**Deduction as a dialogical device**

Catarina Dutilh Novaes*:* The dialogical roots of deduction: historical, cognitive, and philosophical perspectives on reasoning. New York: Cambridge University Press, 2021, xiii+271 pp, £75.00 HB, ISBN 978-1-108-47988-2

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Over the last decade, Catarina Dutilh Novaes has established a wide-ranging and systematic research program at the intersection of philosophical logic and its history, cognitive science, and the philosophy of mathematics (see Dutilh Novaes 2012, 2013, 2015, and 2018). This book extends and amplifies that program by giving a *dialogical* account of deduction. The book integrates work on deductive reasoning in human cognition, and the historical development of the study of deduction in a way that will be of interest to a range of researchers working on human reasoning.

Dutilh Novaes’ account of deduction is dialogical in the sense that it explains some of the characteristic features of deductive reasoning, while also explaining trends in the history of the study of deductive logic, in terms of the role that deductive reasoning plays in argumentative conversation. Dialogical practices involve the interchange of ideas expressed with attitudes like *assent*, *dissent*, and *query*, corresponding to speech acts of *assertion*, *denial*, and *interrogation*. Dutilh Novaes employs a method she calls “conceptual genealogy”, characterized by commitments to “a *historicist* understanding of concepts and values, an emphasis on the *contingency* of the underlying historical developments, the involvement of *multiple lines of influence*, and the *superposition of layers of meaning*, resulting in both change (the new meanings) and continuity (residual traces of the old meanings)” (89, emphasis in the original). Following this method, Dutilh Novaes traces a line of descent for the reflective use of deductive reasoning from the public debates of ancient Athens, through Socrates and the logical works of Plato and Aristotle, and into the medieval schools and their stylized systems of public disputation. The dialogical account of deduction is also compared with the process proof construction in mathematics, and with contemporary work in the empirical study of human cognition.The result is a comprehensive view on the nature of deduction as a device for dialogical argumentative interchange. In the rest of this review, I summarize the book in outline form and situate the work in the context of *social practice* theories of human cognition.

The book is divided into three parts. Part I is titled “The Philosophy of Deduction”, and it consists of four chapters. Chapter 1 characterizes three features central to deductive reasoning, which Dutilh Novaes’ dialogical account aims to explain: (i) the *necessary connection* between the truth of the premises and the truth of the conclusion; (ii) the *perspicuity* of that connection; and (iii) the fact that one *brackets* what one otherwise believes when considering that connection. Chapter 1 also provides a helpful survey of the study of deduction in philosophical logic. In the beginning of Chapter 2 Dutilh Novaes lays out her methodology, characterized as *integrative* and *synthetic*, and the rest of the chapter assembles the explanatory machinery that the coming chapters employ. Dutilh Novaes’ notion of *cultural recapitulation* uses the ontogeny of deductive reasoning in human beings, and the history of the study of deduction in philosophy and logic, to shed light on each other. In a clever nod to the old biological saw that ontogeny recapitulates phylogeny, Dutilh Novaes claims that *ontogeny recapitulates history* (27 and 170).

 Chapters 3 and 4 lay the cornerstones for the rest of the book. Chapter 3 presents the framework of *prover-skeptic dialogues*. Particular attention is given to dialogical accounts of deduction in the twentieth century by Jaakko Hintikka, Paul Lorenzen, Imre Lakatos, and in game theory. Readers who are not familiar with this strand of development in the recent study of deduction will appreciate the discussion, while those familiar with dialogical accounts will appreciate the critical appraisal. Chapter 4 presents Dutilh Novaes’ understanding of deduction as dialogical. Here she argues that the dialogical account of deduction can explain why the three key features (necessary truth-preservation, perspicuity, and belief-bracketing) are thought to be central to the notion of deduction: necessary truth-preservation and perspicuity help convince recalcitrant skeptics, while the bracketing of belief fosters the ability to shift perspectives between different interlocutors. At the same time, the fact that most deductive arguments are not given in prover-skeptic dialogical form is explained by the supposition that the role of the skeptic is *internalized* when a researcher presents a deductive argument. Deduction has not lost its dialogical basis, then, but that basis has instead been folded up into the preparatory work that precedes presentation of the final product.

 Part II, consisting of chapters 5-7, is titled “The History of Deduction”. Chapter 5 looks at the development of deductive reasoning in ancient Greek mathematics and dialectics, and in the public debates of ancient Athens. Chapter 6 examines Aristotle’s syllogistic logic as the first recorded systematic exposition of deductive reasoning, and examines comparable work in Asian traditions. Chapter 7 focuses on the influence of deductive reasoning in the medieval schools of Europe, especially the work on Aristotelian syllogistic logic. Here Dutilh Novaes advances the claim that the dialogical roots of deduction, evident at least through the stylized debates of medieval European philosophy, were gradually “forgotten”, just as the mathematician “internalizes” the skeptic in the process of constructing a proof for some claim.

 Part III, “Deduction and Cognition”, closes out the book with four chapters and a conclusion. Here Dutilh Novaes exhibits an interdisciplinary interest that marks her program as timely and of broad significance. Drawing on work in cognitive science, social psychology, and developmental and comparative psychology, she argues that her account of the origins of deductive reasoning in dialogical interactions is supported by an examination of the development of deductive reasoning in phylogenetic, historical, and ontogenetic timescales. Chapter 8 examines empirical work on the way human beings deductively reason, both individually and in groups. Chapter 9 argues that the three characteristics of deductive reasoning introduced in Chapter 1 can be understood as means for helping groups of people share their views and endeavor to triangulate on a more adequate perspective. Chapter 10 argues that deduction should be seen as a cultural adaptation rather than a genetic one, though it perhaps developed by coopting ancestral traits that have a genetic evolutionary basis. Chapter 11 looks at the construction of proofs in mathematics as a case study for the dialogical account. The concluding chapter examines the sense in which deduction is seen to be a social construction, and maintains that the question of whether deduction is *justified*,or a norm for cognition, has not been settled one way or the other.

This is an engaging book, and it syncretically draws on different literatures in ways that are frequently novel and invariably illuminating. In its focus on the dialogical foundations of *deduction*, the book leaves open the possibility that dialogical accounts might be given for other forms of reasoning, including inductive, analogical (which shows up in consideration of China’s logical tradition in Chapter 6), and abductive. Indeed, at various points Dutilh Novaes characterizes her method as a case of abduction or inference to the best explanation (see, for example, 29, 36, and 69). More generally, the book exemplifies a recent program in philosophy — and related areas in cognitive science, evolutionary anthropology, and comparative and develop-mental psychology — directed at examining the role the social practice of disputation plays and has played in the ontogeny and phylogeny of human cognition. Recent books devoted to this theme include Koreň 2021, Mercier and Sperber 2018, Rouse 2015, and Tomasello 2014 and 2019.

Dutilh Novaes has already made a substantial contribution to this literature, and her new book develops this program in new and exciting directions by drawing on a tradition of deductive reasoning that descends from the public debates of the Athenian democracy, through a central strand in Western intellectual history, and into current scientific research into human cognition. Philosophers and scientists working on human cognition have much to gain from assimilating the careful research put into this book.

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