


BOOK REVIEW ESSAY

Bounded Rationality: Heuristics, Judgement, and Public Policy

Sanjit Dhami and Cass R. Sunstein. MIT Press, 2022, 533 pp.

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(Received 6 September 2023; accepted 6 September 2023)

Bounded rationality, behavioral economics and ‘normal science’

Thomas Kuhn, in his book ‘The Structure of Scientific Revolutions’, introduced the concepts of ‘normal science’, ‘paradigm shifts’, ‘anomalies’ and ‘revolutions’ to illustrate how science develops over time. When Herbert Simon discussed the idea of ‘limits to rationality’ in Chapter 2 of his work *Administrative Behavior* (1947), he pointed out anomalies in how classical administration science and economics viewed rational behavior, putting in motion a revolution that will eventually end in a paradigm shift in social sciences. Simon later replaced the term ‘limited rationality’ with the more positive notion of ‘bounded rationality’ (1957). He argued that human rationality is bounded by cognitive capacity, time limitations and the complexities of the choice environment. This change in terminology was aimed at critiquing the classical and neoclassical economic assumptions within their scientific paradigm that humans are entirely and flawlessly rational in their decision-making processes. The positivity associated with the adjective ‘bounded’ arose from the recognition that human rationality and decision-making, though constrained, can still lead to rational outcomes mainly due to these cognitive boundaries. Simon, therefore, highlighted the flexibility, adaptability to the environment and resourcefulness of human minds when dealing with complex situations. On the other hand, ‘limited’ carried a more negative connotation as it suggested an inherent incapacity to go beyond the restrictions. It could be perceived as an absolute barrier or a lack of potential to make better decisions, which would undermine the capability of rational thinking. Bounded rationality, hence, emerged as an empirically grounded approach to human decision-making, as traditional economics and administration theory failed to provide a realistic (evidence-based) account of it. According to Simon, the classical and neoclassical economic theories’ assumption of ‘Olympian’ rationality is devoid of reality; it exists merely as a metaphysical construct. Simon’s work initiated a paradigm shift in Kuhnian terms, triggered by the anomalies present in the rationality assumptions of the neoclassical

models. These anomalies were subsequently systematized by Tversky and Kahneman (1974) in their prospect theory and their heuristics and biases research program and further solidified by the current efforts of behavioral economists and social scientists who consider the bounded nature of human decision-making in economics, public policy and law.

Nearly 70 years after the introduction of the concept of bounded rationality, economist Sunjit Dhami and legal scholar (renaissance man and prolific writer) Cass R. Sunstein have published an extensive academic textbook titled *Bounded Rationality: Heuristics, Judgment, and Public Policy*. This book provides a comprehensive understanding of the scientific notion of bounded rationality and its implications in the realms of public policy and law. According to Kuhn, during a paradigm shift, the central debates revolve around the clash between the former scientific model and the emerging one. However, in times of 'normal science', the discussions take place within the existing paradigm. Presently, scientists are not engaged in a debate over perfect vs bounded rationality; rather, they are exploring various versions of bounded rationality and the implications thereof. The publication of books like the one being reviewed here serves as evidence that the revolution initiated by Simon has reached its culmination, and bounded rationality has already become a fundamental pillar of our 'normal' social sciences.

Bayesian rationality, bounded rationality, heuristics and biases

Bounded rationality is the main topic of Dhami and Sunstein's book, which is organized into 11 chapters with different subsections. The book is written for academic and knowledgeable audiences, providing introductions to difficult concepts while exploring the complex epistemological ramifications of the theories and models presented to the reader. From the start, this comprehensive, enlightening and entertaining work acknowledges that it will clarify the notion of bounded rationality and its implications for public policy and law. To this end, it begins by exploring, with mathematical analysis included, how neoclassical economics used the Bayesian Rationality Approach (BRA) to richly understand social and economic phenomena, quickly clarifying that such an approach was not supported by empirical evidence: in reality, humans do not possess the unlimited rational capacities assumed by the model.

In contrast with BRA, behavioral economics (BE) is presented as the alternative capable of providing 'rigorous, falsifiable and precise predictions' (Dhami & Sunstein, 2022: 5) without sacrificing empirical evidence, thanks to using methods such as randomized controlled trials or field studies. The authors distinguish between two different (but connected) research programs in BE: an incremental one that tries to replace parts of BRA by promoting gradual changes, and a big-push program, which represents a 'more fundamental departure' from the BRA by making procedural rationality the cornerstone of the scientific building. It started with Herbert Simon, followed by Tversky and Kahneman's heuristics and biases research program, and continues with the work of researchers such as Richard Thaler or Gerd Gigerenzer.

Dhami and Sunstein's academic treatise presents a comprehensive and rigorous examination of various concepts and definitions of rationality in economics and

public policy, focusing at the start on the critique of the BRA (due to its lack of realism) without overlooking its remaining strengths. Parts of the second chapter are used to explain essential terminologies encompassing risk, uncertainty, ambiguity and true uncertainty while offering deep insights into rationality under distinct scenarios such as certainty, risk, time and strategic interaction. The empirical evidence supporting rationality assumptions in the context of BRA is critically evaluated throughout the different sections of the book, supplemented by a comprehensive introduction to behavioral decision theory.

A significant segment of the book is devoted to the actual significance of 'bounded rationality', which is presented as an alternative model that delivers a scientific approach to decision theory while criticizing BRA's lack of empirical grounding. Accordingly, drawing from Simon's seminal distinction between substantive and procedural rationality, the authors cogently advocate for the adoption of bounded rationality approaches, emphasizing the role of procedural rationality for a more robust understanding of human decision-making in social sciences. In this regard, the examination of optimization-based models over time, including an analysis of their reasonability in the context of real-world phenomena, such as microfinance, housing bubbles and tax evasion, further enhances the depth of this academic exploration. Moreover, the integration of contextual factors, including social norms, history, culture and institutions, underscores the multifaceted nature of decision-making processes.

The book meticulously proceeds by evaluating attribute-based models of intertemporal choice, digging into Simon's notion of *satisficing* (Simon, 1956), and discussing also various behavioral models of heuristics-based decision-making. It contrasts standard decision theory models with non-consequentialist models that consider emotions and vividness in decision-making. Attribute-based models for time discounting are examined, along with the comparison between heuristics-based and optimization-based choices in certain intertemporal models. The authors discuss here how heuristics can be explained by psychologically rich models, like prospect theory, and discuss aspiration adaptation theory for cooperation and coordination scenarios. As part of Chapter 4, Dhimi and Sunstein also analyze Kantian rationality, bidding behavior in common value auctions and the winner's curse phenomenon. The application of bounded rationality to macroeconomics is discussed, comparing complexity-based agent-based models with standard rational expectations models. The book also covers narrative economics, mental models, narrow bracketing and evidence on low-probability events. Throughout the initial chapters of the book, the reader is presented with strong scientific evidence about how people often violate basic assumptions of economic rationality, always suggesting a need for a broader and more realistic model of human decision-making.

In this extensive work, the main focus is on bounded rationality, but it missed addressing a crucial aspect of the discussion among the different bounded rationality models developed by Herbert Simon, Tversky and Kahneman, and Thomas Sargent. The model used by Tversky and Kahneman views bounded rationality as a problem to be fixed, while Sargent's approach in his book *Bounded Rationality in Macroeconomics* involves maximizing choices under certain constraints, which aligns with the neoclassical perspective. One key difference between Simon's view and the

approach of Tversky and Kahneman lies in their stance on perfect rationality as the normative standard. Simon rejected the notion of perfect rationality as the benchmark, whereas Tversky and Kahneman retained it, using it to gauge the ‘departures’ from rationality, which they referred to as ‘biases’.

Revisiting the rationality wars

Chapters 5 and 6 serve as a pivotal section, engaging readers with an insightful analysis of Tversky and Kahneman’s heuristics and biases research program (HBP) while recognizing objections raised by the fast and frugal heuristics research program (FFP) carried by Gigerenzer *et al.* (1999) and his group. In this section, the book echoes the *rationality wars* between what some authors (Samuels *et al.*, 2002) have called the pessimistic and the optimistic approach to rationality: while FFP would present an optimistic view of our rational decision-making skills, HBP would consider them as subpar. During a private conversation in Prague, I had the opportunity to speak about this topic with Gerd Gigerenzer, who had been awarded the Allais Memorial Prize at the Center for Behavioral Experiments, where I was invited to give one of the keynote speeches for the prize. In our discussion, Gigerenzer expressed his dislike for the oversimplified pessimistic/optimistic distinction, as he felt it could be likened to the analogy of a glass being half full or half empty. He emphasized that reducing the differences between both approaches to a mere optimism–pessimism spectrum would be overly simplistic. Instead, Gigerenzer pointed out that the disparities between these perspectives are empirically evident and cannot be easily categorized within a narrow psychological framework of optimism and pessimism. In this regard, the book will surprise the readers with enough evidence that may question some of the assumptions of FFP when criticizing HBP. Although Dhimi and Sunstein recognize that HBP ‘does not deny that heuristics are fast and frugal’ (2022: 266), they reject FFP’s criticisms of its approach and, when referring to the evidence provided, it lacked a way to predict the choice of a specific heuristic from the adaptive toolbox, without asserting which heuristic to use. The bias-variance dilemma, for example, is only applicable to true-uncertainty scenarios (the main domain of FFP, but not of HBP), according to the book. I believe that Gigerenzer recognizes this range of applications, but he emphasizes that most situations we face are uncertain: ‘In a world of uncertainty, heuristics are indispensable tools, not second-best solutions [...] In fact, the presence of uncertainty is paramount in a wide range of choice situations in real life’ (Mousavi & Gigerenzer, 2014: 1672).

In this section, the authors also explore other issues raised by FFP, such as the ecological validity of HBP, one-event probabilities and the interplay between human cognition and intelligence, demonstrating the book’s commitment to scholarly rigor and critical analysis. In a similar vein, Chapter 6 delves deeper into the fast and frugal heuristics research program, investigating its epistemological underpinnings and potential concerns regarding the less is more effect, also called the bias-variance dilemma. These two chapters offer valuable insights into human decision-making processes and reflect the book’s commitment to exploring various research perspectives. However, they do not fully address aspects of ecological rationality that are crucial to understanding FFP’s views. The text could have been improved by providing a

more detailed examination of the role of the environment in decision-making and, specifically, the use of heuristics in the different choice environments. Although there are some mentions of this topic, a more thorough exploration of how FFP perceives heuristic mistakes in relation to their application in inappropriate choice scenarios would have made these sections of the book more comprehensive. A bias, therefore, does not necessarily have to originate from flaws in our cognition; it can also arise as a result of environmental factors.

Philosophy, behavioral public policy and law

The subsequent chapters, ranging from 7 to 10, connect bounded rationality, behavioral economics and public policy. They contribute to the new field of behavioral public policy and to the scholarly discourse on behavioral welfare economics, contextualized within a liberal philosophical framework. In these sections, the authors distinguish between means and end paternalism, offering a nuanced exploration of direct and indirect judgments, hard and soft paternalism, libertarian paternalism, taxation, regulatory interventions and nudges, all this in the presence of Mill's harm principle in the rear mirror. Their philosophical approach to public policy proposes respecting people's self-regarding choices if well-informed and unbiased while suggesting that interventions might be needed if choices lead to negative outcomes or do not promote welfare, considering information gaps, biases and philosophical well-being questions. The authors contend that policymakers must conduct with caution, acknowledging diverse values and supporting the presumption when individuals are informed and unbiased. While the coordinates of applicability of different interventions are clear (Mill's harm principle, respect of people's self-regarding choices unless they are biased, misinformation or reduce welfare), the book does not delve enough into the problematic cases that can challenge these perspectives. For instance, the notion of 'harm to others' is not simple, since it can encompass actions or behaviors that have the potential to negatively impact individuals or society. Examples of actions that can cause harm include flying or driving a highly polluting car, both of which contribute to global warming ('harm to others'). Additionally, not having health insurance in the USA and consuming sugary drinks can also be harmful. The lack of health insurance puts individuals at risk of financial burden and limited access to healthcare, while the consumption of sugary drinks may lead to health issues. Both cases would consequently result in higher insurance premiums for everyone ('harm to others'). Could the government justify regulatory interventions since these situations cause harm to others? In general, the authors propose a type of public policy rooted in welfare economics. This perspective emphasizes indirect judgments, specifically, making decisions about the means to achieve desired ends. In line with this, they advocate for a form of means paternalism that considers people's bounded rationality.

When referring to nudges (the result of applying HBP to public policy), the authors contrast them with boosts, which are part of the FFP. They offer the peaceful solution of making both interventions complementary to one another, rather than alternatives. Dhimi and Sunstein uphold that libertarian paternalism, in general, does not try to undermine educational interventions nor neglect the harm institutions

may cause. The authors reiterate that it is a complimentary ‘[...] tool for public policy that imposes no restrictions on individual liberty’ (2022: 420). From my perspective, the book also forgets to address a crucial issue related to governmental austerity policies: with the goal of saving money, governments and institutions may just rely on libertarian paternalistic behavioral approaches, ignoring other more effective educational or regulatory policies (which tend to be costly and carry a higher political price).

In 2022, numerous publications highlighted the replicability problems in studies regarding nudges (Mertens *et al.*, 2022; Maier *et al.*, 2022), and even in 2023, we still observe issues with honesty–nudge interventions (faked and doctored data that dates from 2021). Although not extremely necessary, a few sentences about these matters would have added an extra dialectic layer to this already robust book. It’s crucial to note that this minor crisis in the field does not signify a revolutionary event; rather, they are just scientific adjustments part of the ‘normal science’ period.

A much-needed book in a ‘normal science’ period

This rigorous and entertaining academic work makes an admirable and much-needed contribution to the field of social sciences by meticulously exploring a wide array of economic concepts, axioms, propositions, theories and models related to rationality and human decision-making. The book’s analyses, examples, counterexamples, mathematical demonstrations and use of supporting evidence, along with its comprehensive coverage of essential topics, make it an indispensable resource for scholars, researchers and practitioners alike. From my perspective, the authors offer an exhaustive description of how behavioral economics, behavioral public policy and law convincingly advocate for realism and broader perspectives in social sciences. By providing robust evidence, they demonstrate the potential of this approach to enhance effectiveness in public policy while upholding basic ethical and political principles that respect people’s autonomy while considering their bounded rationality. As was expected by both authors, this quality renders the work highly relevant and significant in contemporary academic discourse within the field.

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