

## 1. No account of polyadic second order quantification

Boolos's plural account is only of *monadic* second-order logic, and not of, e.g.:

Ann is related to Sam in some way that Walter is also related to Nip

$$\exists R(Ras \wedge Rwn)$$

The *F*s are equinumerous with the *G*s

$$\begin{aligned} \exists R[\forall x\forall y\forall z\forall w([Rxy \wedge Rzw] \rightarrow [x = z \leftrightarrow y = w]) \wedge \\ \forall x(Fx \rightarrow \exists y[Gy \wedge Rxy]) \wedge \forall y(Gy \rightarrow \exists x[Fx \wedge Rxy])] \end{aligned}$$

Re/ the second example: neo-Fregeans appeal to the notion of equinumerosity in their attempt to define the notion of number in purely logical terms:

**Hume's principle** the number of the *F*s = the number of the *G*s if and only if *F* and *G* are equinumerous.

## 2. Intensionality

There is something John is such that he might not have been that

$$\exists X(Xj \wedge \diamond \sim Xj)$$

The symbolization is arguably false on Boolos's account, since plural variables seem like rigid designators.

## 3. More on idiomatic higher-order quantification

In first-order logic, bound variables represent anaphoric uses of pronouns and the like. E.g.:

Every presidential candidate relies on *her* staff

There is a number that is twice *its* predecessor

For any two distinct numbers, either *the first* is greater than *the second* or *the second* is greater than *the first*

This “cross-referencing” also occurs in sentences without quantifiers; e.g.:

Amy Klobuchar is a presidential candidate, and she relies on her staff

Rayo and Yablo then note an observation of Dorothy Grover’s:

Anaphors do not always occupy nominal positions. There are, for example, proverbial uses of ‘do.’ ‘Do’ is used as a ... quantificational proverb: “Whatever Mary did, Bill did,” “Do whatever you can do.” ‘Such’ and ‘so’ can be used anaphorically as proadjectives: “The pointless lances of the preceding day were certainly no longer such” (Scott), “To make men happy and to keep them so” (Pope) (Grover, 1992, pp. 83–4)

(“Proadjectives” like ‘so’ in the final sentence are anaphoric on previous uses of adjectives, just as pronoun are anaphoric on previous uses of nouns.) Rayo and Yablo then talk about anaphoric “pro-adverbs” (p. 83)

I despise you, and the boss feels likewise

He did it by breaking the window, and we did it thus, too

They are related as brother and sister, and we are so-related as well

(Cross-indexing, not cross-reference)

Translation from polyadic second-order logic into a natural language:

$\exists F x$   $\Rightarrow$  “Some object is something<sub>*i*</sub> such that that<sub>*i*</sub> is what  $x$  is”

$\exists R x_1 \dots x_n$   $\Rightarrow$  “Some objects are somehow<sub>*i*</sub> related such that  $x_1 \dots x_n$  are so<sub>*i*</sub> related.”

But does it really matter whether we can find nonnominal quantification in natural language? If such quantification doesn’t make sense, natural language can’t be doing it; and if it does make sense and natural language isn’t already doing it, why can’t we stipulatively introduce it?

## References

Grover, Dorothy (1992). *A Prosentential Theory of Truth*. Princeton: Princeton University Press.