

Second-order logic

(Cariani/MacFarlane)

This exam focuses on philosophical issues surrounding second-order logic. The main focus is on Boolos's project of devising interpretations for the second-order quantifiers that go beyond the standard objectual/substitutional dichotomy. Boolos's suggestion is that plural quantifiers in natural language provide a way of understanding second-order quantifiers that has some significant advantages over both the objectual and the substitutional understanding. The reading list includes a representative fragment of the literature that this project has spawned—representing both the 'critical' and the 'sympathetic' camp. Papers (4) and (15) deal with an independent, but related issue: the legitimacy of quantification over domains that are too large to form a set, and in particular the legitimacy of quantification over absolutely everything. Stewart Shapiro's *Foundations without Foundationalism* provides technical and philosophical background on second-order logic—as well as an extended discussion of the philosophical significance of the expressive power of second-order Languages and of the strong incompleteness of their logics (this discussion echoes (6), and is also analyzed in (5)).

1. G. Boolos "On Second-Order Logic" in *Journal of Philosophy*, 72, 1975, pp. 509-527.
2. G. Boolos "To Be is to Be the Value of a Variable (or Some Values of Some Variables)", in *Journal of Philosophy*, 81, 1984, 430-50.
3. G. Boolos "Nominalist Platonism" in *Philosophical Review* 94, 1985, pp. 327-344.
4. R. Cartwright "Speaking of Everything" in *Nous*, 28, 1994, pp. 1-20.
5. M. Gomez Torrente "Logical Consequence and the Logical Constants", *Theoria*, 18(2), 2003, pp. 131-144.
6. G. Kreisel "Informal Rigour and Completeness Proofs", in I. Lakatos (ed.) *Problems in the Philosophy of Mathematics*, North Holland, 1967, pp. 138-171.
7. O. Linnebo "Plural Quantification Exposed", in *Nous*, 37, 2003, pp. 71-92.
8. O. Linnebo "Plural Quantification", in Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2004 Edition).
9. C. Parsons "The Structuralist View of Mathematical Objects" , *Synthese*, 84, 1990, pp. 303-346. (in particular the discussion of Plural Quantification and SOL at pp. 326-329).
10. M. Resnik "Second-Order Logic Still Wild" in *Journal of Philosophy*, 1987, pp. 75-87.
11. W.V.O. Quine, *Philosophy of Logic* pp. 61-79, (Second Edition: 1986).
12. W.V.O. Quine, "Existence and Quantification", in *Ontological Relativity and other essays*, Columbia University Press, pp. 91-113.
13. A. Rayo "Words and Objects", in *Nous*, 36, 2002, pp. 436-64.

14. A. Rayo, S. Yablo, "Nominalism Through De-Nominalization", in *Nous*, 35, 2001, pp. 74-92.
15. S. Shapiro *Foundations without Foundationalism*, ch.1-5, 8.
16. T. Williamson "Everything", *Philosophical Perspectives*, 17, 2003, pp. 415-465.