Comments on Ede Zimmermann's "Monotonicity in Opaque Verbs"

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Paul Égré
(IJN-CNRS, paulegre@magic.fr)

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1 What is the topic of the paper?

• Account for upward monotonicity in opaque verbs.

(1) Jones is looking for a green sweater $\therefore$ Jones is looking for a sweater

(2) Jones is looking for a sweater $\therefore$ Jones is looking for something

• Account for relative clauses:

(3) Jones is looking for something Smith is looking for.

• Account for specific and non-specific readings (a characteristic feature of intensional as opposed to extensional transitive verbs).

2 Zimmermann's analysis

a) Monotonicity

(4) Jones is looking for a sweater: $\exists P[P \sqsubseteq \lambda x S(x) \wedge SEEK(j, P)]$

Namely: there is a property, the property of being a sweater of some kind, such that Jones seeks it.

$P \sqsubseteq \lambda x S(x)$ =*df* $(\exists Q)[P = \lambda x(S(x) \wedge Q(x)]$: the property of being a sweater of some kind

"Look for" = "seek": type $(et)(et)$: expressing a relation between individuals and properties

"sweater": $\begin{cases} \lambda x S(x) : \text{ type } (et) \\ \lambda P.P \sqsubseteq \lambda x S(x) : \text{ type } (et)t \end{cases}$

"a": $\lambda \mathbb{P} \lambda \mathbb{Q}(\exists P)[\mathbb{P}(P) \wedge \mathbb{Q}(P)]$

"a sweater": $\lambda \mathbb{Q}(\exists P)[P \sqsubseteq \lambda x S(x) \wedge \mathbb{Q}(P)]$

(5) Jones is looking for a green sweater: $\exists P[P \sqsubseteq \lambda x(G(x) \wedge S(x)) \wedge SEEK(j, P)]$

The inference from (2) to (4) is explained, since : $\lambda x(G(x) \wedge S(x)) \sqsubseteq \lambda x S(x)$

(6) Jones is looking for something: $\exists P(SEEK(j, P))$

b) Relative clauses

(7) Jones is looking for something Smith is looking for: $\exists P(SEEK(s,P) \wedge SEEK(j,P))$

c) Specific and non-specific readings

(8) There is a particular sweater that Jones seeks: $\exists y[S(y) \wedge SEEK(j, \lambda z(y=z))]$
Jones seeks a sweater (but no particular one): $\exists P[P \sqsubseteq \lambda x S(x) \wedge SEEK(j,P)]$

3 Monotonicity

• A nice feature of Zimmermann's account is the syntactic parallel drawn between ETVs (type $e(et)$) and ITVs (type $(et)(et)$). In each case:

(i) the NP complement is interpreted as taking wide scope over the transitive verb, the difference being in the type of object that is selected.

(9)	(a) Jones is wearing a sweater:	$\exists y[S(y) \wedge WEAR(j,y)]$	(ETV)
	(b) Jones seeks a sweater:	$\exists P[P \sqsubseteq \lambda x S(x) \wedge SEEK(j,P)]$	(ITV, non-specific)
	(c)	$\exists y[S(y) \wedge SEEK(j, \lambda z(y=z))]$	(ITV, specific)

(ii) Monotonicity in ITVs is explained along the same lines as monotonicity in ETVs, namely as resting on existential weakening. This seems nice, as monotonicity in ETVS seems to originate from the properties of the indefinite as an existential NP. More generally, monotonicity in TVs (intensional or extensional) seems to depend solely on the properties of the NP that is in object position of the verb, and not on the lexical semantics of the TV.

(10)	(a) Jones is wearing a green sweater :	$\exists y(S(y) \wedge G(y) \wedge WEAR(j,y))$
	(b) Jones seeks a green sweater:	$\exists P[P \sqsubseteq \lambda x(G(x) \wedge S(x)) \wedge SEEK(j,P)]$
	(c)	$\exists y[S(y) \wedge G(y) \wedge SEEK(j, \lambda z(y=z))]$

• We can note incidentally that the analysis of monotonicity as an instance of existential weakening has to rest on the less-general-than ($\sqsubseteq$) relation instead of just the equality relation ($=$):

(11) Jones seeks a sweater: $\exists P[P = \lambda x S(x) \wedge SEEK(j,P)]$

This analysis would not by itself allow $\uparrow$-monotonicity, and I understand it would moreover fall prey to the Common Goals Problem ("Monotonicity Problem"). In particular, it would validate (12) (replacing $\sqsubseteq$ by $=$), which is not validated in Zimmermann's analysis:

(12)	Jones is looking for a sweater:	$\exists P[P \sqsubseteq \lambda x S(x) \wedge SEEK(j,P)]$
	Smith is looking for a sweater:	$\exists P[P \sqsubseteq \lambda x S(x)) \wedge SEEK(s,P)]$
	Jones is looking for something Smith is looking for:	$\exists P[SEEK(s,P) \wedge SEEK(j,P)]$

A clarification question concerns the following aspect of the solution to the Common Goal problem, however:

- (12) is not valid on a specific reading of "a sweater", as predicted [scenario 1: Jones is looking for the particular green sweater he was wearing yesterday, Smith is looking for the particular blue sweater he was wearing yesterday.][1]

- It is not valid either on Zimmermann's analysis of non-specific readings, where "sweater" is taken to mean "sweater of some kind" (my paraphrase of $\lambda P.P \sqsubseteq \lambda x S(x)$) [scenario 2: Jones is looking for some green sweater or other, Smith for some blue sweater or other].

- However, what about the non-specific reading of the premises suggesting that each of Jones and Smith would be happy to find any sweater whatsoever : it seems to support "Jones is looking for the same thing as Smith" ie "Jones is looking for the same thing Smith is looking for" (namely "a sweater"). What is the account for this reading? The equality analysis (11) would validate the inference, but without explaining monotonicity inferences. The less-general-than analysis explains why monotonicity inferences go through, but conversely it does not seem to account for the reading on which the inference in (12) is valid.

4 Specificity

• The Disjunction Problem (Forbes 2005)

(13)

Jones seeks a sweater:	$\exists P[P \sqsubseteq \lambda x S(x) \wedge SEEK(j,P)]$
Jones seeks a sweater or a balloon:	$\exists P[P \sqsubseteq \lambda x(S(x) \vee B(x)) \wedge SEEK(j,P)]$

The inference in NL does not seem to be valid under the non-specific reading characteristic of ITVs, for "seeking a sweater or a balloon" suggests that finding a balloon and not a sweater would successfully end the search. However, the semantics validates it.

Conjunctive force: the disjunction seems to entail "Jones seeks a sweater and Jones seeks a balloon" (but not necessarily "Jones seeks a sweater and a balloon", which under one interpretation would entail that the search can end successfully iff he finds both).

Zimmermann thinks the problem can be solved by assigning "or" a non-Boolean semantics. I tend to agree with Forbes that an account based on a classical semantics would be more appropriate. Would it be possible to accommodate an account along the lines of Forbes within Zimmermann's approach? (ie an account where the conjunctive force of disjunction is explained as its occurrence within the antecedent of a universal quantifier).

The problem certainly relates to free choice disjunction phenomena: conjunctive force seems to appear only with a subclass of the ITVs (*seek*, *want*, *need*, etc), going with specific success conditions, and moreover for those verbs which licence supplementary *any* (not all of them do, e.g. *imagine*, see Dayal 2005):

(14) Jones needs a book, any book

*Jones has found a book, any book

*Jones imagines a unicorn, any unicorn

- Intuitively, there are different success conditions depending on the reading (specific or non-specific) of the indefinite in "Jones seeks a sweater or a balloon". Roughly, this sentence can imply either:

[1] Thanks to E. Zimmermann for correcting an unfortunate confusion between validity and satisfaction which there was at that point in the original version of these comments, due to a confusion between the *reading* of the sentence and the *scenario* relative to which it is evaluated.

(15) (specific): $\exists x((S(x) \vee B(x)) \wedge \Box_{\text{search-worlds of j}}(FIND(j,x) \rightarrow SUCC(x,j)))$
(non-specific): $\forall x((S(x) \vee B(x)) \rightarrow \Box_{\text{search-worlds of j}}(FIND(j,x) \rightarrow SUCC(x,j)))$

- Maybe the contrast be traced to the link between indefinites and the universal sense of "any":

(16) Jones seeks a sweater, any one would do.
*Jones seeks a particular sweater, any one would do

• **Specific vs non-specific readings**

What is the difference between a specific and a non-specific reading in Zimmermann's theory?

The specific/non-specific distinction is usually phrased as a distinction between *de re/de dicto*, referential/non-referential, and also wide scope/narrow scope reading (see Montague 1973 on *seek*, where all three distinctions coincide). Here, the distinction is not stricto sensu a matter of scope, since both specific and non-specific readings rest on wide scope quantification. Rather, it rests on the type of object that is quantified over: individual (specific) vs property (non-specific). This type distinction is moreover related to the question of existence/non-existence (issue of referentiality). Zimmermann takes non-specific readings to block inferences to existence (since a property can fail to be instantiated by individuals).

- However, the *existential impact* of a reading seems partly orthogonal to the specific/non-specific distinction, which is also found with predicates that are never instantiated, and it seems to depend rather on the lexical semantics of the TV. Intuitively, (a) and (c) are both about a specific object, though a non-existent one in (a) and an existing one in (c):

(17) (a) Jones is looking for a unicorn, not any unicorn, but the one with green eyes that reappears every night in his dreams.
(b) Jones is looking for a unicorn, any unicorn
(c) Jones has seen/met a unicorn in the forest

- This relates to an example that is discussed on p. 28 of the manuscript:

> "Suppose Jones goes to a bar and meets a lady who he feels attracted to and therefore would like to see again. Due to some misunderstanding, he erroneously believes her to be the boss of the company he wants to make business with ; as a matter of fact it is worker-owned. On the following day, when paying a visit to the company, his first objective is to find the boss." (Zimmermann 2005, 28)

(18) (a) Jones is looking for a boss
(b) *Jones is looking for a boss, any boss

Situation where "a boss" is intuitively *de dicto*, but nevertheless where the seeking is about a specific, existent object, and where supplementary *any* is blocked. In Zimmermann's analysis, this is captured by the non-specific reading:

(19) $\exists P[P \sqsubseteq \lambda x Boss(x) \wedge SEEK(j,P)]$

The object of Jones' search is a subproperty of the property of being a boss, whose specification is left to the pragmatics of the discourse situation. For Zimmermann, this means that the reading of "a boss" nevertheless counts as *semantically* non-specific, although it is specific in a *pragmatic* sense. However, what will the account of supplementary *any* be in general, which seems to be correlated to non-specific readings in the intuitive sense, and to be excluded for ETVs? Can it be purely pragmatic?

- Zimmermann's scenario is as it were symmetric to those which support Janet Fodor's "non-specific *de re*" reading (a.k.a "third reading", in "John seeks a hat just like mine", where the property of "being a hat just like mine" is taken *de re* by the ascriber, and not represented as such by the ascribee):[2] here we seem to have rather a "specific *de dicto*" reading of the NP, for Jones is looking for a specific person, but who fulfills the property of being a boss only in his belief worlds. However, it is not obvious what the logical form corresponding precisely to this reading should be. Maybe (by analogy to Bonomi's 1995 representation of the non-specific *de re* reading in second-order logic), assuming a standard lexical decomposition of *seek* as *try to find*:

$\exists x(TRY(j, Boss(x) \wedge FIND(j, x)))$	(specific, *de dicto*)
$\exists x(Boss(x) \wedge TRY(j, FIND(j, x)))$	(specific, *de re*)
$TRY(j, \exists x(Boss(x) \wedge FIND(j, x)))$	(non-specific, *de dicto*)
$\exists P(P = \lambda x Boss(x) \wedge (TRY(j, \exists x(P(x) \wedge FIND(j, x)))))$	(non specific, *de re*)

Here too, specificity is attached to an existential quantifier over individuals taking wide scope over TRY, but non-specificity to the quantifier taking narrow scope. The *de re/de dicto* distinction attaches to whether the property (descriptive condition) takes wide scope over TRY. Existence/non-existence, finally, may depend on whether one is allowed to quantify over possibly non-existent objects.

References

[1] Bononi Andrea (1995), Transparency and Specificity in Intensional Contexts, in P. Leonardi and M. Santambrogio (eds.), *On Quine*, Cambridge University Press, Cambridge 1995 (pp.164-185).

[2] Dayal Veneeta (2005), The Universal Force of Free Choice *Any*, forthcoming in the Linguistic Variation Yearbook 2005.

[3] Fodor Janet (1970), *The Linguistic Description of Opaque Contexts*, PhD Dissertation, MIT.

[4] Forbes Graeme (2005), *Attitude Problems*, book manuscript, to appear at Oxford University Press.

[5] Heim Irene & von Fintel Kai (in progress), *Lecture Notes on Intensional Semantics*, manuscript, MIT.

[6] Montague Richard (1973), The Proper Treatment of Quantification in Ordinary English, in *Formal Philosophy, Selected Papers of Richard Montague*, R. Thomason (ed), Yale UP.

[7] Zimmermann Thomas Ede (2005), Monotonicity in Opaque Verbs, manuscript, Frankfurt, http://semanticsarchive.net/Archive/jU0YzkzN/mono.pdf

[2] See von Fintel & I. Heim's Lecture Notes on Intensional Semantics for a detailed discussion of this example. A similar example for propositional verbs (*believe*) was presented independently by Rainer Baerle (1983) in "Pragmatische Aspekte der NP-Interpretation", in M. Faust & al. (eds) *Allgemeine Sprachwissenschaft, Sprachtypologie and Textlinguistik*, Tbingen: Narr, pp. 121-131, and also by A. Bonomi (1995).