Rationality, Logic and Fast and Frugal Heuristics

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Abstract Gigerenzer et his co-workers make some bold and striking claims about the relation between the fast and frugal heuristics discussed in their book and the traditional norms of rationality provided by deductive logic and probability theory. We are told, for example, that fast and frugal heuristics such as TAKE THE BEST replace "the multiple coherence criteria stemming from the laws of logic and probability with multiple correspondence criteria relating to laws of real-world decision performance" (p. 22). This commentary explores just how we should interpret this proposed replacement of logic and probability theory by fast and frugal heuristics.

The concept of rationality is Janus-faced. It is customary to distinguish the psychological laws governing the actual processes of reasoning from the normative theories according to which such reasoning is to be evaluated (Nozick 1993).[1] Authors who make this distinction often enjoin us to ignore one of the faces to concentrate on the other – either instructing us, as Frege famously did (Frege 1918-1919), to ignore the messy details of psychology to focus on the objective relations between thoughts that are the domain of logic, or, like Willhelm Wundt (cited on p.357), imploring us to ignore the subtleties of the logician in order to explain the psychology of reasoning. It is clear

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[1] For discussion of ways to strike the balance between these two facets of rationality see Bermúdez 1998, 1999, forthcoming and the essays in Bermúdez and Millar in preparation.

that Gigerenzer and his co-workers favour the second of these positions. In fact, they seem to be making an even stronger claim. They seem to be suggesting that, where the dictates of the logician and the heuristics of the quick and dirty reasoner come into conflict, it is logic and probability theory that must be sacrificed. But what exactly does this mean in detail? Why should the prevalence of fast and frugal heuristics have any implications at all for the normative theories of logic and probability theory?

The notion of a fast and frugal heuristic has been around for a long time, although not perhaps under that name (Simon 1982, Tversky and Kahnemann 1973). There is a standard way of interpreting such heuristics so that they are not really in conflict at all with the normative theories of logic and probability theory. One might say, for example, that, although the normative theories provide the standards by which practical reasoning ought to be judged (that is to say, they tell us what <u>ought</u> to be done, or what it is <u>rational</u> to do, in a particular situation when one possesses such-and-such information), there are nonetheless computational reasons why it is often not possible actually to employ such theories in the actual process of decision-making. Since it is not in practice always possible to assign numerical probabilities to possible outcomes, or give them numerical desirability ratings (let alone use these figures to work out the course of action that best maximises expected utility), we are impelled to employ shortcuts. But what justifies these shortcuts (what makes it <u>rational</u> to adopt them) is that they lead us to do more or less what we would have done had we actually put the normative theories into practice by working out the figures and crunching the numbers. Proponents of optimal foraging theory think that something like this holds of the "rules of thumb" converging on optimality that natural selection has thrown up (Dawkins 1995 Ch. 2). And, as the authors point out (p.26), the accuracy of fast and frugal heuristics is often assessed in the literature by measuring how closely they match the predictions of a weighted additive rule, like the rule of maximising expected utility.

But this is emphatically not how Gigerenzer et al. view the operation of heuristics like TAKE THE BEST. It can, by their lights, be rational to use such heuristics even when they result in courses of action that contravene the dictates of the normative theories. The heuristics can trump the normative theories. Again, there is a relatively innocuous way of understanding such a claim.

One might think, for example, that it might be rational to employ a heuristic even in a situation where it does not match the predictions of the normative rule simply because, when one takes a sufficiently longterm view, the overall benefits of using the heuristic outweigh the occasional benefits to be had by crunching the numbers each time. But all this really amounts to is the claim that we should evaluate a strategy rather than a particular application of that strategy. The normative standards according to which we do the judging are not themselves changed. Goigerenzer at al. certainly want to say something more controversial than this. But what?

The authors say that they want to impose a new set of criteria for judging the rationality of decision-rules – what they term "multiple correspondence criteria relating to laws of real-world decision performance" (p.22). So, for example, it becomes rational to select the companies in one's investment portfolio by a simple version of the recognition heuristic (viz. only put companies with a high recognition factor in one's portfolio) because, as it happens, such portfolio seem to outperform both the relevant indices and random portfolios of stocks (see Chapter 3). That is to say, success becomes the sole determinant of rational decision-making.

There are several problems with this, and they point to a difficulty with the research programme as a whole. First, there is a very important equivocation in how the stockmarket experiment is being described. The authors write as if their strategy was a pure application of the recognition heuristic. But this seems wrong. They did not invest in companies that they recognised. Rather they invested in companies that had a high national and/or international recognition factor where this is calculated statistically by comparing the recognition judgments of several different populations. These are two very different things. The first would have been a pure fast and frugal heuristic. The second, in contrast, seems much closer to a calculated investment strategy. What makes this equivocation important is that the notion of rationality applies very differently in the two cases. It is hard to see how anything other than a pure success-based criterion of rationality could be applied to the fast and frugal version of the recognition heuristic. Or, to put this another way, it is hard to see what reasons there might be for holding that it is rational to make one's investment decisions solely according to whether one has heard of the companies in question other than that it more or less works over time - and it is equally hard to see

how, if it doesn't work, then it could possibly be described as rational. But the same does not hold of the sophisticated investment strategy of investing only in companies with a statistically attested high recognition. There are all sorts of reasons why this is a rational strategy to adopt – quite apart from the well-documented "big company effect" in bull markets (to which the authors themselves draw attention) and the simple thought that a company with a high recognition factor will correspondingly have a high market share. That is to say, even if it did turn out (as it probably would in a bear market) that the strategy didn't beat the index it might well still count as a rational strategy to have adopted.

What this points us to is an important dimension in the concept of rationality. A workable concept of rationality must allow us to evaluate the rationality of an action without knowing its outcome. Without this the concept of rationality cannot be a useful tool in the control, regulation and evaluation of decision-making as and when it happens. And it is precisely such a way of evaluating the rationality of an action that we are offered by the orthodox normative theories of expected utility maximisation and so forth. But it is far from clear that Gigerenzer and his co-workers have offered a genuine alternative to this. They claim to have replaced criteria of rationality based upon logic and probability theory with a heuristic-based crieria of real-world performance. But it doesn't look as if they've offered us criteria of <u>rationality</u>.

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