

# Is Man a Rational Animal?

Linda Cochrane\*†

## Abstract

From ancient times, philosophers have been proposing theories of human rationality. More recently, many evolutionary psychologists have been conducting studies which appear to show that, under certain conditions, humans are frequently irrational, or, at least, illogical. Nevertheless, the human species has survived and thrived and thus humans must have developed reasoning capacities which work successfully most of the time. I contend that, while Man may not be a logical animal, many of our so-called “errors of reasoning” are rational depending on the circumstances; that the logical answer is not always the rational one; that claims that Man is irrational are based on a conflation of rationality and logic.

## 1 Introduction

Bertrand Russell (1950) wrote that “[I]t has been said that man is a rational animal. All my life I have been searching for evidence which could support this.” From ancient times, philosophers have been proposing theories of human rationality. There are, however, many definitions of rationality and these change over time. For Plato and Aristotle, man has both a rational and an irrational soul in different proportions – philosophers, of course, are completely rational. But even the Ancient Greeks did not all agree. The Stoics held that humans are rational, and that irrationality is a result of error. For René Descartes (1984), a reliable intellect was God’s gift to man, although data from senses is often “obscure and confused.” David Hume (1978) contended that using reason and senses alone leads to uncertainty and that we also require the irrational faculty, the imagination, to avoid scepticism. A more modern perspective is that a theory of rationality should be in accordance with the best work in the history of science which is often used as the paradigm. But what definition of rationality are these philosophers using? For philosophers, the choice of an action, belief, or desire is rational if we *ought* to choose it. Further, *practical* rationality applies to actions and an irrational action is one that conflicts with

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\*PhD. Candidate in SIP, Concordia University

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our particular system of goals; whereas, *theoretical* rationality is about beliefs and an irrational belief is one that conflicts with what we ought to *know*.

## 2 Judging Rationality

We cannot assign any interpretation to a person's output unless we assume that the person is rational (that is, predictable from our perspective) and that their thought processes follow logical patterns, just like ours. That is to say that we have to assume that a person's beliefs are mostly true, that the inferences he draws from them are mainly right, and that they are appropriate given the circumstances, again from our own perspective. When judging the actions of others, we therefore have to take what Daniel Dennett (1971) calls an "intentional stance". There is, however, a difference in how we judge our own and others' actions. Humans may be judged to be *subjectively rational* when their decisions are consistent with the available facts or, at least, consistent with their own belief systems. It is not necessary for an action to produce a successful outcome for it to be considered subjectively rational; it is only necessary for the reasons for the action to be seen as good by the actor. On the other hand, an action is considered to be *objectively rational* if the decision to take it appears consistent to a third party who takes an intentional stance. Hence, it is possible to have reasons for action that are subjectively rational but not objectively rational. A third party taking the intentional stance may not have all the facts available to the actor; may have different or additional facts; or may not be aware of the actor's system of beliefs. The classical definition of an irrational belief is one that conflicts with what we *ought* to know, but that is to judge the rationality of an action objectively only.

## 3 Rationality and Logic

In a *deductive* reasoning problem there can be only one logically valid answer. Deductive reasoning is usually measured by the ability to apply deductive logic to information that is given. Nevertheless, we often have to make decisions in the absence of complete information and are thereby frequently led to make inferences that may not be deductively valid. While the ability to apply deductive logic validly is necessary for rational thought, it is not sufficient for being considered rational. In certain cases, logic and rationality appeared to have been conflated; for instance, Pierre Laplace contended that probability theory is "nothing more at bottom than good sense reduced to a calculus" (Laplace, 1951, 196); while for Barbel Inhelder and Jean Piaget "reasoning is nothing more than the propositional calculus itself" (Inhelder and Piaget, 1958, 1). More recently evolutionary psychologists have been proposing their own theories of human rationality and conducting various studies to support their hypotheses.

Leda Cosmides and John Tooby (1987), have suggested that humans have no single "reasoning faculty" and that, during the Pleistocene era the start of which

coincides to some extent with the time that the genus *homo* appeared, hominin<sup>1</sup> brains evolved a cluster of cognitive adaptations to deal with social interactions. One of their favourite examples is the so-called “Cheater Detection Module” the existence of which is said to be justified by the results of the Wason Selection Task<sup>2</sup>. Such results have been used extensively, by evolutionary psychologists in particular, as empirical evidence to support the idea that humans do not reason logically if the task hypothesis is abstract. When an early version of the Task was given to a group of undergraduate psychology students, very few (~25%) correctly selected the P and NOT-Q cards which is consistent with the rules of propositional calculus (Griggs and Cox, 1982). Cosmides and Tooby suggested that the abstract nature of the question might be having an effect on the results and redesigned the rule as a benefit/cost social contract (of the form: “If the benefit is received, then the cost must be paid.”).

In the tests performed by Cosmides and Tooby (1987) the predicted selection of “benefit taken” and “cost not paid” corresponds to the truth conditions of conditionals of the propositional calculus and hence they conjectured that by wording the Wason Selection Task in the form of a social contract, that is, in a more socially relevant format, subjects are more likely to select the logically correct answer of P and not-Q. Gerd Gigerenzer and Klaus Hug (1992), on the other hand, claimed that the key to these tests is that cheater detection is pragmatic and depends on perspective, whereas logic does not. To test their claim, they used a rule in the form of a “switched social contract”<sup>3</sup>. In this case, the logically correct answer would be P and NOT-Q, as previously, but detection of a rule violation would require selecting the NOT-P and Q cards thereby violating the rules of propositional calculus. The “illogical” choice would detect cheaters, whereas the formally logical choice would not. The result appears to be that we do *not* use logical reasoning when attempting to detect violation of a social contract rule. Contrary to the claim of Inhelder and Piaget, then, it appears that humans do not use the propositional calculus to reason or, at least, they do not use it when reasoning to solve such problems as these. So what does this mean? A rigidly logical person would sometimes fail to detect cheaters and, while selecting the correct logical answer, could be led into making an adaptive error. P & NOT-Q is always the logically correct answer, but, contrary to the tenets of propositional calculus, we often have to take the content of the rule into account when detecting a rule violation.

So, humans take the content of the rules into account when selecting their

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<sup>1</sup>A “hominin” is what paleoanthropologists have agreed is human or a human ancestor, including all of the *Homo* species (*Homo sapiens*, *H. ergaster*, *H. rudolfensis*), all of the Australopithecines and other ancient forms such as *Paranthropus* and *Ardipithecus*.

<sup>2</sup>In the Wason Selection Task, subjects are presented with four cards each of which has two pieces of information, one on each side. Only one side of each card is visible. The task is to evaluate the relationship between the visible and hidden information on each card in accordance with a given hypothesis by deciding which cards would have to be turned over to test the hypothesis in the form “if P, then Q.” The four cards represent the choices of P, NOT-P, Q, and NOT-Q.

<sup>3</sup>A switched social contract rule has a form similar to that of the social contract but with the two propositions reversed: “if the cost is paid, then the benefit must be received.”

response. But what about context? Gigerenzer and Hug (1992) also conducted experiments in order to disconnect social contracts from cheater detection. For the social contract problems, they constructed two context stories. In one version, the participants were given the perspective of an interested party to a social contract (that is, a party that could be cheated); in the other version of the story the participants were given the perspective of a disinterested party (that is, a party that could not be cheated). For each of the four social contract problems that they tested, Gigerenzer and Hug found that 83% of the subjects selected “benefit taken” and “cost not paid” when cheating was a possibility, compared to 45% in the no-cheating context. This suggests that being a party to a social contract (being a party that could be cheated) influences the manner of reasoning. Results of the Wason Selection Task tests thus indicate that being rational is not the same thing as being logical, only more socially adaptive. In other words, rewording the Wason Selection Task in the form of a social contract does not make participants more logical. It is coincidental if the cheater detection selection in the social contract corresponds with the truth conditions of propositional calculus.

## 4 Rationality and Adaptation

The ability to predict behaviour presupposes that the behaviour of others is predictable, at least most of the time. In order to predict the behaviour of others, we have to assume that they will act rationally, by our own understanding of that term. There are obviously survival benefits to being able to predict the behaviour of our conspecifics as well as that of our predators and prey. Being able to adapt to the content and context of a problem also has significant survival benefits. Behaviour that may appear to be illogical, in so far as it violates the rules of the propositional calculus, may in fact be a side-effect of our ability to adapt to changing circumstances. Being rational implies being predictable and behaving appropriately in accordance with our own or our group’s goals and most if not all social animals exhibit similar behaviour. In fact, such behaviour is necessary for social cohesion. Sarah Brosnan and Frans de Waal (2002) report studies of capuchin monkeys in which monkeys refused to participate if they witnessed a conspecific obtain a more attractive reward for equal effort. The reactions were even greater if another monkey received such a reward without any effort at all. Many of the “working” monkeys became so enraged that they often threw their rewards at the researchers. These reactions support an early evolutionary origin of inequity aversion. During the evolution of cooperative behaviour it may have become critical for individuals to compare their own efforts and rewards with those of others. Negative reactions may occur when expectations are violated. Thus aversion to inequity may help explain human cooperation.

Classical rationality assumes that decisions are based on complete information. In other words, that we have *unbounded* rationality. Herbert Simon (1972) introduced the concept of *bounded* rationality to provide a socially sensitive per-

spective on decision making. Complete information is not always available and decisions have to be made that are “the best under the circumstances”. Simon recognized that humans have limited cognitive abilities, and thus are incapable of acting in a perfectly rational manner. Economists assume we act to maximize returns (gain the most) through rational or logical principles and this assumes unbounded rationality. Nonetheless, in the absence of complete information, we often have to use “fast and simple” methods (heuristics) for resolving a problem. The function of heuristics is not to be coherent or “optimal”. Rather, their function is to make reasonable, adaptive inferences about the real social and physical world given limited time and knowledge (Gigerenzer et al., 1999, 22).

## 5 Conclusions

The human species has survived and thrived, and thus humans must have developed reasoning capabilities which work successfully most of the time. Many of our so-called “errors of reasoning” are rational depending on content and context; the logical answer is not always the rational one. If we take an intentional stance, we can judge other people to be irrational if they do not act in a predictable manner from our perspective. But can we ever judge ourselves to be irrational? If we have reasons for performing an action, if our decisions are consistent with the available facts or, at least, consistent with our belief systems, then it is meaningless to ask if we were rational in performing the action. Evolutionary psychologists, such as Cosmides and Tooby (1987), have suggested that hominin brains evolved a cluster of cognitive adaptations to deal with social interactions. I argue, however, that Cosmides and Tooby are wrong to think that these adaptations reflect strategies for coping with problems encountered during the Pleistocene period of our biological evolution, proposing instead that such strategies are required for any social species; that human rationality is not unique; that rationality is not the maximization of self-interest. Rather, human rationality is a social species rationality. Man is deductively logical, inductively illogical, but rational nonetheless.

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