Non-specific Specifics and the Source of Existential Closure of Exceptional-Scope Indefinites

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Abstract

Sometimes exceptional-scope indefinites are understood as if they refer to a specific individual or function, sometimes they are understood as if there is existential closure of a function variable from the exceptional-scope site. So-called contextualist accounts of these indefinites fail to account for the apparently non-specific exceptional scope readings. Accounts invoking a mechanism of free existential closure generate unattested readings in addition to failing to account for readings in a wider array of cases. Starting with the assumption that all exceptional-scope indefinites are specific, a third account is presented here which employs independently motivated pragmatic strategies of diagonalisation and accommodation. It will be shown how specific indefinites come to be understood as if some mechanism of free-existential closure were in operation. But it will be clear where this closure effect comes from and what constraints there are on it.

1. Introduction

Indefinite noun phrases have long been known to pose a challenge to the orthodox account of the scopal behaviour of quantified noun phrases. The challenge concerns the fact that examples such as (1a,b) can be understood according to the glosses given in (2a,b) respectively:

- 1. a. If an uncle of Mary's dies childless, she will inherit a fortune.
 - b. Every linguist has studied every analysis that has been proposed for some problem.
- 2. a. $\exists x[uncle_of_M(x) \& (die_childless(x) \rightarrow inherit(M))]$
 - b. $\forall x[\text{linguist}(x) \rightarrow \exists y[\text{problem}(y) \& \forall z[\text{solution}_to(y)(z) \rightarrow \text{studied}(z)(x)]]]$

If the scope of the existential were achieved by movement of the indefinite noun phrase to the scope site, as illustrated in (3a,b), this would be in violation of the normal restrictions on the movement of quantified noun phrases:

a. [an uncle of Mary's]_i [If t_i dies childless, she will inherit a fortune]
b. [Every linguist]_j [some problem]_i [t_j has studied every analysis that has been proposed for t_i]

Two well-known types of solutions to this problem avoid allowing exceptional movement for indefinite noun phrases. An early version of the first type of solution was proposed in Fodor and Sag (1982) and says that sometimes indefinite noun phrases are understood as if they are used to make reference to an individual (in the manner of singular definite descriptions or names). As an expression that refers to a particular individual, the indefinite in (1a) becomes effectively scopeless and this is what explains the impression that the phrase has taken widest scope (as in the gloss in (2a)). An important modification of this referential account was proposed in Kratzer (1998) where it is observed that indefinite noun phrases could be interpreted as functions from individuals in the domain of a scopally superior noun phrase to individuals, thus accounting for the impression that the indefinite is interpreted at the nearest scope site below the quantified noun phrase on whose domain members it is dependent (as in the gloss in (2b)). In line with Kratzer's terminology, such accounts will be referred to as 'contextualist' since the question of which individual (or function) is involved in the interpretation is left up to context.

The main competitor to the contextualist account of these exceptional scope indefinites involves the use of a mechanism of existential closure which operates freely on the grammatically determined logical form of the utterance. The main motivation for this account stems from the fact that sometimes indefinites seem to have exceptional scope but they cannot be considered specific - as might be predicted if the expression were referential. These examples, as we will see, pose a serious empirical challenge to contextualist accounts. However, as we will also see, the alternative, free existentialclosure accounts suffer from empirical problems of their own in that they generate readings which are unattested. This has led some (in particular Schwarz 2002) to advocate that indefinites can be understood both referentially and via some additional mechanism which accounts for cases where the indefinite seems to take intermediate scope but be non-specific (such as existential closure or exceptional movement).

In this paper it will be argued that the contextualists' proposals do not take into account how the pragmatics of specific indefinites interacts with the semantics of their interpretation. Once a 'properly pragmatic' story is spelled out, it becomes clear how, sometimes, specific indefinites come to be understood as if some mechanism of freeexistential closure were in operation. But it will be clear where this closure effect comes from and what constraints there are on it.

For the purposes of exposition in this paper, the pragmatic reasoning involving specific indefinites will be described using Stalnaker's two-dimensional framework. Although nothing in the account really turns on the use of this framework, the form of pragmatic reasoning involved in our examples is best known to semantics as a case of *diagonalisation* and so the 2-D framework seems an appropriate expository tool.

Having set out the issues with specific indefinites in some more detail in Section 2, Section 3 takes a detour to consider how Stalnaker's account of pronominals anaphoric on indefinites relies on diagonalisation. In Section 4, further examples of pronominals anaphoric on indefinites are considered - but this time the antecedent is the type of specifically used indefinites illustrated in (1). Such examples add to the catalogue of empirical challenges for any treatment of specific indefinites and exceptional scope. Section 5 works through the reasoning that would be involved if specific indefinites were understood using diagonalisation and shows how the examples previously discussed would be accounted for.

2. Two Views on Exceptional Scope Indefinites

2.1 Early Choice Function Accounts

Early proposals for dealing with exceptional scope found in Reinhart (1997) and Winter (1997) employed choice functions and free existential closure. As defined in (4) below, a choice function, f, is a function from sets to individuals and always returns a member of the set it applies to, unless the set is empty. In that case, it returns a special object, #, of which no predicate holds:

4. Ch(f) iff $\forall X [X \neq \emptyset \rightarrow f(X) \in X] \land [X = \emptyset \rightarrow f(X) = #]$

Choice functions can be used in the analysis of the indefinites in (1a,b) in the manner suggested in (5a,b) respectively, where the sister node of the indefinite's predicate (here the articles 'a' or 'some') is interpreted as a function variable, *f*. So, in (5a), when the function variable, *f*, is given a value, it would combine with ||uncle of Mary's|| to yield a particular member of the set of Mary's uncles. The antecedent clause would then be true just in case the uncle chosen dies childless. In each case, the 'indefinite'

interpretation is achieved by the insertion of an existential quantifier over choice functions. Note that the insertion in the case of (5b) is at a site within the scope of another operator in the sentence:

5. a. ∃f[Ch(f) & [if f(uncle of Mary's) dies childless, she will inherit a fortune]]
b. [Every linguist]_i ∃f[Ch(f) & [t_i has studied every analysis that has been proposed for f(problem)]]

These early accounts, which employ the idea that specific indefinites are interpreted in situ (i.e. no syntactic movement is involved) using choice functions, generated some conceptual criticisms - notably in Geurts (2000) and Schwarzschild (2002). However, even if we put these concerns aside and wished to pursue a choice function analysis of the indefinite's determiner, we need to adjust the original Reinhart/Winter treatment to allow for cases where the exceptional scope indefinite's interpretation is dependent on a scopally superior quantificational term. Whereas it is possible to capture the relevant reading of (1b) using (5b), this general strategy of quantification over simple choice functions is insufficient, as can be seen in the following example taken from Schlenker (2006) (see also Chierchia 2001):

6. Context: Every student in my syntax class has one weak point - John doesn't understand Case Theory, Mary has problems with Binding Theory, etc. Before the final, I say:

If each student makes progress in some / an/ a certain area , nobody will flunk the exam.

Schlenker observes that the intended reading here is that there is a certain distribution of areas of syntax per student such that if each student makes progress in the area assigned to him/her, nobody will flunk the exam. This reading cannot be captured on the most promising Reinhart/Winter analysis:

- 7. If each student_i $\exists f [Ch(f) [e_i makes progress in f(area)]]$, nobody will flunk the exam
 - = If each student makes progress in at least one area, nobody will flunk the exam

According to (7), what the teacher says asymmetrically entails the proposition we intuitively take the teacher to have expressed. The problem is that when indefinites are

understood specifically and are also dependent on other quantifiers, we can intuitively understand them in terms of a pairing of elements in the quantificational domain (here students) and specific instantiations of the predicate (here areas of study).

2.2 Free Existential Closure View (Chierchia 2001, Schlenker 2006, Winter 2004)

In order to circumvent the problem in cases such as (6), apparently we would need to analyse indefinites in terms of functions from individuals in the domain of the scopally superior operator to choice functions. In fact, this is the basis of Kratzer's contextualist alternative (reviewed below). But such *Skolemised* choice functions can also be utilised in free existential closure accounts. For the purposes of exposition, we again follow Schlenker (2006) for the details of such an account (but see also Winter 2004 and Chierchia 2001). The general definition is given in (8):

$d_1,, d_n > of objects$
006, p. 288)
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Accordingly, the Reinhart/Winter accounts use only zero-order functions, F_0 , while Schlenker's claim is that an adequate analysis of (6) requires General Skolem Functions of adicity 1 - as suggested in (9):

9. $\exists F_{<1>}$ if $[\forall x: student x] x$ makes progress in $F_{<1>}(x, \lambda y \text{ area } y)$, nobody will flunk the exam.

Further motivation for the use of General Skolem Functions of adicity greater than zero comes from cross-over data discussed in Chierchia (2002).

So, it is broadly agreed that if indefinites are analysed using General Skolem Functions, sometimes functions of adicity greater than 0 would be needed (Kratzer 1998, Chierchia 2001, Winter 2004, Schlenker 2006). To return to our original examples, (1a,b), we have respectively (10a,b) as potential analyses employing General Skolem Functions:

- 10. a. $\exists F_{<0>}$ [When $F_{<0>}$ (uncle of Mary's) dies, she will inherit a fortune]
 - b. $\exists F_{<1>}$ [[Every linguist]_i [x_i has studied every analysis that has been proposed for $F_{<1>}(x_i, \lambda x.problem(x))$]]

To sum up then, and for the purposes of discussion in what follows, we can give the following characterisation of the Free Existential-Closure account:

The Free Existential-Closure (F \exists C) Account:

In principle, an indefinite can be interpreted with a General Skolem Function variable of any adicity and existential closure of that variable can be at any level.

2.3 Contextualist View (Kratzer 1998, Schwarzschild 2002)

If we consider only the examples discussed so far, it may seem that the above characterisation of the F \exists C account contains an unnecessary stipulation relating to the site of the closure. Given that it is necessary to sometimes use General Skolem Functions of adicity greater than zero, all of these examples would seem to involve closure at the level of the root clause. Moreover, it feels as though in each case discussed, the reason why quantification is widest scope has to do with the fact that, in context, we would imagine the speaker to be suggesting that s/he has one particular witness 'in mind'. For example, we can imagine that what makes (1a) true is a function which picks out the particular uncle the speaker has in mind. Similarly for (1b), we can imagine the formula in (10b) being verified by a function the speaker has in mind which pairs linguists with some particular problem (say, their thesis topic). This feeling that exceptional scope indefinites really are cases where there is some specific individual or function involved motivates contextualist accounts.

For the purposes of this discussion, we will classify two rather different accounts of specific indefinites as contextualist: one which analyses indefinites using choice functions (Kratzer 1998) and one which argues that the phenomenon is another case of domain restriction for quantified noun phrases (Schwarzschild 2002).

The main insight of Kratzer (1998) was that the quantificationally dependent indefinites which appear to have exceptional scope could be analysed using General Skolem Functions - as defined already in (8). Indeed, the main difference between Kratzer's proposal and the F \exists C account lies in her idea that there is no need for existential quantification over the function introduced by the indefinite but that the variable is somehow assigned a value by context - the value being what the speaker has in mind. So, Kratzer's analyses of (1a,b), given in (11a,b) differ from (10a,b) above only in that the function variables are free:¹

¹ There is a difference between what actually appears in Kratzer (1998) and (11a,b) in that here we assume that Skolem functions have variable adicity. In Kratzer (1998), adicity is fixed at 1.

- 11. a. [If $F_{<0>}$ (uncle of Mary's) dies childless, she will inherit a fortune]
 - b. [[Every linguist] [x_i has studied every analysis that has been proposed for $F_{<1>}(x_i, \lambda x.problem(x))$]]

When the speaker utters (1a) she has in mind a particular way of picking out the relevant uncle; when she utters (1b) she has a particular way of picking out the relevant problem relative to the linguists in the domain of the binding QNP.

Schwarzschild's (2002) account differs mainly in the formal analysis of indefinite noun phrases. His point was that one could treat even exceptional scope indefinites as existential quantified noun phrases. No use of choice functions would be necessary. The insight was that if such quantified noun phrases were, in context, deemed to have a domain restricted down to one individual, then they would appear scopeless. For cases like (1b) where the 'speaker's referent' is determined relative to individuals in the domain of a higher quantifier, Schwarzschild observed that the domain of any quantified noun phrase can become dependent on another quantifier and so such relativisation is an independent process.²

Schwarzschild's proposal can be summarised by considering what he would say about (1a,b). This is set out in (12a,b) where the implicit domain restriction is made explicit for the purposes of this discussion. In (12a), the predicate, P, supplied by context, is assumed to be satisfied by only one uncle of Mary. In (12b), the relational predicate, P, is assumed to pair each linguist under discussion with just one problem:

- 12. a. When [an uncle of Mary's *who is P*] dies, she will inherit a fortune.
 - b. [Every linguist] $[x_i$ has studied [every analysis that has been proposed for [some problem *that is* $P(x_i)$]]

2.4 Problems for the Contextualist View - and the Case for Intermediate Existential Closure

While the contextualist accounts discussed above both go some way to capture the apparent specificity of exceptional scope indefinites, they are not without conceptual shortcomings. As noted in Matthewson (1999), on neither contextualist account is the audience privy to the way of picking out the relevant individual which the speaker has

² Schwarzschild refers to Stanley & Szabo (2000) as a possible analysis of dependent domain restriction.

in mind. But in both accounts, what the speaker says involves a determinate way of picking out this individual. So, what is being proposed by both Kratzer and Schwarzschild is that the speaker can say something which the audience cannot grasp. Contrary to suggestions by both, this is not an unexceptionable state of affairs. Normally, expressions of variable reference come with a presupposition that the audience could recover the referent - otherwise infelicity ensues.

In addition to the conceptual issues with contextualist accounts, there are also empirical shortcomings. Chierchia (2002) makes the important observation that intermediate exceptional scope readings can be found in negative contexts and in these cases the readings do not seem to have anything to do with particular individuals. For example, (13a) has a reading which could be glossed in (13b); the analysis with a free function variable is suggested in (13c):

- 13. a. No linguist has studied every analysis that has been proposed for some problem.
 - b. $\forall x[\text{linguist}(x) \rightarrow \neg \exists z[\text{problem}(z) \land \forall y[\text{analysis}(y) \land \text{proposed}_{\text{for}(z)(y)} \rightarrow \text{studied}(y)(x)]]]$
 - c. [[No linguist] [x_i has studied every analysis that has been proposed for $F_{<1>}(x_i, \lambda x.problem(x))$]]

Chierchia's point was that (13c) fails to capture the sense that, given the reading of (13a) in question, one could take any linguist and expect that s/he had failed to exhaustively study any problem, not just that problem that the speaker may or may not have in mind for the given linguist. Similar considerations apply to (14a) (glossed in (14b)) below. It seems that (14a) could be used to deny that there is any kind of special uncle of Mary from whom she might inherit a fortune:

- 14. a. It's not true that Mary will inherit a fortune if an/some old uncle dies childless.
 - b. $\neg(\exists x \text{ uncle}_of_Mary(x) \land [die(x) \rightarrow inherit(m)])$

2.5 Problems for the Existential Closure Account

While apparently undermining contextualist accounts, examples such as (13a) and (14a) seem to provide genuine motivation for the idea that some kind of existential closure mechanism operates freely within the scope of other operators in the sentence. For example, according to the F \exists C account, we get (15) for (14a), which seems to better

capture the 'non-specificity' intended in such examples:

15. It's not true that $\exists F_{<0>}$ [Mary will inherit a fortune if $F_{<0>}$ (old uncle) dies childless]

But now a question arises as to where this existential closure mechanism comes from. There is no independent evidence that such an operator is introduced as part of the grammatically determined derivation of LF. If not, it would seem that free existential closure is some kind of 'interface' mechanism. It thus falls to advocates of $F\exists C$ accounts to provide more motivation for this mechanism and, in particular, why it selectively targets only certain types of noun phrases - not universal quantified noun phrases, definite descriptions or other related forms. These are serious conceptual shortcomings for the account and parallel the conceptual shortcomings of the contextualist account.³

In addition to the lack of independent motivation for $F\exists C$ accounts, there are wellknown empirical problems to do with the fact that they over-generate in non-upward entailing contexts. This problem has been thoroughly investigated in Schwarz (2001, 2002), upon which the following discussion draws heavily.

Although motivated by certain apparently exceptional scope facts, the F \exists C account is presumably quite general and thus would ascribe to (16a) below an analysis along the lines of (16b):

16. a. Every student answered some question.

b. $\exists F_{<1>}[Every student_x [answered F(x, \lambda u.question(u))]]$

³ Although there is little independent support for there being existential quantification of function variables introduced by descriptions, it has been argued in Winter (2004) that there is at least independent motivation for binding of functional variables. The evidence comes from identity statements as in (i) discussed in Jacobson (2002) and elsewhere:

i The woman that every married man loves to hate is his mother in law.

The interesting fact about this kind of example is that, even if one could move the universal from the relative clause to bind the pronoun in the VP, doing so would give the wrong reading. Jacobson argues that the way to capture the intended reading is along the lines of (ii):

This may be so, but there is a question about whether this fact would have any bearing on the case of specific indefinites since (a) the function in question is not a General Skolem Function and (b) this kind of case involves an obvious coercion of the normal meaning of the definite.

As it happens, (16b) is in fact equivalent to (17) where *[some question]* is understood as an existential quantifier and on the assumption that there were some questions.

17. $[Every student]_x [[some question]_y [x read y]]$

In a long discussion which bears on the value of $F \exists C$ accounts, Schwarz (2002) notes that this equivalence holds in virtue of the following two facts:

- 18. a. For every g, if there are some books, then $||\lambda x[answered F(x, \lambda u.question(u))]||^g \subseteq ||\lambda x[[some question]_y [x read y]]||^g$
 - b. For every g, if there are some books, then for some $F_{<1>}$, $\|\lambda x[answered F(x, \lambda u.question(u))]\|^g = \|\lambda x[[some question]_y [x read y]]\|^g$

To see that the equivalence holds, assume that there were questions and that (16b) is true relative to an assignment function, g; this means that for some $F_{<1>}$, f, ||every student||^{g[F/f]}(|| λ x[answered F(x, λ u.question(u))]||^{g[F/f]})=1. Given (18a) above and the fact that *every student* is upward monotone, we can conclude that ||every student||^g(|| λ x[[some question]_y [x read y]]||^g) = 1. That the truth of (17) implies the truth of (16b) - assuming there were questions - follows straightforwardly from (18b).

Schwarz's point is that the equivalence between (16b) and (17) holds in virtue of the monotonicity properties of the subject ('every student'). If these are changed, then things are different. For example, (19a) below is not equivalent to (19b) but rather (19c):

- 19. a. $\exists F_{<1>}[Not every student_x [answered F(x, \lambda u.question(u))]]$
 - b. [Not every student]_x [[some question]_y [x read y]]
 - c. [Not every student]_x [[every question]_y [x read y]]

That the equivalence between (19a) and (19c) holds, turns on the following facts:

- 20. a. For every g, if there are some books, then $\|\lambda x[[every question]_y [x read y]]\|^g \subseteq \|\lambda x[answered F(x, \lambda u.question(u))]\|^g$
 - b. For every g, if there are some books, then for some $F_{<1>}$, $\|\lambda x[$ answered $F(x, \lambda u.question(u))]\|^g = \|\lambda x[[$ every question $]_y [x read y]]\|^g$

By parallel reasoning for the case of the equivalence between (16b) and (17), Schwarz shows that the implication from (19a) to (19c) holds because *not every* is downward monotone. Supposing that (19a) is true and assuming there are questions means that ||not

every student $||^{g}(||\lambda x[answered F(x, \lambda u.question(u))]||^{g[F/f]}) = 1$ for some *f*. Given (20a), it follows that (19c) is true. That (19a) is equivalent to (19c) is problematic for F \exists C accounts since no such reading of (19a) is attested.

Schwarz argues that, in general, where there are things that satisfy β , (21a) below is equivalent to (21b) if δ is right upward monotone (Mon[†]); and (21a) is equivalent to (21c) if δ is right downward monotone (Mon[‡]):

- 21. a. $\exists F_{<1>}[[\delta \alpha] \lambda x[[F(x, \beta)] \gamma]]$
 - b. $[\delta \alpha] \lambda x [[some \beta] \gamma]$
 - c. $[\delta \alpha] \lambda x [[every \beta] \gamma]$

Accordingly, given that non-monotone 'exactly n α ' can be analysed in terms of upward monotone 'at least n α ' and downward monotone 'at most n α ', (22b) below is equivalent to (22c), an unattested reading of the relevant analysand, (22a):

- 22. a. Exactly two students read every paper that some professor wrote.
 - b. $\exists F_{<1>}[[exactly 2 students]_x [x read every paper that F(x, \lambda u.professor(u)) wrote]]$
 - c. [At least two students]_x [[some professor]_y [x read every paper that y wrote]] and [At most two students]_x [[every professor]_y [x read every paper that y wrote]]

In Schwarz's discussion, a distinction is made between an account which attributes exceptional scope behaviour to quantification over first-order General Skolem Functions at the level of the root clause (i.e. always widest scope), and an account (such as that of Reinhart 1997) that only involves quantification over zero-order General Skolem Functions but allows existential closure at any level. We have already encountered independent problems for the latter type of account in relation to (6) above. In addition to that problem, Schwarz notes that where the restriction of the relevant indefinite contains a pronoun bound by an intervening quantifier, the wide-scope closure of zero-order General Skolem Function quantification is equivalent to wide scope closure of the first-order version - in the circumstances where no two individuals in the binding domain are paired with the same set denotation for the indefinite. That is, for an example like (23a), where no two students are paired with the same set of professors, the analysis in (23b) is equivalent to the analysis in (23c). As we have seen, (23c), and thus (23b), is an unattested reading of (23a):

- 23. a. $[Exactly two students]_i$ read every paper that some professor of theirs_i wrote
 - b. $\exists F_{<0>}[[exactly 2 students]_x [x read every paper that F(\lambda u.professor_of(u,x)) wrote]]$
 - c. $\exists F_{<1>}[[exactly \ 2 \ students]_x \ [x \ read \ every \ paper \ that \ F(x, \lambda u.professor_of(u,x)) \ wrote]]$

Schwarz concludes that there are problems with both kind of account he considers when it comes to ascribing a wide-scope closure analysis where the subject noun phrase is not Mon[†]. A suggestion in Schlenker (2006) in relation to these cases involves the observation that the problem only arises because the F \exists C account is characterised as if there were (or can be) no restrictions on existential quantification of these function variables. Schlenker notes that were the wide-scope quantification over Skolem functions in the (22b) analysis of (22a) above to be restricted to the function the speaker has in mind, then a wide-scope reading is actually available. In fact, this is just the reading that contextualists posit for such examples.

Schlenker's observation that existential quantification over Skolem function variables could in principle be restricted is, of course, correct. However, the essence of the F \exists C account is that the domain of quantification is not necessarily always this narrow - otherwise the F \exists C account would just be a notational variant of the contextualist account. In any case, it is the sometimes *unrestricted* but narrow-scope quantification over Skolem functions that seemed to be essential to account for examples such as (14a) which pose a severe problem for contextualist accounts:

(14) a. It's not true that Mary will inherit a fortune if an/some old uncle dies childless.

Recall that the F \exists C analysis of (14a) was as set out in (15):

(15) It's not true that $\exists F_{<0>}$ [Mary will inherit a fortune when $F_{<0>}$ (old uncle) dies]

So, in order to avoid Schwarz's problem, an advocate of $F\exists C$ would have to independently motivate a constraint that widest-scope existential closure of Skolem function variables cannot be unrestricted, while non-maximal scope closure can involve unrestricted quantification.

In his own proposal, Schwarz draws a distinction between genuinely specific uses of functional indefinites, which can give rise to the appearance of intermediate scope readings (as originally suggested in Kratzer 1998), and non-functional indefinites which

can nevertheless gain exceptional intermediate scope. To illustrate, Schwarz argues that (24a,b) below have apparently intermediate scope readings but via different mechanisms:

- 24. a. Exactly two students read every paper that some professor wrote
 - b. [Exactly two students]_i read every paper that a certain professor of theirs_i wrote

In the case of (24a) some exceptional scope mechanism is in operation - either F \exists C, see (25a) below, or simple exceptional scope movement of the noun phrase, as per (25a'); while in (24b) Kratzer's contextualist account comes into play, as in (25b), where *F* is fixed by context to be that function the speaker has in mind:

- 25. a. [Exactly two students]_i $\exists F [e_i \text{ read every paper that } F (\lambda u.professor(u)) wrote]$
 - a'. [Exactly two students]_i [some professor]_i [e_i read every paper that e_i wrote]
 - b. [Exactly two students]_i[e_i read every paper that F (x_i , $\lambda u.professor(u)$) wrote]

In fact, Schwarz suggests he favours the (25a') version of (24a) over (25a). The main motivation that is reported for this preference is that adopting the exceptional movement solution would involve fewer stipulations than the F_∃C alternative (which requires stipulating restrictions on wide-scope closure - that it cannot be unrestricted). Whether fewer stipulations are in fact needed or not, there are two considerations that weigh against following this route. Firstly, to advocate that the 'non-specific' exceptional-scope indefinites are to be handled with exceptional scope movement seems more or less an admission that there is a residue of cases of exceptional scope indefinites which cannot be analysed given current assumptions in semantics. Secondly, motivating the distinction between specific and non-specific exceptional-scope indefinites seems to be problematic. It is suggested in Schwarz's discussion of this point that it is the form of the indefinite that determines whether an indefinite can be understood as specific or not. That is, forms such as 'some professor' or 'a professor' are understood to be strictly non-specific, while forms such as 'a certain professor of his' are understood to be specific. Quite apart from the question as to where one is meant to draw the line, it seems that even simpler forms can be understood specifically - in examples such as (1) for instance.

Returning to our examination of the F \exists C account and to sum up the present discussion, we can say that the F \exists C account is motivated as an alternative to the contextualist accounts precisely because it can handle cases where there is intermediate exceptional

scope but where there is no implicit restriction to the specific individual or function that the speaker has in mind. This was illustrated with negative context examples, (13a) and (14a) - repeated below:

- (13) a. No linguist has studied every analysis that has been proposed for some problem.
- (14) a. It's not true that Mary will inherit a fortune if an/some old uncle dies childless.

In addition to these cases, the phenomenon may be quite general, extending to intermediate scope in non-negative contexts such as (26a), which seems to be able to carry a non-specific reading glossed in (26b):

- 26. a. Exactly two students read every paper that some professor wrote
 - b. [Exactly two students]_i $[\exists x_i [e_i read every paper that x_i wrote]]$

However, as Schwarz argues and as we have seen with examples like (6) (repeated below) there are still many cases where quantification over Skolem functions would seem to be restricted to the unit set of functions the speaker has in mind:

(6) Context: Every student in my syntax class has one weak point - John doesn't understand Case Theory, Mary has problems with Binding Theory, etc. Before the final, I say:

If each student makes progress in some / an/ a certain area , nobody will flunk the exam.

To make the $F\exists C$ account work then, one would have to allow for both restricted and unrestricted quantification over Skolem functions; but in order to avoid overgeneralising, one would have to also stipulate that quantification cannot be unrestricted in certain constructions.

As a prelude to the proposal to be made in the second half of this paper, we can say that the diagonalisation account of exceptional scope indefinites derives *both* the specific exceptional scope interpretations *and* the non-specific intermediate exceptional scope interpretations as pragmatic elaborations of the basic case of specifically used indefinites. The pragmatic mechanisms that allow for these readings are independently motivated and their operation is such that it cannot give rise to the derivation of the unwanted readings described in this section. Before that pragmatic account is presented, it is worthwhile to consider some further cases which suggest that in the end, $F\exists C$ accounts not only overgenerate, but undegenerate too. These cases involve data which, as far as I am aware, have not been considered before.

2.6 What Can Undergo Exceptional Scope?

In standard expositions of the problem of exceptional scope, the example in (1a), which has a reading glossed in (2a), is contrasted with the example in (27), which has no corresponding reading where universal quantification takes scope outside of the subordinate clause of the conditional sentence - as in (28).

- 27. John's fiancé will be upset if every ex-girlfriend of John's comes to the wedding.
- 28. [every ex-girlfriend of John's]_i [John's fiancé will be upset [if e_i comes to the wedding]]

The absence of the (28)-reading of (27) is predictable from grammatical theory which suggests that scope relations obtained through movement are constrained in specific ways (e.g. no movement out of subordinate clauses). In this paper and elsewhere, it is considered plausible that any exceptional scope behaviour arises in virtue of the phrase 'an uncle of Mary's' being read specifically. This being so, the question naturally arises, what other phrases can be understood specifically? A little introspection suggests that, perhaps, many noun phrases can be understood specifically. For instance, those involving 'exactly two', 'at most three' and so forth. Consider for instance that (29) can be understood to mean something other than what we would expect if no movement for scope were possible from the subordinate if-clause:

29. Mary will accede to the throne if exactly two old uncles die before she does.

If no movement for scope is possible, (29) ought to convey the idea that exactly two uncles dying before Mary is sufficient for her accession to the throne. However, the sentence read non-specifically would convey the idea that any two old uncles dying before Mary would suffice to trigger the accession - so long as no more than two die. But this is not the same as the specific reading of this example. The specific reading of this

example is akin to the specific reading of the following:⁴

30. Mary will accede to the throne if two old uncles die before she does.

This is perhaps unremarkable from a specificity account of exceptional scope since one can perfectly make sense of a usage of 'exactly two uncles' where the implication is that the speaker has two particular uncles in mind.

It takes little reflection to realise that if these are genuine specific or exceptional scope readings, such readings cannot be accounted for with the F \exists C account. In fact, since 'exactly n' is not Mon[↑], the account could not really get off the ground since it would be obliged to treat 'exactly n' as a predicate modifier. That is, the account could not discriminate between 'three cats' and 'exactly three cats'. Consider (31a,b) and their F \exists C analysis in (32a,b):

- 31. a. Three cats sleep.
 - b. Exactly three cats sleep.
- 32. a. $\exists F[F(\text{three cats}) \text{ sleep}]$
 - b. $\exists F[F(exactly three cats) sleep]$

Assuming F(exactly three cats) chooses a collection of exactly three cats from the set of such collections, (32b) says the same as (32a). The moral is that $F \exists C$ can only work with indefinite noun phrases whose determiners are Mon[†]. Consequently, any attempt to analyse (29) above by employing free existential closure is doomed to fail:

33. $\exists F[Mary will accede to the throne [if F(exactly old two uncles) die childless]]$

Suppose for instance that there is just one old uncle (who is currently childless) standing between Mary and the throne. In that case, (29) is false on its specific reading. However, we can pair that uncle with any other old uncle of Mary's and the choice of that pair by F would make the conditional true in (33).

The specific reading of (29) can be derived by either contextualist account:

⁴ Some informants get a little distracted by the presence of 'exactly' in (29). But they accept the example if context is given to justify the emphasis that 'exactly' brings. One context might involve A suggesting that Mary will accede if 'around two or three uncles die before she', to which B retorts (29). Alternatively, informants are happier with the use of 'just two' rather than 'exactly two' since the alternative modifier is more appropriate to an out-of-the-blue context.

34. [Mary will accede to the throne [if F(exactly old two uncles) die childless]]

If the value that F is assigned by context chooses the (exactly) two uncles the speaker has in mind, then (34) captures the intuitive reading of (29).

In general it seems that a large class of quantified noun phrases can be subject to these specific readings. Consider the following example in a context where it is not unusual that someone who has the right to accede to the throne does not exercise that right (perhaps because the head of state is often subject to assassination attempts in the country in question):

35. Mary will accede to the throne if at most three old uncles die before she does.

Here the suggestion is that the speaker has three old uncles in mind who in principle stand between Mary and the throne but who may not all be prepared to take the throne when their turn comes. These are the 'at most three' uncles the speaker has in mind.

Reflecting on the broader state of play, we could suppose that, as with Schwarz's examples, an advocate of the F \exists C account could suggest that in the examples discussed in this section, widest scope existential function quantification is restricted down to the unit set containing that function which chooses the speaker's referent. But as with Schwarz's problem, the question arises as to how this restriction is motivated. In addition, in as far as Schwarz contemplates simple exceptional movement as the source of some exceptional scope effects, one would need some motivation for why it is blocked in these cases, since no reading of (29) represented by (36) below is attested:

- (29) Mary will accede to the throne if exactly two old uncles die before she does.
- 36. [exactly two old uncles]_i [Mary will accede to the throne if [e_i die before she does]]

Imagine a situation where old King Siegfried has an aged brother, Boris, and both are childless and the daughter of their now departed brother is Mary. Thus she is second in line to the throne as things stand. Mary may also have many maternal uncles but these are irrelevant to the accession and the intended interpretation of (29) is true in this circumstance. However, since we are able to form collections containing the two paternal uncles and some additional maternal uncles so that [Mary will accede to the throne if $[e_i]$ die before she does]] comes out true when e_i refers to this collection, (36) comes out

false in the circumstance described. We can conclude then that exceptional movement of *[exactly two old uncles]* gives rise to unattested readings in this case. In general, only exceptional movement of monotone increasing indefinite noun phrases are relatively unproblematic (though see Schwarzschild 2002 a.o. for a discussion of well-known problems). Thus, Schwarz's favoured alternative account for non-specific exceptional scope seems to be problematic.

Given the pattern of exceptional scope readings of the indefinites considered in earlier sections, it is worthwhile to consider the effect of embedding (29) under negation. It seems that in such cases we can get the denial of the specific reading which becomes in its turn non-specific:

37. It's not true that Mary will accede to the throne if exactly two old uncles die before she does. There are three old uncles that need die before she sits on the throne.

(37) seems to be denying the idea there is any particular set of just two old uncles whose death automatically leads to Mary's accession. That is, (37) seems to have a reading best glossed using intermediate unrestricted $F \exists C$:

38. It's not true that [∃F [Mary will accede to the throne [if F(exactly two old uncles) die before she does]]].

Once again it seems that the unrestricted, non-specific exceptional scope reading comes to the fore in an embedded context.

3. Anaphoric Dependence on Indefinites and Diagonalisation

To sum up the discussion so far, in addition to the conceptual drawbacks of each type of account being considered, there are also serious and somewhat complementary empirical problems. On the one hand there seem to be genuinely 'non-specific' readings of exceptional scope indefinites that suggest some mechanism of existential closure needs to be involved. On the other hand, if we allow existential closure freely, we generate all kinds of unattested readings while still failing to say much more about the specific cases than the contextualist account does. In later sections, the favoured pragmatic approach will be presented. This approach is based on the strategy of diagonalisation. Before we move onto that discussion, it is worth reviewing how diagonalisation works in a better-

known case. In particular, it is worth highlighting the fact that diagonalisation only operates together with some kind of principle of relevance or coherence.

3.1 An Old Story

A long-standing topic in semantics and pragmatics concerns the treatment of pronouns anaphoric on indefinite descriptions, as exemplified in (39a) which can be understood according to the gloss in (39b):

39. a. A man walked in the park. He whistled. b. $\exists x[man(x) \land walk_in_the_park(x) \land whistled(x)]$

As discussed in Stalnaker (1998), van Rooy (2001) and Breheny (2004), both dynamic and standard E-type accounts have difficulty dealing with pronominal contradiction, illustrated in (40):

40. A: Last night I met a member of Cabinet.B: She wasn't a member of Cabinet.

More to the point, evidence suggests the gloss in (39b) can be false while what the speaker says in uttering (39a) can be true. To see this, consider an utterance of (41b) in the context of (41a):

- 41. a. John is politically naive and is introduced by a practical joking host to a tabloid journalist as a cabinet minister and at the same time to a real cabinet minister as a journalist. In the ensuing (sincere) conversation, the real cabinet minister comes across as pro-Europe while the fake minister comes across as anti-Europe.
 - b. Last night I met a member of the Cabinet. He was anti-Europe.

While it would be appropriate for us to respond with (42a) below, we clearly could not respond with (42b or c). So while it is clear that John is unwittingly misleading us into thinking that he met a member of the Cabinet who was anti-Europe - nothing he actually says can be denied.

- 42. a. He wasn't a member of the Cabinet.
 - b. You didn't meet a member of the Cabinet last night.

c. He wasn't anti-Europe.

This suggests that the gloss in (39b) represents some combination of semantic interpretation and pragmatic inference. According to Stalnaker's (1998) account of (39) the proposition literally expressed by the first sentence could be glossed as $\exists x[man(x) \land walk_in_the_park(x)]$; and the modified diagonal proposition expressed by the second sentence is $\exists x[speakers-referent(x) \land whistled(x)]$. This squares with (41)-(42) above. Even though the speaker's referent is critical to the truth of the utterance of the second sentence, it does not seem to figure in the truth-conditions of the utterance of the first segment. Thus according to this account, the gloss in (39a) results from a contextual implication that the speaker's referent is a man who walked in the park.

3.2 The Use of Diagonalisation

On Stalnaker's account, the pronoun in the second sentence of (39a) is just a variable term of direct reference but the proposition expressed is not a singular proposition.⁵ That is, we understand the second segment so that different individuals could be the speaker's referent in different contextual alternatives. The disparity between what would have been literally expressed and what is actually expressed arises as a form of implicature which turns on the following (two-dimensional) conversational principle taken from Stalnaker (1978):

Principle 3:

The speaker expresses the same proposition in each contextual alternative.

The reasoning behind this form of implicature goes as follows:

- The meaning of the first segment determines an existential proposition, and the context set is updated accordingly. That is, in each alternative possibility consistent with what is presupposed at that point in the exchange, at least one man walked in the park.

- The second sentence contains a singular, third person pronoun, 'he', which carries a presupposition that an individual is uniquely salient for reference.

- When the second segment is uttered, for all that has been presupposed, different

⁵ In this paper, Stalnaker's diagonalisation account of the pronoun in (39a) is being discussed for the purposes of illustration of how diagonalisation works. For reasons discussed in Breheny (2006), Stalnaker's may not be the optimal one and the use of some kind of E-type account may be more appropriate.

male individuals are uniquely available to be the referent of 'he' in different contextual alternatives.

- The speaker is clearly flouting Principle 3 and can see that any audience can see that she is doing so in order to convey another, reflexive, proposition to the effect that the proposition being expressed is true.

- In the two-dimensional framework, such reflexive propositions are diagonal propositions. For a given context set (of alternatives) the diagonal proposition is the proposition which is true in contextual alternative *w* when the proposition the speaker expresses in *w* is true in that alternative.

- On its own, diagonalisation can result in a very weak proposition (that some male is whistling).

- In order to maintain the presumption that the speaker is maintaining discourse coherence (i.e. maintaining relevance between the production of discourse segments), we need to further reduce the set of alternatives so that in each remaining possibility in the context set, the male individual uniquely salient for reference is the particular individual the speaker had in mind in uttering the first segment.

Note that it is only at the point where the second utterance is made that it is *necessary* to presuppose that the speaker intended to raise the particular individual she had in mind to salience when she made the first utterance. I.e., while it is open for the audience to assume that the speaker has a particular individual in mind when the speaker utters the first segment, it is only necessary, according to pragmatic principles of coherence or relevance, to actually presuppose this assumption when making sense of the second utterance made. A second, related observation, is the following: the fact that the proposition communicated by the second segment is that the speaker's referent whistled is the result of not only diagonalisation but also of making some further, coherence-driven accommodation.

4. Anaphoric Relations with Specific Indefinites

Before we move on to consider how the diagonalisation account of exceptional scope works, let us consider some further data which is informative about intuitions motivating the two accounts under discussion. First, consider (43):

- 22 Breheny
- 43. Mary will inherit a fortune if a rich old uncle of hers dies childless. He is an oil magnate.

As in the case of (39) above, the anaphoric pronoun in (43) would normally be understood to refer to 'the speaker's referent'. To see this, take the following context:

44. Context: John utters (43) having in mind an old man who is not in fact an uncle of Mary but a close family friend. Though Mary has rich old uncles, she will inherit from none of them. Knowing this, Bill responds:

Bill: He is not an uncle of Mary's, he is a family friend. It's not true that Mary will inherit a fortune if a rich old uncle of hers dies childless.

Bill's first utterance in (44) is a case of pronominal contradiction and suggests that both John and Bill are talking about the same individual (the one raised to salience by John's utterance).

Also, by analogy with (39) above, we can ask whether the first segment of (43) expresses a purely existential proposition (roughly: that there is a rich old uncle who is such that if he dies childless Mary inherits a fortune). The second utterance by Bill in (44) is potentially informative on this question. If it is taken as a straight denial of John's in (43), our intuitions seem to square with the F \exists C account. The data seem problematic for both contextualist accounts.

To make sense of this data, an advocate of a contextualist account would need to say that in (43) John is presupposing that his referent is a rich old uncle of Mary's. The first part of Bill's utterance can then be seen as a repair, shifting the context set to worlds where John's referent is not an old uncle. The last utterance then is not a direct denial of (43) but a new statement directed at the recently shifted context set. Indeed, this seems to be a plausible account of this example. But now consider the following context:

45. Context: John utters (43) having in mind a rich old uncle who has left Mary out of his will. However, unknown to John, Mary does have another rich old uncle from whom she will inherit if he dies childless. Knowing this, Bill cannot respond:

Bill: It's not true that Mary will inherit a fortune if a rich old uncle dies childless.

Given (45) it would seem that in this context, in uttering (43) with the intended specific reading, John has not said anything false. However, elicited judgements are very delicate

on this kind of example. Informants have said about (45) that what John said was 'sort of true'. We will come back to this point below. In the meantime, we can note that, in as far as what John says is true in this context, that is consistent with the F \exists C account and conflicts with the contextualist account.

That opinions about exceptional scope indefinites vary as to whether the speaker's referent actually figures in the content of what is expressed adds to the collection of data to be explained. In the next section it will be argued that all of the data considered thus far can be explained by a pragmatic account which employs independently motivated mechanisms: diagonalisation and presupposition accommodation.

5. Modifying the Contextualist Account Using Diagonalisation

We can trace the problem with both contextualist accounts discussed above to their assumption that the use of specific indefinites involve a simple violation of Principle 3 without any kind of repair. In pragmatics, principles are either exploited (only apparently violated before contextual modification) or flouted for the purposes of getting across another proposition (See Grice 1975). This kind of flouting is what happens in the case of diagonalisation. Let's see if we can derive the relevant readings as implicatures via diagonalisation.

5.1 Basic Case

For this purpose, we will use the Schwarzschild account of specific indefinites. But note that nothing turns on this decision. The same kind of reasoning would apply if we analyse indefinites using unbound variables over General Skolem Functions.

We start with (12a) as the initial analysis of (1a) where we consider *P* as a one-place predicate term with a to-be-established interpretation:

(12) a. If [an uncle of Mary's *who is P*] dies childless, she will inherit a fortune.

We derive the existential-closure reading as follows:

- (i) Making sense of the utterance as specific would involve accommodating the presupposition that the implicit restriction applies to just one individual who is an uncle of Mary's.
- (ii) But still, the speaker's utterance contains an element, *P*, which, as far as can be presupposed, expresses different properties (identifying uncles of Mary) in

different alternatives in the context set. I.e. for all that can be presupposed, the speaker is not expressing the same proposition in each context alternative.

- (iii) The speaker is clearly flouting Principle 3 and intends rather that a (possibly restricted) diagonal proposition is intended. That is, rather than communicate the proposition s/he is actually expressing, s/he is communicating that the proposition s/he is expressing is true.
- (iv) The resulting context update eliminates context alternatives, w, in which the individual satisfying the identifying condition, P, in w, is a rich old uncle of Mary's who dies childless and Mary does not inherit. This diagonal proposition is different from (asymmetrically entails) the existentially closed proposition that there is a way of choosing a rich old uncle of Mary such that if he dies childless etc. etc.

Before we move to step (v) and in order to elaborate on step (iv), consider the following illustration:

Suppose Mary has two rich old uncles, u_1 and u_2 . Either one or both or none of these uncles could bequeath a fortune to her. Let us consider worlds where just one does. Let us say that in 'a'-worlds, w_{a1} and w_{a2} , u_1 bequeaths a fortune to Mary and u_2 leaves her nothing. In 'b'-worlds, w_{b1} and w_{b2} , u_1 leaves Mary nothing and u_2 bequeaths her a fortune. Now, let us consider what possible contexts we could be in. We could be in a context where *P* picks out the singleton set containing u_1 . Let us call these '1' - worlds. I.e. in context world w_{a1} , $P(w_{a1}) = \{u_1\}$ and similarly, in context world w_{b1} , $P(w_{b1}) = \{u_1\}$. Mutatis mutandis for '2'- worlds: in context world w_{a2} , $P(w_{a2}) = \{u_2\}$ and similarly in w_{b2} $P(w_{b2}) = \{u_2\}$. The relevant part of the propositional concept for (12a) is as follows:

	w _{a1}	W _{a2}	w _{b1}	w _{b2}
W _{a1}	Т	Т	F	F
W _{a2}	F	F	Т	Т
W _{b1}	Т	Т	F	F
W _{b2}	F	F	Т	Т

We should also consider 'c'-worlds where both u_1 and u_2 bequeath a fortune to Mary and 'd'-worlds where neither do. This would add four rows and four columns to the propositional concept but the truth values on the extended part of diagonal of this

propositional concept would pattern with the existentially closed proposition. What is of most interest is the part shown above, since from considering these worlds, we can see that the diagonal proposition is not in fact identical to the existentially closed proposition (which is true in all a-worlds and b-worlds) but entails it. A similar pattern would be found if we expanded our considerations to include worlds where Mary has three, four or more uncles.

So, what does it mean that the diagonal proposition varies in this way from the existentially closed proposition? In certain cases, in terms of what is effectively communicated, it might mean very little if, for the purposes of conversational update, the distinction between the '1'-worlds and '2'-worlds is not relevant. The diagonal proposition is true in both a-worlds and b-worlds under some way of picking out rich old uncles. So under certain conditions...

- (v) As far as the audience is concerned, the same communicative effect is achieved by the diagonal proposition as by an expression of the existentially closed proposition. That is, as far as the audience is concerned, the main point of the utterance could just be to communicate this implication of the diagonal proposition - that there is a way of choosing an uncle of Mary who is such that, if he dies childless *etc*. This seems to be the case in the following kind of context:
- 46. A: Why is John going to marry that rude and nasty Mary?B: Apparently, she will inherit a fortune if a rich old uncle dies childless.

So the claim is that, in some cases at least, flouting Principle 3 and implicating the diagonal proposition is sufficient to get across the point that would be made by the existentially closed proposition. For even if it might often be assumed by the audience that the speaker of (46) has a particular individual in mind, it is not *necessary* to presuppose that assumption in order to understand the main point that the speaker is getting across by his/her utterance.

Of course, judgments in these matters are extremely delicate and in some contexts, for reasons of relevance, it may be seem that the speaker is communicating an enriched diagonal proposition - as is perhaps the impression informants have when they judge John's first utterance false in context (45).

One difference between the example context in (45) and (46) has to do with the fact that in (45) the utterance in question is part of a discourse which contains an anaphoric pronoun in the second segment. In that case, a separate piece of pragmatic reasoning (possibly also involving diagonalisation) would be required as with (39) where it

becomes necessary to presuppose that the speaker had a particular uncle in mind in uttering the first sentence in order to make coherent sense of the second. That is, for reasons of coherence of the whole discourse, one has to presuppose that, in uttering the first segment, the speaker has a particular uncle in mind and is making that individual uniquely salient in virtue of the utterance of that segment. This naturally (although not necessarily) makes one assume the speaker intended that, for the first segment, diagonalisation only be applied to a propositional concept where P picks out the uncle that the speaker has in mind. That way, the distinction between '1'-worlds and '2'-worlds on the diagonal is no longer irrelevant and the truth of the diagonal proposition comes to depend on how things stand with the uncle the speaker has in mind - so we only eliminate context alternatives where the speaker's uncle dies childless and Mary does not inherit.

We can characterise the effect of the speaker communicating this enriched diagonal proposition by saying that it is the same as that which would have obtained had the contextually provided restriction, P, in (12a) been an indexical, reflexive predicate, *certain_u*, which is such that it necessarily applies to one individual if any and that individual is the one the speaker has in mind when producing the utterance u of the indefinite noun phrase.⁶

But note that, although it is a natural enrichment to make for reasons of relevance, it is not absolutely necessary to make that presupposition to establish coherence between the two discourse segments. All that is necessary is to presuppose that the speaker is making uniquely salient the uncle s/he has in mind when s/he makes the first utterance. So it is possible, if not all that natural, to construe John's utterance of (43) in context (45) in a non-referential way.

The above discussion may seem to dwell on overly fine distinctions. But the fact is that judgements about the truth of these examples are very subtle and quite delicate. When considering (45) and (46), informants at least agree that the latter seems to depend less on the speaker's referent and the former more so. This is explained by the diagonalisation account since on the diagonalisation account, in some contexts, examples could be understood so that the main point is to convey the existentially quantified implication of the diagonal proposition but other contexts may push the example to be understood more specifically for reasons of relevance and coherence.

To sum up, the proposal is that we explain intuitions about exceptional scope indefinites by starting out with a formal analysis along the lines of either of the

⁶ To be more precise, *certain*_u applies to the individual (if any) that satisfies the identifying condition the speaker has in mind.

contextualists, but we then work through all of the pragmatic reasoning that should be involved if this formal analysis is right. The result is that we end up deriving an interpretation which does not necessarily have the contextualists' truth conditions but it could be so enriched if relevance considerations require. Moreover, the unenriched diagonal proposition does not strictly have the truth-conditions given by unrestricted free existential closure of a Skolem function variable. However, we explain why, intuitively, an utterance of (1a) containing a specific indefinite might appear to have these $F \exists C$ truth conditions.

5.2 Deriving Intermediate Existential Closure

So far so good; but we do not yet have any account of cases of apparent intermediate existential closure which seem to be also genuinely non-specific. Recall that (13a) can be understood according to the analysis in (47) where quantification over Skolem functions is unrestricted; and that (14a) can be understood according to the analysis in (15).

- (13) a. Not every linguist has studied every analysis that has been proposed for some problem
- 47. [[No linguist] $[\exists F_{<1>}[x_i]$ has studied every analysis that has been proposed for $F(x_i, \lambda x.problem(x))$]]].
- (14) a. It's not true that Mary will inherit a fortune if an old uncle dies childless
- (15) It's not true that $\exists F_{<0>}$ [Mary will inherit a fortune if $F_{<0>}$ (old uncle) dies childless]

In discussing the conceptual motivation for the $F\exists C$ approach, the question was raised as to where this mechanism of intermediate closure comes from. Since the \exists operators are presumably not represented in syntactically derived representation for the examples, the supposition must be that free existential closure is effected at the so-called pragmatic interface. Given the diagonalisation account of these specific indefinites we can cash out what this means in the following way.

We have already seen that, from a pragmatic perspective, when we diagonalize we do not need to stop at the minimal diagonal proposition, but can always accommodate further presuppositions about the identifying condition which implicitly restricts the indefinite. In this way it was explained how what the speaker expresses can come to

depend for its truth on the individual(s) the speaker has in mind. This was done via the step where P is presupposed to express the identifying property the speaker has in mind. In the case of (14a) we can explain the local existential closure effect by supposing that a different kind of presupposition about the implicit restriction, P, is accommodated. In short, we could presuppose that the implicit restriction picks out a 'first among equals' uncle. I.e. in each possibility, the implicit restrictor, P, is presupposed to be such that if any uncle is such that Mary inherits when he dies, then the individual P picks is such that Mary inherits when he dies. I.e., either no uncle leaves Mary a fortune or the individual P picks out does. Thus the diagonal proposition for (14) is true just in case there is no specific uncle of Mary's who is such that if he dies childless, Mary will inherit a fortune.

This 'first among equals' presupposition can be applied generally. For (13a), the presupposition about relational *P* would be along the lines of (48):

48.
$$\forall x, y \ [P(x)(y) \rightarrow ((\exists z [problem(z) \land \forall w [analysis(w) \land proposed_for(z)(w) \rightarrow studied(w)(x)]]) \rightarrow (\forall v [analysis(v) \land proposed_for(y)(v) \rightarrow studied(v)(x)]))$$

In general, if we have the specific indefinite in the scope of some operator, $[O_1...[some F who is P]...]$, and this whole construction is in the scope of another operator, $[O_2...[O_1...[some F who is P]...]]$, then we can always construct a presupposition about P so that we can have the intermediate scope effect without movement. Suppose ϕ is the result of extracting the indefinite from within the scope of the operator, O_2 . That is, if the interpretation of $[O_2...[O_1...some F who is P...]]$ is represented as $O_2'(\psi_1(some_F'(\psi_2)))$ where some_F' is an ((e,t),t) operator and ψ_2 is possibly null, then ϕ is $\lambda x[\psi_1(\lambda Q[Q(x)](\psi_2))]$. In that case, and where P is type (e,t) the 'first among equals' presupposition is as follows:

49. $\neg(\exists y[F(y) \land \varphi(y)]) \lor \exists x[P(x) \land \varphi(x)]$

Where P is type (e,(e,t)) and A represents the domain of the binder of P, the 'first among equals' presupposition is:

50. $\forall u[A(u) \rightarrow \neg(\exists y[F(y) \land \varphi(y)(u)]) \lor \exists x[P(x)(u) \land \varphi(x)(u)]]$

To take another example discussed above, consider that (26a) can be understood according to the F \exists C analysis in (51) - where quantification over Skolem functions is

unrestricted:7

- (26) a. Exactly two students read every paper that some professor wrote.
- 51. [Exactly two students]_i $\exists F_{<1>}$ [x_i read every paper that F(x_i, professor) wrote]

We derive the reading represented in (51) by assuming that *[some professor]* is specific and thus implicitly restricted by a relational predicate, *P* as is made explicit in (52):

52. [Exactly two students]_i [x_i read every paper that [some professor who has P(x_i)] wrote]

Given (50) above, we can form the relevant 'first among equals' assumption about the implicit restriction - bearing in mind that for the specific reading, P is already presupposed to pair each student in the domain with just one professor:

53. $\forall u[student(u) \rightarrow \neg(\exists y[professor(y) \land \forall z[paper(z) \land wrote(z)(y) \rightarrow read(z)(u)]) \lor \exists x[P(x)(u) \land \forall z[paper(z) \land wrote(z)(x) \rightarrow read(z)(u)]]]$

Given (52) and (53), we learn that exactly two students read every paper that the professor paired with them by P wrote; and in addition that P pairs each student, x, with a professor all of whose papers x has read, if there is any such professor. Thus, together, (52) and (53) tell us just what (51) tells us.

What all of this means is that the effect of unrestricted, intermediate existential closure can be obtained as an extension of the same kind of pragmatic approach that delivers the referential reading. To put things another way: If indefinites are used specifically, triggering a mechanism of diagonalisation, then this very fact together with the fact that assumptions like those in (49) or (50) can be accommodated mean that the effect of unrestricted, intermediate existential closure can be derived. So, if the formal analysis of specifics is correct, then free intermediate existential closure can be accounted for in terms of independently motivated pragmatic mechanisms - diagonalisation and accommodation.

At this stage, one could ask why it would occur to anyone to make this 'first among equals' accommodation. And of course the answer is that (at least in the cases we are

⁷ Note that it makes no difference if quantification is over first-order functions, as represented in (51) or whether it is over zero-order functions.

considering) it is the only way to obtain the relevant intermediate scope reading of the indefinite - the normal means of achieving such a scope reading at the level of syntactic representation having been blocked. If this is the explanation for why the accommodation is made, it presumes that language users are aware of scope relations and could contemplate possible scope relations independently of what their grammar suggests. This seems plausible since awareness derives from processing and there is more to the on-line computation of semantic interpretations than the algorithm provided by the semantic component of any grammar (see Altmann & Steedman 1988, Sedivy et al 1999 among many others).

Another important consequence of this account is that it tells us why certain noun phrases can obtain this kind of exceptional scope and not others. Recall from section 2.6 that it is not only upward monotone indefinite phrases that can give rise to this effect but also non-monotonic phrases like [exactly two students] and downward monotone phrases like [at most two students]. In as far as the data from that section is admissible, we also learnt that 'exceptional scope' readings are in fact not properly exceptional scope readings - in the sense that properly exceptional scope readings would be derived by moving the relevant noun phrase to the scope site. Recall that there was no specific or exceptional scope reading of (29) that corresponds to (36):

- (29) Mary will accede to the throne if exactly two old uncles die before she does.
- (36) [exactly two old uncles]_i [Mary will accede to the throne if [e_i die before she does]]

Likewise, the exceptional intermediate scope reading of (37) corresponds to (38) and not (54):

- (37) It's not true that Mary will accede to the throne if exactly two old uncles die before she does. There are three old uncles that need to die before she sits on the throne.
- (38) It's not true that [∃F [Mary will accede to the throne [if F(exactly two old uncles) die before she does]]]
- 54. It's not true that [exactly two old uncles]_i [Mary will accede to the throne if [e_i die before she does]]

Note by the way that the intermediate scope reading of (37) glossed in (38) can be derived using (49) where ϕ is $\lambda X[dies_before_Mary(X) \rightarrow accedes(Mary)]$. Given that the relevant domain restriction of (37) is *P*, (37) asserts the right disjunct of (49) to be false, leaving us with the implication, $\neg (\exists X[exactly_two_old_uncles(X) \land \phi(X)])$.

Whatever the full range of phrases that can have this exceptional intermediate scope, we know that universal phrases, *[every student]* and other so-called strong noun phrases like *[the students]* are not among them (for a characterisation of strong noun phrases, see Milsark 1977). The reason for this seems straightforward: strong noun phrases carry a presupposition that their domain of quantification is given. As such, their felicitous use requires that in each context alternative, the same set of individuals is in the domain; so diagonalisation cannot get off the ground as it relies on the flouting of Stalnaker's Principle 3.⁸

5.3 Avoiding Overgeneration

An important property of this pragmatic account of how free existential closure arises, is that it only goes as far as *intermediate* existential closure. Widest scope existential closure cannot be derived in this way. To see why, let us reconsider (26a), which proved problematic for the F \exists C account on its widest-scope analysis - (55a) is equivalent to (55b) but no such reading is attested:

⁸ It should be noted here that examples that correspond to (1b) but with plural definites instead of an indefinite give rise to a reading that could be derived if the definite takes exceptional intermediate scope. I.e. the prominent reading of (i) requires each student to have read any paper their professors recommended and not just those papers which all of her professors recommended:

⁽i) Every student read every paper that her professors recommended.

Although this reading could be derived if the definite takes exceptional scope, in fact it should be put down to an unrelated phenomenon having to do with the interpretation of plurals in downwardentailing contexts. For example, (ii) is read as though the plural definite is the existential, 'any of the professors that teach her' - a reading which cannot be derived by the (universal) definite scoping over the subject. (See Breheny 2005 for a fuller discussion):

⁽ii) No student likes the professors who teach her.

If we consider cases like (i) but with non-downward entailing contexts for the description, the apparent intermediate scope reading disappears:

⁽iii) Every student read exactly two papers that her professors recommended.

This example only requires that each student read just two papers, regardless of the number of her professors.

- (26) a. Exactly two students read every paper that some professor wrote
- 55. a. $\exists F_{<1>}[[exactly 2 students]_x [x read every paper that F(x, \lambda u.professor(u)) wrote]]$
 - b. [At least two students]_x [[some professor]_y [x read every paper that y wrote]] and [At most two students]_x [[every professor]_y [x read every paper that y wrote]]

As when we derived the intermediate scope reading for (26a), we start with the analysis in (52) above and consider how we might apply (50). One can immediately see that there is a problem since in this case ϕ would be $\lambda x [exactly_two(student')(\lambda y [every(\lambda z.paper(z) \land wrote(z)(x))(\lambda u [read(u)(y)]))]$. If we try to plug this into (50) we get nonsense. As a rule, if we try to construct ϕ to include in its scope the binder of the argument in the implicit restriction, P(x), we will always get nonsense.

We could instead try an analysis of (26a) along the lines of (56) below:

56. Exactly two students read every paper that [some professor who has P] wrote

In that case, we would try the pattern of presupposition in (49). This yields a disjunction whose right disjunct says the same thing as what (56) would assert while the left disjunct contradicts what is asserted. Thus the accommodating presupposition would be pointless. As a general rule, given that the implicit restriction by P makes the indefinite effectively scopeless, the pattern of presupposition in (49) will always yield no information when the 'scope' of ϕ is as wide as possible.

6. Discussion and Summary

That one can only derive the effect of *intermediate* scope closure via diagonalisation plus presupposition accommodation is a promising outcome as it seems that the account delivers exactly what Schwarz's dual strategy was designed to deliver.

As Schwarz suggests, we can get intermediate scope of (57a) below by two routes: a specific route and a non-specific route. On the one hand, we can accommodate the 'referential' presupposition for relational *P* in (57b) - for example when 'a certain' is added to emphasise this reading - making the enriched diagonal proposition depend for its truth on the function the speaker has in mind. This is the same result as Kratzer's or Schwarzschild's contextualist account derived.

- 57. a. Exactly two students read every book that some (/a certain) professor recommended.
 - b. [Exactly two students]_i [e_i read [every book [that [some (/a certain) professor who has $P(x_i)$]] recommended]
 - c. Not every student read every book that some (/a certain) professor recommended.

On the other hand, we can accommodate the relevant 'first among equals' presupposition about P and derive the non-specific, narrow-scope construal which unrestricted intermediate existential closure would derive - as per the F \exists C account. We do not need to posit two kinds of indefinites. In principle either form ought to be able to have either reading given appropriate context.⁹ When the subject noun phrase in (57a) is replaced with a downward monotone quantifier, as in (57c), informants naturally read the example as non-specific, but this has to do with a tendency to choose informationally stronger readings where there is such a choice. The specific reading is also in principle available.

But now we cannot derive the unwanted, widest-scope existential-closure reading which is generated by the F \exists C account. At best, the proposition obtained from widest-scope existential closure is an implication of the unenriched diagonal proposition. As we saw in relation to (46), it may be that in the appropriate kind of context, this is understood to be the main point of the utterance and no further enrichment of the diagonal is deemed necessary:

(46) A: Why is John going to marry that rude and nasty Mary?B: Apparently, she will inherit a fortune if a rich old uncle dies childless

However, in cases such as (57a) or (57c), although the unenriched diagonal proposition still entails the widest-scope existentially closed proposition, that latter proposition is relatively weak or uninformative and hence there is unlikely to be a context where this implication is considered the main point of the utterance.

So, it seems that by paying close attention to the interplay between what is grammatically derived and what is pragmatically inferred, we can get a relatively principled account of the pattern of data that the use of these noun phrases gives rise to. In addition, by working through the pragmatics thoroughly, it can be shown why both the

⁹ Actually, this claim may be too strong. It may be that 'a certain' triggers the referential reading as a matter of conventional implicature - but this is a matter for further research.

contextualist and $F \exists C$ accounts seem to go some way to covering the data while at the same time accounting for where they fall short: contextualists needed to take heed of the pragmatic principles at play, advocates of $F \exists C$ needed to look more closely into the pragmatics interface to discover the constraints on closure.

We also found that the subtlety of the judgements about whether the truth of an exceptional-scope indefinite depends on what the speaker has in mind can be accounted for on the diagonalisation account: Diagonalisation *per se* does not yield the contextualists' truth-conditions but it does not take much to trigger the further step whereby the diagonal is understood to depend on the speaker's referent. In a way, the diagonalisation account vindicates those who are sceptical that exceptional scope or specific indefinites necessarily involve the individual the speaker has in mind in their interpretation.

Finally, in as far as the new data discussed in section 2.6 is admissible, it seems that 'exceptional scope' really cannot be a matter of exceptional movement to the relevant scope site. This new data also points towards a motivated classification of noun phrases that can give rise to the exceptional scope phenomena and those that may not.

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