The scope of indefinites

Simon Charlow (simon.charlow@rutgers.edu)

November 18, 2015

1 Data

- Indefinites have a pretty easy time projecting their quantificational force out of islands. Both (1) and (2) admit readings with the indefinite taking maximal scope.

  (1) If ⟨a famous relative of mine dies⟩, I'll inherit a fortune.

  (2) Everyone who ⟨believed a famous expert on indefinites would be at the conference⟩ was sorely disappointed.

- The behavior of quantifiers like *every NP* and modified numerals seems to differ. The following lack wide-scope readings on which the embedded quantifier distributes over (resp.) *if* and *everyone*.

  (3) If ⟨every famous relative of mine dies⟩, I'll inherit a fortune.

  (4) Everyone who ⟨believed at least one famous expert on indefinites would be at the conference⟩ was sorely disappointed.

- *Sluicing* (more or less) requires an indefinite in an antecedent clause to have maximal scope (Chung et al. 1995; Reinhart 1997). Sometimes this maximal scope requires subverting islands (the flipside is the ostensible island-independence of sluicing type "movement" in the sluiced clause).

  (5) …But I can't remember who.

  Useful for forcing a reading. For (5) to be a good continuation to either (1) or (2), the indefinite must take (exceptional) wide scope.

- Related data cross-linguistically, even in languages that seem to lack scope shift, or reserve it as a marked option (e.g. Japanese, Chinese, Hungarian).

2 Analyses

2.1 First stab: referential indefinites

- Fodor & Sag 1982 analyze wide-scope indefinites as referring expressions:

$$[\![a_i]\!]^g :\approx \lambda P.\, \iota x.\, P\, x \wedge x = g\, i$$

- Posits an ambiguity in the semantics of the indefinite determiner. Unaccounted for: why exceptionally scoping indefinites class with garden-variety indefinites in sluicing, but not with proper names/definites.

- Also unexplained: the existence of intermediate exceptional scope readings, i.e. readings on which the indefinite does not seem to be construed referentially (e.g. Farkas 1981; Ruys 1992; Abusch 1994).

  (6) Every professor$_i$ will rejoice if ⟨a student of his$_i$ cheats on the exam⟩.
  (Ruys 1992: 101)

  (7) Most lings have looked at every analysis that ⟨solves some problem⟩.
  (Reinhart 1997, ex. 21a)

- Referential treatment fails to generate intermediate readings and in the case of (6) manages to derive an impossible widest-scope reading, as well (i.e. one entailing that there's an individual every professor hopes cheats)!

2.2 Choice functions

- Intuition: exceptional scope looks like more like binding (e.g. long-distance, selective) than scope-taking (local). Binding can be non-local, and can happen from non-maximal positions.
- But a naïve binding treatment won't work. If we leave descriptive content in situ and simply bind a variable, we run into trouble. Consider the following for *John didn't meet a linguist*:[1]

  $$\exists x.\ \neg \textsc{meet}\,(\textsc{j},\ x) \wedge \textsc{ling}\,x$$

  The truth of this is witnessed by any non-linguist (or by anybody John didn't meet, regardless of whether they're a linguist). That won't do.
- Reinhart's proposed solution: the thing being long-distance bound in exceptional scope cases is *higher-order*, i.e. a *choice function*.
- What is (the linguistically relevant notion of) a choice function? A choice function simply takes a set P and returns a member of P:

  $$\mathsf{CH} \coloneqq \{f : \forall P \in \mathrm{Dom}\, f.\ P\,(f\,P)\}$$

  Notice that this says CFs applied to the empty set do not yield a defined result. This is a tricky issue, but I'll gloss over it.
- The basic implementation has two parts. First, the indefinite determiner denotes a variable ranging over choice functions. Second, we posit a silent existential closure operator which can be adjoined to any propositional node and imbue it with a syncategorematic semantics along the lines of predicate abstraction:

  $$[\![a_i]\!]^g \coloneqq g(i)$$
  $$[\![\exists_i X]\!]^g \coloneqq \exists f.\ f \in \mathsf{CH} \wedge [\![X]\!]^{g[i \to f]}$$

- Simple example (assuming the quantified object is interpretable in situ, for simplicity):

  $$\begin{aligned}&[\![\exists_2\ \text{[every book written by } a_2 \text{ famous linguist]}]\!]\\ &\quad = \exists f.\ \forall x.\ (\textsc{book}\,x \wedge \textsc{written-by}\,(x, f\ \textsc{famous-linguist})) \Rightarrow \textsc{read}\,(\textsc{j},\ x)\end{aligned}$$

  The thing to note: even without moving out the relative clause island, the indefinite acquires a kind of "scope" over *every*. This mirrors how alternative semantics worked, as we saw in the previous class.
- Because binding of a choice function can happen from a non-maximal position, intermediate exceptional scope readings are likewise predicted.
- Choice functions also proposed for exceptional scope *vis à vis* questions (as Reinhart 1997 emphasizes; see also Dayal 1996, 2002), but not (so far as I know) for focus.

[1] Reinhart never actually says how to derive truth conditions like this (she references Heim 1982, but does not share many of Heim's assumptions about the nature of $[\![\cdot]\!]$). However, a related treatment has been worked out in Szabolcsi 2003 and yields essentially the above.

3 Issues

3.1 Explanatory oomph

- One question we might ask: which DPs can in principle be interpreted via choice functions (i.e. as a matter of getting the right truth conditions)? Are the CF-able DPs restricted to the exceptional scope-takers?
- Alas, no. The range of quantified DPs which can be interpreted via choice functions is quite large. For example, why should *at least one* behave differently from *some*? It does not seem that the relevant distinction can be a matter of truth conditions.
- What we do know: the exceptional scope-takers seem to license non-maximal donkey anaphora, and to readily admit cumulative interpretations (compare: *at least one dog*, *more than three men*).

  (8) I own a dog. I feed it Alpo. I own another dog. I feed it Iams.

  (9) Three men can lift two pianos.

  Yet while this is good news (i.e. there is independent motivation for classing off the exceptional scope-takers), it seems we still need to stipulate a distinction between one class of DPs and another.
- Reinhart 1997 considers these issues in some detail and concludes that the answer is to be found in the syntax. See also Kamp & Reyle 1993; Szabolcsi 1997 for further related discussion.
- I *don't* mean, by the way, to suggest that this is a special difficulty for choice-functional accounts. It's a worry for any semantics that treats indefinites specially. One we will keep in mind.

3.2 The scope of the restrictor

- Reinhart notes that in questions like (10), where *who* marks the scope of *which millionaire*, the admissible answers don't specify individuals the subject wants or believes to be millionaires.

  (10) Who wants to marry which millionaire?
  (Reinhart 1997, ex. 97)

  (11) Bob believes that his sows were blighted by a witch.
  (after Geurts 2000, ex. 12)

  Geurts piles on, noting a related *under-generation* issue. We want to derive a reading for (11) entailing that there is a witch such that Bob believes her to be a sow-blighter (cf. Fodor 1970; Keshet 2008).
- In both such cases, leaving the descriptive content in situ, as the choice functional analysis does, gives the wrong result: the descriptive content is interpreted intensionally rather than extensionally.
- Relatedly, Schwarz 2001 points out that unrestricted wide-scope quantification over choice functions derives unattested meanings when an indefinite is bound into by a non-increasing quantifier:

  (12) No candidate$_i$ submitted a paper he$_i$ had written.
  (Schwarz 2001, ex. 24)
  $\rightsquigarrow \exists f.\ \neg\exists x.\ \textsc{cand}\ x \wedge \textsc{submitted}\ (x,\ f\ \textsc{paper-by-}x)$

  The truth conditions are that no candidate submitted *every* paper he wrote. That won't do. *No candidate* seems to delimit, or **roof**, the scope of the indefinite it binds into.
- Geurts 2000 points out another problem for cases like (13). Unrestricted existential closure lets us derive the following:

  (13) Every girl$_i$ gave a flower to a boy she$_i$ fancied.
  (Geurts 2000, ex. 5)
  $\rightsquigarrow \exists f.\ \forall x \in \textsc{girl}.\ \exists y \in \textsc{flower}.\ \textsc{gave}\ (x,\ y,\ f\ \textsc{boy-fancied-by-}x)$

The issue arises in a situation where the girls all fancy the same boys. In such a situation, since f is a function, the same individual must always be returned by $f(\textsc{boy-fancied-by-}x)$. But (13) actually seems to (mysteriously) *require* some degree of covariation of boys with girls.

- To my mind, this looks a lot like a roofing configuration. But it has not been, so far as I know analyzed as such (outside Charlow 2014).
- Something like roofing can even be observed in association with focus. For example, *John only read a book by TOLSTOY* seems to lack a reading on which the indefinite out-scopes *only*. However, using choice functions allows us to derive the following:

$$\exists f.\ \{x_e : \textsc{read}(j, f\ \textsc{book-by-}x)\} = \{t\}$$

This problematically means that there's a way of choosing books on which Tolstoy's the only x such that John read *that* book by x! In other words, John read a book by Tolstoy, and he didn't read *every* non-Tolstoy book.

- ...And layered DPs: *John didn't read a book by a famous linguist.*

$$\exists f.\ \neg\exists g.\ \textsc{read}(j, f\ \textsc{book-by-}g(\textsc{fam-ling}))$$

Truth conditions (roughly): every famous linguist has some book that John didn't read. This does not represent a possible reading.[2]

- Analogous issues for *John met a member of fewer than three committees*. Can derive a reading which guarantees a way of picking members such that fewer than three committees x are such that John met *that* member of x.

4 Scope after all?

- All signs point to indefinites actually being evaluated at their scope position! In other words, indefinite scope looks awfully scope-y! Exceptional QR would handle all these cases swimmingly (though we would still be disturbed that indefinites could QR in ways other quantifiers could not).
- Though we can hack something together with an intensionalized version of what counts as a "choice function", this takes a degree of stipulative gerrymandering, and it's not clear if there's a way forward on all the data we'd like to cover.
- The issues are characteristic of in situ treatments of indefinites, even those that make no reference to choice functions (e.g. Schwarzschild 2002; Kratzer & Shimoyama 2002; Brasoveanu & Farkas 2011).
- However, Ruys 1992 and Reinhart 1997 object that island-free QR gives the wrong results for plural indefinites. The following has an exceptional scope reading, but does not admit an exceptional *distributive* reading.

  (14) If three relatives of mine die, I'll inherit a house.

- One of our main tasks: assessing the extent to which an analysis of indefinites can imbue their ostensible "scope-taking" with all the hallmarks of scope-taking, while respecting islands and the ways in which it differs from bona fide scope-taking.

References

Abusch, Dorit. 1994. The scope of indefinites. *Natural Language Semantics* 2(2). 83–135. doi:10.1007/BF01250400.

Brasoveanu, Adrian & Donka F. Farkas. 2011. How indefinites choose their scope. *Linguistics and Philosophy* 34(1). 1–55. doi:10.1007/s10988-011-9092-7.

[2] Interestingly, the other reading, the one which gives widest scope to the *embedded* DP *a famous linguist*, also seems absent. This is surprising on just about any view.

Charlow, Simon. 2014. *On the semantics of exceptional scope*: New York University Ph.D. thesis.

Chung, Sandra, William A. Ladusaw & James McCloskey. 1995. Sluicing and logical form. *Natural Language Semantics* 3(3). 239–282. doi:10.1007/BF01248819.

Dayal, Veneeta. 1996. *Locality in wh quantification*. Dordrecht: Springer Science+Business Media.

Dayal, Veneeta. 2002. Single-pair versus multiple-pair answers: Wh-in-situ and scope. *Linguistic Inquiry* 33(3). 512–520. doi:10.1162/ling.2002.33.3.512.

Farkas, Donka F. 1981. Quantifier scope and syntactic islands. In Roberta Hendrick, Carrie Masek & Mary Frances Miller (eds.), *Papers from the Seventh Regional Meeting, Chicago Linguistic Society*, 59–66. Chicago: CLS.

Fodor, Janet Dean. 1970. *The Linguistic Description of Opaque Contexts*: Massachusetts Institute of Technology Ph.D. thesis.

Fodor, Janet Dean & Ivan A. Sag. 1982. Referential and quantificational indefinites. *Linguistics and Philosophy* 5(3). 355–398. doi:10.1007/BF00351459.

Geurts, Bart. 2000. Indefinites and choice functions. *Linguistic Inquiry* 31(4). 731–738. doi:10.1162/002438900554550.

Heim, Irene. 1982. *The semantics of definite and indefinite noun phrases*: University of Massachusetts, Amherst Ph.D. thesis.

Kamp, Hans & Uwe Reyle. 1993. *From Discourse to Logic*. Dordrecht: Kluwer Academic Publishers.

Keshet, Ezra. 2008. *Good Intensions: Paving Two Roads to a Theory of the De re/De dicto Distinction*: Massachusetts Institute of Technology Ph.D. thesis.

Kratzer, Angelika & Junko Shimoyama. 2002. Indeterminate pronouns: The view from Japanese. In Yukio Otsu (ed.), *Proceedings of the Third Tokyo Conference on Psycholinguistics*, 1–25. Tokyo: Hituzi Syobo.

Reinhart, Tanya. 1997. Quantifier scope: How labor is divided between QR and choice functions. *Linguistics and Philosophy* 20(4). 335–397. doi:10.1023/A:1005349801431.

Ruys, Eddy. 1992. *The Scope of Indefinites*: OTS, University of Utrecht Ph.D. thesis.

Schwarz, Bernhard. 2001. Two kinds of long-distance indefinites. In Robert van Rooy & Martin Stokhof (eds.), *Proceedings of the Thirteenth Amsterdam Colloquium*, 192–197. University of Amsterdam.

Schwarzschild, Roger. 2002. Singleton Indefinites. *Journal of Semantics* 19(3). 289–314. doi:10.1093/jos/19.3.289.

Szabolcsi, Anna. 1997. Strategies for scope taking. In Anna Szabolcsi (ed.), *Ways of scope taking*, chap. 4, 109–154. Dordrecht: Kluwer Academic Publishers.

Szabolcsi, Anna. 2003. Binding on the fly: Cross-sentential anaphora in variable-free semantics. In Geert-Jan M. Kruijff & Richard T. Oehrle (eds.), *Resource-Sensitivity, Binding and Anaphora*, 215–227. Dordrecht: Kluwer Academic Publishers.