snippets

Issue 24 **November 2011**

Contents

LED
Edizioni Universitarie di Lettere Economia Diritto

5.

Philippe Schlenker – *Institut Jean Nicod (CNRS) and New York University*
Generalized bishop sentences

philippe.schlenker@gmail.com

There are two main approaches to 'donkey' sentences such as (1). Dynamic theories argue that pronouns have the semantics of variables, but that existential quantifiers can bind outside of their c-command domain. E-type theories argue instead that pronouns have the semantics of definite descriptions, with *it ≈ the donkey that the farmer owns* (e.g. Heim 1990) or just *the donkey* (Elbourne 2005). Such accounts require adoption of an event or situation semantics, but no revision of the standard notion of scope.

(2) poses well-known difficulties for E-type theories. Since the two antecedents play semantically symmetric roles, it is difficult to get *he* and *him* to refer to distinct individuals (note that *the bishop that meets a bishop* and *the bishop that a bishop meets* are synonymous). Dynamic theories have no such difficulty: each existential quantifier simply binds a separate pronoun.

(1) A farmer owns a donkey. He beats it.

(2) [A bishop]$_i$ met [a bishop]$_k$. He$_i$ blessed him$_k$.

We will show that dynamic approaches are faced with a similar 'bishop' problem in minimally different examples such as (3). The source of the difficulty is that numerals give rise to maximal readings, as shown in (4).

(3) At least two bishops will(each) meet at least two bishops.They will each bless them.

(4) (Tomorrow,) I will meet at least two bishops. They will bless me.

=> All bishops that I meet (tomorrow) will bless me.

Dynamic theories have resorted to two strategies to capture the maximality condition. Both backfire with (3):

[1] First, *at least two* could be treated as a generalized quantifier in the framework of Kamp and Reyle 1993 (they also give a 'cardinal quantifier' treatment, similar to the second theory we discuss below). They posit an 'abstraction' operation which makes it possible for the pronoun *they* to be interpreted as *the sum of bishops that I will meet* (= *[Σx: x bishop & I will-meet x]*). When this strategy is applied to (3), it yields the analysis in (6).

(5) [at least two bishops]$_x$ I will-meet x. [Σx: x bishop & I will-meet x] will-bless me.

(6) [at least two bishops]$_x$ [at least two bishops]$_y$ x will-meet y. <u>[Σx: x bishop & [at least two bishops]$_y$ x meet y]</u> each$_x$ will-bless **[Σy: y bishop & x meet y]**

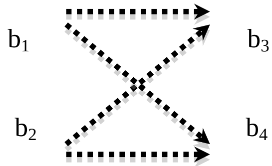
Kamp and Reyle do not discuss the case in which abstraction produces an expression with a free variable, as happens with the object pronoun (in bold; by contrast, in the

---

underlined expression corresponding to the subject pronoun, Kamp and Reyle's abstraction procedure produces an expression with no free variable). Here we have opted to bind the variable with a distributive operator *each*. But our argument can be given for any plausible resolution of the object pronoun: the problem already arises with the subject pronoun.

Consider the situation in (7). Meetings, which are symmetric, are here represented as dotted lines; blessings, which are asymmetric, are represented with arrows.

(7)



Intuitively, (7) makes (3) true, with *they* denoting $\{b_1, b_2\}$ and *them* denoting $\{b_3, b_4\}$. But the analysis in (6) predicts (3) to be false in (7): *they* must denote *all* the bishops who each met at least two bishops, i.e. $\{b_1, b_2, b_3, b_4\}$. But with this denotation, the second sentence of (3) is predicted to be false, since it is false that each of these individuals did some blessing (b_3 and b_4 didn't).

[2] Now consider van den Berg's analysis (1994) (it is rather close in this case to Kamp and Reyle's 'cardinal quantifier' analysis p. 458). (8a) is analyzed as in (8b), with the truth conditions in (8c) (ε_x is a dynamic existential quantifier and M_x is a maximality operator; $\geq 2(x', x)$ means that at least two elements of x' are in x).

(8) a. [≥2 y: bishops y] I will-meet y

b. $\varepsilon_y \wedge \varepsilon_{y'} \wedge M_{y'}(\text{bishops } y') \wedge M_y(y \subseteq y' \wedge \text{I will-meet } y) \wedge \geq 2(y', y)$

c. There is a set y, and there is a set y', and y' is a maximal set of bishops, and y is a maximal subset of y' whose members I will meet, and there are at least two members of y' that are in y.

Interpreting all predicates as distributive, (3) receives the analysis in (9) (for legibility, we leave the underlined part unanalyzed).

(9) a. [≥2 x: bishops x] [≥2 y: bishops y] (x will-meet y). x blessed y.

b. $\varepsilon_x \wedge \varepsilon_{x'} \wedge M_{x'}(\text{bishops } x') \wedge \mathbf{M_x(x \subseteq x' \wedge \underline{[\geq 2\ y\text{: bishops } y]\ (x \text{ will-meet } y)})}$
$\wedge \geq 2(x', x)$
$\wedge\ \varepsilon_y \wedge \varepsilon_{y'} \wedge M_{y'}(\text{bishops } y') \wedge M_y(y \subseteq y' \wedge x \text{ will-meet } y') \wedge \geq 2(y', y)$
$\wedge\ x \text{ will-bless } y$

Without fully simplifying these truth conditions, it is enough to observe that the constraint on *x* which appears in bold guarantees that its denotation should include all of $\{b_1, b_2, b_3, b_4\}$: by treating the underlined part in the same way as in (8) (replacing *I* with *x'*), we end up with a requirement that *x* denote the maximal set of bishops who (each) met at least two bishops, i.e. $\{b_1, b_2, b_3, b_4\}$. With this denotation, *x will bless y* cannot be satisfied in (7).

In fact, plausible truth conditions can be obtained, but at the cost of separating the existential quantifiers ε_x and ε_y (boxed below) from their maximality conditions, as in (10a), which can be simplified to (10b) (because $\varepsilon y'$ plays the same role as $\varepsilon x'$):

(10) a. $\boxed{\varepsilon_x \wedge \varepsilon_y} \wedge [\varepsilon_{x'} \wedge M_{x'}(\text{bishops } x') \wedge M_x(x \subseteq x' \wedge x \text{ will-meet } y) \wedge {\geq}2(x', x)] \wedge [\varepsilon_{y'} \wedge M_{y'}(\text{bishops } y') \wedge M_y(y \subseteq y' \wedge x \text{ will-meet } y) \wedge {\geq}2(y', y)] \wedge x \text{ will-bless } y$

b. $\boxed{\varepsilon_x \wedge \varepsilon_y} \wedge [\varepsilon_{x'} \wedge M_{x'}(\text{bishops } x') \wedge M_x(x \subseteq x' \wedge x \text{ will-meet } y) \wedge {\geq}2(x', x)] \wedge [M_y(y \subseteq x' \wedge x \text{ will-meet } y) \wedge {\geq}2(x', y)] \wedge x \text{ will-bless } y$

c. There is a set x, and there is a set y, and [there is a set x' which is the maximal set of bishops, and x is the maximal subset of x' which meets y, and there are at least two members of x' that are in x], and [y is a maximal subset of x' which x will meet, and there are at least two members of x' that are in y], and x will bless y.

The separation between existential force and maximality might be surprising; but it is also used in Sher's (1991) analysis of branching readings of generalized quantifiers.

References

Elbourne, P. (2005) *Situations and Individuals.* Cambridge: MIT Press.

Heim, I. (1990) "E-type pronouns and donkey anaphora." *Linguistics and Philosophy* 13, 137–177.

Kamp, H. and U. Reyle (1993) *From Discourse to Logic*. Dordrecht: Reidel.

Sher, G. (1991) *The Bounds of Logic*. Cambridge, MA: MIT Press.

van den Berg, M. (1994) "A direct definition of generalized dynamic quantifiers," in *Proceedings of the Ninth Amsterdam Colloquium*, ed. J. van de Does and J. van Eijck. Amsterdam: ILLC.