



Epidemiology of Fallacies

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Accepted: 16 May 2024 / Published online: 3 June 2024
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Abstract

In this paper I apply the epidemiological model of the spread of beliefs and how they become cultural representations to the field of fallacies. The model suggests that beliefs tend to replicate as a virus does in a potential epidemic, and those strains that are dominant in a given socio-cultural sphere become cultural representations. My ultimate aim is to denounce the fact that some presumptive argumentation schemes are widely applied as definitive arguments, but turn out to be instances of common and traditional fallacies. Moreover, some such fallacies have managed to colonise the human mind and become cultural representations in society today. Adopting the approach I advocate here, we could say that the fallacy has become a belief, which has then managed to replicate like a virus, and finally the fallacy has become a cultural representation. One of the great harms that results from this process is that it is very difficult to open up effective lines of argument that expose the fallacious nature of these new and perverse cultural representations.

Keywords Argumentation schemes · Epidemiology of beliefs · Fallacies · Presumptive arguments · Sperber

1 Introduction

In this paper I reflect on the idea of applying the epidemiological model of the spread of beliefs and how they become cultural representations, which is well known in anthropology and psychology, to the emergence of fallacies in the public sphere. This idea highlights the existence of fallacious axioms in contemporary society which are often applied as cultural, social, and/or ideological assumptions. I thereby intend to launch a denunciation, I believe with strong justification, of the fact that presumptive argumentation schemes are widely applied as definitive arguments, in the form of commonly held beliefs and even as cultural representations. We could say

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that the resulting fallacy has become a belief, which has then managed to replicate like a virus, and has finally been constituted as a cultural representation. Beliefs, therefore, are often mixed with arguments to the point that argumentation schemes, such as appeal to popular opinion and the middle-ground approach, are commonly and increasingly used as axiomatic considerations in many instances involving the public sphere. These fallacious axioms are so widespread that they dominate our thinking, not only in the political or ideological sphere. Although these arguments are not applicable to cognitive and scientific matters, they are commonly used in, for example, medical discourse. This may even lend legitimacy to anti-scientific arguments, which can increase scepticism towards scientific knowledge and promote conspiratorial thinking. A serious consequence of this process is that it is impossible (or at least extremely difficult) to open up effective lines of argumentation that reveal the fallacious character of these new and harmful cultural representations.

The basis and main conclusions of this exploratory study are presented in a step-by-step manner. I begin by introducing the idea of the epidemiology of beliefs (Sect. 2). Section 3 then presents a simple view of fallacies, but one which is appropriate for my aim in this paper. Section 4 is devoted to a practical example of the institutionalisation of fallacious argumentation schemes; in this section, I also identify some fallacy-viruses that have infected public and institutional discourses. Finally, I present a brief discussion and some open questions in Sect. 5.

2 Epidemiology of Beliefs

Belief is one of the most controversial concepts in the social sciences (see e.g., Salazar 2015 and references therein). In anthropology, beliefs are mental states attributed to an agent. However, for the anthropologist, the key component of belief is not brain activity, but interaction, understood as part of the way of engaging with the world that defines a particular form of life (Salazar 2015, p. 4). In this context, in which a fundamental condition for the attribution of belief is these interactions between brains, and perhaps with some brainless entities, the idea of an epidemiology of beliefs is easy to understand: beliefs in a given society tend to replicate as a virus does in a potential epidemic, and strains that are dominant in a particular socio-cultural system become part of the cultural representations of that society. Dan Sperber developed this idea of the epidemiology of beliefs in 1996, long before the internet and viral postings, and, of course, long before the recent coronavirus pandemic. Moreover, as he makes explicit, “the value of an epidemiological approach lies in making our understanding of micro-processes of transmission and macro-processes of evolution mutually relevant.” (Sperber 2002, p. 82).

It is important to note at this point that beliefs such as “witches ride on broomsticks”, “ $E=mc^2$ ” or “all men are born equal” are examples of cultural representations based on reflective beliefs. These reflective beliefs owe their spread to communicative processes. As Sperber says:

Reflective beliefs are not only consciously held; they are also often deliberately spread. For instance, religious believers, political ideologists, and scientists, however they may differ otherwise, see it as incumbent upon them to cause others to share their beliefs. Precisely because the distribution of reflective beliefs is a highly visible social process, it should be obvious that different types of reflective beliefs reach a cultural level of distribution in very different ways. (Sperber 2002, p. 95)

The process of a belief spreading can be very different depending on the belief in question, but Sperber shows with some examples that there are essentially two factors to consider: the cognitive factor (being attractive, easy to remember) and the ecological factor (spreading by authority, by institutions). While the diffusion of a religious belief or a myth is very much determined by cognitive factors, political beliefs are essentially diffused by ecological factors (mainly from the institutional sphere), and scientific beliefs require a high degree of both cognitive and ecological factors for their diffusion. Let us look at this briefly because it will be of interest in addressing the question of the establishment of fallacies as cultural representations.

So, as an example, a myth that is far from our intuitive beliefs and our relationship with the world needs to be attractive or easy to remember in order to spread. It also requires that the person recounting it has authority (ecological factor), but this authority structure is weaker than the transmission itself because of its cognitive attractiveness. In the case of political beliefs, the fate of beliefs is linked to that of institutions. Sperber gives the example of “all men are born equal”: in a society organised around different rights based on birth, this belief is highly relevant and can gain ground if enough people take the risk of spreading it. Institutional support is essential for the spread in such cases.

Scientific beliefs are influenced by both factors in very relevant ways. On the one hand, we believe in everything that science tells us in an institutional way. We believe in the scientific method, in scientists and in the consensus among them. That is why we believe $E=mc^2$, even if we do not fully understand what this equation means or its consequences. But, on the other hand, there is also the cognitive factor. As Sperber says: “The human cognitive organization is such that we cannot understand such a belief and not hold it.” (Sperber 2002, p. 97) So, if we study for several years and come to understand the argumentation that leads to $E=mc^2$, the cognitive effort is so great that it would be very difficult not to believe in it.

I would like to point out that I am not addressing the ethics of belief as an issue here (see, for example, de Donato Rodríguez and Zamora Bonilla 2014). In general, I assume that, according to this epidemiological model, we lack voluntary control over the beliefs we hold that have previously become (or are about to become) cultural representations. In contrast, however, and although it is not discussed here, I would like to point out that in normative discourse governed by rational norms, such as science and argumentation theory, it should be natural to take a deontological view of beliefs when it comes to their acceptance, maintenance or rejection.

3 Fallacies

Let me now define the scope of the fallacy I wish to consider. The definition of a fallacy is not straightforward and depends on one's perspective and theory of argumentation. However, I would like to adopt a simple perspective here.

Fallacious arguments might be identified by their scheme: either the inference, one of the premises or the context makes the argument a fallacy. Each type of argument has its own criteria for correctness, and if these criteria are not met, the argument is fallacious. Presumptive arguments such as arguments from popular opinion (*ad populum*), from authority (*ad auctoritatem*) or from ignorance (*ad ignorantiam*) take the form of fallacious arguments, depending on the context or their particular merits, in the course of a critical discussion or dialogue framework (see, e.g., van Eemeren and Grootendorst 1984; Walton 2006, 2008; van Eemeren 2012). In my analysis here of fallacies at the institutional level, I defend the notion that such arguments are incorrectly applied because when we find these presumptive arguments at the institutional level, they appear more decisive than they really are, and we tend to lose sight of their inherently presumptive and defeasible nature. In such cases, a presumptive argument becomes fallacious (see e.g., Walton 1995, p. 228). Then, I refer to them as fallacious argumentation schemes and they could be considered traditional fallacies.

For the moment, I will leave aside widely used methods for assessing the fallacious character of an argument, such as a thorough analysis of the context (Walton 2008), an examination of possible violations of the rules of critical discussion (van Eemeren and Grootendorst 1987), derailment of strategic manoeuvring (van Eemeren and Houtlosser 2000), or diving deep into the critical questions for a particular argumentation scheme (Walton et al. 2008). I will, however, return to this issue later, in Sects. 4.4 and 5. The approach I adopt aims to highlight the common use of classic fallacies at an institutional level due to the lack of additional support for the use of presumptive arguments such as the argument from popular opinion.

It is not difficult to identify fallacies in public discourse (political, ideological, advertising), even at the institutional level, when we are immersed in the academic sphere. Some of them are as gross as evident abusive *ad hominem* arguments and it would seem impossible for such arguments to survive in any kind of argumentative discourse. But the truth is that they do survive in many instances in the public sphere, certainly aided by the role of emotions which could also obscure the identification of fallacious arguments when they are attached to certain currents. For this reason, I will refrain from analysing political, ideological, or advertising discourse. Let me move directly on to science: we all generally agree that science must be governed by sound arguments based on the scientific method.

4 Fallacies as Cultural Representations

In the digital age, mis/disinformation has become much more prevalent. It was one of the main issues and posed considerable risk to public health during the recent coronavirus pandemic. To combat what was no doubt the first social media

infodemic, social media giants such as Twitter, YouTube, Facebook, and WhatsApp worked with the World Health Organization (WHO) and national health authorities to display correct information about the virus prominently on their platforms and make it easily accessible (Nguyen & Catalan-Matamoros 2020). In a public health emergency like the one we experienced in 2020, we recognise the key role of a trusted institution like the WHO. The WHO is the global health institution that coordinates the world's response to health emergencies such as the COVID-19 emergency. On its web site we find this:

Who we are: Founded in 1948, WHO is the United Nations agency that connects nations, partners and people to promote health, keep the world safe and serve the vulnerable, so everyone, everywhere can attain the highest level of health.

What we do: WHO leads global efforts to expand universal health coverage. We direct and coordinate the world's response to health emergencies. And we promote healthier lives, from pregnancy care through old age. Our Triple Billion targets outline an ambitious plan for the world to achieve good health for all using science-based policies and programmes.¹

It is far from the purpose of this paper to question the functions, purposes or merits of the WHO. However, in order to understand how some fallacies are commonly introduced into institutional discourse and denounce the fallacy-virus, I would like to discuss here the promotion of traditional and complementary medicine (T&CM) that the WHO has been carrying out in recent years. This promoting has taken the form of various WHO reports and a new chapter on diagnostic patterns in traditional Chinese medicine in the 11th revision of the *International Classification of Diseases* (WHO 2019), which was accepted by the WHO on 25th May 2019 and came into effect on 1st January 2022. This document is an influential and essential tool for medical practice. Many of the conclusions and recommendations of the reports I am concerned with here have been widely criticised and denounced by, among others, independent experts (Edzard Ernst, Cochrane.org, see e.g. Ernst 2006; Singh & Ernst 2008), international academies of science and medicine (European Academies' Science Advisory Council (EASAC), Federation of European Academies of Medicine (FEAM); see Fears et al. 2020), and editorials and reports in leading scientific journals (Cyranoski 2018; Nature's editorial 2019). The main criticism is that T&CM treatments have not yet been adequately validated according to established scientific and regulatory criteria to earn the acceptance they are being afforded. In this sense, the WHO's goal of achieving "good health for all using *science-based* policies and programmes" could be questioned if we consider the publication and spread of these reports from this institution. Furthermore, in terms of the effectiveness of medical treatments, it could be argued that the WHO is spreading misinformation by publishing these reports.

In this paper I want to show that fallacious argumentation schemes, consolidated as cultural representations, can benefit certain kinds of institutional discourse. The

¹ <https://www.who.int/about>. Accessed 31st October 2023.

big question is: Why does an institution that is key for all of us promote therapies that are not scientifically supported? Obviously, the answer to this question has several dimensions, which I will not go into here. From an argumentative point of view, it would also be a never-ending task to fully analyse the WHO reports and evaluate their arguments. I would like to reiterate and make it perfectly clear that I only taken this case here as an example in order to denounce the institutionalisation of fallacious argumentation schemes, inasmuch as some arguments that might be considered traditional fallacies are used as positive arguments to support the promotion of T&CM, leaving aside the presumptive nature of those arguments.

Moreover, to illustrate the continuing spread of these fallacies, later I will also discuss some recommendations made by the American Heart Association (AHA) concerning regulation of the use of complementary and alternative medicine (CAM, fully analogous to T&CM) in the management of heart failure (Chow et al. 2023).

4.1 WHO Traditional Medicine Strategy: 2014–2023

Here, I will focus on the report *WHO traditional medicine strategy: 2014–2023* (WHO 2013). First of all, I would like to point out that, although one might expect a WHO report on T&CM to regulate practices that are widespread around the world and affect people's health, the aim of this report is not to regulate but to promote T&CM. This is made evident in many paragraphs of the report, for example: “policy: integrate traditional medicine within national health care systems, where feasible, by developing and implementing national traditional medicine policies and programmes” (WHO 2013, p. 11). This aim is also made clear on the website where the report is hosted: “The strategy aims to support Member States in developing proactive policies and implementing action plans that will strengthen the role traditional medicine plays in keeping populations healthy”.² In this regard, I would also like to point out that the report is available on the WHO website (see footnote 2) in 9 languages (Arabic, Chinese, Italian, Russian, Thai, Vietnamese, English, French, and Spanish). If you browse through the website, you will notice that the other reports, mostly related to conventional medicine,³ are only available in English or in English and French.⁴

Although I do not provide a detailed analysis of the report here, clearly there are some issues regarding argumentation: in line with the purpose of the report, namely, it adopts an engaged argumentation style (van Eemeren 2019; van Eemeren et al. 2022). However, for reports on healthcare and medicine, a fully detached style is expected (see Table 1 of van Eemeren 2022 to see the basic differences between detached and engaged styles at the different stages of a critical discussion). This departure from standard practices of presentation makes the report a good candidate for exploring the complex notion of argumentation style. The WHO authors will

² <https://www.who.int/publications/i/item/9789241506096>. Accessed 31st October 2023.

³ Conventional medicine is also sometimes called Western medicine.

⁴ See e.g., *WHO Medicines and Health Products Programme Strategic Framework 2016–2030*. <https://www.who.int/publications/i/item/WHO-EMP-2017-01>. Accessed 31st October 2023.

intuitively know that such a report needs to appear scientific and be written in a detached style (i.e. reflecting objectivity, conveying reliability, with starting points that consist primarily of verifiable facts and generally recognised norms). However, the argumentative weaknesses (deceptive argumentative moves or derailed strategic manoeuvres) that we can find throughout the report help us to visualise the engaged argumentation style of the report:

- (1) We could suspect publication bias, since most of the references in support of T&CM are in previous WHO reports or to journals of T&CM.
- (2) The report states that there is no proven evidence for T&CM (and yet the WHO wants to include it in public health systems around the world!) because typical clinical trials or conventional methods, although they are valuable methods, are not sufficient to prove the effectiveness of these therapies (see e.g., WHO 2013, p. 39). However, the other methods proposed to generate evidence on the effectiveness of T&CM are ambiguous and not well specified (see WHO 2013, pp. 39, 47, 48). For instance, we find that one of the strategic actions for partners and stakeholders is to “develop research methodologies consistent with T&CM theories and practice” (WHO 2013, p. 48). This is one of the cornerstones of any pseudoscientific practice: it is presented as if it were scientific fact, and to justify this, if some scientific evidence supports the practice, they use this evidence to make their case; but if they find opposition in the science, they claim that the scientific method is not appropriate for what they are trying to evaluate.
- (3) Let us look at the definition of traditional medicine (the type of medicine promoted by the report):

Traditional medicine (TM): Traditional medicine has a long history. It is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness. (WHO 2013, p. 15)

It is quite striking that the WHO proclaims that public health systems should invest in treatments “whether explicable or not”!

- (4) The report also encourages Member States to follow the example of countries where the two types of medicine coexist (see WHO 2013, p. 37). While it is perfectly logical for a country with a strong tradition of T&CM to encourage both types of medicine to coexist, should the rest of the Member States really follow this example? I think it would be more appropriate for a WHO report to try to promote conventional medicine in places where traditional medicine is deeply rooted and the population is reluctant to accept Western medicine. The WHO’s arguments here could be identified with the fallacy of the middle-ground approach: when the arguments of the two parties are balanced it is best to occupy the middle ground, although the weight and the substance of the arguments are not equivalent. In this case, T&CM and conventional (Western) medicine are

treated equally, whereas the treatments endorsed by conventional medicine are tested according to rigorous procedures and the scientific method. As pointed out by de Felipe (2021) in his philosophical appraisal of traditional Chinese medicine from the point of view of the philosophy of science:

The take-home message that this analysis entails has to do with a noticeable explanatory asymmetry between Western Medicine (WM) and Traditional Chinese Medicine (TCM) which paves the way for an inference to the best explanation: while WM can explain TCM's success in a way that really makes intelligible why such a success obtains, TCM in contrast fails to do the same. This dissymmetry signals one specific aspect at which WM shows superiority over TCM. (de Felipe 2021, pp. 1358–1359)

- (5) Presumptive argumentation schemes appear in the report more decisive than they really are. The clearest argument of this type is the appeal to popular opinion. Statements such as the following are prominent in the report: “T&CM is an important and often underestimated part of health care. It is found in almost every country in the world and the demand for its services is increasing.” (WHO 2013, p. 7) We also find reports such as:

the WHO Director-General, Dr Margaret Chan, stated that “For many millions of people, herbal medicines, traditional treatments, and traditional practitioners are the main source of health care, and sometimes the only source of care. It is also culturally acceptable and trusted by large numbers of people.” (WHO 2013, p. 16)

used as positive arguments to support the promotion of T&CM therapies. Although these presumptive arguments should be evaluated with the adequate criteria to assess their strengths and weaknesses (see Sect. 5), as I have said before, at first glance, the fact that many people around the world rely on alternative medicines should in itself be reason for the WHO to issue a report containing regulations, not a roadmap that continually encourages their use and promotes their integration into public health systems.

As I have already mentioned, the lack of respect for the detached style expected of a scientific report and instead the use of the engaged style that is typically adopted in promotional material, results in unjustified argumentative moves (considering the context: the primary authority on healthcare is laying out its position on T&CM, which, remember, is based on unproven theoretical concepts and treatments). It is a straightforward matter to find clear instances of an engaged argumentative style, for example: introducing points of contention by showing that the arguer identifies with what is important to the audience; arguments placing the point presented in a familiar light or making it easier to judge its acceptability; or explaining the conclusion that is reached in a way that is appealing to the audience. The following are just a few points that underline

the argumentative style and that are necessary to understand the fallacy-virus involved.

4.2 AHA Scientific Statement

I would like to present here a recent statement by the AHA on the use of CAM in the management of heart failure (Chow et al. 2023). While the aim of the WHO report was to promote T&CM, the AHA scientific statement aims both to regulate such practices and to seek further evidence on (both for and against) the effectiveness of these treatments. Clear justification for this is derived from both the lack of regulation and the increasing popularity of CAM:

There is a lack of federal guidance and regulation of CAM products sold in the United States, and these agents are readily accessible to consumers with increasing popularity. It is estimated that >30% of patients with heart failure (HF) use CAM, and 1 of 5 patients have used herbal therapy annually. Misconceptions regarding their purported efficacy have largely driven the popularity of these products, whereas adverse effects have been underemphasized and underreported. Furthermore, patients who purchase over-the-counter CAM products often receive prescription medications, concomitant use of which could lead to serious drug interactions when taken together. (Chow et al. 2023, p. e4)

Moreover, the authors make it clear that there is limited evidence about the use of these treatments:

Limited published reports suggest that select alternative therapies might have some clinical benefit, whereas others could worsen HF or interact with medications commonly used by adults with HF. More research and well-powered randomized controlled trials are warranted to further evaluate CAM efficacy and adverse effects in this population. (Chow et al. 2023, p. e22)

The purpose of this statement is certainly well justified given the large number of people who use these treatments and the limited evidence on them, but to assess the scope of this scientific statement and its infection with the fallacy-virus, it is also worth noting some of the following considerations regarding clinical practice and public health initiatives:

Health care professionals are strongly encouraged to inquire about CAM use with their patients at every clinical visit.

Health care professionals should consider discussing the interactions, benefits, and adverse-effect profile of CAM and guideline-directed medical therapy using a shared decision-making model with patients.

Because the manufacturing process is not overseen by the FDA, health care professionals and patients should be aware of the current lack of federal oversight and regulation if considering CAM.

Health care professionals may perform causality assessment of potentially CAM-related adverse reactions and interactions to determine likelihood of CAM-induced harm.

Reporting of CAM-related adverse reactions to health authorities is encouraged although causality assessment remains unclear.

Routine evaluation of CAM in HF management is important to improve patient safety, and continued use is strongly discouraged if adverse effects, drug interactions, or both are known to cause harm.

Health care professionals are strongly encouraged to initiate an open dialogue with patients without judgment about their current CAM therapies, when applicable. (Chow et al. 2023, pp. e5, e7, e21, e22)

The aim of these recommendations is to track the use of CAM and also to report benefits and adverse effects. In this sense, it could be argued that patients are being used to report the effectiveness of unproven therapies without the rigorous regulation required for clinical trials. In addition, it may not be legitimate for a doctor to include unproven treatments in a shared decision-making model with patients. Snoeck Henkemans and Mohammed (2012, p. 21) point out that in a shared decision-making model, the institutional requirement that a doctor discusses the available treatment options based on evidence with the patient imposes an institutional burden of proof on the doctor. However, for CAM therapies already used by the patients, the doctor should provide information about possible interactions or benefits, although these therapies by definition are not “available treatment options based on evidence” and therefore they should not be considered in an ideal shared decision-making model.

The point is that the AHA does not discourage the use of these treatments and includes them in the ideal model of shared decision-making. The only reason for this seems to be the increasing number of people using them. This practice will also serve to gather evidence about the treatments. This procedure could lead to new knowledge about the benefits and harms of CAM, but in a way that might be ethically questionable for a medical institution.

4.3 Fallacies of T&CM

In this section, I highlight the fact that many experts who have extensively studied the scientific basis of T&CM have denounced a plethora of fallacies⁵ commonly used by T&CM advocates. Although it is not the aim of this paper to evaluate the arguments commonly used in defence of T&CM, this section could help us to understand: (1) the reservations of many experts with regards to these therapies and (2) the proliferation of discourse riddled with fallacies that count on the tacit approval of both society and powerful institutions.

Here, I focus on the work of Edzard Ernst who held the world’s first chair in complementary medicine at the University of Exeter. As he explains in *A Scientist*

⁵ In this section, the notion of “fallacy” is that used by Ernst (2015, 2020) and Eigenschink et al. (2020) and could be assimilated to the more extended notion of traditional or classical fallacy.

in *Wonderland* (Ernst 2015), this position allowed him to invest time and money in studying alternative therapies and their effectiveness. He wanted to apply the scientific method, which is ultimately applied to any conventional medical therapy, to alternative therapies in order to investigate not only their efficacy but also their safety and cost. To do this, he needed the help and cooperation of therapists. His first major argumentative task was, therefore, to set up an interdisciplinary team (therapists, experts in experimental methodology and doctors) and to design experiments that were agreed on by all parties and that could take account of the problem to be evaluated. The idea was to carry out experiments in which all the parties felt adequately represented. His first study found that it could not be proven that the therapy which had been tested was effective beyond the placebo effect, although he also noted the great power of this placebo effect, to the point that some patients suffering from chronic pain were able to forego using the wheelchairs they had found it necessary to arrive in after a session of spiritual healing (or actors pretending to perform such healing). From here on, the list of experiments and therapies tested grows very long, but the results always seem to be the same. The treatments are not effective beyond the placebo effect; meanwhile, most of the therapies are not entirely harmless and may put patient health at risk, partly because some patients, faced with serious illnesses, do not resort to conventional therapies because of their faith in these treatments.

Ernst has also denounced the fallacies used by those who wish to refute his studies or simply promote alternative therapies. Ernst (2015) denounces the use of the middle-ground approach in these areas (conventional medicine vs. alternative medicine) where there simply is no such thing: “the insistence on balance creates the erroneous impression that there is a continuing, valid scientific debate between two equal hypotheses” (Ernst 2015, p. 133). Moreover, in several of his works, Ernst concludes with a list of the most common fallacies and argument patterns used in the field. In a short opinion article, Ernst (2020) summarises and discusses seven of them: appeal to popularity and appeal to authority; post hoc fallacy; even if it is just a placebo, it helps patients; appeal to tradition; esoteric medicine⁶ (EM) is ethical; EM cannot be scientifically tested; EM is natural and hence harmless. For Ernst, “the realm of EM is riddled with fallacies which confuse patients and consumers and are used regularly to undermine critical thinking and promote the use of EM” (Ernst 2020, p. 224).

Along similar lines, a publication of Eigenschink et al. (2020) discusses whether scientific literature on traditional Chinese medicine reflects current research standards, as described in good scientific practice (GSP) and good clinical practice (GCP) guidelines. The authors evaluated the quality of the 100 most cited publications (63 after exclusion criteria, see Fig. 2a of Eigenschink et al. 2020) on traditional Chinese medicine according to a predefined scoring system. The point system consisted of three major areas: “overall wording” (exaggeration, lack

⁶ Ernst used the term *esoteric medicine* as an amalgam of the following terms that are currently used very frequently and almost interchangeably: alternative medicine, complementary medicine, holistic medicine, integrative medicine, and natural medicine.

of objectivity, blaming “Big Pharma”, non-scientific wording), “argumentative patterns” (emphasising superiority, emphasising importance, pressing for research, distortion of facts, definitism) and “use of classical fallacies” (appeal to authority, appeal to tradition, persisting on better tolerance, naturalistic argumentation). Of the whole sample, only 23 works were free of fallacies. The authors concluded:

Considering nearly exponentially rising publication rates, the need for awareness regarding GSP and GCP is urgent and obvious. Multiple agendas, based on the four elemental concepts of research: honesty, accountability, professional courtesy and fairness, and good stewardship, have been published on the World Conferences of Research Integrity throughout the past years, aiming to provide guidelines for modern state of the art research and dissemination. With respect to clinical trials, GCP guidelines are readily available, regularly updated and even partly implemented in legislation. Many of the aforementioned traditional Chinese medicine publications ignore these common scientific conventions that are based on GCP and GSP guidelines. Therefore, they constitute a source for misinformation regarding complex research topics, such as the evaluation of traditional herbal therapies. Moreover, fallacies and unconventional argumentation patterns will continue to undermine the development of more credible, valuable research. (Eigenschink et al. 2020, pp. 264–265)

4.4 Argument from Authority

Before identifying the fallacy-viruses embedded in the WHO report, I would like to point out that all the different standpoints that I report in this document could legitimately be used as arguments from authority or expert opinion in the field of T&CM. The outstanding prestige of the WHO as a reliable medical authority is unquestionable. Argumentation from expert opinion can be reconstructed and evaluated, for instance, according to Walton’s argumentation schemes for appeal to expert opinion (see e.g., Walton 1997), the pragma-dialectical account of argument schemes (see e.g., Hitchcock & Wagemans 2011), or the integrative tool developed by Wagemans (2011). Here I focus on Walton’s account, which is less systematic but offers relevant critical questions regarding reflection on how an argument from expert opinion should be evaluated. Walton (1997, p. 258) proposes the following argumentation scheme and associated critical questions for the appeal to expert opinion:

E is an expert in domain *D*.

E asserts that proposition *A* is known to be true.

A is within *D*.

Therefore, *A* may (plausibly) be taken to be true.

Critical Questions

Expertise Question: How credible is *E* as an expert source?

Field Question: Is *E* an expert in the field that *A* is in?

Opinion Question: What did *E* assert that implies *A*?

Trustworthiness Question: Is *E* personally reliable as a source?

Consistency Question: Is *A* consistent with what other experts assert?

Backup Evidence Question: Is *A*'s assertion based on evidence?

For all the standpoints we could extract from the WHO report (propositions *A*) in a subsequent critical discussion, the argument scheme will follow this form, where *E* is *the WHO* and *D* is *medicine or healthcare* in a broad sense. The only critical questions that might raise doubts for a layperson (especially a Western one) are the *Consistency Questions* and the *Backup Evidence Question*. However, these expert reports, and in general arguments from authority, help people to make good arguments. How could a layperson answer the last two critical questions? The investment in terms of work and time for non-experts to answer questions of *Consistency* and *Backup Evidence* is so huge that, in a global sense, we could say that these kinds of institutions have been created precisely to save people from the requirement of having to make the effort to answer all these critical questions for standpoints put forward by them. Most people have limited abilities to apply epistemic standards in a subject due to their lack of expertise. However, as demonstrated by Goodwin and Bogomoletc (2022), the ability to assess social standing is widespread. Non-experts may be correct in trusting entities with established reputations for scientific legitimacy. Therefore, for standpoints expressed by the WHO connected to healthcare or medicine we generally assume, by default, that they are based on contrasting and information derived from the best available evidence. The critical questions that might be raised for standpoints adopted by the WHO are tacitly answered positively by most citizens. It is generally accepted that assessing authority is a reasonable way to proceed in the face of significant epistemic asymmetry (see e.g. Goodwin 2011).

4.5 Popular Opinion and the Middle-Ground Approach

As we have seen, the promotion of T&CM by the WHO and its reports on these therapies collide with the standards we expect of arguments put forward by a global public health institution. We might think that when an institution as important to us as the WHO promotes T&CM, even though the efficacy of these therapies is not well established, it is because arguments such as popular opinion and the middle-ground approach prevail in our society. In addition, we have also seen that a medical association such as the AHA, which has been reticent about the benefits of T&CM, encourages discussion of these treatments in a shared decision-making process between patients and doctors, rather than discouraging the use of T&CM, because of the increasing number of people using it.

I think we are facing a case that fits the idea of viral replication of a belief, in this case of popular opinion and middle-ground approach arguments used as fallacies. Unfortunately, it is very reminiscent of what Sperber said about how ideological beliefs spread until they become cultural representations. As we have seen, the beliefs in question are spread by ecological factors: by the institutions. The serious thing here is that these *viruses* have taken over the institutions and the population, and now one cannot argue against this position and be taken seriously. To refute

these WHO reports, one has to be an expert, one has to know which studies that concluded that T&CM therapies are not effective were omitted, and so on. One cannot just argue against the substance of the report: the WHO cannot simply promote T&CM therapies because many people use them or put conventional medicine and T&CM on an equal footing, and these are the arguments widely used as positive arguments in the report. Nowadays, arguments from popular opinion (even if it is not supported by the majority) and the middle-ground approach are considered sound arguments, regardless of the particular context and have become beliefs and cultural representations: everything is equal; everything is the same; everyone is right! In a scientific context such as the one I have presented here, these presumptive argumentation schemes have grown to take precedence over the results of science itself. Presumptive argumentation schemes are increasingly being used as definitive arguments in a wide variety of fields, but they tend to be used with regard to political and ideological issues. One can only feel increasingly limited in the ability to rise to the task of denouncing them, because it seems that by attacking the fallacy one is attacking the ideology. The good thing about finding these schemes in science, from the point of view of denouncing them, is that we all generally agree that science needs to be governed by other kinds of arguments.

Certainly, our social desire for justice, democracy and equality for every citizen in the world does not lead us to denounce “democratic” fallacies like the two presented here resulting from the incorrect application of *ad populum* and the middle-ground approach arguments. This is closely related to the role of group emotions in argumentation. As Polo et al. (2017, p. 305) point out, “emotions are not apprehended as independent variables but rather through their relation to knowledge, values and norms in a complex appraisal activity”. Therefore, emotions are often not introduced as external factors affecting argumentative discourse, but rather as part of that discourse. In this sense, emotions work as key argumentative resources and not just as marginal fallacies. Popular opinion and the middle-ground approach are closely associated with our way of life and our idea of free and democratic societies, our deep beliefs in Western societies. This identification has facilitated the spread of these fallacies, disguised as established “positive” beliefs, as fallacy-viruses. We should distinguish genuine social justice based on democratic principles from argumentative fallacies that would have us believe that they are the same as our ideological beliefs.

5 Discussion and Conclusion

Finally, I would like to raise some questions for argumentation theorists. Presumptive arguments that might be identified with traditional fallacies can be legitimate and perfectly reasonable, depending on the context. For instance, argumentation from popular opinion is often a good tentative basis for prudent action where an issue is open to divided opinions. However, regardless of the context-specific standards or the institutional conventions that have led to the fallacy judgements, I defend, in accordance with the pragma-dialectical perspective, the idea that the norms for judging the reasonableness of discourse are context independent (see van Eemeren

and Houtlosser 2007; Snoeck Henkemans and Wagemans 2015; Wagemans 2020). Appeal to context is essential to carry out further argumentative evaluation: for institutionalised contexts, Wagemans (2020) points out that “certain moves performed in institutionalized contexts should be judged as fallacious when assessed from a pragma-dialectical perspective, while they seem perfectly reasonable in the sense that they promote the institutional goal of the communicative activity in which they are put forward.” In this sense, I have denounced that argument from popular opinion is incorrectly applied in the reports mentioned above (see Sect. 4) turning into a fallacy because it appears as a more decisive argument than it really is, and sight is lost of its inherently presumptive and defeasible nature. In this case, the argument put forward clearly helps to promote the institutional goal; but at the same time, the justification for this goal (promoting T&CM), its reasonableness, is based on inappropriate application of the same presumptive *ad populum* argument. This circularity reveals the extent to which institutional discourse is infected with the *ad populum* fallacy-virus. In addition, the fact that an argument reaches the institutional goal for which it is deployed, does not guarantee its reasonableness; as Snoeck Henkemans and Wagemans (2015, p. 1358) say, “regarding the reasonableness of argumentative discourse as dependent on the aims of the institutionalized context in which the discourse is situated amounts to confusing argumentative reasonableness with institutional efficacy”.

Nowadays, I think that appeal to context to evaluate the legitimacy of certain fallacious moves could certainly be dangerous. I find that it is common to invert the situation and adapt the context in order to justify fallacies. Is such relativism in the evaluation of fallacies what is responsible for their spreading so readily? And if so, is it possible to limit this relativism? Certainly, the critical questions associated with argumentation schemes constitute a move in this direction. Let us revisit the argumentation scheme proposed by Walton and consider it with regard to the argument from popular opinion:

If a large majority of some reference group accept *A* as true, then there is a presumption in favor of *A*.

A large majority of the reference group accept *A* as true.

Therefore there is a presumption in favor of *A*.

Critical questions:

1. Does a large majority of the cited reference group accept *A* as true?
2. Is there other relevant evidence available that would support the assumption that *A* is not true?
3. What reason is there for thinking that the view of this large majority is likely to be right? (Walton 1995, pp. 155–154)

The arguments put forward in the WHO report do not allow the critical questions to be answered properly. We cannot answer question (1), simply because the report does not provide statistics or there is no clear identification of the reference group. To answer question (2), it should be noted that we have found a bias in the publications mentioned in the report; the report fails to include relevant evidence that would support the assumption that *A* is not true. For question (3), if we follow the arguments in the report, we have circular

argumentation: this large majority is right because it is the large majority. It is worth noting that the vagueness of the argument put forward by the WHO and the lack of a clear justification are consistent with the assumption that these argumentation schemes (which are only presumptive arguments) have the status of consolidated beliefs. To me, the argument is fallacious because the critical questions cannot be satisfactorily answered taking into account the published discourse (the report). Furthermore, the criteria of this *ad populum* argument are generally not applicable to scientific matters, such as medical discourse, and therefore should be considered fallacious. The number of people who belong to the Flat Earth Society, for example, does not make the idea of a flat Earth acceptable. Such arguments may be strong in the context of customs, morals, and traditions, but not in scientific discourse. Certainly, the evaluation of *ad populum* arguments is highly dependent on the context.

However, the critical questions of the argument from popular opinion could be answered in some far-fetched way in order to achieve the goal of presenting the argument as non-fallacious. What I mean is that with this method, it will always be possible to find a loophole which allows fallacious arguments no longer to be fallacies. For example, to answer question (1): if millions of people rely on T&CM (even if many of these people do not have access to Western medicine—note that these data are not included in the report), this is enough to believe in T&CM because the number is very significant, regardless of the extension of the reference group. Similarly, to answer question (2): if there are no references to relevant evidence against the efficacy of T&CM in the WHO report, it is simply because there are none; a credible institution like the WHO produces reliable reports. Finally, for question (3): countries with a long tradition of T&CM, such as China, do not have higher mortality rates than Western countries (data not included in the report), so this type of medicine is appropriate for citizens all over the world.

Now, after examining both set of answers, who is right in this case? Who has answered according to the dialectical rules of an argumentative exchange?

In conclusion, I would like to emphasise that the core idea I am trying to defend here cannot be hidden by the many dimensions, from an argumentative point of view, that could be extracted from these reports. The fallacies used by traditional medicine advocates or the argumentative style of the WHO report have been presented in order to illustrate the current problems associated with these publications and the need to find further explanations that can rationalise the publication of this information by trusted institutions. Our beliefs, deeply rooted in our way of life, are often mixed with these “democratic” fallacies to the point that presumptive argumentation schemes, such as appeal to popular opinion and the middle-ground approach, are commonly and increasingly used as definitive arguments or, even more, as axiomatic considerations in many instances involving the public sphere, and also in the course of critical discussions in our daily lives. The infection is so great that the classical tools for argument evaluation can be disarmed by appealing to the same fallacy-viruses that have infected the discourse. If we assume that this paper has probed or at least has legitimately denounced the existence of these fallacy-viruses, I would like to pose one final question: How can argumentation theorists combat fallacies as cultural representations?

Acknowledgements This work has benefited from the support granted by Research Projects “Argumentative practices and the pragmatics of reasons 2” (PID2022-136423NB-I00) funded by Spanish Ministerio de Ciencia e Innovación MCIN/ AEI / <https://doi.org/10.13039/501100011033> and by “ERDF A way of making Europe”, “Relatividad lingüística y filosofía experimental” (PID2019-105746GB-I00) funded by MCIN, and “DESTERRA: Los sótanos de la desinformación. De usuarios a terroristas en la sociedad digital” (TED2021-130322B-I00) funded by MCIN (<https://doi.org/10.13039/501100011033>) and the European Union NextGenerationEU/PRT. I also thank the financial support of the Universidad Complutense de Madrid through the research group “Lenguaje, pensamiento y realidad” (930174).

Funding Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature.

Declarations

Conflict of interest The author has no relevant financial or non-financial interests to disclose, no competing interests to declare that are relevant to the content of this article, and certifies that he has no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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