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Normative rationality after behavioral economics: what is left?

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This is the written version of the annual Behavioural Public Policy lecture I gave at the London School of Economics on 27 March 2025. It is dedicated to the memory of the late Paul Lewis, Professor of Political Economy at King's College, London. The contents of this article reflect joint research over many years with Professor Glen Whitman of California State University at Northridge. I am indebted to Adam Oliver, Professor of Behavioural Public Policy at the LSE, for the opportunity to present the lecture. I am indebted to the members of the audience at the LSE who gave me valuable ideas for improving the ideas discuss here. I am also indebted to Malte Dold and Glen Whitman for comments on this article. All responsibility for errors lies with me.

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Abstract

The research of many decades by behavioral economists and psychologists has shown that the standard rationality axioms do not describe how individuals actually behave in many circumstances. Nevertheless, behavioral economists still argue for the normative character of the axioms: they describe how individuals *should* behave. Violations of the axioms are red flags for some type of pathology. This article argues that the history of the axiomatic approach in economics does not lend support to the normative case. Furthermore, it is argued analytically that the rationality axioms are vacuous. The attribution of irrationality to behavior can only be accomplished by reference of a more inclusive idea of rationality. The axioms are too thin and misleading. They do not have policy significance.

Keywords: axioms; choice theory; inclusive rationality; irrationality; normativity

> Properly construed, rationality is as wide ranging and complex as the domain of intelligence at large. Nicholas Rescher (1988: viii).
>
> …[Many] persons talk as if the minutest dose of disconnectedness of one part with another, the smallest modicum of independence, the faintest tremor of ambiguity about the future…would ruin everything, and turn this goodly universe into a sort of insane sand-heap or nulliverse, no universe at all. William James (1979 [1884]:121)

Rational choice is most frequently defined as choice that satisfies a particular set of rationality axioms.[1] Behavioral economics has subjected these axioms to criticism from a descriptive point of view. It is argued that they do not describe how individuals actually behave, and much evidence has been adduced to support that conclusion. I more or less accept that.[2] And yet behavioral economists apparently think that they are normative. They describe how individuals *should* behave.

I state my conclusions first. The rationality axioms are not normative. They are simply modeling assumptions. The evaluation of choices or preferences as rational or irrational cannot be based on these structural criteria. They must be based on evaluations outside of the structure. I argue that the rationality axioms are empty insofar as behavior violating the axioms can be reasonably redescribed in such a way as to not violate them. Thus, they do not separate the rational from the irrational. Furthermore, since rationality is as wide as the domain of human intelligence (Rescher, 1988: viii), it is not easy to declare behavior or preferences irrational in more than a technical modeling sense. This is one reason I urge a liberal approach to evaluating people's decisions as well as a largely hands-off policy that avoids paternalistic intervention.

It is useful to divide the discussion into four parts. Part 1 is history, a short history of the axiomatic method in economics. The history is important because it gives us a view of the different functions of axioms as seen by important economists. Part 2 is an analysis of the normative vacuity of the axioms in economic theory. Part 3 discusses the possibility of irrational behavior. Part 4 briefly concludes.

History: classical school and Lionel Robbins

In the 19th century, an important view of axioms was that they were undoubted statements about the real world. In economics, the Irish economist John Elliott Cairnes (1875), generally known as the last classical economist, organized economics as he knew it around 1870, in an axiomatic form. He established five or six premises on which he believed the science of economics was based. Every one of these premises is a statement about the real world. At the motivation level, he states that individuals desire material wellbeing and that they try to reach their ends by the least possible sacrifice. People also have the intellectual ability to judge the efficacy of means to ends. To these he adds the laws of diminishing marginal returns to productive activity and the laws of population increase as part of the physical universe in which the motivational activity of individuals takes place. Upon these undoubted premises, the discipline of economics was based. There were of course nuances and issues of application, but the core of economics was thereby established.

[1] The standard axioms are: *Completeness*. An agent can always compare any two options and express preference or indifference between them. *Transitivity*. If an agent prefers A to B, and B to C, then it should logically prefer A to C. *Independence of Irrelevant Alternatives*. Adding or removing a choice that isn't being directly compared should not change the decision between the options being considered. *Irrelevance of Framing*. Logically equivalent descriptions produce the same behavior. All of these can be referred to as 'consistency'. Various technical assumptions were also added.

[2] My acceptance is qualified. If, as I discuss later, it is true that behavior can be redescribed to satisfy the axioms then they can only be *superficially or apparently* falsified.

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Moving ahead to Keynes (1890), John Neville Keynes added to the premises that Cairnes had presented two more: decreasing marginal utility, defined psychologically, and free competition in most cases. By the time Lionel Robbins wrote in 1932 and 1935, a core of economics had been identified, under the strong influence of the Austrian school. Robbins elaborated the argument that the essential part of economics is preference satisfaction in a world of scarcity. People were assumed able to order their preferences; they were able to perceive different opportunities; they were able to rank these opportunities in terms of the different preferences they would satisfy. They could also roughly maximize their satisfaction subject to the constraints as they saw them. The older view of axioms was clearly present here. These statements were considered realistic, and undoubted, premises.

But what about consistency? Robbins (1935: 90–94) thought it was a minor issue in several respects. He admitted that consistency (transitivity) of preferences is required for certain analytical constructions like the equimarginal principle. Nevertheless, the effort to attain full consistency is manifestly uneconomic. Who can search all their numerous preferences and choice of means to decide whether they are consistent or not? He refers to the famous idea of the marginal disutility of bothering about marginal utility.

Robbins believed that even when preferences are not consistent and, importantly, people do not know the full implications of what they are doing, economics has something to say. It is still the case that means are scarce in relation to ends. People still engage in exchange and production. There are still business fluctuations. Obviously, an economics such as this will not satisfy the demands of complete analytical precision.

Importantly, for my purposes, none of these economists, Cairnes, Keynes and Robbins, thought that their premises or axioms were normative. They described how people allegedly behaved and the actual characteristics of the world in which behavior took place. Normativity for these economists was to be found in the domain of ethics, not in the axioms.

History: new view of axioms

In the early years of the 20th century, the mathematician David Hilbert transformed the idea of axioms into a more austere conception. He sought the necessary and sufficient conditions to support some existing theoretical or mathematical structure. Hilbert's ideas influenced mathematically oriented economists. As far as I know, the first economist to take up the task of axiomatizing choice theory in more or less the contemporary, Hilbert-influenced, way was the Nobelist Ragnar Frisch in 1926. He started with assumptions such as individuals could order all of their preferences, their preferences were transitive, and that you could add utilities. His task was to put choice theory, or as we would say today, the utility function on a solid mathematical foundation (Frisch, 1971 [1926]). His further purposes were to estimate demand curves using statistical data and to derive a cardinal measure of marginal utility so that he could make welfare statements about the redistribution of income. The phenomena Frisch wanted to explain were largely statistical phenomena and thus the test of his axioms was how well they did that. To the extent that his axioms were descriptive they were meant to describe the typical or average individual. (Of course, this is not a real person

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but an elementary statistical concept.) But the real nature of the axioms is that they are *logical*, that is, propositions necessary and sufficient to build a system of analysis. No normative claims were being made with respect to these axioms.

In 1944 John von Neumann and Oskar Morgenstern (vN-M) published their work, *The Theory of Games and Economic Behavior*. The details of game theory and the minimax principle are not germane to my purposes here. However, the development of expected utility theory is.[3] At the time they wrote there was a perceived need among economists for a theoretical approach to decision-making under risk. This theory helped fill that lacuna. They showed that *if* there were a complete preference ordering, transitivity, and the independence of irrelevant alternatives, then choices under risk could be represented as expected utility maximization. vN-M considered choices that satisfied the axioms to be rational.

The full significance of rationality is unclear in *The Theory of Games*. However, in an article published in (Morgenstern, 1979)[4] Morgenstern reflected on expected utility theory:

> That theory, as formulated by the von Neumann-Morgenstern axioms, is normative in the sense that the theory is "absolutely convincing" which implies that men will act accordingly. If they deviate from the theory, an explanation of the theory and their deviation will cause them to readjust their behavior. [However]…there are certainly persons for whom this is impossible. Whether they then should be called "irrational" is a matter of taste (180).

If people know what they are doing, their behavior will satisfy the axioms. But some people may not be intellectually capable so they may not behave in accordance with the axioms. Morgenstern's use of the word 'normative' therefore incorporates a *prediction* that knowledgeable individuals will act in a way that permits the economist to call them *expected utility maximizers*.[5]

The first economist to clearly endorse a normative view of the rationality axioms was Jacob Marschak (1950, 1951). He was the director of the Cowles Commission, originally at the University of Chicago. And then when it moved to Yale, he remained a member of the Commission. Marschak (1950: 112) argued that we could extend the rigor of conventional logic and arithmetic by also positing certain rationality constraints (essentially the same ones adopted by vN-M and today's standard economics). He *defines* rational behavior as that which satisfies these norms:

> The fulfillment of rules of conventional logic and arithmetic is a necessary but not a sufficient condition for a decision to be advisable. We need additional definitions and postulated rules, to "prolong" logic and arithmetic into the realm of decision. *We shall define rational behavior as that which follows those rules, in addition to the rules of logic and arithmetic.* (112, emphasis added)

[3]This was more completely developed in the von Neumann and Morgenstern (1947) revised edition.

[4]Morgenstern died in 1977. I have a draft of this paper dated 1974 in which the same sentences appear.

[5]It is not clear how the absolutely convincing logic of the theory causes individuals to have a complete preference ordering or to discover the objective probabilities of different outcomes.

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Nevertheless, people may act contrary to the norms. Therefore, they may not be descriptive. *But then people do not act reasonably*. The violation of the rationality axioms is a problem in logic, not in psychology (Marschak, 1951: 493). The extended *logic* of Marschak's axioms is the source of normativity. There is no claim that nonnormative decisions have led to costs for individuals.

Leonard Savage (1972), but originally in 1954, extended the vN-M expected utility theory to what is now called subjective expected utility theory. The probabilities are now subjective or personal degrees of belief, rather than objective frequencies. Savage is clear that the main use of the axioms is normative (20). They can be used to monitor one's decisions for consistency and make complicated decisions depend on simpler ones. However, this defines rational behavior only in 'small worlds' – essentially the world of gambling games where all of the possible outcomes are known (16). In this small world, however, Savage wanted to go beyond simply declaring certain behavior rational. He wanted to be able correct to non-rational behavior. In other words, he wanted the axioms to be *prescriptive* – almost like a medicine that could cure nonnormative behavior. But there is a fundamental problem. In order to obtain subjective probabilities and utilities from betting decisions, you must assume that the axioms are followed. But if they are not followed you cannot ascertain the subjective probabilities and utilities that you need for correction of the nonnormative behavior (Shafer, 1988: 210–214). *So, the axioms may be normative, but they are not prescriptive*. The axioms may indicate what rational behavior is like. Nevertheless, you cannot get from the theoretical structure enough information about nonnormative behavior to correct it, that is, to find out what the normatively proper behavior should be.

It should be clear that even when normative claims were made for the rationality axioms, there was no suggestion that these could serve as practical standards for policy.

History: Gerard Debreu

Debreu's *Theory of Value* (Debreu, 1959) incorporates a view of axioms that was influenced by the French collective of mathematicians known as 'Bourbaki'. They were founded in 1934–35 and wrote over a 20- to-30-year period. What is important for our purposes is what Debreu derived from their influence. To the extent that he cared about economics, he wanted to put general equilibrium theory on a firm grounding in individual choice. But the system Debreu created was meant to be independent of its applications. It was to make perfect sense as a logical construct. Precisely because of its abstract character, it could be versatile in that new ideas and extensions could be explored within it. Thus, Debreu's conception of the axioms was in no way normative. The axioms provided the foundations of a logical system that would ground general equilibrium and facilitate its extensions.

What can we conclude from this brief history? First, the earliest use of the axiomatic method was empirical – fundamental features of human motives and of the world that were so obvious they could not be doubted. There were no normative associations. Normativity was the province of ethics. Second, beginning with Marschak in the early 1950s claims of normativity started to be made explicitly. In retrospect, Morgenstern said that the expected utility axioms are normative in the sense that they are absolutely convincing within the framework of the theory. But no policy standards were asserted

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from these because the domain of the theory was not explicitly stated. Leonard Savage did say that his axioms were normative but that his subjective expected utility theory applied only to 'small worlds'. Most decision-making contexts outside of the casino do not qualify. Furthermore, since the theory itself is incapable of suggesting corrections to choices that do not satisfy the axioms, their policy use even in a small world is yet to be demonstrated. Finally, we come to Debreu. In his work, the axioms are clearly only logical foundations for a system of thought whose empirical domain is unstated. Therefore, *I conclude that the history of economic thought discussed here provides no basis for the use of the rationality axioms as normative standards that have policy implications.*[6]

The normative vacuity of the standard rationality axioms

To have any chance of possessing normative content, axioms cannot be characteristics of mere 'actions'. They must be characteristics of *choices* that have psychological meaning to those who make them. This is because mere actions can be different, but they literally cannot be inconsistent. More generally, as Frank Knight (1944: 307) argued, 'In the discussion of conduct we cannot separate description from the teleological interpretation – the "what" from the "why" in this sense – what is done from what is achieved or expected to be achieved.' Sen (1993) essentially agrees. Therefore, an action is not simply grabbing something. You do *not* simply notice that a person grabs a pen and then grabs something else and then grabs a third thing, at which point you decide whether that series is consistent or not. Although we choose objects (including courses of action) the choices *are* not objects – they are acts of meaning.

With this in mind, let's examine an example posed by John Broome (1995). Maurice has the following binary preferences. As between touring Rome (A) and mountaineering in the Alps (B), he prefers to tour Rome. When he compares mountaineering (B) to staying at home (C), he prefers to mountaineer. Thus, A is preferred to B and B is preferred to C. There is no irrationality here. These are just his preferences. But now when comparing staying at home (C) with touring Rome (A) he prefers to stay home. Therefore, we have A is preferred to B, B is preferred to C and C is preferred to A. This series is intransitive and thus violates one of the rationality axioms. From the perspective of behavioral economics, this is a red flag. Something must be wrong. *Given* the other preferences, *there is something wrong with preferring C to A*. (Or, of course, one of the other binary preferences might be wrong instead.)[7] The behavioral economist – convinced that something is wrong here – can now search the box of biases to determine what is wrong. Instead, I propose to look more closely at what is going on before jumping to conclusions.

[6]This history has one important omission: the perspective of the Chicago school. In that view the axioms are not intended to apply to individual behavior. They are the *logical foundations* for rational choice theories that aim to explain market or other aggregate behavior. Therefore, they are neither descriptive of actual behavior nor normative. The only test of the axioms is the success of the theories they construct in predicting aggregate behavior. See Jaffe *et al.*, (2019: 1–4).

[7]This is a profound problem. To point to an inconsistency does not tell us how to resolve the inconsistency. See Rizzo and Whitman (2020: 75–8).

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I interrogate Maurice to learn his explanation of these preferences. He tells me, 'If I preferred to stay at home over going to the Alps, I would show cowardice.' But then I ask, 'Why did it not show cowardice to prefer touring Rome to going to the Alps?' He responds, 'Because that alternative pits culture against mountaineering and it's okay to prefer culture in that case.' We cannot conclude that this is *irrational* even though we may not share Maurice's sensitivity to displaying what he considers cowardice. His series of preferences is *inclusively rational*, that is, rational in a broader sense than the axioms allow.[8]

The defender of axiomatic rationality is not without tools to convert this case into one that does not fail the rationality test. We may be tempted to *redescribe* the sequence of binary preferences to avoid any inconsistency (intransitivity). But note that instead of the options being chosen on the basis of the stand-alone consequences of the individual's actions (the payoffs as traditionally considered), the choice will depend also on the alternative rejected.

Let $(A|B)$ represent A being chosen when B is the alternative; let $(B|A)$ represent B being chosen when A is the alternative, and so on for the other options. So now we have six rather than three options. Thus, $(A|B)$ is preferred to $(B|A)$; $(B|C)$ is preferred to $(C|B)$; $(C|A)$ is preferred to $(A|C)$. Each comparison shows that Maurice's attitude about any given option is affected by what it is being compared to.[9] The redescription also eliminates the original intransitivity since no cycle occurs.[10]

How does redescription proceed? Are there limits or criteria? There are three possibilities. First, we can mechanically multiply the preference-options. Each option can be considered different depending on what the alternative is with no particular rationale. Second, we can characterize the options as the individual sees them (AJBT – as judged by themselves). Third, we can characterize the options in the way the economist thinks appropriate. If he thinks it is 'rational' for the individual to fear being called a coward when the alternative to mountaineering is staying home, then our redescription is appropriate, otherwise not.

I chose a redescription based on the second criterion, as the individual sees things. The first empties the axiom simply because allowing any redescription of this kind means that intransitivity is simply not analytically possible because no object appears more than once. The third criterion rejects the traditional value neutrality of the economist. The economist does not allow the individual to see the particular choice as exhibiting cowardice and to have the avoidance of cowardice as a value. This criterion makes the attribution of irrationality simply a matter of opinion.[11] I think that is wrong.

[8]For a more detailed discussion of 'inclusive rationality', see Rizzo and Whitman (2020: Chap. 2). Essentially, inclusive rationality does not refer to a small set of legitimate rationalizations. It is the expression we use for *granting the analyst permission* to draw on the wide range of sensible reasons people in fact have for their behavior.

[9]This is not exactly how Broome (1995: 101) redescribes the options.

[10]This redescription is inconsistent with Savage's subjective expected utility theory because in that theory all of the results depend upon individuals choosing on the basis of the stand-alone consequences in each state of the world. Therefore, the redescription, which here includes regret, is not permitted technically (Sugden, 1991: 761–63). This suggests that the model is inadequate to its task of explanation.

[11]Or perhaps a matter of ethical judgment.

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Obviously, the AJBT criterion requires insight into what the individual *means* by her choices. This is external to the abstract axiomatic structure but internal to the individual's frame of decisions. We can redescribe if the redescription makes sense from a point of view that is broader (thicker) than transitivity. In fact, given this criterion for allowable redescription, transitivity is the slave of inclusive rationality.[12] If an action passes the test of inclusive rationality, it will not fail the test of transitivity. Transitivity does no normative work for us. It is empty.

We focused here only on one form of redescription. There can be others depending on the precise scenarios. Anand (1993: 103) generalizes and includes: 'All intransitive behaviours can be redescribed in such a way that transitivity is not violated, and all transitive behaviours can be redescribed in such a way as transitivity is violated.'[13]

However, this will be the case only if the first, mechanical criterion is adopted. It will not be the case if the individual does not see the decision framework as the redescription suggests. This exception does not make the axiom a normative standard. As I have argued, given the possibility of redescription, whether a violation of transitivity is present or not depends entirely on whether the behavior makes sense from a broader perspective. The feasibility of redescription to eliminate intransitivity is a *consequence* of the inclusive rationality of the behavior.

It is important to note that some redescriptions may undermine the logical purpose of the transitivity axiom – for example, providing a mathematical basis for a standard utility function. For example, Broome's (1995: 101) redescription of the Maurice problem simply involves individuating C (staying at home) into C^1 (staying at home without having turned down a mountaineering alternative) and C^2 (staying at home having turned down a mountaineering alternative). The problem is that this redescription produces *nonsense possibilities*. In the story as presented, Maurice could not have an option $C^1|B$. In our version, Maurice does not have the option of staying at home without cowardice when the alternative is mountaineering. Broome's individuation strategy produces a hypothetical transitive series (A pref B, C^1 pref A, C^1 pref B) but at the expense of deviating from empirical reality. The last preference makes no sense. Thus, the utility function that could be constructed is incoherent. But even if this were not so, the analytical move would have no normative implications.

It should now be clear that *mere redescription* cannot turn irrational behavior into rational behavior. I am not arguing that it can. I am arguing that intransitivity by itself is irrelevant to answering questions about the rationality of behavior. The transitivity axiom is empty. It cannot distinguish rational from irrational behavior. We must make a judgment based on an inclusive notion of rationality.

[12]Broome (1995: 101) seems to deny this 'Maurice's views about cowardice played no essential part in restoring his preferences to transitivity.' This is because Broome is thinking about the mechanical approach to redescription.

[13]Broome (1995: 101) makes a similar but stronger claim: 'Whenever you meet anyone who has intransitive preferences, it will always be possible to individuate outcomes more finely and thereby restore transitivity.' The elimination of intransitivity is not the same as the restoration of transitivity. I am only going as far as the weaker claim under the first criterion for redescription as explained in the text.

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Whither irrationality?

The relatively open-endedness of inclusive rationality (see the quotation from Rescher at the beginning of this article) may lead the reader to think that, whatever the behavior, the social scientist can always find a way to rationalize (justify) it. So, in effect, inclusive rationality abolishes the category of irrational. This is not true.

Let us examine a story discussed by the philosopher Elizabeth Anscombe (1963: 35–36). Imagine an individual who says, 'I need to get my camera.' And you say, 'Where is your camera?' Her reply is 'My camera is upstairs. So I am going downstairs to get it.' 'Wait a minute,' you say, 'what is going on here?' Unless you have already decided that the person is 'crazy', the principle of charity suggests that you are misunderstanding something. Maybe she is saying that I am going downstairs to do something first and then I am going upstairs to get the camera. You try to figure it out; you presume her rationality. But if it is clear that she is saying what she seems to be saying and that there is no more to it, then she is instrumentally irrational. She is irrational in the broad sense we have been discussing. But to get to that attribution we must pass through a presumption of rationality and have access to what she means by what she says and does. *Irrationality is not an empty box but it is difficult to fill.*[14] Economists have deceived themselves into thinking that it is not so difficult because they have used a narrow or thin technical conception of rationality. This can be useful for many purposes such as constructing a mathematically convenient utility function but it is not useful for making normative or prescriptive or remedial statements about behavior. It is therefore not useful as a policy standard or as a red flag to indicate some possible pathology.[15]

Conclusions

The axioms have a valid function in logically supporting the utility function and other analytical concepts. To invoke them is part of a modeling choice. The issue is whether the model chosen adequately explains the phenomenon at hand. Neither the history of economic thought, when carefully considered, nor analysis of how axioms work supports the idea that they are normative. The idea that they are is the result of an intellectual confusion between logical systems and the behavior that they purport to describe and prescribe.

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[14]I stress that while it may be difficult to falsify, by reference to inclusive rationality, a statement attributing rationality (the presumption) to an agent, the statement is still falsifiable in principle. On the other hand, the statement that a behavior is rational cannot be falsified in principle by simply showing that an axiom has been violated.

[15]What is 'good' for the individual turns on things many of which are invisible to the outsider, being present only in the mind of the individual. This can be a disconcerting fact to the analyst who wants, for whatever reason, to judge people.

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