

Kevin Elliott: *A Tapestry of Values: An Introduction to Values in Science*  
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**1. Introduction.** Traditionally, people have subscribed to the belief that scientific research should be as neutral as possible and avoid value influence. For example, a scientific claim would be regarded as misleading if the researchers had adopted an inappropriate methodology to court the interests of industry. It is important to ensure that the conclusion reached by scientific research is objective. This point of view is called the value free ideal (VFI). Ensuring science maintains a value-neutral stance is critically important as sound scientific knowledge informs us about the world and leads to advancements which improve the human condition. It is reasonable to expect that the claims made by scientists are valid and reliable, and do not reflect the disguised interests or values of a minority group. If scientists claim that a chemical substance is harmless to humans below certain doses, we expect this claim is based on a series of rigorous experiments and sound evidence, not merely from fabrications of evidence or as a result of a deliberate attempt to ignore certain results which may lead to a conflict of interest. Society has attributed to science the role of intellectual authority because of its great success in the past. Compared to other non-scientific disciplines (such as astrology), society has greater confidence in scientific claims, and even regards science as the most reasonable means to the acquisition of knowledge.

Despite science being the best road to knowledge about the natural world, there have been many inconsistent scientific claims, such as the safety of genetically modified foods or diet strategies. These disputed findings are presented in the media and are usually accompanied by statements such as “results from

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reliable scientific research.” Hence, it is becoming increasingly difficult to ignore the confusion.

In this regard, we can ask two questions.

1. Although value free science sounds good in theory, at the practical level, are there ways to avoid the impact of values at all stages of scientific research, especially non-epistemic values, that is, values that do not contribute to the acquisition of knowledge?
2. If it is unavoidable that values have an influence on scientific research, is the VFI approach better than the value-regulating approach?

The value-regulating approach is one where values can influence science appropriately according to the context, and scientists should consider the aspect of value influence when they make decisions on their research. That is, if scientists can't actually avoid the value impact, instead of adhering to VFI, the value-regulating approach seems to be a better option as it demonstrates the objectivity and authority of science.

Elliott provides many case studies in this book to demonstrate that value influence occurs at many stages of scientific research. Instead of trying to avoid value influence when making decisions regarding research, a thorough examination of the value judgments which affect research will help science maintain its objectivity and will enable scientists to meet their moral responsibility.

In comparison to the moral responsibility of scientists advocated by Heather Douglas, that is, scientists as general agents have a responsibility not to make reckless mistakes and then cause some foreseeable harm to others, Elliott extends this moral responsibility and argues that scientists have the responsibility to benefit society, stating:

[...] given that we as a society provide scientists with a great deal of financial and institutional support, it would be surprising if scientists did not have at least some responsibilities to do their work in a manner that benefits society. Thus, we will find that values have a legitimate role to play in many aspects of science because they help scientists to achieve their goals of serving society. (p.14)

The book review comprises four sections. Section 1 is the introduction, Section 2 introduces the main subjects of the book, Section 3 details the differences between Elliott's approach and VFI, and Section 4 draws the conclusion.

**2. Subjects of the book.** Elliott provides many examples of modern science (toxicology, biology, environmental science, anthropology) where value effects occur and have a significant impact on society. Elliott focuses on the following five features of scientific research and argues that values play an important role in scientific reasoning: 1. Topics that scientists investigate; 2. The methods scientists use, the assumptions they employ, and the specific questions they ask; 3. The aims of scientific inquiry; 4. How to respond to scientific uncertainty, and 5. How to communicate and frame scientific information.

To elaborate on these five features of scientific research, Elliott compares relevant cases which show that values play an important role in scientific activities, and we can determine which value impacts are appropriate and which are not. One advantage of this book is that, in such an abstract philosophical discussion, Elliott cites many examples (not just the event itself, but detailed information about the context) to help readers capture the importance of the problem quickly. Furthermore, Elliott provides discussion questions on each chapter to help readers reflect on related issues.

Even though most of these examples are policy-related studies, such as FDA's methods for drug toxicity testing and measuring environmental pollution and climate change, Elliott expands the scope of the case studies and claims that value judgments affect all areas of science. Quantum physics, which is removed from our daily lives, often faces the problem of value judgments. In relation to the allocation of research funding and how to convey the results to the public or policymakers, these are also crucial for quantum physicists since it will not be the first choice to fund a scientific project such as quantum physics due to financial considerations.

To provide a more thorough analysis, Elliott suggests the following three conditions to evaluate the appropriateness of the values which may influence science: 1) transparency, that is, scientists should ensure that value influences are made as transparent as possible so that others can analyze the research comprehensively; 2) representative, that is, value influences should be representative of important social and ethical priorities; 3) engagement, that is, the impact of values should be examined carefully by researchers and stakeholders to reflect on their appropriateness. Elliott claims that scientific research that satisfies these three conditions may play the role of authority better than VFI does. Not only that but going by this way can also meet the moral responsibility of scientists.

Traditionally, we would expect scientists to uphold their responsibility by screening out their values. This implies that scientists should uphold their

responsibilities by providing a correct description of the world. Elliott's approach is that it is the responsibility of scientists to not only provide an accurate description of the world, given that scientists often need to make choices in uncertain situations, many of which affect the outcome or can have terrible consequences for society, scientists should ensure that their choices are underpinned by appropriate value judgments in order to meet their moral responsibility.

We doubt whether scientific research will lose its neutrality and thus undermine the authority of science. Of course, we believe that wishful thinking is not acceptable in scientific reasoning. Under the requirement of transparency, we can carry out retrospective work. We can clearly know the details of scientific research, including the judgments made in marginal cases, whether the methodology is accepted by the relevant scientific community, etc., and thus we can thoroughly scrutinize the process of scientific activity.

Elliott's approach (value-regulating approach and the three conditions) seems to be a more appropriate way of dealing with the issue of values impacting on scientific research rather than rejecting the involvement of values and ignoring the real influence of values. In addition, through the two conditions of representativeness and engagement, scientists can play a better role at a practical level, not only providing more appropriate scientific advice (including good communication with stakeholders), but also meeting their moral responsibility.

**3. Comparison with VFI.** Elliott provides many examples from different fields of science to show that values play a role in scientific research. We can also try to analyze whether particular values are appropriate or not in a specific context. For example, as discussed in Chapter 2, studies on the cognitive differences between males and females will not be a social priority in today's modern world. Regardless of whether there are glaring errors in the research process about gender cognitive differences, such as deliberately ignoring specific evidence, the research results could easily cause confusion in its dissemination via the media, or the results could be manipulated by particular groups.

Research exploring differences in gender cognitive abilities is likely to be magnified or over-interpreted through stereotypes. This is not to say that this kind of research is worthless or wrong. In light of the current situation, information about gender cognitive differences is sensitive and may easily have a significant (harmful) impact on society. Although conducting such research will help us discover some facts about ourselves as human beings, scientists not only

need to be cautious about the accuracy of their research but also need to be careful about their social responsibilities.

Here, we analyze the relation between the position of VFI and the three conditions that Elliott proposes (transparency, representativeness, and engagement). In relation to transparency, whether or not one supports the notion of VFI, it is clear that transparency is an important scientific virtue. Of course, transparency is controversial at some point. For example, the transparency of information related to biological weapons may cause significant harm to public safety. However, in general cases, this is an essential requirement for scientists. Many problematic types of research often lack transparency and establish inappropriate links between evidence and conclusions but cannot be immediately examined.

Supporters of VFI may have some different opinions on the other two conditions: representativeness and engagement. At first glance, Elliott's approach demonstrates that accepting the appropriate influence of values leads to decisions that best meet the priorities of society and stakeholders. However, supporters of VFI may respond by saying that surely a scientist's priority is to conduct accurate research, not to meet the priorities of society and stakeholders.

In the past, there have been several examples of research which has been compromised by political repression or false results, however, if several parties participate in engagement, the shortcomings of compromised research are more likely to become apparent (for more detail refer to Chapter 7). However, it is important to note that VFI is concerned with the satisfaction of epistemic aims, or in other words, improving the accuracy and reliability of research. Obtaining more information from different groups can help scientists to conduct more comprehensive policy-related research. But this does not mean that weighting the tradeoffs of values can improve the accuracy of research. In other words, values cannot play a role as evidence. Academics living in ivory towers are unpopular today, but this does not mean that decisions made by scientists should be based on specific values, such as acceptable values under stakeholder consensus.

This is not to say that Elliott's approach is not concerned about the accuracy of scientific research, rather it attempts to satisfy both epistemic and non-epistemic aims at the same time. From the perspective of objectivity, whether a particular value to guide scientific research can fulfill both epistemic and non-epistemic requirements is still a debate between Elliott's approach and VFI.

In relation to representativeness, which is an issue concerning the social responsibility of scientists, the expectations for scientists in today's society do

not seem to be concerned with merely the rigor of scientific research activities. We expect that scientists will meet some social responsibility in information dissemination, such as how scientists should shape their reports to the public and policymakers, and how to engage in effective communication with society. For example, the use of terminology will have an impact on society. “The greenhouse effect” and “global warming” may cause an unnecessary misunderstanding about the level of severity (for more detail refer to Chapter 6). Strictly speaking, this is not the concern of traditional scientific activities. The main job of scientists is to focus on the accuracy of their research, rather than how to convey scientific messages to laymen. VFI does not focus on message communication. Of course, for supporters of VFI, considerations like how to communicate with the public and policymakers may not be a primary part of the process of research.

**4. Conclusion.** The influence of values in scientific activities, as reflected in the author’s use of the word “tapestry” in the title, is intertwined and complex. In the many detailed case studies presented by Elliott suggest that instead of circumventing value influences, a careful review seems to be a better choice. Finally, it is worth mentioning that in addition to providing research-related advice, it is also invaluable for institutional-level advice. For example, the patent system is one of the main reasons why today’s drug markets are so chaotic. We can blame the pharmaceutical factory for producing a lot of “me-too” drugs, but we can still evaluate the current system to see if it is suitable for society. It is not reasonable for us only to ask scientists or the scientific community to take on the whole responsibility. How to conduct reviews and recommendations involves many aspects, including scientists, stakeholders, policies and institutions and this book is a good start for readers to investigate this issue of the impact of values on scientific research.