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Seven Fallacies of Thought and Reason: Common Errors in Reasoning and Argument from Pseudoscience

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## Seven Fallacies of Thought and Reason: Common Errors in Reasoning and Argument from Pseudoscience

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## Overview:

Humans have a great capacity to be wrong. Our natural biases, habits of thought, intuitions, and heuristics usually serve us well. However, under certain circumstances they can also lead us directly towards error. Intelligent people are more than capable of holding irrational ideas that recruit subjective belief more than objective facts and evidence. Having qualifications and intelligence are no guarantee that ones views are correct. This paper discusses seven common and persuasive errors of thinking and reason. Some are errors of

logic; others are more general errors of thinking and reason. These errors are typically directed against science, by modern popular science writers, pseudoscientists, and amateur enthusiasts. One thing unites all these errors of reasoning. That is, they all reflect common misunderstandings of what science is, what it does, and how it goes about doing what it does. Therefore, these errors of reason are united by a complete failure to characterise science correctly. The level of interest in popular science and pseudoscience is increasing, and so is the corrosive misperception of science. There is a real danger that the public's and student's perceptions of science may be influenced by the apparently more visible, vocal and somewhat more intuitively appealing message of pseudoscience. This document outlines just some of the main fallacies, errors, and mistakes of reason commonly directed towards science (with the explicit intention to undermine it). Science is not perfect; and it has never claimed to be infallible. However, science is far closer to providing helpful understanding than any alternative system of knowledge (i.e., belief-systems & pseudoscience). There may

be many valid reasons to question scientific knowledge, but the fallacies outlined in the present paper are not them.

There is more than one way to be right, and there are certainly many ways in which one can be wrong. Natural human thinking about the world and the events within it has a particular affinity to erroneous reasoning. Whether it is in the form of a formal logical fallacy, or a more informal mistake of reason the end point is the same - error. Not all mistakes of but an increasing attraction to anti-science seems, historically at least, all too familiar. At a time when we can send a man to the moon, there are people who think UFOs are flown by aliens who go around abducting and experimenting on humans. At a time when Darwin's theory of Evolution via natural selection has been considerably expanded and supported, some still think that living organisms and the universe were designed by a somewhat more supernatural process. Despite advances from the world pf physics in theories of Relativity, Quantum Mechanics, the evolution of the cosmos, others argue that the earth and the universe is only around 6000 years old. As medicine has helped to rid the modern world of

many aliments, there are those who think drinking a homeopathic remedy (water) will cure illness. Still further are those who consult psychics and astrologers before making decisions, who think that the dead live on in the afterlife, who think that unicorns and angels are real, that twins have psychic powers, and that fairies live at the bottom of the garden. Progress indeed!

In more recent times, people holding such questionable views have made an interesting switch from trying to provide evidence to silence the skeptical scientists (partly due to the fact they failed to produce any evidence), to attacking the process of science itself. Because science makes the seemingly (to these individuals) unhelpful request for evidence, it has placed itself right in the firing line from those that seek to undermine it and the knowledge it generates. This process has led to an unhelpful situation where the reality of science and the public's perception of it often differ markedly. Pseudoscience is more palatable to the public as it often provides the message the public want to hear and claims

they want to be true (i.e., we all survive bodily death). This gives pseudoscience considerable currency in forming the public's perception of the nature of things in science. However, science tackles how things are, not how we want them to be. Whatever the explanation for why people hold irrational views, one thing is for sure – certain factions of the population seek to undermine scientific knowledge, and promote their 'alternative' system of knowledge and information. However, a closer examination reveals that these alternatives amount to little more than circular belief-systems and unfounded pseudoscience, having little to do with evidence and reason.

Jumping to conclusions often involves a leap towards error.

It is often the case that a particular interpretation or view may well seem so blindingly obvious to the individual it would appear odd to question it. However, this alone does not make such an interpretation necessarily correct or true. In other words, the strength of the

conviction that one is correct is no reliable measure, on its own, that one actually is correct (see below). Conviction does not equal correctness! Nevertheless, the level of conviction alone will dictate that the particular view will be resistant to change, and will be held in contrast to the available evidence. This is unfortunate. A useful thing to keep in mind is that

For example, imagine a man and women are in an elevator having an argument. You enter the elevator to help get to your intended level within the building. During their argument you overhear them mention; 'the house' and 'the children' etc. It would be perfectly natural from overhearing such statements to arrive at the conclusion that the people having the argument are husband and wife. However, the evidence does not directly support this and although such a conclusion may well appear natural and persuasive, these factors on their own do not make such conclusions correct. The couple could simply have been colleagues debating a newspaper story of a family, or even a family situation from a reality television programme. Human reasoning often tries to fill in the blanks – and often does so by generating spurious conclusions to fit the incoming information. Sometimes the conclusion is correct, sometimes it is not. Due to the considerable scope for error in human

reasoning scientists and philosophers have developed methods for reasoning about the

World.

Enter the role of critical thinking and scientific reasoning. These are strategic mental tools to protect the individual from delusion and error. The tools of critical thinking and the scientific method are specifically designed to navigate around these limitations and natural biases. They fight against the initial reaction we all have that seem to want us to 'jump to an immediate conclusion' which may actually lead us to arrive at a conclusion or opinion that is false. Critical thinking constantly prompts us to ask ourselves, "...to what extent might I be deluded about this issue?" Science allows us to address this question and hopefully reduce the probability that our views and theories are based in error and delusion.

## In the name of science

A great deal of nonsense is touted in the name of science. Many forms of knowledge claim

thole trientific or folging the bebassed precidentification in the pre-existing peuler based ther reasoning and bastardised concepts of science. Pseudosciences are a collection of nebulous ideas, practices, and claims which are packaged as being scientific when in fact they are not scientific at all<sup>1</sup>. Typically a pseudoscience is based on little if any empirical evidence, starts from unfounded premises, violates logic and reason and flies in the face of high-quality evidence which supports an alternative account. On occasion a pseudoscience may begin with a legitimate assumption, though from this sound basis, make spurious unfounded claims. The results are the same – delusion and error. The normal rules of science do not apply to the pseudosciences never produce new insightful knowledge, they are circular and static. Any *research* that is carried out serves only to establish the pre-existing beliefs or agendas of the individuals (committing the *confirmation-bias fallacy*). Here, only certain forms of information count as knowledge.



























