

Critical Rationalism in Theory and Practice

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Abstract

Fools give you reasons, wise men never try

Oscar Hammerstein, *South Pacific*, 1949

It is a simple mistake, though an ancient one, to suppose that justification, in any degree, is central to rationality, or even important to it. What matters is not where an idea came from, or what it is based on, but how we deal with it and expose its shortcomings. The lecture will outline (not for the first time) the principal ideas of Popper's critical rationalism, which aims to abandon justification in all its forms. It will be urged that, in both theory and practice, we can live without it. We have to cut the intellectual apron strings that continue to offer us spurious and unneeded security. This position may be both intellectually and emotionally uncomfortable; but it is, I think, on the right lines.

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0 Introduction

Critical rationalism is a generalization beyond empiricism of the *deductivism* that was proposed by Karl Popper in *Logik der Forschung* in 1934 as an alternative to the prevalent positivism and inductivism.

The Vienna Circle held that all knowledge is either analytic knowledge, which is justified by formal proof, or scientific knowledge, which is justified by empirical verification.

While dissenting from their identification of the empirical with the verifiable, and from their rejection of traditional metaphysics as meaningless, Popper did at first accept that all serious investigations that are not purely formal must make some ‘appeal to the authority of “experience” ’.

0 Introduction

According to *falsificationism*, our exclusive concern, outside the formal sciences, should be with those statements that can conflict with the reports of experience; that is, those that are empirically falsifiable. This is the *criterion of demarcation* of the empirical from what is not empirical.

There is a humdrum explanation for this insistence on falsifiability: the hypotheses that are characteristic of science are not, as naive inductivism supposes, certified in the act of being formulated. They have to be arraigned before they can be judged. Hypotheses are literally *prejudices*.

They can be confirmed or corrected. Confirmation teaches us nothing, and provides only psychological comfort.

0 Introduction

If empirical investigation has an objective purpose, it can only be to determine how badly our hypotheses are in error.

Sense experience is doubly demoted in this version of empiricism. Observation is neither the origin of knowledge nor its basis. The empirical method continues to rest its decisions on observation reports; not because these reports are firm, or established, but because they are easily checked, and easily replaced if they are found to be untenable.

The bankrupt justificationist partnership of experience and induction is dissolved. Experience is reemployed in the new enterprise of empirical falsification and criticism. Induction is permanently retired on an invalidity pension.

0 Introduction

There being nothing immaculate about experience, this deductivist alternative to verificationism may be readily extended to any area in which viable objective criticism is possible. This leads to *critical rationalism*.

Central to it is the realization that the process of reasoning, or argument, can never generate justification, either conclusive justification (proof), or inconclusive justification (support, confirmation, positive evidence, good reasons).

Arguments can generate criticism. The rational attitude consists mainly of openness to criticism, and of appropriate responses to it. Even if they are possible, justification and proof are far from being the only proper goals of reasoning.

1 Critical Rationalism by Its Own Lights

Critical rationalism *CR* was first sketched in Chapter 24 of Popper's book *The Open Society & Its Enemies*, where it was contrasted both with Plato's mystical rationalism and with *comprehensive* or *uncritical rationalism UR*, the traditional (and still greatly favoured) doctrine that we should believe or adopt only those propositions or policies that are justified by means of argument and experience.

Popper argued that *UR* is an untenable position: 'a rationalist attitude must first be adopted if any argument or experience is to be [rationally] effective, and it cannot therefore be based upon argument or experience'. If this is so, then *UR* tells us not to accept *UR*.

1 Critical Rationalism by Its Own Lights

Must the proposition '*UR* is unacceptable' be accepted? It is one of the merits of Popper's formulation of *UR* that although the acceptance of a proposition may be permitted, and even recommended, it is never demanded.

This feature of *UR* is inherited by *CR*. We cannot rationally demand reason, for no argument has force against a person who has renounced reason. *CR* does not demand acceptance, of itself or of any other thesis or attitude. But it may be possible to exclude some instances of unreason.

Note in passing that a conditional of the form 'if *A* is accepted then [its logical consequence] *C* has to be accepted' is not a conditional demand but an absolute prohibition.

1 Critical Rationalism by Its Own Lights

Popper proposed notoriously that we adopt an *irrational faith in reason*. Too much weight has been placed on the unfortunate term 'faith' used here for a frame of mind that, in the same sentence, he described as tentative; and on the pejorative word 'irrational', which reflects a lingering attachment to the rational hegemony of justification.

This modest admission of the frailty of reason, and of its limitations, provoked accusations of fideism. Critical rationalists, it was said, are committed to critical rationalism.

Critical rationalism, Popper repeatedly said, is an attitude enshrined in the words 'I may be wrong, and you may be right, and with an effort we may get nearer to the truth'.

1 Critical Rationalism by Its Own Lights

We cannot rationally demand reason, but we need not irrationally (dogmatically) demand it either. W.W. Bartley noted that if an adoption of the critical attitude is all that there is to being rational, then critical rationalism is self-contained. It may by its own lights be adopted rationally.

This self-contained variant of *CR* he named *comprehensively critical rationalism (CCR)*. It is the attitude of holding all one's ideas open to critical discussion, welcoming it, and being open to suggestions for improvement and correction. Requests for justification are ignored.

The question 'Why do you think that?' is systematically met with response 'What is wrong with thinking that?'

1 Critical Rationalism by Its Own Lights

In particular, the unanswerable question

Why should we be rational?,

which calls for a justification of rationality, is replaced by

What is objectionable (counter-productive, imprudent) about adopting a rational attitude?

If rationality is identified with criticism, it may be possible to answer this question, if only with the answer NOTHING.

For a critical rationalist, a failure (so far) to find fault with critical rationalism does nothing to justify it.

1 Critical Rationalism by Its Own Lights

CCR is self-contained, in the sense that it may be applied to itself. It may be adopted rationally, since it may be held open to criticism. It has in fact been a good deal critically discussed, and some critics have concluded (wrongly, I think) that it is vulnerable to criticism and must be rejected.

One of the principal criticisms has concerned the status of logical rules of inference. Logic, it is said, must be immune from criticism, since it is the basis of all criticism.

We shall see that this is a mistaken line of attack. Reason may be used to criticize the use of reason, and could even be successful (though rationalists hope that it will not be).

How would rationalists respond to a successful criticism?

2 *Petitio Principii* and *Reductio ad Absurdum*

Crucial to critical rationalism is the irrefragable distinction between a *petitio principii* (which assumes what is to be concluded) and a *reductio ad absurdum* argument (which assumes the contradictory of what is to be concluded).

These forms of argument are still often confused, even by writers who well understand the difference.

A catalogue a few years ago puffed the book *Against Relativism* like this: 'James F. Harris shows that all the positions adopted by radical relativists suffer from the same fatal flaw: they must assume what they seek to refute.'

Heisenberg has more than once been criticized for offering causal arguments against the universal sway of causality.

2 *Petitio Principii* and *Reductio ad Absurdum*

The theory-ladenness of observation is often taken to show how difficult it is to test a sophisticated scientific theory.

A theory of optics cannot be investigated without assumptions about optics. The law that the linear expansion of heated metals is proportional to the increase in temperature cannot be investigated using a mercury thermometer.

But if there is a conflict between a theory and a fact interpreted in terms of the theory, then (granted that the fact) there is incontestably something amiss with the theory. The involvement of the theory in the fact is no excuse.

A falsification (*reductio ad absurdum*) is decisive. A confirmation is often question-begging (a *petitio principii*).

2 *Petitio Principii* and *Reductio ad Absurdum*

Justification and criticism are different modes of evaluation, but both depend on logic. The distinction between them is never more valuable than when we ask how we can evaluate the logical rules of inference without which both justification and criticism would be impossible. It is plain that every attempt to justify these rules must be circular.

Can the rules of logic be criticized? If I understand them well, Apel, Habermas, and Thomas Nagel, and even Bartley himself, have claimed that there is some (small) set of [classical] logical laws that constitutes an ‘absolute presupposition of argument’. Since these laws are involved in every criticism, they themselves are immune to criticism.

2 Petitio Principii and Reductio ad Absurdum

A statement, such as ‘There is no meaningful language’ or ‘I am dumb’, that contradicts one of its own presuppositions is sometimes called a *performative contradiction*.

The first three of the authors mentioned claim that the denial of the central laws of logic leads to performative contradictions, and that these laws can therefore be conclusively justified. It has accordingly been concluded, even by Bartley, that these laws are immune to criticism.

The physicist Oliver Heaviside said many years ago: ‘Logic is invincible because one must use logic to criticize logic.’ Yet no one thinks that physics is invincible because one must use physics to defeat physics.

2 Petitio Principii and Reductio ad Absurdum

One author wrote recently:

The idea . . . seems to be applicable [when an attempt is made to establish the invalidity of some rule]. If the criticism is aimed at showing that an inference rule is invalid, then it is of course problematic if in the critical argument one presupposes the validity of the same rule.

Jonas Nilsson, 'On the Idea of Logical Presuppositions of Rational Criticism', p. 112. In Jarvie, Milford, & Miller, editors, *Karl Popper: A Centenary Assessment, Volume II*, pp. 109-117. Aldershot & Burlington VT: Ashgate 2006.

This conclusion seems to me to be plainly incorrect, unless 'presuppose' means something decidedly odd.

2 Petitio Principii and Reductio ad Absurdum

If a rule \mathcal{R} of inference is supposed (or presupposed) to be valid — that is, not to admit a counterexample —, and a counterexample is derived with its assistance, then either the rule \mathcal{R} itself, or one of the other rules used in the derivation, is not valid.

If \mathcal{R} is the *only* rule used in the derivation, then if \mathcal{R} is valid it is invalid. It follows that \mathcal{R} is invalid.

Nilsson says of the presupposition of the rule \mathcal{R} : ‘It is reasonable to think that an argument presupposes a certain inference rule only if that rule is actually used in it. It may be possible to reconstruct one’s critical argument in such a way that \mathcal{R} is not used in any step.’ (ibidem, p. 113).

2 Petitio Principii and Reductio ad Absurdum

He suggests that we should therefore seek to eliminate the use of the rule \mathcal{R} from the derivation of the counterexample; or we might ‘propose a *more strict* version of \mathcal{R} , a version that contains a *restriction* that rules out all cases with the special characteristic of the counterexample’.

Dispensing with, or abridging, the rule \mathcal{R} seems quite a wrong-headed approach. The force of the counterexample to \mathcal{R} would be massively enhanced were we to eliminate *all the other rules of inference*. Were this possible we could eliminate the Duhemian problem of which rule to blame.

In sum: a counterexample is not vitiated because it assumes the validity of the rule whose validity is under threat.

3 Practical Action

There is more to critical rationalism than its theory of rationality, which insists on consistency but is minimal, and compatible with wholesale scepticism. In particular there are methodological rules that aid the search for truth.

In theoretical science *CR* advocates (but does not demand) the origination of bold conjectures that are easily falsified, if they are false, followed by the severest criticism. Where auxiliary hypotheses are required in the work of falsification, these should not be bold, but unadventurous and, for the time being, uncontroversial. In this way the fangs may be drawn from the problem raised by Duhem.

Example: the rationality principle in the social sciences.

3 Practical Action

Conjectures form part of what Popper called *world 3*, the world of the objective creations of the human mind. False conjectures, for the most part, do little harm, for they can be eliminated: we can afford to make many mistakes.

In the case of practical action, where we work in a concrete domain, mistakes are less easily eliminated. Some are irreversible. *CR* therefore advocates a *piecemeal* approach to practical affairs, especially social affairs.

The best practical proposals, especially in social life, are those whose unwanted consequences (as well as the proposals themselves) can be eliminated if necessary. Theoretical audacity and practical caution serve identical purposes.

3 Practical Action

CR has no well developed account of practical decision making, especially decision making under risk or uncertainty.

This shortcoming may be blamed on two failures:

- (a) the mistake of supposing that in practice we act on the basis of theories, so that the practical problem of which course of action to take can be reduced to the theoretical problem of which scientific theory to prefer;**
- (b) the oversimplification of supposing that the explanatory scheme of *situational logic* can in most cases be converted into a rule of action: *Do what is appropriate to the situation as you see it!***

I have explained already why (a) embodies a serious error.

3 Practical Action

To correct (a), let us note that (scientific) theories are used not to generate courses of action but to eliminate them.

As for (b), we can cheerfully concede that, when an agent knows so much about the situation he is in that only one course of action makes sense, or is appropriate, then that course of action should be followed. That is to say, if that our (scientific) knowledge essentially rules out every course of action but one, then that is what we should do.

Life is rarely like that. We know much less than we think.

I shall consider briefly three situations in which something must be added to CR in order to provide an adequate explanation of what a rational agent must and must not do.

3 Practical Action

The three situations of (total or partial) ignorance are:

- 0 *decision making in a state of ignorance*: no proposed course of action has survived critical scrutiny.
- 1 *decision making under uncertainty*: one proposed course of action has been subjected to serious criticism and has survived, but there remain other proposals that have not been *effectively* criticized, simply because they have not been properly criticized at all.
- 2 *decision making under risk*: our theories tell us that there are several courses of action that are sometimes successful, sometimes not; and we have some information about the relative frequencies of success of each.

3.0 Decision Making in a State of Ignorance

It must be noted that in all these situations (not just 2, here called *decision making under uncertainty*) the agent is in a state of uncertainty. Even in a situation where there is only one course of action open, there is still uncertainty.

In situation 0, where the agent is entirely ignorant, the only thing to be done is to resort to trial and error. There are no surviving proposals on the table, so some new ones must be produced. *Trial and error may be regarded as situational logic in a state of complete ignorance.*

Situation 1 presents the familiar dilemma of whether to prefer a well tested treatment for headache (say, aspirins) to an untested one (say, mackerel & marmalade macaroons).

3.1 Decision Making under Uncertainty

According to *CR*, neither treatment is in the least bit justified. But to prefer the treatment that has been successful in the past looks horribly like an appeal to induction.

Note that *CR* does not suggest that the previously successful treatment should be rejected. What it does not do is to suggest that the untested treatment should be rejected.

But it does say that a decision will be the more rationally made the more severely all the alternatives are criticized.

In the present case, I suspect that our accumulated knowledge of biochemistry rules out macaroons as a successful cure for a headache. If we dismiss quack cures for mortal illness, it is not simply because they have had no success.

3.1 Decision Making under Uncertainty

Recall that most practical decision making is a matter of *satisficing* rather than maximizing. It is not necessary for the agent to be fully rational (or fully successful); just rational (and successful) enough for present needs.

If the aspirin dispels the headache, the agent may not worry excessively about the existence of side effects, effects that a better (untried) cure might avoid.

In situation 2, *decision making under risk*, the agent knows only the frequencies, or probabilities of success, of each of a number of well understood and well tested options. Aspirin, for example, has a 99% probability of successfully clearing a headache; macaroons a mere 2%.

3.2 Decision Making under Risk

Can *CR* explain the preference of the agent who, like most people, ignores the macaroons and takes the aspirins?

This is not an easy question. Both treatments have been thoroughly investigated, both have had some success. Why should we prefer the treatment that has been successful more often? Or, better, is there anything irrational about undergoing the treatment that has been less successful?

An appeal to the long run may make some sense in the case of recurring headaches, but it is hardly appropriate to situations that are more or less unique. We do not face life-&-death decisions every day. Besides, as Keynes memorably remarked: *In the long run we are all dead.*

3.2 Decision Making under Risk

Perhaps only 2% of headaches are relieved by macaroons, but my headache today may belong to that 2%.

The truth is that the statement that a type of event (or treatment) has a specific frequency of occurrence, even 99%, is much weaker than the statement that the type of event always occurs. From the latter we may deduce that that type of event always occurs in every sub-population. From the former, we may deduce nothing of the kind.

If all the relevant information that we possess consists of frequency data, however extensive, then we do not have much information. It is hardly to be wondered at that an informed rational decision may be difficult.

3.2 Decision Making under Risk

Critical rationalists usually reject appeals to probability, at least if this is understood as a surrogate for certainty. But more importantly, frequency data do not allow us to make predictions. And it is for their power to make predictions that in the practical domain we call on scientific theories.

CR is risk averse in an unusual way: uncertainty is not a problem, but lack of specificity is. For critical rationalists, probabilistic knowledge is defective not because it falls short of certainty not because it lacks predictive power.

Why do we buy fire insurance or travel insurance? The premium is a certain loss. Whatever happens, fire or no fire, suitcase or no suitcase, we cannot break even.

3.2 Decision Making under Risk

Insurance is a way of buying information. If we insure against a mislaid suitcase, then we can assume that the suitcase will not be mislaid, because we shall be fully compensated for it if it is mislaid. (This is an oversimplification, of course. A missing suitcase is more than a financial loss.)

In principle we can insure against mislaying a suitcase or against not mislaying a suitcase; in the latter case, the insurer pays up if the suitcase is safely delivered to the carousel. Because more suitcases are safely delivered than mislaid (just), and the insurer, in contrast to the insurant, does business in a long run of similar cases, insuring against loss is much cheaper than insuring against delivery.

3.2 Decision Making under Risk

The prudent agent, who does not want to spend money unnecessarily, but does want to convert inadequate knowledge of frequencies into usable knowledge on which predictions may be based, will choose the lower premium, and will therefore assume that the outcome with the greater frequency in the past is the outcome that will occur.

More needs to be said about the connection between probability and frequency. Let me anyway admit to grave doubts about the acceptability of this economic explanation of why it is irrational to prefer an outcome with a poor record to one with a good record. Please explain why it is mistaken.