Indefinites in Negated Intensional Contexts

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Outline

- We will see a new scope paradox:
  - Indefinites in the surface syntactic scope of negated intensional operators can yield a reading in which the indefinite appears to take wider scope over the negation, and narrow scope with respect to the intensional operator. We will call this construal "**wide pseudo-scope *de dicto* reading**"
  - Genuine generalized quantifiers cannot yield such readings.
- We see problems this scope paradox poses for movement theories of indefinites' scope.
- We review in-situ approaches to the scope of indefinites, and show that they can straightforwarldy account for the existence of such wide pseudo-scope *de dicto* readings.

Modelling cross-linguistic variation

- There's cross-linguistic variation in the availability of such readings.
- An ideal account should neither undergenerate nor overgenerate.
- Can we find a unified semantics and/or scope mechanism for indefinite expressions that can still account for the observed cross-linguistic variation?

Context: Rodica knows that Carl has to read five books for his exam. She also knows that it takes 1 hour for Carl to read a book. She learns that Carl has started reading books 3 hours ago. Given Carl's speed in reading a book, Rodica believes that there are at least two books that he didn't have time to read but she doesn't know which books.

(1) Rodica fekr ne-mi-kon-ad ke Carl čand-ta/ye ketab
Rodica thought NEG-IMPF-do-3SG that Carl some.PL-CL/some book
ro xunde bash-ad.
RA studied SUB.be-3SG
"*Rodica doesn't think that Carl read some of the books.*"

think ≫ *some* ≫ ¬

In the intended reading of (1):

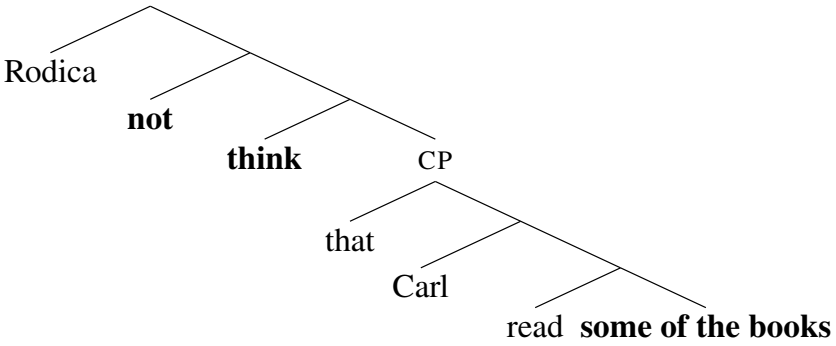
- the indefinite is interpreted under the scope of intensional verb *think* (*de dicto*), since there is no specific book(s) x such that Rodica has formed the belief that Carl didn't read x. To clarify this reading, the sentences can be continued with "*but she doesn't know which books*."

- the indefinite takes wide scope over negation. The low scope reading of the indefinite with respect to negation, which is equivalent to "Rodica thinks that it is not the case that Carl read any of the books", is clearly false in this scenario.

Why is this a paradox

- As shown in (2), both negation and *think* reside in the matrix clause, and the indefinite *some of the books* is syntactically below both of them.
- Assuming the scope of an element is determined by its syntactic position, (1) is predicted to give rise to two readings, none of which is the intended reading.

(2)



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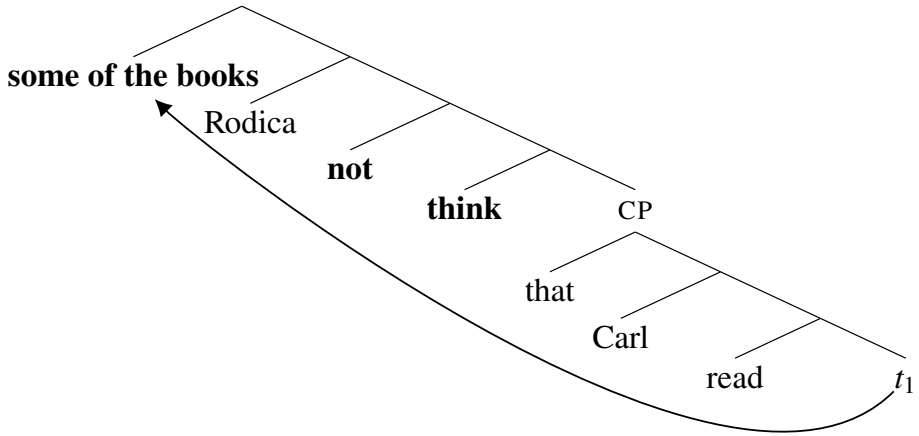


It's not about neg-raising

Context: There are five questions on the exam. Each question has 10 points. To get the full points on the exam (30 points), students only need to answer three questions. Students can pick any three questions to answer. An examiner to students:

(4) a. lazem ni-st do-ta soal ro javab
necessary NEG-be.3SG two-CL question RA answer
be-d-id
SUBJ-give-2PL
You don't have to answer two of the questions.

b. False paraphrase in the scenario: *it's permissible to answer any number of questions which is not exactly two /more than two.*
✗ $\neg \gg \Box \gg$ *two questions* $\Longleftrightarrow \Diamond \gg \neg \gg$ *two of the questions*

c. Possible paraphrase: *It is allowed for two of the questions not to be answered.*
✓ $\Diamond \gg$ *two of the questions* $\gg \neg$

Indefinites are unique

(5) a. lazem ni-st hame-ye soal-ha ro javab be-d-id
necessary NEG-be.3SG all-EZ question-PL RA answer SUBJ-give-2PL
You don't have to answer all of the questions.

b. Possible paraphrase: *it's permissible to not answer all of question.*
✓ $\neg \gg \Box \gg$ *all of the questions* $\Longleftrightarrow \Diamond \gg \neg \gg$ *all of the questions*

c. Impossible paraphrase: $*$*It is allowed for all questions not to be answered.*
$*\Diamond \gg$ *all of the questions* $\gg \neg$

Indefinites are unique

(6) a. Rodica fekr ne-mi-kon-ad ke Carl hame-ye ketab-ha ro
Rodica think NEG-IMPF-do-3SG that Carl all-EZ book-PL RA
xunde bash-ad.
studied SUB.be-3SG
"*Rodica doesn't think that Carl read all of the books.*"

b. Possible paraphrase: *Rodica thinks that not all of the books are such that Carl read.*
✓ *think* ¬ ≫ *all of the books*

c. Impossible paraphrase: ∗*Rodica thinks all of the books are such that Carl didn't read.*
∗ *think*≫ *all of the books* ≫ ¬

(7) a. [Hame-ye bache-ha]*f* na-yam-ad-and.
all-EZ child-PL NEG-come-PST-3.PL
All of the children didn't come. *all of the children* ≫ ¬

b. fekr na-konam [hame-ye bache-ha]*f* oumade baš-and.
think NEG-do-1SG all-EZ child-PL come-PP SUB-be-3.PL
I don't think all of the children came. ∗*think*≫ *all of the children* ≫ ¬

Scope of indefinites

- Indefinites have been shown to differ from generalized quantifiers in their scope-taking behavior.

(8) A colleague believes that every paper of mine contains an error.
'For ever paper of mine there is a potentially different colleague who believes that it contains an error.' ✗ every paper ≫ a colleague

- Indefinites, in contrast, can scope out of islands (Fodor & Sag, 1982), as shown in (9).

(9) Each teacher overheard the rumor that a student of mine had been called before the dean.
'There is a student of mine, say Mary, and each teacher overheard the rumor that Mary was called before the dean.'
✓ a student ≫ each teacher

- This unique island-escaping behavior of indefinites led to approaches that take indefinites as inherently different from generalized quantifiers (Abusch, 1993; Reinhart, 1997; Winter, 1997; Brasoveanu & Farkas, 2011; Charlow, 2014, 2020)
- There are two main approaches within this group to explain the exceptional scope of indefinites:
  - Movement approaches: indefinites have access to special movement-based scope taking mechanisms, unavailable to generalized quantifiers (Charlow, 2014, 2020; Demirok, 2019)
  - In-situ approaches: Indefinites do not depend on syntactic movement in order to take scope (Reinhart, 1997; Winter, 1997; Kratzer, 1998; Brasoveanu & Farkas, 2011)

What the new paradox shows:

- The asymmetry between indefinites and quantifiers can also be observed within clause boundaries. This shows that indefinites are not only unique in their ability to take exceptional scope, but also in their local scopal properties.

(10) ye zan lazem ast pošt-e har mard-i
a woman necessary be.3SG back-EZ every man-INDF
baš-ad
be.SUBJ-3SG
A woman should support every man (namely, their mother).

- Movement-based approaches fail to derive wide pseudo-scope *de dicto* readings of indefinites irrespective of whether or not QR is sensitive to islands.

A movement approach

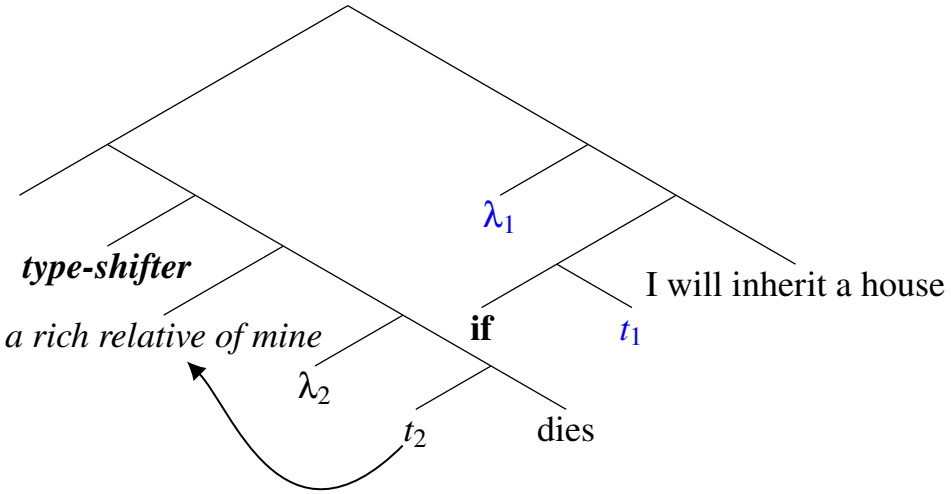
- Recently, new movement-based accounts have been developed to derive the exceptional scope of indefinites out of island via a sequence of island obeying movements (a.k.a *pied-piping*), (Charlow, 2014, 2020; Demirok, 2019).
- This approach takes indefinites to be different from generalized quantifiers by treating them as alternative-generating expressions, in line with alternative semantic (Ramchand, 1997; Kratzer & Shimoyama, 2002, 2017) and inquisitive treatments of indefiniteness (Ciardelli et al., 2017).
- The innovation of this approach is that it relies only bona fide scope mechanisms to explain indefinite scope.

A movement approach

- The essential parts of these accounts are:
  - there is a scope position at the island edge to which the indefinite DP can move
  - subsequently the island can be type-shifted into a scope taking expression, which itself moves to higher position in the structure.
- Under this approach, the structure of (11-a) would roughly be (11-b).

(11) a. If [a rich relative of mine dies], I'll inherit a house.

b.



- Building on the system proposed by Charlow (2014), an intensionalized version of the system has also been developed by Demirok (2019) and Elliott (2020), which aims to explain the exceptional *de re* readings of quantificational DPs that cannot scope out of islands.
- For instance, (12) shows that while the quantifier *every* in (12) cannot scope out of the if-clause island, it can get a *de re* reading.
- The DP *everyone in this room* in (12-b) is construed *de re* relative to the intensional operator governing the conditional. As no one can be in this room and outside in the same world, the *de dicto* interpretation of *everyone in this room* creates a non-sensical reading.

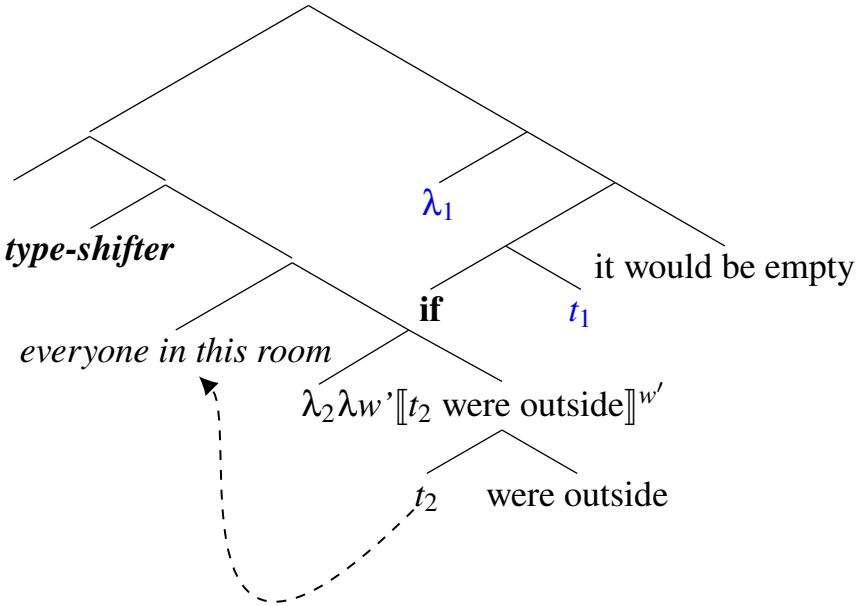
(12) a. If [every rich relative of mine dies], Ill inherit a house.$*$**every**$>$**if**

b. If everyone in this room were outside, it would be empty.

- This system assumes a scope analysis of intensionality, according to which a DP embedded under an intensional operator can only get a *de re* construal if it moves to a position higher than the intensional operator in the structure (Keshet, 2008, 2010a,b; Charlow, 2014, 2020; Demirok, 2019; Elliott, 2020).
- The special pied-piping mechanism introduced in this system (Charlow, 2020; Demirok, 2019; Elliott, 2020), however, allow DPs to take exceptional *de re* interpretation, without violating island constraints.
- Unlike indefinites, however, quantificational DPs like *every* leave a higher order trace of type $\langle\langle e,t\rangle,t\rangle$ behind, forcing it to semantically reconstruct into the syntactic position of the trace.

- The syntactic position of the higher order trace marks the scope of quantifiers, capturing the fact that they cannot outscope an island.
- The intensionality of quantifiers is determined by their final syntactic position with respect to the intensional operator.
- As a result, quantifiers can outscope an intensional operator, even when embedded in an island, to be construed *de re*, but their quantificational scope can never escape an island.

(13)



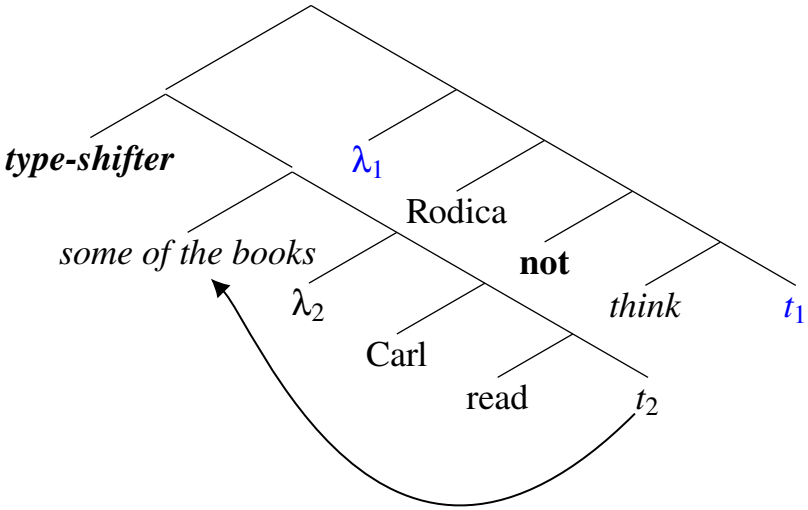
Back to the scope paradox

- The existence of wide pseudo-scope *de dicto* readings of indefinites creates a serious problem for this approach.
- To get the intended reading, the indefinite has to move to a position higher than negation in the matrix clause, and yet under the intensional verb *think* in order to be interpreted *de dicto*.

(14) Rodica doesn't think that Carl read some of the books.

There are only two licit movement options:

- moving the indefinite to the edge of the embedded clause, but this position is not above negation.
- shifting the embedded clause to a scope taking object and then moving it to a higher position. This movement puts the indefinite above negation, but as the indefinite now outscopes the intensional operator, it cannot be interpreted *de dicto* anymore.



- We have also seen that indefinites can get wide pseudo-scope *de dicto* readings under the scope of a clause-mated negated modal, but universal quantifiers cannot.
- It is not clear how a movement-based approach to indefinites could distinguish between local movement mechanisms available to universal quantifiers and indefinites in order to capture this asymmetry.

(15) a. do-ta kart ro ne-mi-tun-id be-bin-id
two–CL card RA NEG-IMPF-can-2PL SUBJ-see-2PL
"*You can't see two of the cards.*"
$\neg \gg \Diamond \gg$ *two of the cards* $\longrightarrow \Box \gg$ *two of the cards* $\gg \neg$

b. hame-ye kart-ha ro ne-mi-tun-id be-bin-id
all-EZ card-PL RA NEG-IMPF-can-2PL SUBJ-see-2PL
You can't see all of the cards.
$\neg \gg \Diamond \gg$ *all of the cards* $\longmapsto \Box \gg$ *all of the cards* $\gg \neg$

The exceptional scope conspiracy

The data above also provides evidence against what Barker (2022) calls *the exceptional scope conspiracy*.

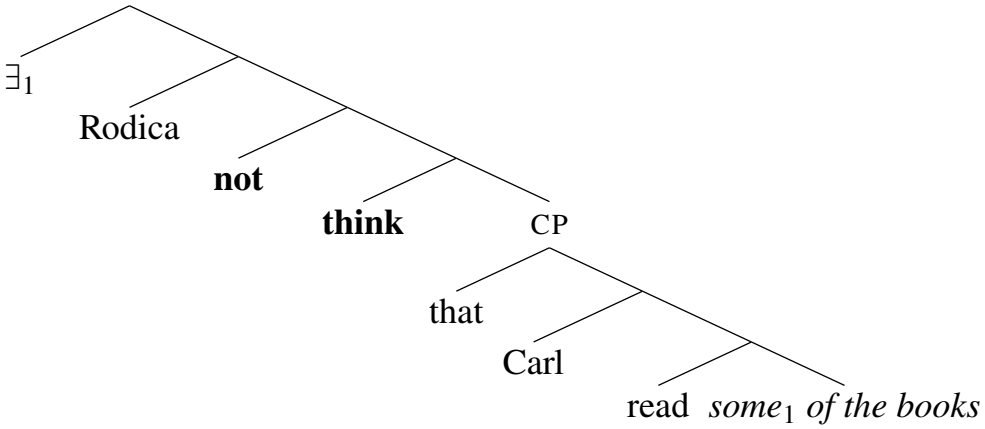
(16) **The exceptional scope conspiracy** (Barker, 2022)
Non-QR scoping mechanisms deliver the same truth conditions that QR would have delivered if we ignored islands.

- Since the behavior of indefinites and generalized quantifiers differ even within the clause domain where island constraints are irrelevant, the movement-based approach fails to derive wide pseudo-scope *de dicto* readings of indefinites irrespective of whether or not QR is sensitive to islands.

In-situ approaches

- A major line of thought has been to separate the existential quantification and the descriptive content of indefinites.
- In line with Heim (1982) and Kamp (1981), many have taken indefinites to only contribute some kind of variable and have relied on the freely available existential closure mechanism to account for the existential power of indefinites (Abusch 1993; Reinhart 1997; Winter 1997; Jäger 2007; Onea 2015, a.o.)
- Although it has remained unnoticed, in-situ accounts in terms of a default existential closure over intensional variables predicts the existence of wide pseudo-scope *de dicto* readings of indefinites.

(17)



- But this would be too easy.
- Why don't indefinite expressions in ?English, German, and French have such readings, despite having exceptional wide scope?

An In-situ account that doesn't work for us

- Brasoveanu & Farkas (2011) propose that the semantics of an indefinite determines whether the witness choice it contributes is dependent on or independent of variables that are syntactically accessible to the existential.
- This is represented by the choice of the superscript variable set on the existential quantifier as shown below.
- Given that the indefinite a^{y} *paper* is evaluated after the universal quantifier *every*^{x} *student*, it can be interpreted relative to the non-empty set of variables $\{x\}$ (i.e. taking narrow scope), or as fixed (i.e. taking wide scope) $\varnothing$.

(18) Every^{x} student read a^{y} paper.

a. $\forall x[\text{STUD}(x)](\exists^{\varnothing} y[\text{PAPER}(y)](\text{READ}(x,y)))$

b. $\forall x[\text{STUD}(x)](\exists^{\{x\}} y[\text{PAPER}(y)](\text{READ}(x,y)))$

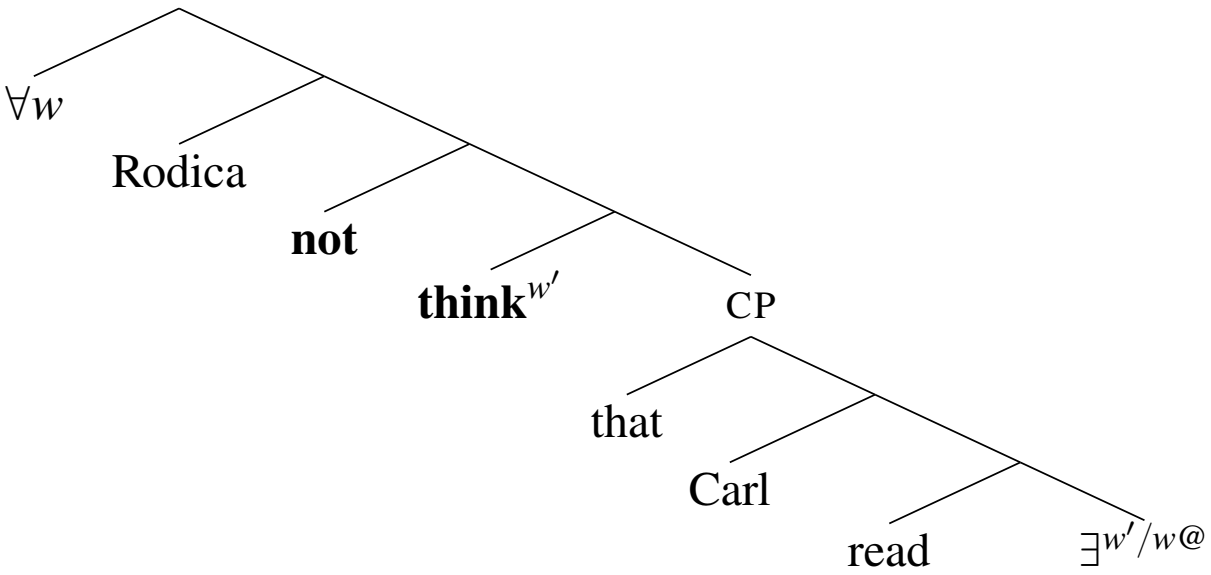
- To account for the scopal relation between negation and indefinites, Brasoveanu & Farkas (2011) take negation to be a universal quantifier over possible worlds.
- For instance, if the superscript on the existential is the singleton set $\{w^@\}$ containing the actual world variable, as in (19-a), the indefinite *an umbrella* has wide scope relative to negation.
- If the superscript on the existential is $\{w\}$, as in (19-b), the indefinite *an umbrella* has narrow scope relative to negation.

(19) John didn't bring an umbrella.

a. $\forall w[\exists^{\{w^@\}} x[\text{UMBRELLA}(w^@,x)](\text{BRING}(w,\text{JOHN},y))] \ (w \neq w^@)$

b. $\forall w[\exists^{\{w\}} x[\text{UMBRELLA}(w,x)](\text{BRING}(w,\text{JOHN},y))] \ (w \neq w^@)$

(20)



$(w \neq w^{@})$

Choice functions

- A successful in-situ account of island-free scope of indefinites, within static semantics, takes an indefinite determiner to introduce a *choice function* variable that takes the restrictor of the indefinite as argument.(Reinhart, 1997; Winter, 1997; Kratzer, 1998; Matthewson, 1999; Steedman, 2012).

(21) A *choice function* is a function that maps any non-empty set onto an element of that set.

- It is a function of type $\langle \langle e,t \rangle, e \rangle$, which applies to the property denoted by the nominal predicate of type $\langle e,t \rangle$ and returns an individual of type e that has that property.

(22) $f(\{A,B,C,D,E\}) = A$

Two roads to narrow/intermediate scope

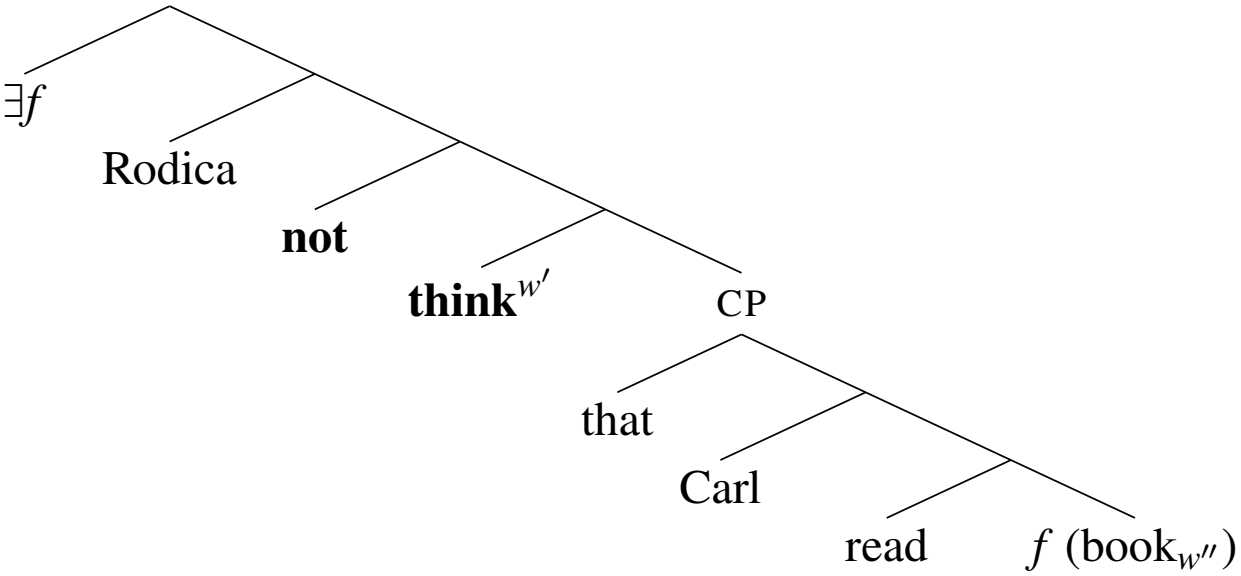
- According to the choice functional analysis proposed by Reinhart (1997) and Winter (1997), a *choice function* variable introduced by an indefinite determiner can be bound by an existential quantifier at any level of the compositional derivation.
- According to Kratzer (1998), choice functions are interpreted as free variables, with values to be provided by the context. To account for the intermediate and narrow scope of indefinites, she proposes to use *Skolemized choice functions* which are skolem functions that have both set and individual-variable arguments.

(23) (24) a. $f(x_1, \{A,B,C,D,E\}) = A$

b. $f(x_2, \{A,B,C,D,E\}) = C$

(25) An intensional choice function takes an intensional property ($\langle e, \langle s, t \rangle \rangle$) as argument, and returns an individual concept $\langle s, e \rangle$ (Heim, 1994)

(26)



A problem for intensional choice functions

Rodica and Carl are students of a course on Covid-19. The final exam is tomorrow. Students have to read the only five books ever written on the topic {A,B,C,D,E}. Rodica learns that Carl has started studying for his exam tomorrow exam 3 hours ago. Rodica is convinced that Carl is reading for the course on Covid. Knowing that it takes at least an hour to read any of those book, Rodica believes that there are at least two books that he didn't have time to read but she doesn't know which books. Unknown to Rodica, Carl has dropped that course and is reading for another exam that happens to also take place tomorrow. For that exam, he does not have to read any book, rather he has to read some articles.

(27) Rodica fekr ne-mi-kon-ad ke Carl čand-ta/ye ketab
Rodica thought NEG-IMPF-do-3SG that Carl some.PL-CL/some book
ro xunde bash-ad.
RA studied SUB.be-3SG
"*Rodica doesn't think that Carl read some of the books.*"

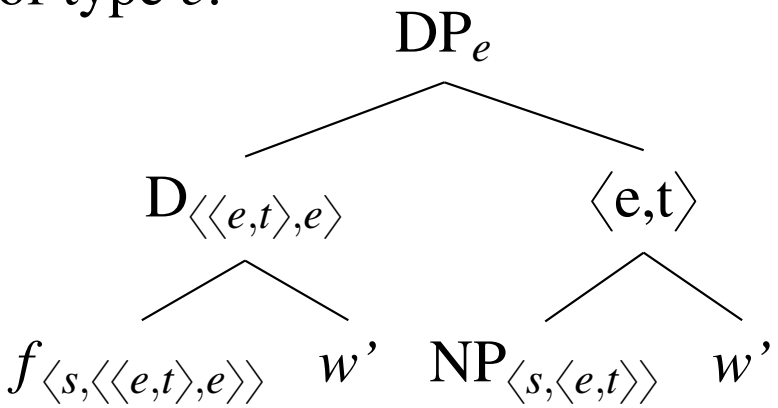
- As Rodica knows that there are only five books written on the subject of the exam, there cannot be a world in her belief worlds in which the intensional property of 'being a book Carl has to read for his exam' contains different books other than those five books.
- The intensional choice function applies to the intensional property 'being a book Carl has to read for his exam', but since the set of books Carl has to read is fixed across all of Rodica's belief worlds, it always returns the same output.

(28) $f(\{A,B,C,D,E\}) = A$

- This gives rise to the wide pseudo-scope (*de re*) reading of the indefinite, which is not the intended reading
- To get the intended reading, the choice function needs to pick different elements from a single set across Rodica's belief worlds. But our current machinery doesn't provide a way to do this.

Proposal

- I follow Schwarz's 2012 proposal that determiners can introduce a world variable (a situation variable in his system).
- I propose that a choice function introduced by an indefinite determiner can be of type $\langle s, \langle \langle e,t \rangle, e \rangle \rangle$. They take world variables as their first argument, then they apply on a set of type $\langle$e,t$\rangle$, and return an individual of type e.



- This amounts to skolemiziation with world variable.

- Following a suggestion by Schwarz (2012), I take the world argument of NP to be obligatorily bound locally, thus it is always evaluated relative to the same world as its determiner.
- This yield two possible configurations:

i When the world variables of the choice function's and the NP's are set to the actual world, we will have $f(w_0, (\text{NP}\ (\ w_0)))$. The world argument is constant and the effect will be as if there is no skolemization, $f(\text{NP})$.

ii When the world variables of the choice function's and the NP's are bound by an intensional operator, we will have $f(w', (\text{NP}\ (w')))$.

(29)
a. $f\ (\text{w}_1, \{\text{A,B,C,D,E}\ \}) = \text{A}$
b. $f\ (\text{w}_2, \{\text{A,B,C,D,E}\ \}) = \text{C}$
c. $f\ (\text{w}_3, \{\text{A,B,C,D,E}\ \}) = \text{E}$

Cross-linguistic variation

- Schwarz notes that determiners can vary with respect to whether or not they combine with such a world/situation pronoun.
- This also opens up a locus of variation across languages. A choice functional determiner may be able to combine with a world pronoun in one language like Farsi, and not in another one, like German or French.
- As for English, Schwarz (2012) proposes that it can be assumed that there are two variants of the indefinite determiner *some*: one that takes a situation pronoun argument, and one that does not.
- It can be argued that the grammar of English speakers for whom the reported readings are impossible, only has indefinite determiners that lack a situation variable. Others might have both versions in their grammar, but show a preference for one of them.

Binder Roof Constraint

- Under the choice functional analysis, no limitation on the exceptional upward scope of indefinites is predicted to exist. As observed by Abusch (1993), and extensively discussed in Chierchia (2001); Schwarz (2001) and Schwarz (2011), this account overgenerates unattested readings.

(30) **Binder Roof constraint**
An indefinite cannot scope over a quantifier that binds into its restrictor. (Brasoveanu & Farkas, 2011)

Context: Sue wrote two papers SP={S_1,S_2} but only submitted S_1, and Mary wrote two papers MP={M_1,M_2} but only submitted M_2.

(31) a. No candidate$_1$ submitted *a* paper they$_1$ had written.

b. $(\exists)f$[No candidate$_1$ λ_1[t_1 submitted f [paper they$_1$ had written.]]]

- This LF conveys that there's a way of choosing among papers that each candidate wrote such that no candidate submitted whatever paper is selected by f for them.
- As we can find such a function, namely a function that picks S_2 for Sue, and M_1 for Mary, the choice function account predicts that the sentence (31-a) should be judged true in this scenario, contrary to the fact.
- The sentence in (31-a) only means that for no candidate there is a paper they wrote that they submitted.

(32) No candidate$_1$ submitted *a certain* paper they$_1$ had written.

- The cross-linguistic studies on the scopal properties of indefinites have revealed that the constraint doesn't hold.
- Renans (2018) and Dawson (2020) show that indefinites in Ga and Tiwa pattern with English *a certain* indefinites in their ability to giving rise to the wide scope reading in downward-entailing contexts.
- Farsi indefinites present another case where the Binder Roof constraint doesn't hold.

(33) hič danešjuy-i ye mašq-eš ro tahvil na-dade
any student-INDF some assignment-their RA submit NEG-give.PP
ast.
AUX.3SG
No student submitted a certain/an assignment of theirs.

- This also shows that despite the fact that wide pseudo-scope *de dicto* readings are easily available to Farsi indefinites, in-situ accounts that can easily generate such readings but rule out violations of the binder roof constraint (Jäger, 2007; Onea, 2015) are not viable accounts for Farsi indefinites.

A solution to Binder Roof problem

- The functional dependency between a DP and a higher quantifier is built in the NP level.
- Both *some/a* and *a certain* indefinites uniformly introduce skolem functions f of type $\langle\langle e,t\rangle,e\rangle$ that are existentially closed in the topmost level of the derivation (Matthewson, 1999).

Building a functional dependency

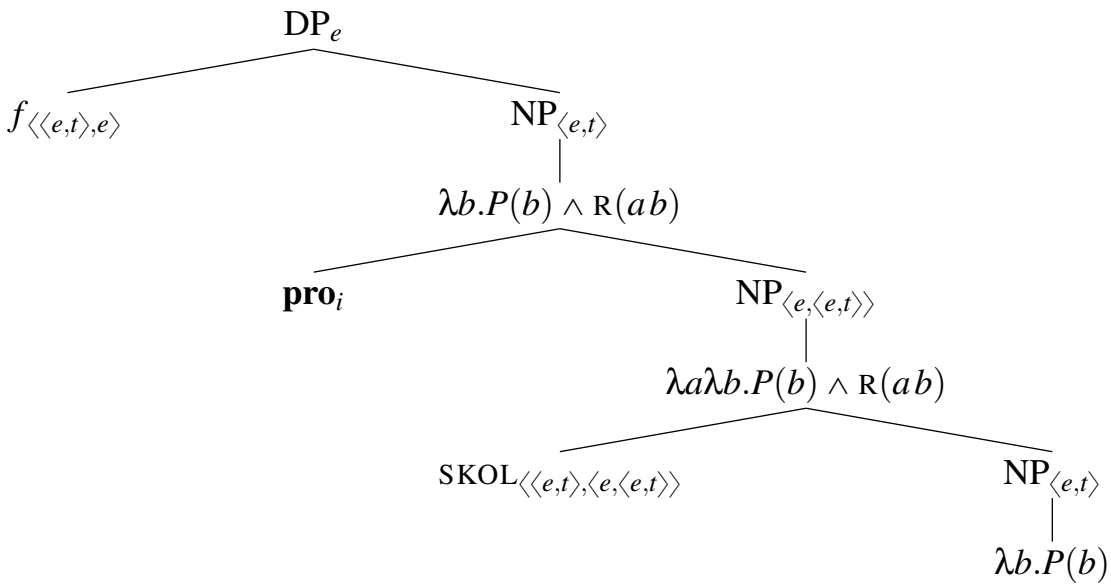
- Common nouns which are of type ⟨e,t⟩ are shifted to $\langle e, \langle e, t \rangle \rangle$ via a type-shifter SKOL.

  (34) SKOL P= $\lambda a \in$A. $\lambda b \in \beta$. [$P(b) \wedge$ R(a, b)], where R is a total function.

- A functional variable R, and an individual variable x_i are introduced.
- R is free variable whose referent is contextually determined.
- The variable x_i has to be bound by a higher quantifier in the structure.

- The indefinite determiner is a skolem function of type $\langle\langle e,t\rangle,e\rangle$
- It takes the functional NP, which is fed an individual pronoun a co-indexed with other bound variables in the larger structure, as argument and chooses a unique witness for every value of a.

(35)



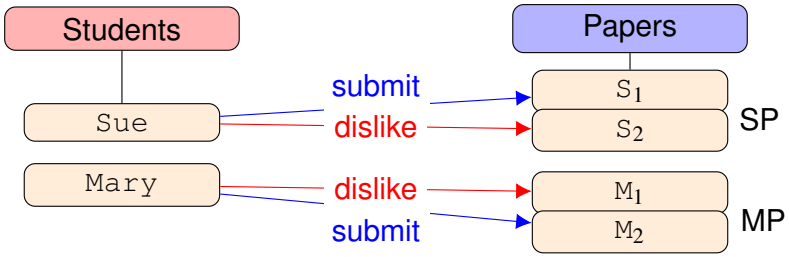
Difference between *some/a* and *a certain* indefinites

- The functional variable R introduced via skolemization, like other pronouns, triggers a referent/existence implication *m* that there is a discourse referent with which the pronoun can be identified. The referent/existence implication imposes a strong contextual felicity condition (SFC) (Tonhauser et al., 2013; King, 2018).
- Ignorance inferences block accommodation (Katzir & Singh, 2013).
- As accommodation depends on the hearers trusting that the speaker (Von Fintel, 2008), the accommodation strategy only becomes possible with the presence of the NP modifier "*certain*" which overtly signals speaker's commitment.
- **Prediction:** Epistemically specific indefinites are not subject to Binder Roof Constraint.

- All cases of over-generation in non-upward monotone contexts (Binder Roof constraint) are cases where we have a indefinite DP which is dependent on another quantifier but its referent implication is not entailed in the context. That is, R lacks a suitable referent in the discourse.

let's consider (36) in the context below.

(36) $\exists f$[No candidate$_1$ λ_1[t$_1$ submitted a$_{f_1}$ [paper they$_1$ had written.]]]



- There are restrictions on what qualifies as a contextually salient relation. The relation between candidates and their not-submitted paper is apparently not salient enough to serve as the referent of the alienable possessive relation either.

(37) a. No candidate's paper was submitted.

b. $[\![\text{no}]\!]$ ([**candidate**$(x)\wedge$ **paper**$(y)\wedge$R(x,y)],**was-submitted**(y)])

(38) a. No candidate$_1$ submitted **a** paper they$_1$ wrote but disliked.

b. $\exists f$[No candidate(**x**) λ_1[t$_1$ submitted f [λz.paper(z)$\wedge$R(**x**, z)$\wedge$write(**x**, z)$\wedge$dislike(**x**, z)]]]

Concluding remarks

- The challenge for all accounts of indefinite scope is to derive the variation among different kinds of indefinites within and across languages.
- We might need multiple scope mechanisms to account for the diversity of indefinite expressions both within and across languages.
- Despite the claims to the contrary, however, choice functions remain a successful approach to account for a cross-linguistically well-attested group of indefinites.

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