BOOK REVIEW

Catarina Dutilh Novaes: *The Dialogical Roots of Deduction: Historical, Cognitive and Philosophical Perspectives on Reasoning*
Cambridge: Cambridge University Press, 2021, xiii + 271 pages

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What is reasoning and what is it good for? An almost self-evident explanation may run as follows: reasoning helps us extend our knowledge by equipping us with new pieces of knowledge drawn out of our older pieces. And as such, it is clearly useful and therefore it is obvious why the human brain has developed to support it. An individual capable of reasoning—and hence capable of extending her knowledge—is clearly superior to one who is not, and hence no wonder the former overtakes the latter in the evolution race. Reasoning, viewed from this perspective, is an individual matter; a matter that has to do with the maintenance of information that is stored in one's mind/brain. Any kind of interpersonal reasoning, aka argumentation, is then the outcome of the individual reasoning coming into the open—for once we are capable of reasoning, it may be useful to make one's reasoning known to one's peers and to confront one's own ways of reasoning with those of others.

This plausible sounding explanation, however, has been challenged in recent years by several experts. Hugo Mercier and Dan Sperber (Mercier & Sperber, 2011; Sperber & Mercier, 2012) put forward the thesis that public argumentation is more basic than individual reasoning—that rather than the former being an externalization of the latter, the latter is an internalization of the former. Mercier & Sperber (2017) went on to develop a comprehensive theory of the origins, the nature, and the evolutionary rationale of reasoning.

Catrina Dutilh Novaes' book pursues a similar goal. Her particular focus is on *deductive* reasoning, and she strives to show that the basis of any deduction

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lies in dialogue and hence that reasoning in the public sphere is more funda-
mental than any private ruminations.

Part I of the book is called *The Philosophy of Deduction*. In the first chapter
the author describes her understanding of deduction. She characterizes it as
having three attributes:

- necessary truth-preservation (a deductive argument ca not lead us from
  true premises to a false conclusion);
- step-wise structure (a deductive argument is a chain of perspicuous
  steps); and
- bracketing belief (a deductive argument cannot be influenced by collat-
  eral beliefs).

Given these, Dutilh Novaes considers three fundamental questions concerning
deduction:

- *Where Is Deduction to Be Found*? Here the author's answer is straight-
  forward: deductive reasoning is not something ubiquitous, it is "predom-
  inantly instantiated in mathematics and in some other regimented con-
  texts of argumentation, such as philosophy." (p. 12)
- *What Is the Nature of Deductive Necessity*? Here the author does not
  reach an unambiguous answer: "We may never come to a fully convinc-
  ing account of the necessity involved in deductive arguments." (p. 17)
- *What Is the Point of Deduction*? Here the author looks first at what it
  is not, and then defers her positive answer to the rest of the book:
  "Deduction does not seem to be a particularly suitable way to produce
  new information, given that it is non-ampliative, and it does not seem
  to be a reasonable guide for managing our beliefs and thoughts either."
  (p. 21)

In the next chapter Dutilh Novaes explains her motivation for exploring the
"roots of deduction"—and she stresses the necessity to distinguish ontogenetic,
phylogenetic and historical roots. She also foreshadows what will govern the
upcoming investigation of the book.

In Chapter 3 the author analyzes the kind of dialogue that she holds must
underlie deduction. She surveys the existing attempts at capturing deduction
via dialogic (or game-theoretic) means, in Hintikka's game-theoretic semantics
and especially in Lorenzen's dialogic logic. She concludes that the kind of dia-
logue she is after is best characterized as that between characters she calls

a "Prover" and a "Sceptic", whose roles display, in her view, an optimal mixture of cooperation and adversariality.

In Chapter 4 the author checks whether the notion of deduction that grows out of these dialogical roots displays the three key features of deduction she identified earlier. She concludes that while the necessary truth-preservation grows out of the adversarial dimension of dialogue (the Sceptic persists in challenging the Prover until even the most marginal cases have been covered), the perspicuity grows out of the cooperative dimension (the Prover tries to make the deduction as transparent as possible for the Sceptic). The belief bracketing is then connected with the ability to assume perspectives different from one's own. At the end of this chapter the author sketches the route from dialogue proper to deduction proper—via the internalization of the Sceptic by the Prover. In the same chapter Dutilh Novaes considers some of the most basic philosophical problems related to deduction: proof-theory vs. model theory, the normativity of logic, logical paradoxes, structural rules of deductive systems and logical pluralism.

Part II of the book is devoted to topics from the history of logic. Here Dutilh Novaes attempts to show that our facility of deduction originated out of various kinds of dialogues as a matter of fact. As in the rest of the book, a positive quality of her exposition is the breadth of literature she makes use of. In Chapter 5 she considers deduction in the context of what we know about ancient Greek mathematics and dialectics. In Chapter 6 she concentrates on Aristotelian Syllogistic (as the first complex logical system), also touching upon the contexts of ancient India and China. Chapter 7 then covers the role of deduction in the long period from the Middle Ages to our Modern times. Everywhere she finds deductive and logical practices to be underlain by dialogical and interactional ones.

Part III of the book, by my lights, is the most interesting. Here Dutilh Novaes considers the problem of deduction and dialogue from the viewpoint of human cognition. In Chapter 8 the author surveys some well-known ways in which human reasoning tends to fail systematically. This evidence poses problems for those who maintain that deductive reasoning is a direct evolutionary adaptation—for if it were, it would be hard to imagine that it would be so awkward. A possible explanation might be that it is not itself an adaptation, but rather the by-product of an adaptation. A significant fact is that the results of reasoning are significantly improved if the reasoning proceeds interactively in a group of individuals.

In Chapter 9 the author argues that on the ontogenetic level, the skills needed for deductive reasoning are originally acquired by means of dialogues and are significantly bolstered precisely by the dialogical nature of the contexts in which they are acquired.

In Chapter 10 Dutilh Novaes investigates the phylogenetic roots of deduction, to conclude, as the reader would expect, that here again the skills for deductive reasoning derive from those for dialogic communication. A great deal of this chapter is devoted to the author's polemic with the concurrent view of Mercier and Sperber. Like Dutilh Novaes, Mercier and Sperber claim that reasoning proper originates on an interpersonal level, because it requires the confrontation of two different human discursive abilities. We are very good, Mercier and Sperber insist, at finding reasons for our own view - not in an impartial manner, but with a strong 'my side bias'. On the other hand, we are also very good at checking and challenging reasons put forward by others - and when these two abilities are played against each other in a dialogic situation, reasoning as the search for truth is likely to be the result.

This appears to be nearer to Dutilh Novaes' theory than she herself is willing to acknowledge. The difference is that, for Mercier and Sperber, the abilities which yield reasoning as a by-product are genetic adaptations—they have to do with social coordination. In contrast, Dutilh Novaes insists that deductive reasoning is what Heyes (2018) dubbed a cognitive *gadget*—the corresponding abilities are not anchored in our genes, but are a matter of cultural learning. However, both sides agree on what I take as the most central message—namely that deductive reasoning is not itself an adaptation.

In the final chapter of the book the author strives to show that even mathematical practice shows clear signs of its dialogical origins.

The whole book is interdisciplinary in the best sense of the world: it brings together—and interconnects—relevant results of logic, philosophy, psychology, evolution theory and history in a way that casts fresh light on the relationship between argumentative and deductive reasoning. I think that the case for the dialogical roots of deduction has been made quite persuasively.

The only argument that I find less convincing is the author's repudiation of the view of Mercier and Sperber. Concerning their view Dutilh Novaes writes: "Reason must be an adaptation, but if conceived as having the function of supporting the cognitive processes of the lone reasoner, it does not seem to perform this function very well. So, there must be a different function that reason is in fact responding to, given that it cannot be anything other than an adaptation"

(p. 193). And further: "Prima facie, to argue for the adaptive nature of reason seems like a tall order in view of the numerous empirical findings suggesting that human reason is 'biased and lazy'. ... But Mercier and Sperber go on to argue that these two features are in fact advantageous for the function of reason as socially conceived" (*ibid.*)

I think that we must distinguish between two varieties of "reason as socially conceived" (or argumentation). Let me call the first of them "Socratic": this is the argumentation which aims at an impartial seeking of truth, where reason acts "as a judge" (to use the metaphor of Haidt, 2001). The other variety of argumentation is "sophistic": this aims at defending one's pre-given views cost what it may (it acts as a "defense lawyer").

In my view, Dutil Novaes wrongly portrays Mercier & Sperber as claiming that Socratic argumentation is an adaptation. As I read them, what they claim is that it is a kind of sophistic argumentation that is an adaptation, and that Socratic argumentation is its by-product. Defending one's position (cost what it may) is an adaptation; and seeking flaws in another's defense is a counter-move to this adaptation. It is only when these two adaptations are played against each other that "Socratic" argumentation may arise.

Nevertheless, the book is definitely a valuable contribution to current discussions both about the nature of logic and mathematics and about the nature of human reason.

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