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HOW TO BE A CRITICAL BUT REASONABLE DEBATER

SUGGESTIONS FOR CRITICALLY ADDRESSING PSEUDOSCIENTISTS AND OTHER SIMILAR GROUPS

Jesús Alcolea Banegas

Discourse about pseudoscience usually accompanies dialogue about science. Despite attempts to separate the two domains, people still rely on pseudoscientific remedies. The ease with which beliefs become contagious, the popularity of certain products, and the verbiage of their sellers often leave us in the hands of so-called experts. Although the scientific method can help us to prove the ineffectiveness of certain remedies, we do not always have conclusive arguments to dispel doubts, and so we are left at the mercy of supposed technical knowledge or false scientific rigour. Faced with this, we must resort to critical thinking to respond to alleged experts and conduct ourselves reasonably.

Keywords: critical thinking, argumentation, scientific method, scientific discourse vs. pseudoscientific discourse, authority.

BETWEEN SCIENCE AND SOCIETY

Discourse about pseudoscience often accompanies conversation about science, both in a positive and negative way. Despite the efforts made by some thinkers to separate them neatly by using effective criteria (Pigliucci & Boudry, 2013), the reality is that many people continue to rely on pseudoscientific healing practices and alternative or complementary therapies.

Surely, the influence of personal psychology on our perception of reality, the ease with which beliefs – especially harmful ones – become contagious (Blackburn, 2001, p. 20), the popularity of certain products, and the verbiage of many of their sellers often leave many people in the hands of practitioners with purported knowledge. In other words, so-called experts whose only interest is business and who may even prescribe unproven and unorthodox drugs, sometimes relying on natural healing that never comes, thus creating a vicious circle.

«THE REALITY IS THAT MANY PEOPLE CONTINUE TO RELY ON PSEUDOSCIENTIFIC HEALING PRACTICES AND ALTERNATIVE OR COMPLEMENTARY THERAPIES»

Faced with this situation, the scientific method is the best procedure we have to eliminate subjectivities and external conditioning factors. However, while in practice this (very successful) method is not available to everyone, most people have developed some critical skills. It is precisely education in generalised critical thinking, and especially in scientific fields, that might be able to help us to restore the balance lost because of harmful practices, and to separate the metaphorical wheat from the chaff. Claude Bernard drew our attention to this issue more than a century and a half ago in his *Introduction à l'étude de la médecine expérimentale*:

> In science the word *criticism* is not a synonym for disparagement; criticising means looking for truth by separating the true from the false and distinguishing the good from the bad. While just to men of science, such criticism alone is profitable for science. [...] In my opinion, then, the inspiration of physicians, who do not rely on experimental science, is mere fantasy; and in the name of science and humanity they should be rebuked and proscribed.
>
> (Bernard, 1865/2005, p. 370 and p. 398)

Therefore, although the scientific method can help us to prove the ineffectiveness and risk of certain remedies by using clinical trials that reveal latent contradictions or conflicting scientific evidence, we do not always have conclusive arguments to dispel our doubts, so we are always vulnerable to presumed experiments of questionable quality, alleged technical expertise or false scientific rigour. To counter this, reasonable criticism is required.

RATIONALITY AND REASONABLENESS: FOR REASONABLE SCIENCE-BASED CRITICISM

Fortunately, we have some disciplines which, when well understood, can come to our aid. Thus, logic is interested in the validity of certain argumentative forms, and it is often said to be the canon of rationality and the organ of critique (Popper, 1974/2007, p. 40). Argumentation theory, on the other hand, is interested in the quality of the argumentative discourse and tends to equate validity with reasonableness (Alcolea, 2015). In fact, the terms *rational* and *reasonable* are related, but do not coincide in meaning. There is an important distinction in their use. We call the use of the faculty of reasoning «rational»; that is, it is the ability that makes us rational beings, while «reasonable» refers to using the faculty of reasoning correctly; it is what makes us reasonable people. Using it this way, rationality is a necessary condition for reasonableness, but it is not automatically a sufficient condition.

Although studies in the philosophy of science have observed that some irrational elements play an important role in the design of theories (Thomas Samuel Kuhn and Paul Karl Feyerabend, among others), many thinkers argue that scientific research is the paradigm of rational discussion with a specific objective and is the most important way of reasonably exchanging ideas that can be translated into critical discussion. Critical rationalists like Karl Popper have argued that any topic that can be subject to critical discussion lends itself to reasonable treatment, regardless of whether the difference of opinion has to do with facts, ideas, value judgments, attitudes, or actions. Based on this, argumentation theorists aim to explain how the general rule of reasonableness can be fulfilled in any type of critical discussion.

Nevertheless, we need science in order to be able to speak about pseudoscience and to clarify the reasons for the *pseudo-* prefix: if science is inclined towards certain pretensions of knowledge – from *praetendĕre*, "to put forward" – pseudoscience would include those pretensions of knowledge yet would lack evidence for them. Consequently, assessing a claim of knowledge as

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Pietro Longhi. *The charlatan*, 1757. Oil on canvas, 50 × 62 cm.
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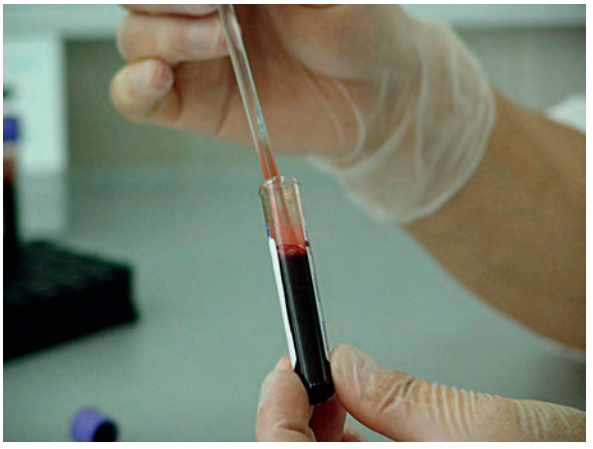
«WE NEED SCIENCE IN ORDER TO BE ABLE TO SPEAK ABOUT PSEUDOSCIENCE AND TO CLARIFY THE REASONS FOR THE 'PSEUDO-' PREFIX»



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Although the scientific method can help us to prove the ineffectiveness and risk of certain remedies using clinical trials that reveal latent contradictions or conflicting scientific evidence, we do not always have conclusive arguments to dispel our doubts.

such depends on the pretension of knowledge itself, the person who has such a claim, the attempts to contrast it in accordance with the scientific method, and the criticism to which a reasonable critic (or arguer) may subject it. Claims that are scientifically lacking or weak regarding these last three aspects would separate the claim from the scientific field and from a rigorous (scientific) arguer worthy of the name.

We know, moreover, that «science» is what certain people do when they conjecture (i.e., people who formulate certain pretensions), draw conclusions from those conjectures, submit themselves to the court of nature to test whether those pretensions of knowledge are genuine or not – whether they are confirmed or refuted. People who are recognised as experts, as scientific authorities, yet who are still fallible because they are scientists.

For all these reasons, we find the tragedy not so much in the practice of science, but in the practice of pseudoscience, where we find: 1) authorities that are, in reality, irrelevant, because their pretensions of knowledge are irrelevant to the subject matter; 2) false or questionable authorities, because something calls their credibility into question or because they appeal to authorities in an improper or inadequate way; 3) invincible authorities, because appealing to them cancels or eliminates any other consideration; 4) unidentified experts or experts who are identified in a vague or incomplete manner, so that their reliability or rigour cannot be verified; 5) compromised experts, with good credentials, but who raise doubts due to a demonstrable conflict of interest; 6) divided experts who do not always agree with each other.

How should we react to such a scenario? We must be cautious, suspend judgment, initiate alternative investigation, and wait for new evidence.

THE PROBLEM OF AUTHORITY IN SCIENCE

The problem of authority in science relates to the way in which research results are communicated to (or shared with) a group of users who are not experts in the discipline. Of note, this process is not identified with, nor is it constituted by, the process we follow to reach conclusions. The issue becomes complicated when we realise that we move within two frameworks of communicative discourse in which the same argumentative sequence is used: on the one hand, internal scientific argumentation leads to a particular conclusion within the discipline; and, on the other, the presentation and use of that conclusion, and the explanation of the argumentative line that had led to such a conclusion in a communicative exchange between the authority and the user.

«IT IS UP TO THE SCIENTIFIC EXPERTS TO DECIDE WHAT SCIENCE IS AND TO DIFFERENTIATE IT FROM NON-SCIENCE, INCLUDING PSEUDOSCIENCE»

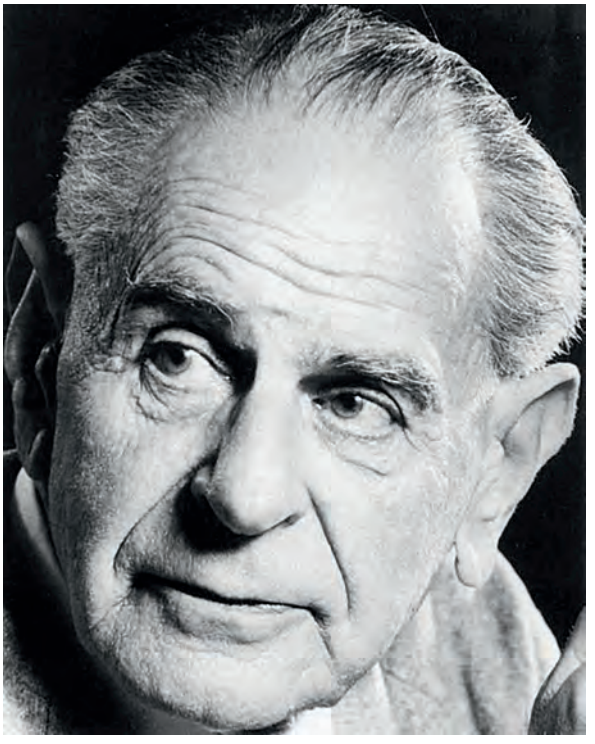
It should be noted that this second discursive framework requires arguments which, by themselves, are not scientific and which will also be used by non-experts who need the advice of an authority when involved in a persuasive argumentation. In this circumstance, and so as not to appear inexperienced, non-experts will act as follows: firstly, they ask the expert intelligent questions; secondly, they proceed reasonably when what the expert says lacks credibility or contradicts another expert; and, thirdly, they present an argumentative judgement that is independent of the way in which pretensions of knowledge are established with the scientific method.

In contrast, in order not to appear authoritarian, the authority will act as thus: firstly, because they work with and through words, they must do so in a persuasive way, even if they do not need to elaborate on their arguments; secondly, although those who consult them do not have direct access to scientific evidence or to their qualified experience, they must communicate their opinions and give advice in a way that the user can understand; and, thirdly, while transmitting information or advising, they must allow

the layperson to ask them intelligent questions about their own statements or pretensions of knowledge.

But both scientists and pseudoscientists consider themselves authorities, or can be considered as such, with the difference that in the first case they show the authority of knowledge and in the second case the authority consists of presumed knowledge or power. Scientists receive their authority from a body of knowledge that is: 1) independent of them as a subject, and of their beliefs or disposition to acquiesce or act (Popper, 1974/2007, p. 108); 2) methodical: all scientists agree on the fundamental methods used in their area of study; 3) conservative: it is not necessary to constantly reinvestigate results anchored in previously fixed foundations, although this does not mean that they cannot be revisable; 4) predictive of what we do not know based on our pretended knowledge and what may be falsifiable; 5) consistent: the pretensions of the knowledge of two given scientists must not conflict with an outstanding thesis in their area.

Then, it is useful to ask oneself, can these characteristics be found in the case of pseudoscience?



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INVITATION TO CRITICAL DISCUSSION

The first thing we must make clear is that there are no tribunals, no courts of justice, no eyes of God to decide whether a discourse, a practice, an area, and so on are scientific or pseudoscientific. It is up to scientific experts to decide what science is, presumably in accordance with the abovementioned characteristics (an internal task), and to differentiate it from non-science, including pseudoscience. But we must go one step further and show a willingness to critically discuss the scientific value of their discourse and the consequences of their practices with the practitioners of pseudoscience (an external task). To this end, scientists and non-scientists must present themselves as reasonable and critical debaters who wish to engage in a process of critical discussion to resolve their differences of opinion. In other words: experts, so-called experts, and non-experts should conduct themselves as reasonable and critical debaters and embrace the idea of a critical discussion.

Then, what is a critical discussion? It is an argumentative exchange in a pragmatic context with which we try to resolve a difference of opinion following certain rules (Alcolea, 2011). In a critical discussion, those who are in favour (proponents, or the PR) and those who are against (opponents, or the OP) an opinion or pretension of knowledge try to jointly establish whether that opinion or pretension is defensible from certain doubts and critical objections. The PR argues for or against the opinion. The OP may respond critically to the PR's argument, which may result in the PR continuing to try to justify or refute it using other arguments. Again, the OP can respond critically, and so on. This exchange is characteristic of a correct, reasonable, and critical dialectical persuasion process and ends when the OP accepts the justification of the PR, when the PR accepts the refutation of the OP, or when they do not reach an agreement in a clear but reasonable manner (Van Eemeren & Grootendorst, 2004).

Therefore, in a critical discussion, a reasonable critic must show a willingness to resolve the difference of opinion via pragmatic, instrumental, and utilitarian rules, accept the rules, resolve differences in opinion in an intersubjective manner, and achieve the optimal result in the most effective way. This does not mean that the parties must automatically agree – or even fully agree – on everything, but rather, they must critically test the points of view under discussion in order to determine their sustainability. Van Eemeren and Grootendorst (2004, p. 189) have drawn attention to what we might understand as conditions for a critical, reasonable and adequate discussion: 1) the first-order objective conditions are the rules of the critical discussion process; 2) the second-order internal

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conditions are related to the mental state of the people involved, whose freedom may be more or less limited by psychological factors (emotional constraints or personal pressures) beyond their control; 3) the third-order external conditions pertain to the social circumstances of the discussion, special circumstances of the situation, and the power or authority relationship between the parties involved in the critical discussion.

Is it possible to achieve full critical reasonableness in practice? Only if the second and third-order conditions are met. To this end, the fulfilment of the second-order conditions can be stimulated through education aimed at reflecting on the first-order conditions and an understanding of their rational basis. Fulfilment of the third-order conditions can be encouraged by opting politically for individual freedom, non-violence, intellectual pluralism, and institutional guarantees of the right to information and criticism.

It is precisely at this point that we are in a position to consult the expert and ask ourselves *when* authority is legitimate and *when* it is legitimate to appeal to it (Walton, 1997). The answer is simple: when the individual is really an expert, when they are trustworthy, and when the other authorities agree with them. But how do we know if a person is an expert in a particular field? Would it not be necessary to already be an expert in that field? Because not everyone is an expert in all areas, problems multiply. However, is there an alternative to education? Let us remember an interesting note from Pigliucci (2010, p. 89): «If there ever was a reason to push for more education not just about science, but about basic critical thinking skills more generally, this seems to be it.»

«IN A CRITICAL DISCUSSION, A REASONABLE CRITIC MUST SHOW A WILLINGNESS TO RESOLVE THE DIFFERENCE OF OPINION VIA PRAGMATIC RULES»

We are aware that any individual – no matter how much of a critical thinker they may consider themselves and how willing they are to resolve their differences of opinion in a critical, reasonable, and appropriate manner when faced with any real or presumed authority – may wish to apply a simple test to make a decision on this matter. This is because it is well known that we do not react in the same way to a real authority as we do to a presumed authority. The kind readers can see for themselves when to apply the pragmatic test of authority: if they are in the presence of one of these authorities they should be able to answer the following questions in the affirmative:

1. Is this authority reliable?
2. Do they frame their pretensions of knowledge into a theory?
3. Can their pretensions be verified by a different authority?
4. Are their pretensions (internally and externally) consistent?
5. Have their pretensions been contested or only confirmed?
6. Are their conclusions supported by the available evidence?
7. Do they follow science-approved methods rather than following recipes?
8. Do they propose alternative explanations for a phenomenon rather than deny those offered by a different authority?
9. Are their explanations conservative or expansive?
10. Are their conclusions independent from their personal beliefs?

There are no tribunals, no courts of justice, no eyes of God to decide whether a discourse, a practice, an area, and so on are scientific or pseudoscientific.

Passing the test means that we have found a critical scientific authority. However, can everyone pass the test of being a presumed authority? Figure 1 (Walton, Reed,

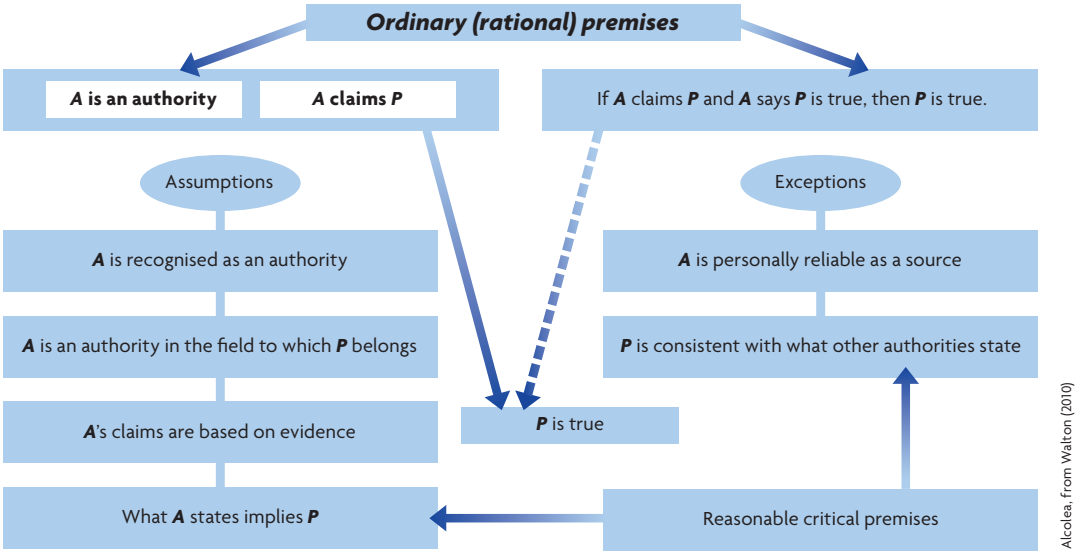

Figure 1. Argumentative diagram based on the one proposed by Walton (2010).

& Macagno, 2008, pp. 309–310) can help us to take a step towards unmasking a fake authority.

In this diagram (Walton, 2010, p. 170), the usual conclusion drawn from the box on the left, which contains two boxes with two statements, is that *P* is true, an inference which would be heuristically justified if we also consider the box on the right, which in turn contains a condition that would link both statements to the conclusion. This inferential procedure tends to hide what we consider to be «reasonable critical premises» – assumptions and exceptions, which tend to diminish or weaken the claims of the authority (especially exceptions) compared to other possible ones that gain strength with the presentation of evidence – which must be satisfied by a (presumed) authority so that their claims can be accepted as true in a valid argumentative way, based on premises of a rationally-motivating force.

In other words, to the reasons we have for believing a statement to be true (*P*, in this case), we must add the (critical) reasons we have for believing in the authority of the one who holds that statement as true. Therefore, when used correctly and prudently, the justification for the behaviour outlined in this argumentative scheme (Walton, 1999, p. 58) is ultimately based on the scientific evidence provided by a given field of knowledge and on the competencies of a person who is proficient in its techniques and who may nevertheless be questioned as an authority if these critical conditions are not met.

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