

Reasoning Competence

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In the 1970s, various experiments were carried out on ordinary people's reasoning powers suggesting our natural ability to reason does not match up to the normative standards endorsed in logic and probability theory. The two most famous of these have come to be termed *the selection experiment*, and *the conjunction experiment* (or *Linda experiment*). In the first, Peter Wason asked subjects to test a rule for cards with numbers on one side and letters on the other, such as 'If the card has a vowel on one side, it has an odd number on the other' (Wason 1971). Wason's basic finding was that very few subjects selected the two cards that are necessary to test such a rule, suggesting that they do not understand the logic of conditionals (that they are false just if the antecedent is true and the consequent false). In the second experiment, Kahneman and Tversky told subjects a story about a woman called Linda, and then gave them a list of statements about Linda concerning what kind of occupation she has and/or what she does in her free time, and asked them to rank the statements from most to least likely. Nearly all subjects ranked the statement *Linda is a bank teller and active in the feminist movement* as more likely than *Linda is a bank teller*, which contravenes a fundamental theorem of statistics to the effect that the probability of any single event A can never be lower than the probability of both A and some other event B. (Cf. Tversky & Kahneman 1983.)

Both of these experiments suggest that people naturally reason in ways which flout normative principles of reasoning. However, that this is indeed the case has never been accepted by all parties to the debate. A lot of energy has been spent over the last thirty years in trying to sort out the implications of the findings (and others along the same lines): At the most empirical end of the debate, there has been effort to ascertain the real nature of the thought processes underlying the answers given. At the most philosophical level, many have claimed that showing we are irrational is a conceptual impossibility; a central figure of reference here is Donald Davidson, who argues that principles of rationality are constitutive of the mental (cf. Davidson 1980, 1984). At a level perhaps intermediate between these two, psychologists influenced by evolutionary thinking have argued that an ecological understanding of the cognitive challenges we face and of the cognitive resources at our disposal reveals that human strategies are for the most part fast, effective and even correct in relation to traditional norms. That we in certain experimental situations fail to reason optimally is no more an indictment of the reliability of our reasoning powers than visual illusions are of the visual capacity.

These findings and ideas will be familiar to those who have followed the so-called 'rationality debate' over the past 20-30 years. In this paper, I want to take up a particular way of framing the issues that became prominent in the wake of an article by Jonathan L. Cohen (Cohen 1981), and which has informed a recent, critically-acclaimed book by Edward Stein (Stein 1996). In the article in question, Cohen introduces the notion of *cognitive competence*, to be understood by analogy with our *linguistic competence* as postulated by Noam Chomsky. Linguistic competence embodies the speaker's knowledge of the principles of grammar that characterise her language, but her language behaviour – her *perform-*

ance – may exhibit divergences from this as a result of interfering factors in the process whereby the knowledge is put to use (cf. Chomsky 1965, ch. 1).¹ Utterances of ungrammatical sentences etc. are thus known as *performance errors* – the implication being that they do not reflect the speaker's underlying competence.

Cohen's central gambit is that the examples of *prima facie* irrational behaviour uncovered in experiments like the above can likewise be viewed as performance errors: as interference of an underlying body of knowledge fully in accord with the correct rules of inference. Moreover, argues Cohen, such *prima facie* irrational behaviour *must* be so viewed, for there is a *constitutive* link between the concrete intuitions of ordinary people and what the correct rules of inference are; in particular, normative standards of inference are determined in relation to judgements about concrete cases through a process of *reflective equilibrium* (RE).² In a process of RE, one attempts to bring general principles into accord with intuitions about particular cases, making adjustments on both sides until the principles and intuitions harmonise with one another. Cohen sees a striking resemblance between this method and that standardly used in linguistics to uncover grammatical competence, whereby one probes ordinary speakers' intuitions about the grammaticality of sentences, but also rejects some if they conflict with well-established grammatical principles. On this basis, Cohen argues for the impossibility of irrationality as follows: Given that the method in linguistics for uncovering an underlying grammatical competence is also the method used for uncovering the correct rules of rational inference, we should see the latter as apt to uncover the nature of an underlying reasoning competence (as I shall call it). Hence, our reasoning competence will of necessity be characterised by the correct rules of inference, and any deviations from it viewed as performance errors.

As Stein points out, there is something rather fishy about this argument (Stein op. cit., ch. 2 and p. 139). There seems to be a strong disanalogy between Chomsky's understanding of grammar, and reasoning: crudely put, whereas the latter is a normative matter, the former is not. Rules of inference or reasoning concern first and foremost what one *ought* to do – how one ought to reason; tacitly known rules of grammar do not state how one ought to use language, but rather are part of the complex psychological processes underlying our linguistic ability. Exactly what positing unconscious, descriptive rules amounts to is a vexed issue in its own right. But even if we accept the idea, it would seem a leap of faith to apply the notion of competence in linguistics directly to questions about reasoning, where normative matters are at stake.

In light of this, what is striking about Stein's presentation of Cohen – indeed, of his whole book – is that this does not lead him to question the idea of rational competence that Cohen introduces. Rather, he proceeds to analyse in detail the debate between defenders and opponents of what he calls 'the rationality thesis' – the claim that

¹ For present purposes, I am not committed to the principles being *known*, in the everyday sense. For discussion of the speaker-grammar relationship, cf. Knowles (2000).

² The idea has its origins in Goodman (1965, pp. 63-4). The term 'reflective equilibrium' stems from Rawls' work on ethics

humans are fundamentally rational – precisely in terms of whether our underlying competence is ‘rational’ or not, i.e. embodies principles that match up to the normatively correct ones.

It is this supposition – that the rationality debate can or should be posed in relation to the idea of reasoning competence – that I will question here. In the rest of this short paper (essentially work in progress), I will sketch my two main lines of scepticism towards the notion, hoping they can serve as a springboard to discussion and reflection.

Line 1: The first problem with the idea of reasoning competence stems from the fact that Cohen’s analogy with linguistics does not forge the constitutive link between ordinary people’s judgements and what is rational that he seeks to vindicate. Cohen seems to want, like those influenced by Davidson, to cast aspersions on the very idea of an experimental demonstration of human irrationality. Davidsonians do this by stressing what they see as constitutive links between the concept of belief and that of rationality; attributing beliefs to someone commits one to seeing them as fundamentally rational – or rather, since of course people do commit fallacies occasionally, what we cannot make sense of is them doing this generally. Thus, the constitutive link between rational norms and attributability of belief applies, not first and foremost at the level of particular utterances or actions, but rather at the level of a person’s behaviour as a whole.

Having made this concession, one might think that deviations from rational norms observed in behaviour could be classed as performance errors, and that the Davidsonian argument could be seen as applying at the level of reasoning competence, to the effect that this competence must contain the normatively correct principles. This is how Stein interprets the Davidsonian argument (op. cit., ch. 4) – even though he goes on to reject it as a defence of the rationality thesis (since, for him, there are no strongly apriori constraints on actually possessing beliefs). However, it strikes me that this must be misguided as a way of understanding the Davidsonian argument. For Davidson, it is apriori that we find other people rational, at least according to our standards. There is no conceptual distance or slack between our standards – the rational standards, there being no others – and those of other people, such that it might be meaningful to say that the rational competence of these others actually coincides with these standards. What anyone’s rational competence is is, by contrast, an empirical question, and we cannot know apriori that any such cognitive structure does or does not embody any particular principles. It might be retorted that Davidson’s argument amounts to saying that we must all possess fundamentally the same principles in our rational competence. But this is clearly *not* what is meant. Rather, the idea of rationality depends on reaching agreement on what is correct; there is something essentially public about rationality. As Davidson has often stressed, the existence of psychological structures is quite irrelevant to his thesis, and cannot be used to express it.

As far as I understand him, Cohen has something similar in mind insofar as he thinks there are apriori limits to what science can show, and one of these is demonstrating human irrationality. But if so, then surely the notion of a reasoning competence must likewise be unsuited to expressing his idea, for it is *anything but* apriori what the nature of any such competence is.³

³ A possible way out here would be to simply identify the correct reasoning norms with the principles in our reasoning competence. For criticism of this idea, cf. Knowles (2003, ch. 5).

Line 2: Whether or not one thinks there are apriori bounds to what can be shown scientifically, it seems clear that, empirically, we are *in some sense* less than fully optimal in our reasoning, taken across all possible contexts. The question now arises as to whether a notion of reasoning competence might be of use in articulating a debate concerning human rationality at this more empirical level.

In the most recent defences of the rationality thesis, no particular play with the idea of reasoning competence seems to be made. This is reflected in the arguments of many evolutionary psychologists, such as Cosmides, Pinker and Gigerenzer, whose point is to point out that too little attention has been paid to the kinds of tasks that we are evolved to solve in assessing questions of human rationality. Cosmides’ work (e.g. 1989) promotes the idea of conditional reasoning as keyed to the socially vital task of cheater-detection: when conditional reasoning concerns the detection of a violation of a social contract, we reason logically, otherwise not. Gigerenzer has argued that the reason humans perform badly in relation to ‘Linda’ kinds of tasks is that our cognitive mechanisms for assessing chance events have not evolved in environments in which it is meaningful to assess probabilities in this way (Gigerenzer 1997). We naturally think of probability in terms of frequencies, and make estimates of probabilities on this basis, for the most part in ways which statistics would countenance, and in any case quickly and effectively. This may lead, under the ‘right’ kinds of conditions, to faulty probability estimates, in particular those in which probability does not have much to do with past observations (e.g. in roulette). But that this should render us irrational seems just as perverse as accusing the visual system of faultiness because we are subject to illusions.

The details underlying these defences of human rationality are complicated and controversial; nor is the only possible conclusion that we, after all, are as rational as we could be. The point I want to emphasize is simply that these debates do not rest on a distinction between competence and performance. Take the analogy with the visual system: its functionality does not consist in the fact that we embody an underlying body of principles that only under certain circumstances are properly manifested. Rather, the visual system is a mechanism which operates in a certain way, serving, for the most part, rapidly to deliver veridical information about external surfaces in our environment relevant to potential action. In other environments, unlike those in which it was evolved, the visual system will not serve us well. But it will still be essentially operating as it should: there will be no meaningful sense in which its errors are merely a matter of ‘performance’. Something similar would seem to be the case with our reasoning abilities, as understood by evolutionary psychology: They are evolved in certain contexts for certain purposes, and will deliver us useful and reliable information in those contexts. Outwith those contexts, their functioning may still be triggered, but then we cannot rely on them.

Contrast this with the case of knowledge of grammar. Here, it is not the case that someone who fails to parse, say, a garden-path sentence is using a capacity in a context in which it fails to have application. The problem is not with the linguistic ability, in the sense of our competence, but with the systems that use that knowledge – or, perhaps, with the interaction between the two. There is a kind of *internal* dysfunctioning in the overall cognitive system – as there is not when we, say, see one line as longer in the Müller-Lyer illusion. To put the point somewhat differently: The visionist has nothing to study beyond

the output of the *visual input-system*, be this veridical or not; whereas the linguist precisely does want to go further: to determine which aspects of the output delivered by the *linguistic input-system* – the parser – are reflective of the grammar and which not.⁴

I do not mean to suggest that our reasoning capacities should be classed as precisely *input-systems* in the way vision is (for one thing, we can learn to overcome the limitations of the former). The important point of analogy between them, however, is that they are functional mechanisms whose operation is felicitous or not depending on whether the relevant environmental conditions obtain. If we are reasoning about ordinary, repeatable events exhibiting a pattern over time, our probabilistic judgements will probably be close the mark; if we are reasoning about situations involving contracts our ability to understand *if-so*-constructions will be largely correct. In other, 'artificial' contexts, we can expect less optimal performance. However, in neither of these cases, nor in the general approach to reasoning adopted by most psychologists today, would there seem to be scope for something further to be determined beyond the output of these mechanisms – an underlying competence of known principles.

In this piece, I have sketched my reasons for rejecting this construct in discussions of human rationality. On the one hand, for those who see a conceptual, apriori barrier to demonstrations of human irrationality, questions about our psychological make-up, at whatever level of abstraction, must be irrelevant. On the other hand, for those who want to assess our rationality in relation to a more ecological conception of our cognitive challenges, the relevant psychological structures for evaluation are not bodies of knowledge that are more or less imperfectly applied in performance.

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⁴ Here I adopt Fodor's (1983) terminology, though not, importantly, his conception of the subject matter of linguistics, which for him is precisely an input-module (and possibly output-module; cf. p. 135, note 29). For why he must be wrong about this, see Knowles (2000).