Island-Escaping Indefinites and Scopal Independence

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0 Goals

Hintikka claimed in the 1970s that indefinites and disjunctions give rise to 'branching readings' which can only be handled by a logic with the expressive power of quantification over Skolem functions. Due to empirical and methodological difficulties, the issue was left unresolved in the linguistic literature. Independently, however, it was discovered in the 1980s that, contrary to other quantifiers, indefinites may scope out of syntactic islands. We claim that:

I. Claim 1: Branching readings and island-escaping behavior are two sides of the same coin: when the latter problem is considered in full generality, a mechanism must be postulated (quantification over Skolem functions) which predicts that Hintikka's branching readings are real (Winter 1998, 2003, Schlenker 1998).

II. Claim 2: As Hintikka had seen, disjunctions largely share the behavior of indefinites, esp. with respect to island-escaping behavior (probably also with respect to branching). The functional analysis can thus naturally be extended to them.

III. Speculation: A pragmatic reinterpretation of the Skolem analysis can be offered, which borrows from virtually every theory of specific indefinites on the market. Instead of being a semantic primitive, (the appearance of) functional quantification results the accommodation of a *presupposition* triggered by the modifier 'a certain', or focus, or possibly simply from the pragmatic situation.

1 Indefinites I: Branching

1.1 The original debate

- **Hintikka's claim**

(1) Hintikka's examples

a. Some book by every author is referred to in some essay by every critic

b. Some relative of each villager and some relative of each townsman hate each other

(2) a. □x [x a author] □z [z a critic] □y [y a book by x] □t [t an essay by z] y is-referred-to-in t

b. □x [x a author] □y [y a book by x] □z [z a critic] □t [t an essay by z] y is-referred-to-in t

c. □z [z a critic] □t [t an essay by z] □x [x a author] □y [y a book by x] y is-referred-to-in t

(3) [□x: author x] [□y: y book-by x]

[□z: critic z] [□t: t essay-by z]

y is-referred-to-in t

- **Second-Order Translation using Skolem Functions**

(4) Standard Reading

a. □x □y P(x, y)

b. □$f_{<1>}$ □x P(x, f(x))

(5) Standard Reading

a. [□x: x an author][□y: y a book by x][□z: z a critic][□t: t an essay by z] y is-referred-to-in t

b. □$f_{<1>}$□$g_{<2>}$[□x: x an author][□z: z a critic]] $f_{<1>}$(x, book by x) is-referred-to-in **$g_{<2>}$ (x, z, essay by z)**

☞ Informally, the choice of t depends on the choice of x and the choice of z (and y).

(6) Branching Reading (Hintikka)

a. [□x: x an author][□y: y a book by x]

y is-referred-to-in t

[□z: z a critic][□t: t an essay by z]

b. □$f_{<1>}$□$g_{<1>}$[□x: x an author][□z: z a critic]] $f_{<1>}$(x, book by x) is-referred-to-in **$g_{<1>}$(z, essay by z)**

☞ Informally, the choice of t depends only on the choice of z (and the choice of y depends only on the choice of x).

- **Game-theoretic motivation**

(7) A Game with perfect information

a. Formula: □x □y P(x, y)

b. Move 1a: Falsifier chooses an x (call it x_1).

c. Move 1b: Verifier chooses a y (call it y_1)

d. If P(x_1, y_1) is true, Verifier wins; if P(x_1, y_1) is false, Falsifier wins.

e. (7)a is true iff the Verifier has a winning strategy, i.e. iff there is a function that pairs y's (=the Verifier's choices) with x's (=the Falsifier's choices) so as to make P(x, y) true, iff

□$f_{<1>}$ □x P(x, f(x))

(8) Another game with perfect information

a. Formula: □x □y □z □t P(x, y, z, t)

b. Move 1a: Falsifier chooses an x (call it x_1).

c. Move 1b: Verifier chooses a y (call it y_1)

d. Move 2a: Falsifier chooses a z (call it z_2)

e. Move 2b: Verifier **has access to the value of x_1, y_1, z_2, and** chooses a t (call it t_2)

f. If P(x_1, y_1, z_2, t_2) is true, Verifier wins; otherwise Falsifier wins.

g. (8)a is true iff the Verifier has a winning strategy, iff

□$f_{<1>}$ □$g_{<2>}$ □x □z P(x, $f_{<1>}$(x), z, $g_{<2>}$(x, z))

(9) A Game with *imperfect* information

a. Formula:
$$\left.\begin{array}{l} \forall x\ \exists y \\ \\ \forall z\ \exists t \end{array}\right\rangle P(x, y, z, t)$$

b. Move 1a: Falsifier chooses an x (call it x_1).

c. Move 1b: Verifier chooses a y (call it y_1) (with information about x_1)

d. Move 2a: Falsifier chooses a z (call it z_2)

e. Move 2b: Verifier choose a t (call it t_2) (with information about z_2 **but not x_1**)

f. If $P(x_1, y_1, z_2, t_2)$ is true, Verifier wins; otherwise Falsifier wins.

g. (9)a is true iff the Verifier has a winning strategy, iff

$\exists f_{<1>}\ \exists g_{<1>}\ \forall x\ \forall z\ P(x, f_{<1>}(x), z, g_{<1>}(z))$

- **Adapting Skolem Functions to Restricted Quantification (Winter 1998, 2003; Schlenker 1998)**

(10) $F_{<n>}$ is an n-ary General Skolem function for restricted quantification if and only if for any n-tuple of individuals $<x_1, ..., x_n>$ and non-empty set P,
$F_{<n>}(x_1, ..., x_n, P) \in P$
$F_{<n>}(x_1, ..., x_n, Ø)=\#$
(in the following I put Skolem functions in the object language; $x_1, ..., x_n$ are then variables, P and Ø are predicates or formulas).

1.2 Problems and Improvement

- **Problems**

-Judgments are hard.

-The branching reading entails the non-branching one, whose existence is uncontroversial. Thus:
(a) Every situation compatible with the branching reading is also compatible with the non-branching one.
(b) In a situation that makes the branching reading false but the non-branching reading true, a charitable interpreter will tend to garden-path on the non-branching reading, and hence to be reluctant to count the (ambiguous) sentence as 'false' even if its branching reading is false. (see Fauconnier 1975)

- **Improvement**

Embed S in: S'=If ____, our campaign will be a success.

$S_{branching} \Rightarrow S_{non\text{-}branching}$

hence

$S'_{non\text{-}branching} \Rightarrow S'_{branching}$

i.e (If $S_{non\text{-}branching}$, our campaign will be a success) $\Rightarrow$ (If $S_{branching}$, our campaign will be a success)

In a situation that makes $S'_{branching}$ true but $S'_{non\text{-}branching}$ false, a charitable interpreter should now garden-path on the branching reading, and thus deem the sentence as 'true' (if the branching reading exists!)

(11) Context: A human rights organization starts a campaign aiming at freeing one dissident (any one dissident) from every Chinese prison. In order to reach this goal, I suggest the following plan:

a. If every country selects a senator to pressure each prison to release **a (certain) dissident**, our campaign will be a success **=> Ok branching reading**
b. If every country selects a senator to pressure each prison to release **at least one dissident**, our campaign will be a success **=> * branching reading**

a'. Si chaque pays choisit un député pour inciter chaque prison à relâcher un (certain) prisonnier, notre campagne sera un succès **=> Ok branching reading**
b'. Si chaque pays choisit un député pour inciter chaque prison à relâcher au moins un prisonnier, notre campagne sera un succès (Schlenker 1998) **=> *branching reading**

Eklund & Kolak 2002, who agree with the conclusions of Schlenker 1998, modified (11) to (12) and claimed that the latter also a branching reading[1]:

(12) *Context:* We are fighting for human rights in China and as part of that campaign we are trying to get a senator from each country to fight for the release of one dissident from each (Chinese) prison: and trying to coordinate the attempts so all the senators fight for the release of one and the same prisoner from each prison. We issue a statement saying:

If a senator from each country fights for the release of a (certain) dissident from each prison, our campaign will be a success.

(13) Branching Reading: First-Order Representation (with Branching Quantifiers)

If [□x: country x][□y: y senator-from x]
[□z: prison z][□t: dissident t] y pressures z to release t,

our campaign will be a success

(14) Branching Reading: Second-Order Translation (with Quantification Over Skolem Functions)

If □$F_{<1>}$ [□x: country x][□y: y senator-from x][□z: prison z] y pressures z to release $\mathbf{F_{<1>}}$**(x, dissident)**,

our campaign will be a success

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[1] Eklund & Kolak write:

Presumably, [(12)] is multiply ambiguous. The reading that we want to focus on is one where "a dissident" is understood to have the force of "a certain dissident" rather than "at least one dissident". It seems clear to us that statement [(12)] is *not* false on this reading. For example, it seems rather clear that we (as speakers asserting [(12)]) could defend the truth of our statement by pointing to precisely the fact that the political efforts were not sufficiently coordinated. If we are right in this judgment, then Hintikka's claim that his IF-logic is indeed first-order is vindicated on the NL-conception [=Natural Language conception -PS] of logic (Eklund & Kolak 2002 p. 382)

Situation:

(i) every country did in fact select a senator who went to each prison to lobby for the liberation of a dissident, but

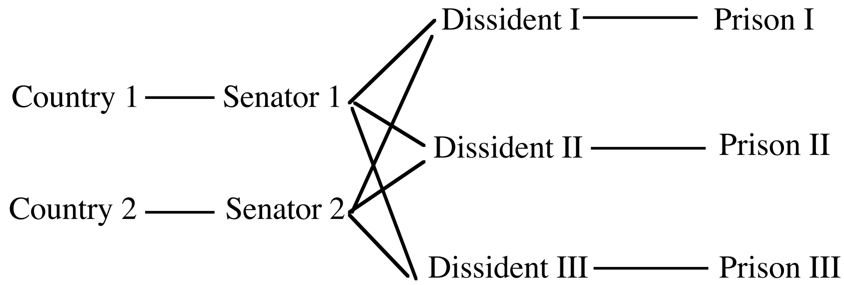
(ii) for a given prison different senators lobbied for the liberation of different dissidents, i.e. **they did not coordinate their actions.**

Suppose the campaign fails. Does this mean I lied when I uttered (11)a? (11)b?

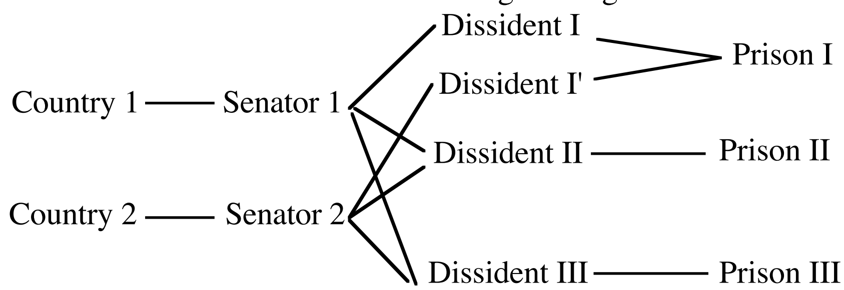
-If I uttered (11)b, it seems that I necessarily lied.

-If my claim was (11)a, there is a construal of what I said which makes it compatible with the facts. (11)a allows for a strong (branching) reading of the condition, according to which the senators must coordinate their actions for the campaign to be a success, as represented below:

(15) a. A situation that satisfies the Branching Reading (and thus also the Non-Branching Reading)



b. A situation that satisfies the Non-Branching reading but not the Branching Reading



(16) a. [□x x a country] [□y y a senator] [□z z a prison] [□t t a dissident] x selects y to pressure z to release t
b. [□z z a prison] [□t t a dissident] [□x x a country] [□y y a senator] x selects y to pressure z to release t

(17) a. Clinton selected a senator to pressure each prison to improve its conditions of detention
<*?> [□x x a prison] [□y y a senator] Clinton selected y to pressure x improve its conditions of detention
b. Clinton a choisi un député (différent) pour inciter chaque prison à améliorer ses conditions de détention.
<*?> [□x x a prison] [□y y a senator] Clinton selected y to pressure x improve its conditions of detention

2 Indefinites II: Island-escaping behavior

2.1 The original discussion

- **Unlike other quantifiers, indefinites scope out of syntactic islands**

(18) Rodman's generalization (=Reinhart 1997 (1-4))
a. Which patients will a doctor make sure that we give a tranquilizer?
b. A doctor will make sure that we give every new patient a tranquilizer
=>^{Ok} [every new patient]$_i$ [a doctor]$_j$ x_j will make sure that we give x_i a tranquilizer
c. *Which patients should a doctor worry if we sedate?
d. A doctor should worry if we sedate every new patient
=>* [every new patient]$_i$ [a doctor]$_j$ x_j should worry if we sedate x_i

(19) a. If some relative of mine dies, I will inherit a house
b. [some relative of mine]$_i$ [if x_i dies, I will inherit a house]
c. ≠If at least one relative of mine dies, I will inherit a house.
a'. If we invite a certain philosopher, the party will be a disaster
b'. [a certain philosopher]$_i$ if we invite x_i, the party will be a disaster
c'. ≠If we invite at least one philosopher, the party will be a disaster

☞ Note that the parenthetical 'but I won't tell you which /but I don't remember which' can be added to a. to bring out the specific reading, but not to c.

- **General Skolem Functions can solve the problem**

(20) $\exists F_{<0>}$ [if $F_{<0>}$(relative of mine) dies, I'll inherit a house

A 0-ary General Skolem Function (Winter 2003) is just a Choice Function.

- **But the recent literature (esp. Reinhart 1997) preferred Choice Functions instead**

(i) Reinhart 1997 suggested that existential closure over Choice Functions could be performed at any (propositional) level of a syntactic derivation.
(ii) By contrast, Kratzer 1997 suggested that Choice Functions should not be existentially quantified. Rather, a Choice Function is given by the context, and may also contain additional individual (or event?) arguments - on Kratzer's theory Choice Functions can be Skolemized, though not existentially closed.
(iii) Matthewson suggested against Kratzer that Choice Functions should be existentially quantified. However against Reinhart she claimed that the existential closure need only occur at the highest level.

2.2 Functional readings: General Skolem Functions Are Necessary!

- **Choice Functions Must Be Skolemized (Winter, Chierchia, Schlenker 1998, ...)**

(21) [<u>Context:</u> 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:]
a. If each student makes progress in some / a<n> (certain) area , nobody will flunk the exam
^{Ok}***Functional Reading:*** There is a certain distribution of fields per student such that if each student makes progress in the field assigned to him/her, nobody will flunk the exam.
b. ≠If each student makes progress in at least one area, nobody will flunk the exam
****Functional Reading***
a'. Si chaque étudiant/chacun fait des progrès dans un domaine (particulier), personne ne ratera l'examen
b'. ≠Si chaque étudiant fait des progrès dans au moins un domaine, personne ne ratera l'examen
c. **$\exists F_{<1>}$ if [$\forall$x: student x] x makes progress in $F_{<1>}$(x, area),** nobody will flunk the exam.

Situation: (i) every student made progress in some area he was already good at, but
(ii) I still flunked some of the students.

-It seems that in such a situation I could have uttered (21)a without lying.
-Had I asserted (21)b, on the other hand, my utterance could not have been construed as true.

(21)a appears to have the reading given in (21)c, which can be paraphrased as follows: 'There is a distribution of areas per student such that if every student makes progress in the area that is assigned to him (say, the one that he is weakest in), then nobody will flunk the exam'. (21)b lacks such a reading.

(22) [Context: Every student in my syntax class has two weak points - John doesn't understand Case Theory and LF, Mary has problems with Binding and Theta theory, etc. Before the final, I say:]

a. If each student makes progress in two (specific) areas, nobody will flunk the exam

^{Ok}***Functional Reading:*** There is a certain distribution of pairs of fields per student such that if each student makes progress in the two fields assigned to him/her, nobody will flunk the exam.

b. If each student makes progress in at least two areas, nobody will flunk the exam

****Functional Reading***

a'. Si chaque étudiant fait des progrès dans deux domaines (particuliers), personne ne ratera l'examen
b'. ≠Si chaque étudiant fait des progrès dans au moins deux domaines, personne ne ratera l'examen

c. **$\square F_{<1>}$ if [$\square$x: student x] x makes progress in $F_{<1>}$(x, two areas),** nobody will flunk the exam.

On the relevant reading of (21)a and (22)a, the choice of the area(s) is clearly dependent on the choice of the student. Thus Reinhart has no choice but to insert an existential quantifier over Choice functions *below* the universal quantifier, which is itself in the scope of the *if*-clause - as in (23)a (or (23)b for (22)a; note that we must assume -with the literature- that *two areas* denotes the set of pluralities of (exactly or at least) two areas):

(23) a. If ([$\square$x: student x] $\square F_{<0>}$ [x improves in $F_{<0>}$ (area)]), nobody will flunk the exam
b. If ([$\square$x: student x] $\square F_{<0>}$ [x improves in $F_{<0>}$ (two areas)]), nobody will flunk the exam

But this now yields the wrong truth-conditions, for (23)a predicts that I will necessarily have lied in the situation outlined above - Reinhart's system predicts that in case each student makes progress in *any* area, then I am not allowed to flunk anybody. But this is not the reading we are after. On the other hand the additional dependency offered by 1-Skolem functions (as in (21)c and (22)c) suffices to solve the problem.

At this point one could try to save Reinhart's system by postulating that the examples in (21) and (22) contain concealed pronouns, along the lines of (24):

(24) a. If each student makes progress in some / a<n> (certain) area **<that he must make progress in>**, nobody will flunk the exam
b. If each student makes progress in two (specific) areas **<that he must make progress in>**, nobody will flunk the exam

Apart from the fact that such a mechanism is *ad hoc* and unconstrained, it also makes the wrong predictions. For if it is generally available, there is no reason it could not be used in(21)b and (22)b as well. But this generates a reading that these sentences do not have:

(25) a. If each student makes progress at least one area **<that he must make progress in>**, nobody will flunk the exam
b. If each student makes progress in at least two areas **<that he must make progress in>**, nobody will flunk the exam

- **Skolemized Choice Functions Must Be Existentially Closed At Various Levels (Chierchia 2001)**

(26) a. Every linguist studied every solution that some problem might have
b. **Not** every linguist studied every solution that some problem might have
c. **Lee said that** not every linguist studied every solution that some problem might have

<u>Basic Point</u> (Chierchia): On one reading, (26)b. denies and (26)c. attributes to Lee, what (26)a. asserts.

(27) a. Not [[$\forall$x: linguist x] $\exists F_{<0>}$ [$\forall$y: y solution-to $F_{<0>}$(problem)] x studied y]
or (equivalently):
b. Not $\exists F_{<1>}$ [[$\forall$x: linguist x] [$\forall$y: y solution-to $F_{<1>}$(x, problem)] x studied y]
... but in any event the quantification over Skolem functions must have scope **below** negation:
c. # $\exists F_{<1>}$ Not [[$\forall$x: linguist x] [$\forall$y: y solution-to $F_{<1>}$(x, problem)] x studied y] (too weak!)

While the environments in (26) are all monotonic, the same point applies to non-monotonic environments, as in (28) (intermediate scope for the island-escaping indefinite).

(28) a. Exactly two linguists studied every solution that some problem might have.|
b. An odd number of linguists studied every solution that some problem might have.

- **Other Uses of Skolem Functions (see Winter 2003 for a unified account)**

-Questions: Pair-List Questions vs. Functional Questions

(29) Which dish did every guest make? (Krifka 2001)

a. (Every guest made) his favorite dish	= Functional Reading
b. Al (made) the pasta; Bill, the salad; and Carl, the pudding	=Pair-List Reading

(30) Which dish did most/several/a few/no guests make? (Krifka 2001)

a. Their favorite dish.	=Functional Reading
b. #Al the pasta, and Bill the salad.	=Pair-List Reading

☞ Note that only the functional reading is available when the quantifier is non-upward-monotonic!

-Copular sentences according to Jacobson 1994 and Sharvit 1999

(31) a. The only woman that no man loves is his mother-in-law (originally due to Dahl 1981)
b. [no x: man x] [[the only y: woman y & x loves y]= x'mother-in-law.]
c. [[ιf: f is a natural function & f maps men to women & [no x: man x] x loves f(x)]= [λx: man x. x's mother-in-law]

The point is that (31)b does not yield the right truth conditions, a point that Jacobson attributes to Dahl 1981 and Hornstein 1984. As summarized by Winter 2003, we may 'consider a situation in which John is a man who loves both his wife and his mother-in-law. In this situation (31)b *[and (31)c -PS]* is false. However, [(31)a] may still be true, as long as also other men do not love *only* their mother-in-law'. (Other arguments against (31)b are offered in Jacobson 1994 and Sharvit 1999)

2.3 A Problem of Overgeneration?

Schwartz 2002 argues that an analysis of specific indefinites based on Skolem Functions is bound to overgenerate miserably. The problem arises when a specific indefinite is found in the scope of an operator O that is not upward-entailing, when the existential quantifier over Skolem functions has scope over O.

(32) a. No student read a book I had recommended.
b. $\exists F_{<1>}$ [[no x: student x] x read $F_{<1>}$ (x, book I had recommended)]
c. No student read every book I had recommended.

Suppose that none of the restrictors are empty
b ⇒ c is clear.
c ⇒ b: Construct f so that for each student x, f(x) is a book I had recommended and that x did not read.

(33) a. Every child who hates a certain woman he knows will develop a serious complex. (Winter)
b. ∃f [[every x: child x & x hates f (woman x knows)] x will develop a serious complex]
c. Every child who hates every woman he knows will develop a serious complex.

Suppose that none of the restrictors are empty
b ⇒ c is clear.
c ⇒ b: Construct f as follows.
(i) if x is a child who hates every woman he knows, f(x) is some woman x knows
(ii) if x is a child who doesn't hate every woman he knows, f(x) is a woman x knows and x does not hate.
Then f is a witness of the truth of b.

<u>Problem</u>: (b) is equivalent to (c). And (c) is not attested.

<u>Solution</u>: The existential quantifier does not range over all the functions there are, but only on the 'natural' ones (this is the solution suggested by Schwartz).

<u>Motivation</u>: This is necessary in any event for the analysis of functional readings of questions! Furthermore, non-upward monotonic environments are precisely ones in which pair-list readings of questions are unavailable anyway.

(34) a. No student read a (certain) book I had recommended. (downward-monotonic)
b. Which book that you had recommended did no student read?
-The book that appeared to them to be hardest.
-The book their mother had told them to read
c. Which book that you had recommended did most students read? (upward-monotonic, functional only)
-The book that they liked best
-The book that appeared to them to be easiest
-#John read *War and Peace;* Peter read *The Human Stain, ...*

3 <u>Disjunction: Island-escaping Behavior and Branching</u>

3.1 Similarities Between Disjunctions and Indefinites

- **Standard Logic and Hintikka's Logic**

-A conjunction can be thought of as a universal quantification over a set of two propositions. Similarly a disjunction can be thought of as an existential quantification over a set of two propositions.

-In his game-theoretic treatment, this is precisely how Hintikka treats conjunction and disjunction. As a result, disjunctions share the behavior of existential quantifiers.

(35)
a. First-Order Notation:

$$\begin{array}{l} \forall x\ \exists y \\ \qquad\qquad (P(x, y, z), Q(x, y, z)) \\ \forall z\ \ v \end{array}$$

b. Second-Order Translation:

$\square f_{<1>} \square g_{<1>} \square x \square z ((P(x, f_{<1>}(x), z) \& g_{<1>}(z)=0) \vee (Q(x, f_{<1>}(x), z) \& g_{<1>}(z)=1)$

- **Anaphoric Potential**

Stone 1992 discusses the anaphoric potential of disjunctions, which he shows to be similar to that of indefinites. Thus in (36)a the natural interpretation is that if *Mary sees John or Bill, she waves at the person (be it John or be it Bill) that she sees*. This is of course formally analogous to the well-known 'donkey' interpretation of (36)b, which means that *if Mary sees a man, she waves to the man that she sees.*

(36) a. If Mary sees John or Bill, she waves to him (Stone 1992)
b. If Mary sees a man, she waves to him

Stone observed that this behavior was entirely unsurprising for the E-type analysis of pronouns, according to which *him* goes proxy for a definite description (the actual implementation is rather complex - the conditional sentence is analyzed as something like the following: *In every minimal situation in which Mary sees John or Bill (resp. a man), Mary waves to the man that she sees / the man in question.* By contrast, Stone observed, DRT-style analyses of donkey anaphora have nothing to say about disjunction, since for DRT it is because indefinites introduce variables that they give the impression of binding elements that they do not c-command. Since disjunctions do not introduce variables in DRS's, there is no reason why they should share the same behavior (I will remain agnostic about Stone's eventual conclusion. In part the discussion below will show that the analogies between disjunctions and indefinites are *so* pervasive that it might be reasonable to analyze disjunctions, quite literally, as higher-order indefinites. If so, Stone's point becomes moot, since the DRT analysis of donkey anaphora with indefinites will automatically carry over to the case of disjunctions)

3.2 Island-Escaping Behavior

- **Simple Island-Escaping Behavior**

(37) Students taking the exam have a choice of two options: Greek or Latin
a. <>Not a single student who picked a certain option (I don't remember which) passed the exam.
b. <#> Not a single student who picked at least one option (I don't remember which) passed the exam.
a'. Pas un seul étudiant qui a choisi une certaine option (je ne me rappelle plus laquelle) n'a réussi l'examen.
b'.# Pas un seul étudiant qui a choisi au moins une option (je ne me rappelle plus laquelle) n'a réussi l'examen.

(38) Students taking the exam have a choice of two options: Greek or Latin
a. <>Not a single student who picked Greek OR Latin (I don't remember which) passed the exam.
a'. Pas un seul étudiant qui a choisi le grec OU le latin (je ne me rappelle plus) n'a réussi l'examen.
b'. Pas un seul étudiant qui a choisi, OU le grec, OU le latin (je ne me rappelle plus) n'a réussi l'examen.
c'. Pas un seul étudiant qui a choisi OU BIEN le grec, OU BIEN le latin (je ne me rappelle plus) n'a réussi l'examen.
d'. Pas un seul étudiant qui a choisi SOIT le grec, SOIT le latin (je ne me rappelle plus) n'a réussi l'examen.

(39) Island-escaping reading for 'or'
$\square F_{<0>}$ [no x: student x & x picked $F_{<0>}$({Greek, Latin})] x passed the exam

(40) a. <>Exactly three students who studied a certain language passed the exam.
b. <>Exactly three students who studied Greek OR Latin (I don't remember) passed the exam.
a'. Exactement trois étudiants qui ont étudié une certaine langue ancienne ont réussi l'examen.

b'. Exactement trois étudiants qui ont étudié SOIT le grec, SOIT le latin (je ne me rappelle plus) ont réussi l'examen.

Notes: (i) Without a strong emphasis or a parenthetical, these readings are extremely difficult to get.
(ii) The claim that disjunctions can escape islands appears to contradict claims in Larson 1985.

- **Functional Readings**

(41) [Context: Every student in my linguistics class in syntax or in semantics. Before the final, I say:]
a. If each student makes progress in syntax *or* in semantics, nobody will flunk the exam
Intended Reading: There is a certain distribution of fields (syntax or semantics) per student such that if each student makes progress in the field assigned to him/her, nobody will flunk the exam.
b. If each student makes progress in a certain area, nobody will flunk the exam.
c. ≠If each student makes progress in at least one area, nobody will flunk the exam
a'. Si chacun d'entre vous fait des progrès en syntaxe *ou* en sémantique, personne ne ratera l'examen
b'. Si chacun d'entre vous fait des progrès dans un certain domaine, personne ne ratera l'examen
c'. ≠Si chacun d'entre vous fait des progrès dans au moins un domaine, personne ne ratera l'examen

(42) a. **Disjunction:** $\exists F_{<1>}$ if [$\forall$x: student x] x makes progress in $F_{<1>}$(x, {syntax, semantics}), nobody will flunk the exam.
b. **Indefinites:** $\exists F_{<1>}$ if [$\forall$x: student x] x makes progress in $F_{<1>}$(x, area), nobody will flunk the exam.
c. (Formalization used by Hintikka for disjunction)
$\exists f_{<1>}$ if [$\forall$x: student x] (x makes progress in syntax & $f_{<1>}(x)=0$ or x makes progress in semantics & $f_{<1>}(x)=1$), nobody will flunk the exam.

3.3 *Branching Readings?*

(43) Context: A human rights organization starts a campaign aiming at freeing one dissident (any one dissident) from every Chinese prison. In order to reach this goal, I suggest the following plan:

If every country selects a senator to pressure each prison to release **the youngest OR the oldest inmate**, our campaign will be a success

4 Towards A Pragmatic Reinterpretation? (A Sketch)

☞ **Goal:** Sketch a pragmatic reinterpretation of the functional analysis. Functional readings arise when an indefinite or a disjunction (... or other things) are pragmatically.

4.1 *Problems with the Functional Analysis*

(i) Ad hoc
=> Alternative: pragmatic strengthening.

(ii) Does not account for the fact that intermediate readings are often harder to get.
=> Accommodation strategy (Geurts : intermediate accommodation is in general harder to get than global accommodation).

(iii) Does not account for the role of intonation or of 'certain'
=> Intonation is used to focus a term; 'certain' is a modifier.
(iv) Does not account for the lack of a definiteness effect
=> It would be better to treat specific indefinites as being existentially quantified locally (... which does not prevent them from also including a quantified second-order variable in their restrictor)

(44) a. #S'il vient Jean, la fête sera un désastre
 # If there comes Jean, the party will-be a disaster
b. S'il vient un certain ami à toi, la fête sera un désastre
If there comes a certain friend of yours, the party will be a disaster
a'. <#> If there's John at the party, I'll have a terrible time.
b'. <> If there's a certain friend of yours at the party, I'll have a terrible time

Note: The judgments are not entirely clear. The sentences with a specific indefinite in an existential construction appear to have an intermediate status. Fodor & Sag find some of these somewhat degraded:

(45) a. There was someone smoking behind the woodshed.
b. There's a man that Kim used to go to school with in the late sixties in Arkansas smoking behind the woodshed. (Fodor & Sag 1982, (18)-(19)) ('somewhat odd').

(v) Specific indefinites cannot really be topicalized in French

(46) a. Ton ami, il m'embête.
Your friend, he annoys me
b. ??Un certain ami à toi, il m'embête
A certain friend of yours, he annoys me

Again judgments differ:

(47) A Frenchman that I met in Tokyo, I went and had dinner with (him) in New York last week.
[Fodor & Sag 1982, (13)]

4.2 Towards a Reinterpretation I: Indefinites

Basic idea:
(i) The indefinite is a normal existential quantifier (='singleton indefinite' line due to Schwarzschild, Portner)
(ii) Its restrictor contains a modifier that triggers a higher-order presupposition, to the effect that the restrictor applies to a singleton (again, this is the 'singleton indefinite' line)
(iii) The presupposition is accommodated, preferably globally, but if necessary at various intermediate levels (=this is the accommodation line due to Geurts and others).

- ***'a certain'***

$|certain|^{c, s}$=# unless there is exactly one salient identifying property in c (identifying=which holds true of exactly one individual). Otherwise, $|certain|^{c, s}$=the salient identifying property in c.
Thus: certain=[□Y: SALIENT(Y) & IDENTIFYING(Y)]

(48) a. If we invite a certain philosopher, the party will be a disaster
b. □$F_{<0>}$ [if we invite $F_{<0>}$(philosopher), the party will be a disaster
c. If [□x: philosopher x & [□$Y_{<e,t>}$: SALIENT($Y_{<e,t>}$) & IDENTIFYING ($Y_{<e,t>}$)](x)] we invite x, the party will be a disaster
d. Writing the presupposition explicitly:
If [□x: philosopher x &[□$Y_{<e,t>}$: SALIENT($Y_{<e,t>}$) & IDENTIFYING ($Y_{<e,t>}$)] (x) {□=1$Y_{<e,t>}$: SALIENT($Y_{<e,t>}$) & IDENTIFYING ($Y_{<e,t>}$)] weinvite x, the party will be a disaster
e. Presupposition accommodation:

[□=1Y$_{<e,t>}$: SALIENT(Y$_{<e,t>}$) & IDENTIFYING (Y$_{<e,t>}$)] If [□x: philosopher x & [□Y$_{<e,t>}$: SALIENT(Y$_{<e,t>}$) & IDENTIFYING (Y$_{<e,t>}$)](x)] we invite x, the party will be a disaster

(49) a. If each student makes progress a certain area , nobody will flunk the exam
b. □F$_{<1>}$ if [□ x: student x] x makes progress in F$_{<1>}$(x, area), nobody will flunk the exam.
c. If [□ x: student x][□y: area y & [□Z$_{<e,<e,t>>}$: SALIENT(Z$_{<e,<e,t>>}$) & IDENTIFYING (Z$_{<e,<e,t>>}$)](y)] x makes progress in y, nobody will flunk the exam
d. If [□ x: student x][□y: area y & [□Z$_{<e,<e,t>>}$: SALIENT(Z$_{<e,<e,t>>}$) & IDENTIFYING (Z$_{<e,<e,t>>}$)](y) {□=1 Z$_{<e,<e,t>>}$: SALIENT(Z$_{<e,<e,t>>}$) & IDENTIFYING (Z$_{<e,<e,t>>}$)}] x makes progress in y, nobody will flunk the exam
d. [□=1 Z$_{<e,<e,t>>}$: SALIENT(Z$_{<e,<e,t>>}$) & IDENTIFYING (Z$_{<e,<e,t>>}$)] If [□ x: student x][□y: area y & [□X: SALIENT(X)& IDENTIFYING (X)](x, y)] x makes progress in y, nobody will flunk the exam

- ***some$_F$***

(50) a. Some$_F$one is flirting with your sister.
b. Assertion: [□x:human x] x is flirting with your sister
c. Focus value: {Someone is flirting with your sister, John is flirting with your sister, Peter is flirting with your sister, Mary is flirting with your sister, the director is flirting with your sister}
d. Presupposition: Some more informative element of the focus value is true[2].

☞ For the moment, I can only apply the same recipe as for 'a certain' (but this is unsatisfactory; the results should be derived from the semantics of focus, etc.)

- ***Constraint on the restrictor of 'at least n' quantifiers (*cf.* Schwarzschild / Portner)***

(51) a. France finally elected a President
b. #France finally elected at least one President

☞ 'at least n' quantifiers require a restrictor whose extension contains strictly more than n elements.

4.3 Towards a Reinterpretation II: Disjunctions (to be investigated)

(52) a. Not a single student who picked Greek OR Latin (I don't remember which) passed the exam.
b. □F$_{<0>}$ [no x: student x & x picked F$_{<0>}$({Greek, Latin})] x passed the exam
c. [No x: student x & (x picked Greek v x picked Latin) & x picked [□y$_{<e>}$:salient(y$_{<e>}$) & (y=Greek v y=Latin)] x passed the exam
d. [No x: student x & (x picked Greek v x picked Latin) & x picked [□y$_{<e>}$:salient(y$_{<e>}$) & (y=Greek v y=Latin){ □=1y$_{<e>}$:salient(y$_{<e>}$) & (y=Greek v y=Latin)}] x passed the exam
e. [□=1y$_{<e>}$:salient(y$_{<e>}$) & (y=Greek v y=Latin)] [No x: student x & (x picked Greek v x picked Latin) & x picked [□y$_{<e>}$:salient(y$_{<e>}$) & (y=Greek v y=Latin)] x passed the exam

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[2] Compare to scalar implicatures with focused elements.

(1) a. Someone likes your sister.
b. Assertion: [□x:human x] x likes your sister
c. Focus value: {Someone likes your sister, Everyone likes your sister}
d. Implicature: No more informative element of the focus value is true

4.4 Other illustrations of the same mechanism?

(53) [The Godfather is talking to his henchmen]
a. If each of you ACTS, we will reach our goal.
b. $\exists F_{<1>}$ if [$\forall$x:one-of-you x] x is-an-agent-of $F_{<1>}$(x, act), we will reach our goals.

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