal mechanism for such indefinites. This, in itself, means that the QR-based theory of scope can be maintained, in the face of these apparent counterexamples. At the same time, works in formal semantics about wide-scope indefinites have become more and more elaborate, and have uncovered a number of important issues and problems which are currently not all well understood, and are therefore an important topic for current research.

NOTES

* This article is a revised and updated version of Ruys 2006. Chapters 1-5 and 8, taken from the first author's original article, appear here edited and shortened where possible by the second author. Chapters 6 and 7, which reflect more recent developments in the field, were written by the second author. Both authors share the responsibility for any remaining errors.

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1 A note on this terminology: the label ‘specific’ has been attached to indefinite (as well as definite) NPs for widely different reasons, and on the basis of widely different observations – whether those observations will all permit of one unified analysis is highly questionable. We use it here as a
non-theoretical term in the sense of, e.g., Karttunen (1971a), Ruys (1992): an indefinite or weak NP is specific relative to a given operator (that c-commands it in overt syntax) if it is not interpreted in the scope of that operator, under some reasonable analysis.

2 Karttunen did not fail to observe that even non-specific indefinites may introduce discourse referents, albeit short-term ones that quickly ‘decay’. Thus, the scopally embedded indefinites in (i) allow for discourse anaphoric pronouns, provided the pronouns are embedded in a similar way (see further (54–56) below):

(i)  a. You must write a letter to your parents. It has to be sent by airmail.
    b. Harvey courts a girl at every convention. She always comes to the banquet with him.

3 To avoid the terminological confusion that hindsight may bring, the reader should note that ‘quantificational’ is used here in the uncomplicated sense of ‘involving a quantifier’ (namely, the existential quantifier $\exists$ (or, notationally, the $\eta$-operator)). We are not concerned yet with such niceties as the ‘quantificational’ (as opposed to ‘cardinal’) use of weak determiners (Milsark 1974), or with ‘essentially quantificational’ NPs in the sense of non-intersective and necessarily distributive NPs (see Szabolcsi 1997b and references cited there). Likewise, the ‘referential’ reading in Karttunen’s work was thought of as simply being brought about by translating the indefinite as an individual constant, just like a proper name.

4 To be slightly more historically accurate: for reasons having to do with such cases as (13) below, Fodor proposed a novel operator instead of the existential quantifier employed here – one which does not allow existential entailment but merely captures the ‘individuating’ effect of the de re reading. The existential entailment does, however, appear to be real in many cases.

5 For an analysis of this issue and an overview of its role in the literature, see Ruys (1992: 7–15) and Ruys (2002).

6 Despite mistaken claims to the contrary in the literature; see Cooper (1979) and Farkas (1981).

7 Nearly, but not quite, as pointed out also by Abbott (1993). The referential reading is obtained in Fodor and Sag (1982) by enriching the model with a context that includes a value for “the individual the speaker has in mind”; a specific indefinite refers to this individual. This implies that the
specific reading of, say, (19a) could be falsified in case uncle Winston’s death would make me rich, but I had my penniless aunt Sue in mind when I uttered (19a). This subtle prediction is difficult to verify, if only because the non-specific, narrow-scope reading is also false in that situation.

8 Recall that intermediate readings are possible for examples like (14), a fact that was originally put forward as an argument against a simple binary ambiguity analysis of specificity. But (14) does not falsify Fodor and Sag’s position, which allows island-obeying Quantifier Raising in addition to the inherent binary ambiguity. Since a high American official in (14) is not embedded in an extraction island, the intermediate reading (14b) can be derived by Quantifier Raising the indefinite on its quantificational reading to the intermediate position. We will attempt to revive the argument from (14) in section 4.

9 . . . unless the copy of that variable in the elided VP is bound by the same quantifier (see below).

10 For (26) we assume a ‘deletion under LF identity’ approach to VP ellipsis, as in Sag (1980) and Fox (1995b); under Williams’s (1977) copying of LF theory, VP2 in (26) would contain an unbound variable.

11 Fiengo and May (1994: 232, fn. 34) likewise report on every student hit someone, and every professor did, too that it “permits a reading in which the existential has broad scope, but under which different people were hit.”

12 Hirschbühler (1982), however, speculates that a sequence of sentences might constitute a single conjoined structure, allowing syntactic scope taking across sentence boundaries.

13 The right-hand conjuncts in (30) do not have a quantificational subject; Fox argues that QR is licensed here because it results in inverse scope relative to a covert quantifier over events and a generic quantifier, respectively. The reported intuitions on (24a) and (24c), however, remain unaccounted for.

14 For an introduction to Generalized Quantifier theory, see, e.g., Gamut (1991), Keenan (1996). (32b) paraphrases as: ‘Among the sets whose intersection with the set of my relatives contains three elements, is the set of individuals wearing a tie.’ This is equivalent to:

(i) $\exists X \subseteq \text{relative_of_mine'} \land |X| = 3 \land \forall x \in X \exists y \text{[tie'}(y) \land \text{wear'}(y)(x)]].$

15 For an introduction to plurality, see Landman (1996) and references cited there.
(33a) is used here for simplicity’s sake but may be susceptible to the objection that (taking \( I I \)
as material implication) (33c) entails (33d), creating a problem of the type hinted at in section 2.1 (see
also Winter 1998: 95ff.). The problem does not arise with the examples given below. (33) is not from
Ruys 1992 but from Ruys 1995; however, it was deleted from the published version of that manuscript
due to space limitations.) For those unfamiliar with Generalized Quantifiers: (33c) is equivalent to:

(i) \( \exists X [X \subseteq \text{relative of mine} \land |X| = 3 \land \forall x \in X \ [\text{IF x dies THEN I will inherit a house}]]. \)

This description of the problem in terms of ‘existential scope’ and ‘scope of distributivity’
follows the detailed discussion of specificity and its interaction with distributivity/collectivity effects in

We know of one example in the literature that has been claimed to show island-escaping
distributive scope for a plural indefinite: Abusch’s (1994: (44)):

(i) Every critic who reviewed two books by Henry Miller panned them.

Abusch states that (i) can be read as conveying that there is a set of two books by Miller, such that
for each book x from this set, whoever reviewed x, panned x. If this intuition is genuine, it undermines
the argument being made here, but it is hard to see how one could derive a wide-scope distributive
reading for (i) without predicting that (33–39) also have such a reading, which they clearly do not. If
we must choose which intuition is genuine, it is not obvious that we should follow Abusch, for two
reasons. First, the reading Abusch attributes to (i) is not logically independent from the reading that all
agree on, the wide-scope non-distributive reading that there is a set of two books by Miller such that
whoever reviewed both, panned both. The alleged distributive reading entails the non-distributive
reading, and can therefore be explained away as a ‘special case’ (see section 2.1 above, and Abusch
1994: 88ff.). Second, Abusch appears to feel that a wide-scope distributive reading is also possible
when we replace two books in (i) with the strong quantifier most books – if so, this cannot be an effect
of specificity and her dialect must allow real island-insensitive QR. See also Winter (1997: fn. 21) for
discussion of Abusch’s claim.

This example represents joint work of one of us (Eddy Ruys) with Yoad Winter: see Winter
(1997, 1998). That specific indefinites distribute locally was assumed also in Ruys (1992: 217) (but not
demonstrated).
20 Verkuyl (1999: ch. 6) does allow inverse wide scope for *three books* in (39), albeit grudgingly.

21 For a discussion of branching quantification see Beghelli et al. (1997), as well as references cited there.

22 Hence, the interpretation of *three books* given in (46a) is often described as the ‘branching’ or ‘independent’ reading. The similarity with the island-escaping non-distributive readings in (33–38) above, however, is often ignored, although it is hard to see how an account of specificity that explains the island-escaping examples could fail to explain the ‘independent’ reading (46a) as well. See also section 8.

23 This describes the approach advocated in Ruys (1992).

24 See section 5 for further discussion, and comparison of possible solutions.

25 And if ACD resolution is due to Case-movement in general, that still would not necessarily exclude the possibility that in certain instances ACD can be resolved through QR. This might explain why we find a contrast between QNPs and referential NPs in contexts without Case-movement such as (i):

(i)  a. *Mary stood near Susan, who Emily did [vp e] as well.
   b. Mary stood near everyone Emily did [vp e].

26 Actually, this is not quite true, since the structure really contains *four* scoped elements if we count the modal *has to*. Wide scope relative to this expression does not entail the narrow-scope reading. But taking advantage of this would again involve very subtle judgments.


28 Other types of intervening scope takers are disallowed as well. Thus, (ia) only has a *de re* reading for *a dog*. As in (56d), we need to repeat the modal to obtain a *de dicto* reading, as (ib) illustrates; see also Roberts (1987):

(i)  a. Every farmer who was looking for a dog found it.
    b. Every farmer who was looking for a dog wanted it to be really big.

29 Fox suggests that the problem, if it exists, might be overcome by resorting to Kratzer’s (1998) CF account without existential closure, to be discussed in section 6 below; but to the extent that
Kratzer allows apparent intermediate-scope readings as an effect of functional readings on indefinites, she would also allow the intermediate reading (65a).

30 CF must then be of a higher type than stated in definition (60); we shall not discuss such technical details; the reader is referred to the publications by Reinhart and Winter cited above.

31. If we consider the possibility that the denotation of ‘problem’ may be empty, Winter’s approach to the empty-set case, cashed out in (69), is not sufficient to predict the equivalence between (73) and (74), in contrast with more simple cases where Winter’s approach correctly predicts existential entailments. See Winter (1997) and Ruys (1999).

32 Proof: assume (88) is true, and also that ‘topic’ has a non-empty denotation (this assumption is in fact not needed in this case for the equivalence to hold if we adopt Winter’s approach to the empty set problem, but as announced we assume here that the context ensures that the restrictor of an indefinite is known not to be empty). Then let us pick a student S. If S studied every topic, then, for any parametrized CF f, S studied f(S, TOPIC), and therefore, since (88) is true, S passed. This holds for every such S, so (88) entails (89). In the other direction, let us assume that (89) is true. Let us consider the parametrized choice-function f which a) maps every student who studied every topic to Topic #1, and b) maps every student x who did not study every topic to a topic that x did not study. Note that the only students s who studied f(s, TOPIC) are the students who studied every topic. It follows, for this particular choice of f, that ‘Every student, who studied f(x, TOPIC) passed’ is true, and therefore (88) is true as well.

33 Schlenker (2006) however suggests another possibility: we might allow restricted existential quantification over parametrized CF variables, i.e. where the range of the existential quantifier is restricted to ‘natural functions’. For a sentence such as Every man loves a certain woman, the natural functions will include salient concepts such as mother, sister, wife... The intended interpretation for this sentence would then be: ‘there is a function f in the set {mother function, sister function, wife function, ...} such that every man x loves f(x)’. Note that other types of functional readings (relative clauses, questions) have motivated such restrictions to ‘natural functions’ (Sharvit 1999, Winter 2004). See also Solomon (2011) for an interesting proposal where existential quantification over parametrized CF variables is sometimes, but not always, restricted to ‘natural functions’.

34 In fact, on the wide-scope construal, together with a material implication view of conditionals, (92) turns out (counter-intuitively) equivalent to I have at least one relative and if every relative of mine dies tomorrow, I will inherit a fortune.

For instance, there is a considerable body of literature (much of it in the typological tradition, but also in the generative framework) on ‘specificity markers’ in various languages: Persian rá is a famous example (see, e.g., Browne 1970; Karimi 1990, 1999). Unfortunately, most of this work bears little relevance to our present concerns, for the reasons stated in the text. A recent exception is Matthewson’s (1999) description of St’át’imcets: some indefinite determiners in this language force (island-escaping, non-distributive) wide scope; another indefinite determiner prevents it.

See also Ruys (2001).

For convenience, we will continue to call NPs with these determiners ‘indefinites’. See the references cited above, and also Reinhart (1997), for discussion of other properties that set these determiners apart. Unfortunately, the generalization is not without exception; e.g., exactly n sometimes seems to allow a specific reading, as in if exactly one relative of mine dies, I will inherit a house.

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