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THE ART OF ABDUCTION

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Igor Douven

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Igor Douven's most recent book, *The Art of Abduction*, summarizes much of the author's research on the topic of abduction that he has conducted over the last several decades, as well as gesturing at intriguing ways it may be developed in the future. It is an excellent snapshot of the state of play in formal approaches to the topic of abduction and is a must-read for anyone interested in the question of how the techniques of formal epistemology can be profitably used in the study of this sometimes maligned form of inference.

While there is some material in the first several chapters discussing abduction as a form of inference in which we infer the best explanation of the data that lies before us, the core of the book revolves around abduction viewed as a non-Bayesian way of updating degrees of belief in such a way that more explanatory hypotheses get 'bonus points'. Some discussion of Douven's reasons for analysing abduction in this way occurs in Chapter 2. There is thus little new analysis of abductive inference viewed more traditionally as a rule taking a premise in which we have justified belief to a conclusion in which we have justified belief, or of Peircian conceptions of abduction that yield a rational guess that may then be scrutinized in accordance with the canons of induction. The intended audience for this book is not readers interested in abduction viewed in these ways, but rather readers interested in abduction as a rule for

updating credences and its relationship with more traditional forms of updating. This latter type of reader will find much of interest in this book.

Chapters 1 and 2 make the case for the ubiquity of abduction, arguing that it is present in the low-level tasks of basic cognitive processing, such as linguistic understanding and vision, as well as in the high-level tasks of philosophy, such as dealing with problems of underdetermination and justifying the choice of a set of logical rules. These chapters also include a discussion of Bayesian updating and the arguments given in its favour that act as a foil for much of the rest of the book. Douven also lays out the basic idea that while Bayesian updating manages to avoid Dutch books and minimize inaccuracy, these are only some virtues among many that must be considered when choosing updating rules. Douven's claim is that non-Bayesian 'abductive' updating rules have other virtues that at least sometimes render them superior to strictly Bayesian alternatives. In Chapter 2, we are also first presented with the very general form of Douven's updating rule, EXPL (p. 51), that will be the subject of much investigation in subsequent chapters.

Chapter 3 is an extended argument that as a matter of empirical fact people are not strict Bayesian updaters, but instead sometimes take explanatory considerations into account in non-Bayesian ways when updating their credences. The core evidence offered in the chapter is a series of studies by Douven and Schupbach ([2015]). In these studies, subjects are asked to estimate fairly complex probabilities, and evidence is presented that subjects use explanatory considerations in estimating such probabilities. This evidence suggests 'that people respond to the receipt of new evidence at least somewhat as if they followed an update rule akin to EXPL' (p. 88). Although the statistical analysis behind these experiments is explained in great detail, some more obvious philosophical questions are left open. For example, it is very natural to wonder whether the explanatory considerations invoked by actual reasoners should be viewed merely as a heuristic for Bayesian calculations when they are too difficult to perform directly, or whether the presence of such explanatory considerations suggests that there is something fundamentally wrong with the idea that only Bayesian updating is genuinely rational. This question is never really confronted head on, though it is broached in many ways in the following chapters.

Chapter 4 is mostly devoted to Dutch book arguments and how to respond to the fact that updating in non-Bayesian ways exposes one to Dutch books. Douven argues that his non-Bayesian updating method allows one to avoid diachronic Dutch books, but leaves one exposed to synchronic Dutch books. Douven suggests that in the synchronic Dutch book case, we can simply refrain from betting. Using Simon's ([1982]) terminology, the rationality of refraining from betting can be warranted on the grounds that we are 'satisficers' rather than 'maximizers'. This gestures back to Douven's main idea that in choosing how to update one's credences and deciding how to act in accordance with those updated credences, there are virtues other than the maximization of gains or to be considered. To illustrate such a competing virtue quite explicitly, Douven shows that in certain cases EXPL converges to the truth more quickly than Bayesian updating. He points out that 'we might prefer an update rule that is more likely to take us fairly close to the truth in a reasonably short time span over one that is more likely to take us extremely close to the truth in the long run but less likely to take us even fairly close to the truth in, for example, the medium-long run' (p. 125).

Of course, the examples he uses to demonstrate this strength of EXPL are cases in which it is unsurprising that reasoning in a way that adds bonus points to explanatory hypotheses will be advantageous. Douven's point, however, is that 'which update rule [we] use may depend on context' (p. 130). Perhaps the thought is that in cases where it looks like it will be advantageous to use EXPL we should do so, and in cases where it looks like it will be advantageous to use Bayesian updating we should do so. How exactly we should decide this (and, indeed, whether this is the sort of thing we can know in advance in anything other than the most contrived settings) is unfortunately not discussed in any real detail.

In Chapter 5, Douven turns his attention to scoring rules, a technical notion in formal epistemology often used in arguments in support of Bayesian updating. In order to make space for his own non-Bayesian conception of updating, Douven suggests that scoring rules need not be proper and that this blocks the standard arguments for Bayesian updating. Douven's argument is that although there is a case to be made that scoring rules must be proper when trying to elicit probabilities, this does not entail anything about what sort of scoring rules are appropriate for assessing our own probabilities. An interesting complementary discussion of the propriety of scoring rules can be found in (Titelbaum [2022], Section 10.3.3). To what extent Douven's complaints against propriety are related to the worries of circularity voiced by Titelbaum is a question worthy of further thought.

Chapter 6 returns to the question of the justification of abduction—that is, the justification of the EXPL updating rule. Some traditional justifications of abduction are critiqued and data is presented to show that in certain environments, using the EXPL rule to update credences produces accurate results more quickly than certain rivals. Douven also reiterates the idea that we should not expect any updating rule to be universally rational. Presumably the upshot is that the only sort of 'justification' of abduction for which it is appropriate to ask is given by evidence that EXPL functions well in the environments where it is apt to be used. Douven's argument is interesting and has much in common with arguments found in the bounded rationality literature, as he acknowledges. Still, the question of to what extent carving out a set of environments in which a rule is reliable (or has some other virtue) constitutes an argument for the rationality of that rule is never really directly tackled.

In Chapter 7, Douven turns his attention to group-based (that is, 'social') reasoning, in which agents allow their credences to be influenced by others. Data is presented suggesting that in such a setting, reasoning based on EXPL is in some ways more accurate and converges to the truth more quickly than Bayesian reasoning. This is at least in part due to the fact that in the social setting, reasoners are allowed to be influenced by convergence in other reasoners' credences. Of course, precisely this fact can also lead to groups being more easily misled by the evidence. The question of whether, in light of this, it is rational to allow our credences to be influenced by the credences of others is not really considered in great detail, even though it is made more pressing by the results of this chapter.

In Chapter 8, Douven turns to his most ambitious task—an abductive reply to the sceptic about the existence of the external world. Douven's view is that while more straightforward Moorean and Russellian attempts to answer the external world sceptic do not work, he has the resources at his disposal to correct the deficiencies in their arguments and defend realism. What follows is a very complex account with a large number of moving parts, but with a fairly simple idea at its core. The key idea is that when unsure whether (i) to take perception as more or less veridically showing us how the world really is (that is, in Douven's terminology, to take our evidence in a Moorean way) or (ii) to take our perception as only revealing to us something about the world of appearances (that is, in Douven's terminology, to take our evidence in a sceptical way), our credences should represent a kind of average of these two viewpoints. In Douven's terminology, the Moorean and the sceptic should constitute a 'panel of experts' for us. As long as we are willing to grant some credence to the idea that our perceptions directly show us how the world is, and as long as enough of the data we subsequently encounter is evidentially relevant to the question of whether our senses do in fact show us how the world is, then if we are exposed to enough of the right data, our updating procedure will eventually assign a high credence to the claim that our sense perception is reliable. In this way, the sceptic is addressed.

Douven's basic idea here is of course simple and intuitive: if in some half-awake/half-asleep state I am not sure whether to believe my senses, then as long as I grant some sort of credence to the hypothesis that I am awake, I can actually come to believe that I am awake by being exposed to a sequence of appropriately relevant data. By petting

the cat and noticing that she does not transform into a dragon, then going to the refrigerator and noticing that it does not contain 500 giant stuffed pheasants but rather the leftovers from yesterday's dinner, I can come to acquire confidence that I am no longer dreaming. Something like this process is used by all of us once in a while. Perhaps this process even has something like the structure described by Douven: I treat the hypothesis that I am awake and the hypothesis that I am dreaming as something like a panel of experts, none of which I have the right to dismiss without consideration, and I regard the data with which I am presented at least sometimes evidentially relevant to the question of which of these experts is right, and in this way, after repeated investigations, I come to believe that I am awake and my senses are reliable.

But it is difficult to see how this addresses the problem of scepticism. The problem of scepticism is not that of devising a procedure we can use in the wee and blurry hours of the morning to reliably figure out whether we are in fact awake. We do not need philosophy for that. The problem of scepticism is rather that of explaining how we can be justified in believing that our senses are reliable or that there is an external world. If Douven thinks that his procedure provides us with such justified belief, then he needs to explain at least two things. First of all, he must explain why we should initially grant any authority whatsoever to the Moorean way of viewing our evidence. (In Douven's terminology: why must the Moorean be admitted to our panel of experts?) Second, Douven must also explain why we should regard any data we come across as evidentially relevant to the hypothesis that our senses are reliable or that the external world exists. Why should any perceptual experience increase my degree of belief that there is an external world by one iota? (The fact that in earlier chapters Douven trenchantly argues against things like coherence requirements on credences only makes this task harder for him.) Without addressing questions like these, it is hard to see how Douven's procedure gives us justified belief in the reliability of the senses, and thus hard to see any substantive sense in which the sceptic has been addressed.

In spite of these concerns, Douven's book is full of intriguing ideas that will provide much of interest to anyone interested in abduction and non-Bayesian updating methods. Undoubtedly, many of the strands of thought outlined more impressionistically in this book will be fleshed out in more detail in Douven's future work, which will be very eagerly awaited. In the meantime, this book will surely shape the debate about abduction and its nature.

Kevin Davey
University of Chicago
kjdavey@uchicago.edu

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