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**Characterizing the Value-Free Ideal:**

**From a Dichotomy to a Multiplicity**[[1]](#footnote-1)

**Kevin C. Elliott**

1. **Introduction**

The value-free ideal (VFI) for science has been an important topic of debate for hundreds of years (Proctor 1991), and it has played a particularly significant role in the recent philosophical literature on “values and science.”[[2]](#footnote-2) In her groundbreaking book, *Science, Policy, and the Value-Free Ideal* (2009), Heather Douglas examined the history of philosophical debates about values in science during the latter half of the twentieth century. On the basis of that analysis, she defined the VFI as the view that “the value judgments internal to science, involving the evaluation and acceptance of scientific results at the heart of the research process, are to be as free as humanly possible of all social and ethical values” (2009, 45). Most introductions to the field have adopted roughly the same formulation as Douglas (see e.g., Biddle 2013; Brown 2020; Elliott 2017; Elliott 2022),[[3]](#footnote-3) and at this point the dominant position among philosophers of science is that this VFI should be rejected (Brown 2024; Douglas and Branch 2024; Parker 2024). By adopting this conclusion, scholars have opened up a range of important questions about how to manage the influences of values in science and how to distinguish between appropriate and inappropriate roles for values (e.g., Holman and Wilholt 2022).

Despite the centrality of the VFI for the recent literature on values and science, I argue in this chapter that the nature of the VFI has not been adequately scrutinized. Although Douglas provided an influential historical analysis of the development of the VFI among philosophers of science during the mid- to late-twentieth century, that literature does not exhaust the range of options for thinking about and characterizing the VFI. As Proctor put it in his own historical analysis of this topic, “‘Value-freedom’ has meant different things to different people at different times. Slogans like ‘sciences must be value-free’ or ‘all knowledge is political’ must be understood in light of specific fears and goals that change over time” (1991, x). He emphasized that figures throughout history have promoted science’s value freedom for many different reasons, including efforts to resist the suppression of science by states or religions, to guard against the intrusion of personal interests in science, to promote the professionalization or secularization of science, and to conceal the social aspects of scientific practice. Thus, different motivations and historical/scholarly vantage points can generate different ways of thinking about the VFI. Even within the philosophy of science, some scholars have responded to recent debates about the VFI by suggesting other plausible ways of characterizing it (see e.g., de Melo-Martín and Intemann 2016; Menon and Stegenga 2023; Stegenga and Menon 2023).[[4]](#footnote-4)

I contend that ongoing philosophical debates over the cogency of the VFI (see e.g., Brown 2024; Stamenkovic 2024) could be improved by developing a more systematic assessment of the different options for characterizing it. Instead of providing a historical analysis, as figures like Douglas (2009) and Proctor (1991) have done, my focus will be on providing a preliminary taxonomy of different ways that value freedom could, in theory, be conceptualized. Ultimately, I think this analysis suggests that one could potentially maintain some formulations of the VFI, despite the arguments that have been raised against it (for an overview of these arguments, see Douglas 2016; Elliott 2022). Nevertheless, even if the VFI is not officially “dead,” it is probably not the most fruitful concept for guiding future debates about values in science; philosophers are likely to communicate their insights more effectively to the scientific community and to society as a whole by talking about strategies for managing values instead. On my view, however, these value management strategies could encompass both the kinds of strategies advocated by proponents of the VFI and those promoted by opponents of the VFI, depending on a variety of local factors at play in different research contexts.

As a framework for guiding my analysis, I focus on the three central concepts associated with the VFI: values, freedom, and ideals. In other words, I suggest that one can arrive at different characterizations of the value-free ideal depending on how one interprets *values*, what one means by *freedom* from value influences, and what kind of an *ideal* one is putting forward. On the basis of this analysis, I conclude that it would be better not to think of the VFI in terms of a single characterization but rather in terms of a multiplicity of distinct but related characterizations. This conclusion has significant implications for the literature on values and science because it shifts the focus from asking a relatively simple yes/no question (“Should the VFI be rejected?”) to asking much more complex questions (e.g., “Should all forms of the VFI be rejected?” or “Is it fruitful to try to develop a form of the VFI that could be maintained?”).

This shift in focus has at least two significant benefits. First, it softens the opposition that has developed between proponents and opponents of the VFI. Rather than generating two “camps” with opposing positions, this shift draws attention to a more diverse array of positions that one might accept or reject. By considering all these potential positions, both the critics and the defenders of the VFI might develop more nuanced views and soften their opposition. Those uncomfortable with the current oppositional framing of the literature on values and science might also be encouraged to join the discussion. Second, this shift in focus can encourage new questions for scholars studying the topic of values and science. The past several decades of work on this topic have made it possible to develop much more nuanced views about many of the concepts under discussion. Attending to these nuances and working with multiple different characterizations of the VFI can highlight new opportunities for philosophical scholarship.

Nevertheless, attending to the many different possible ways of characterizing the VFI also raises questions about whether it is in fact the most fruitful principle for organizing the literature on values and science. On the positive side, framing scholarship on values and science in terms of opposition to the VFI has been an important strategy for drawing renewed attention to this area of inquiry and challenging earlier philosophical assumptions about the legitimate roles for values in science (see e.g., Douglas 2009). Also, as long as the VFI is characterized in a multiplicity of different ways, it can serve as a helpful heuristic tool for “mapping” the wide range of possible relationships between values and scientific practice.[[5]](#footnote-5) However, when communicating their insights to the scientific community and to society as a whole, philosophers may find that talking about the VFI is more confusing than it is helpful. For example, as scholarship on values and science has progressed, it has become clear that many of the important ways in which values influence scientific practice involve elements of science that would typically be labeled as “outside” the core of scientific reasoning by the traditional VFI (see e.g., Elliott and McKaughan 2009; Holman and Bruner 2017; O’Connor and Freeborn 2025; Okruhlik 1994; Winsberg 2018). These include decisions about which research questions to pursue, which studies to perform, and how to “curate” and frame all the information stemming from the resulting studies (on information curation, see Elabbar 2023). Therefore, for audiences outside the philosophical community, talking about the VFI may already be confusing because they may not appreciate the nuanced senses in which it does and does not allow for values to influence science. Once one realizes that there are many other reasonable ways in which the VFI could be formulated (all of which allow values to play some roles in science), it becomes even more confusing. Thus, given that almost everyone involved in current debates (both proponents and opponents of the traditional VFI) can agree that values have appropriate roles to play in science, it may be more fruitful to frame discussions about values in science in terms of value management rather than defending or rejecting the VFI.

1. **Values**

According to my three-part framework, the first way in which characterizations of the VFI can vary is by employing different notions of the “values” that are to be excluded. The basic idea of the VFI is that science is supposed to remain free of values or value influences, but one can arrive at different characterizations of the VFI depending on which *categories* or *kinds* of values it excludes. This point is not a new one. In her classic formulation of the VFI, Douglas (2009) noted that it does not exclude all values from scientific reasoning; it excludes ethical and social values but not “epistemic” or “cognitive” ones. Thus, one avenue for challenging that version of the VFI is to deny that it is even possible to distinguish between epistemic and non-epistemic values (see e.g., Longino 1996; Rooney 2017). However, even if one granted the defenders of the VFI that a general distinction could be made between epistemic and non-epistemic values, the precise contours of this distinction would still be subject to debate (see e.g., Douglas 2013; Lacey 2017; Laudan 1984; Rooney 2017). For example, aesthetic values have received relatively little attention in the literature on values and science (although see Currie 2023; Ivanova 2017; Morgan 2013), and it is unclear whether they should be regarded as epistemic or non-epistemic. Faced with these sorts of difficult distinctions between values that straddle the borderline between epistemic and non-epistemic ones (or cognitive and noncognitive ones, or constitutive and contextual ones), it seems most reasonable to acknowledge that one could formulate different characterizations of the VFI depending on which kinds of values it allowed and which kinds it excluded.[[6]](#footnote-6)

Beyond the question of what *categories* of values to exclude, characterizations of the VFI could also vary based on what kinds of things they count as values, i.e., what *concept* of value they employ. Scholars working on the topic of values and science commonly worry that the word ‘value’ is used in a wide variety of different ways (e.g., Biddle 2013; Elliott 2022; Ward 2021). For example, according to Miriam Solomon:

“Value” has been used to include political values, aesthetic preferences, psychological biases, cognitive goals, personal and societal goals, ideologies, and pre-theoretic intuitions. So “value” is, in practice, not restricted to ethical values or even aesthetic values. “Values” include pre-theoretic assumptions, ethical conduct of inquiry, and causes of preference for one theory over another. (2012, 332-333)

Thus, efforts to distinguish different concepts of values (as well as other related phenomena that might be excluded by the VFI) can potentially generate different characterizations of the VFI (see e.g., Hilligardt 2022; Ward 2021).

 Consider, for example, four concepts of values that Rebecca Korf and I recently proposed (Elliott and Korf 2024). First, many of those working on the topic of values and science have regarded values as criteria or standards for evaluating scientific theories or other phenomena, such as predictive accuracy, scope, or consistency (e.g., Anderson 1993; Kuhn 1977; Lacey 1999; McMullin 1983). Second, values are sometimes regarded as causal factors that influence scientific decision making, such as heuristics or ideologies or psychological inclinations (e.g., Longino 1990; Solomon 2012; Zhao 2022).[[7]](#footnote-7) Third, values are sometimes treated as beliefs or attitudes about what is desirable, such as ethical beliefs about the importance of environmental sustainability or justice (e.g., Brown 2020; Douglas 2009; Steel 2010). Finally, values can also be regarded as desirable things themselves, such as public health or animal welfare (e.g., Brown 2020; Elliott 2017). Admittedly, the distinctions between these four categories are not entirely sharp. For example, criteria for choice often involve beliefs about what is desirable, and those beliefs or attitudes may serve as causal factors that influence scientific decision making. Nevertheless, although there are likely to be considerable overlaps among these concepts, they do not overlap completely, and so something can serve as a value in one sense without serving as a value in another sense.[[8]](#footnote-8)

 These different concepts of values can give rise to different characterizations of the VFI. For example, there are important differences between saying that values *in the sense of causal factors* (or particular types of causal factors, such as non-epistemic ones) should be excluded from scientific reasoning versus saying that values *in the sense of beliefs or attitudes about what is desirable* should be excluded from scientific reasoning. In fact, this difference sheds light on a recent disagreement between Robert Hudson (2021) and Heather Douglas and myself (Douglas and Elliott 2022). Hudson (2021) claimed that those who reject the VFI open the door for scientific reasoning to be corrupted by biases, and he worried that this would exacerbate the lack of reproducibility that afflicts some areas of scientific research. In contrast, Douglas and I (2022) argued that there are important distinctions to be made between biases and values, such that the rejection of the VFI does not mean that biases should be accepted as legitimate elements of scientific reasoning. Once one begins to consider different concepts of values, it becomes clear that this dispute arises partly because Hudson is employing a different concept of values when he thinks about the VFI.[[9]](#footnote-9) Hudson insists that “scientists are affected on a daily basis by all sorts of non-epistemic factors: social forces, moral obligations, political interests, and so on” (2021, 12). He then contends that, because Douglas and I hold that non-epistemic values can legitimately influence science, we are accepting the influences of all these potentially biasing factors. In contrast, Douglas typically conceptualizes values as beliefs about what is desirable (e.g., the ethical belief that public health tends to be more important than short-term corporate profits). Thus, Douglas and I would agree with Hudson in accepting a characterization of the VFI that focuses on excluding biases from scientific reasoning (see Douglas and Elliott 2022), but we would insist that this does not justify accepting characterizations of the VFI that exclude values conceptualized in other ways.

 Another source of variation when characterizing the VFI is *whose* values should be excluded from scientific reasoning. Douglas’s (2009) formulation of the VFI does not specify whose values are at play, but one could characterize the VFI in such a way that that this matters. For example, Inmaculada de Melo-Martín and Kristen Intemann (2016) appear to characterize the VFI as the view that scientists should not allow their *own* *idiosyncratic* *values* to influence their reasoning. They imagine a situation in which scientists address value-laden decisions in their research by employing the values of stakeholders rather than the scientists’ own personal values. They claim that such an approach would not violate the VFI: “This seems perfectly consistent with the claim made by proponents of the VFI that scientists, qua scientists, ought to refrain from allowing their personal value judgments to influence their decision making” (2016, 513). This interpretation of the VFI seems importantly different from the way Douglas (2009) conceives of it, insofar as Douglas characterizes the VFI as the view that scientists should refrain from allowing *any* social or ethical values from influencing their reasoning, not merely that they should block their *personal* social or ethical values. Nevertheless, recent commentators have suggested that Isaac Levi may have thought of the VFI in roughly the same manner as de Melo-Martín and Intemann (see e.g., Boulicault and Schroeder 2021; Staley 2017). Similarly, Marion Boulicault has recently proposed an “idiosyncrasy-free ideal,” according to which scientists should not allow their unique individual features to influence their decision making (see Boulicault and Schroeder 2021). Extending these ideas, one could adopt different characterizations of the VFI depending on whose values one excluded from influencing science. For example, one could handle the values of individual scientists, communities of scientists, policy makers, institutional structures, or broad communities of “interested and affected parties” differently (see e.g., Levy 2025).

1. **Value Freedom**

Turning next to the notion of value *freedom*, it turns out that one can also generate different characterizations of the VFI depending on how one handles this idea. First, one has to specify *what elements* of science are supposed to remain free of values. As noted in the introduction, Douglas’s (2009) formulation of the VFI focuses on the “internal” aspects of science, which she specifies as involving the evaluation and acceptance of hypotheses and theories. She acknowledges that even most proponents of the VFI would accept that values can appropriately influence more “external” aspects of science, such as decisions about what projects are undertaken and how scientific findings are applied. Matt Brown (2020) also emphasizes this point. He notes that most proponents of the VFI rely on a rough distinction between the “context of discovery” and the “context of justification,” and they formulate the VFI so that it excludes values from the context of justification while allowing values in the context of discovery. (For a sophisticated contemporary development of an approach along these lines, see Parker 2024.) Nevertheless, one could hold an even stricter interpretation of the VFI that restricts value influences even in the context of discovery; Percy Bridgman and Michael Polanyi may have held something like this view, insofar as they thought the pursuit of “basic” or “pure” scientific research projects ought to be based solely on “internal” considerations about which ideas were most scientifically promising (see Douglas and Branch 2024; Nye 2011; Shaw 2021). Those concerned to prevent values from influencing the context of justification might find this restrictive view to be all the more tempting in light of recent scholarship showing that the influences of values in the context of discovery are likely to bleed over into the context of justification (see e.g., Elliott and McKaughan 2009; Holman and Bruner 2017; O’Connor and Freeborn 2025; Okruhlik 1994; Winsberg 2018), and value influences in the context of justification could potentially be shifted into the context of discovery (Parker 2024). Thus, those who are sympathetic to the VFI might want to develop characterizations of it that limit the influences of values on at least some aspects of study design or question formulation.[[10]](#footnote-10)

 Even if one focuses solely on excluding values from the “internal” aspects of scientific reasoning, there is room for different views about precisely which aspects of scientific reasoning should be classified as internal. Menon and Stegenga (2023) recently brought this issue to the fore because they insisted that the VFI should focus only narrowly on excluding values from the activity of *scientific inference* and not on other activities, such as the interpretation of scientific concepts. This is significant because prominent critics of the VFI have sometimes appealed to the value-ladenness of scientific concepts as an argument against the VFI (e.g., Dupré 2007; Elliott 2022). If one characterizes the VFI so that it focuses only on keeping values out of scientific inference, however, the value-ladenness of scientific concepts may not challenge this characterization of the VFI.[[11]](#footnote-11) Once one starts distinguishing different aspects of scientific reasoning, one could argue that even Douglas (2009) maintains a form of the VFI because she insists that the activity of assessing the degree of evidence in favor of a hypothesis or theory should not be influenced by social or ethical values. On her view, values become relevant once that level of evidence has been determined and scientists turn to the question of whether that level of evidence is sufficient to accept the hypothesis or theory. Others would challenge this view and argue that values cannot and should not be excluded from assessing the amount of evidence in favor of a hypothesis or theory (see e.g., Bluhm 2017; Brown 2020). In addition, Stephanie Harvard and Eric Winsberg (2022) have recently emphasized that scholars working on the topic of science and values should pay attention not only to inference but also to representation; thus, their work raises the question of whether values should play a role in various activities involving scientific modeling (see also Intemann 2015). Finally, some scholars working on the topic of values and science suggest that their primary concern is to keep scientists from engaging in wishful thinking, which would involve driving inquiry toward pre-determined conclusions (e.g., Anderson 2004; Brown 2013). Thus, one might argue that these scholars are accepting a characterization of the VFI that excludes values from influencing science in ways that pre-determine the results of inquiry.[[12]](#footnote-12)

 In addition to this variation regarding the *elements of science* that should be kept free of values, characterizations of the VFI can also vary in terms of the *form of value-ladenness* that is meant to be avoided. Zina Ward (2021) has helped to clarify this point because she has identified four different ways in which judgments in science can be value-laden; values can relate to scientific judgments as: (1) motivating reasons; (2) justifying reasons; (3) causes; or (4) effects.[[13]](#footnote-13) It is not entirely clear whether the VFI as presented by Douglas (2009) was designed to prevent values from playing a role as *motivating reasons* for judgments involved in scientific reasoning or whether it was intended to exclude values from being treated as *justifying reasons*. Some of the debates over whether scientists should defer value-laden judgments to policy makers (thereby maintaining the VFI) seem to presuppose that ethical or social values could legitimately serve as *justifying* reasons for these kinds of choices but that they should not serve as *motivating* reasons for scientists (e.g., Betz 2013; Betz 2017; Elliott 2011; Havstad and Brown 2017). One could formulate different characterizations of the VFI depending on which form of value-ladenness one decided to focus on. In principle, one could also develop a characterization of the VFI that focused on preventing the judgments involved in scientific reasoning from generating value-laden *effects*. Given the pervasive way in which different scientific judgments generate differing conclusions and consequences for society, however, one would probably have to abandon this characterization of the VFI as untenable (Elliott 2017; Ratti and Russo 2024).

 Finally, characterizations of the VFI can differ depending on which *cognitive attitudes* are supposed to remain free of values. For example, David Willmes and I (2013) have argued that it is important to maintain a distinction between the cognitive attitudes of *belief* and *acceptance*. By employing this distinction, one could maintain a version of the VFI that focuses on keeping scientists’ beliefs free of values while at the same time affirming that scientists should allow their values to influence what they accept for various practical purposes (see also Fleisher 2018).[[14]](#footnote-14) Along these lines, Hugh Lacey makes cognitive attitudes central to his views about the proper roles for values in science:

Cognitive but not social values play essential roles in making the judgment that a theory or hypothesis is impartially held of a set of phenomena. However, social values have proper and ineliminable roles in other aspects of science, for example, when adopting a theory for the sake of giving direction to a research project, or endorsing a theoretically articulated hypothesis for the sake of informing practical action. (Lacey 2017, 15)

Lacey is difficult to categorize straightforwardly as a proponent or an opponent of the VFI if one does not distinguish different characterizations of it. On one hand, he explicitly prohibits incorporating ethical and social values from influencing scientific reasoning if that reasoning involves impartially holding theories; this appears to make him a proponent of the VFI. Nevertheless, if one were to treat science as a pragmatic enterprise in which scientists are almost always adopting or endorsing conclusions for the sake of giving direction to research projects or informing practical action, then he would appear to be an opponent of the VFI. Kareem Khalifa and Marina DiMarco (2019) provide another example of appealing to cognitive attitudes in order to clarify roles for values in science; they argue that one can maintain some forms of the VFI while denying that it applies to judgments of the *pursuit worthiness* of scientific hypotheses, theories, or models (see also Shaw 2022).

1. **The Notion of “An Ideal”**

Characterizations of the VFI can also vary based on different notions of the *ideal* toward which they are aiming. One potential source of variation is the relationship between descriptive and normative elements in the ideal. Given that the very notion of an ideal seems to be inherently normative, it probably does not make sense to interpret the VFI as being solely descriptive. However, this still leaves room for varying positions on whether and how the ideal might include some descriptive elements along with normative ones. For example, one could characterize the VFI in a sociological way, as the claim that scientists typically regard the exclusion of values from their reasoning as a feature of good science. Claims like this would constitute descriptions of individuals’ or communities’ normative views about science. Or one could characterize the VFI as the view that scientists, when they are operating at their best or doing proper science, do not incorporate values in their reasoning. Lacey (1999) may be thinking along these lines when he structures his book around the claim that “science is value-free.” He is clearly not intending his analysis to be merely descriptive; he is interested in the characteristics of “good” or “proper” science. Justin Biddle’s account of the VFI (or, as he puts it, the ideal of epistemic purity), has a similar mixture of descriptive and normative elements: “this view maintains that (1) the proper application of scientific methods will, as a matter of fact, always screen out all contextual factors, and (2) scientists ought to apply scientific methods properly, thereby screening out all contextual factors” (Biddle 2013, 125). Douglas (2009) seems to be almost completely normative when she characterizes the VFI as the view that scientists *ought* to exclude values from the core of scientific reasoning. However, her normative claims still pertain to what scientists *should actually do* under ordinary circumstances; one could focus instead on normative claims about what scientists *should strive for or pursue* under ideal circumstances (de Melo-Martín and Intemann 2016).

Building on this point, Menon and Stegenga (2023) have shown that one could distinguish between thinking of ideals in science as *states to be achieved* versus thinking of ideals as *pursuits* that scientists should try to engage in. This distinction is important because Menon and Stegenga contend that the VFI can be a worthy ideal in the sense of a pursuit even if it is not a worthy ideal in the sense of an end state. In other words, they acknowledge that scientists should not (and cannot) actually achieve the end state of keeping their judgments completely free of value influences. Nevertheless, they argue that it is beneficial for scientists to try to minimize the extent to which their conclusions are value-laden, and thus they contend that the VFI is a worthy ideal if it is regarded as a form of pursuit. Stamenkovic (2024) also appears to sympathize with this way of understanding the VFI.

One could develop a closely related distinction between characterizations that treat the VFI as a state to be achieved versus characterizations that treat it as a practical guideline for working scientists. (For more on ideals as states vs guidelines, see Philippi 2020). One might initially think that if scientists understood the state that they should be trying to achieve (e.g., excluding non-epistemic values from specific aspects of scientific reasoning), they would automatically be able to guide their decision making by pursuing that state. However, this idea might be too simple. For example, as noted in an earlier footnote, it might be difficult for scientists to determine which values are genuinely epistemic vs non-epistemic. Thus, even if one employed the language of “epistemic” vs “non-epistemic” values in a characterization of the VFI designed to specify the state to be achieved, one might need to describe values in more easily and immediately recognizable ways in order to characterize the VFI as a guideline for working scientists.

Finally, de Melo-Martín and Intemann (2016) have pointed out that one needs to clarify the *circumstances* under which the VFI is actually a meaningful ideal. In other words, one must consider whether it applies only under special circumstances or whether it applies under the real-life circumstances in which scientists typically find themselves. De Melo-Martín and Intemann contend that this distinction is important for understanding Douglas’s (2009) critique of the VFI. In their view, she is critiquing the VFI only under non-ideal circumstances, and they claim that she would still accept the VFI as a claim that applies to ideal circumstances. They draw this conclusion because Douglas contends that values have less of a role to play as uncertainty decreases and as the evidence for a hypothesis increases (Douglas 2009). Therefore, under conditions of perfect evidence, de Melo-Martín and Intemann conclude that Douglas would actually accept the VFI. They use this observation as a source of motivation for exploring stronger arguments that would challenge characterizations of the VFI that apply even under ideal evidential circumstances.

One could extend de Melo-Martín and Intemann’s point by claiming that even under non-ideal circumstances, there might be some conditions under which a VFI holds and other conditions under which it can be overridden. As Lorraine Daston (2022) has recently emphasized, rules do not have to be regarded as exceptionless; one could regard them instead as generalizations or models that admit of exceptions. One might think about ideals in a similar way, as generalizations or models that still have some exceptions (see e.g., Sheykh-Rezaee and Bikaraan-Behesht 2023). In fact, Stegenga and Menon appear to hold this view, insofar as they propound a particular characterization of the VFI while acknowledging that it could legitimately be violated under a narrow range of conditions (typically involving the application of science for decision making; Stegenga and Menon 2023, 438). This notion that the VFI could be a viable ideal even while having exceptions is highly significant because it makes the VFI more difficult to challenge; to reject a VFI of this sort requires not merely showing that it should be violated in some cases but rather showing that it is problematic in a deeper or more systematic fashion.

1. **The Upshot**

I have argued that it is possible to characterize the VFI in a surprisingly wide variety of ways, and I have organized these different characterizations based on how one interprets *values*, what one means by *freedom* from value influences, and what kind of an *ideal* one is discussing. Table 1 summarizes how variations in the VFI can be organized based on this three-part framework.

|  |
| --- |
| **Table 1: Different ways of characterizing the VFI, organized in terms of three categories** |
| Values | Value-freedom | Ideal |
| * Which kinds of values should be excluded?
* What concept of values are we employing (i.e., what are we talking about when we refer to values)?
* Whose values should be excluded?
 | * What elements of science should be kept free of values?
* What form of value-ladenness should be prevented?
* Which cognitive attitudes should be kept free of values?
 | * How does the ideal incorporate descriptive vs normative elements?
* Does the ideal refer to a state, a pursuit, or a guideline?
* Under which circumstances does the ideal hold?
 |

To further clarify how different characterizations of the VFI relate to each other, one could employ visualization techniques like those developed by Palider et al. (2021). As a brief example, Figure 1 illustrates how Douglas’s (2009) characterization of the VFI and de Melo-Martín and Intemann’s (2016) characterization of the VFI handle three of the nine questions provided in Table 1. The box on the left captures how Douglas’s characterization of the VFI answers the questions, the box on the right captures how de Melo-Martín and Intemann’s characterization of the VFI answers the questions, and the darker area shared by the two boxes represents the overlap where their characterizations provide the same answers. The three questions provided in the figure were chosen to illustrate three different kinds of relationships that can be represented using these sorts of visualizations. For the first question, the figure demonstrates that neither Douglas nor de Melo-Martín and Intemann are very explicit about the specific concept of values that they are employing. For the second question, the figure shows that both Douglas’s characterization of the VFI and de Melo-Martín and Intemann’s characterization of the VFI exclude the values of scientists from influencing scientific reasoning. However, as discussed above, Douglas’s characterization of the VFI also excludes the values of non-scientists (e.g., stakeholders) from influencing scientific reasoning, whereas de Melo-Martín and Intemann do not appear to think that the VFI excludes such influences. For the third question, the figure shows that Douglas and de Melo-Martín and Intemann appear to answer the question in the same way. Thus, Figure 2 illustrates the heuristic role that diagrams like these could play in clarifying the relationships between different characterizations of the VFI and highlighting issues that merit further clarification.

**Douglas**

**de Melo-Martín & Intemann**

Scientists’ values should be excluded.

Whose values should be excluded?

Non-scientists’ values should be excluded.

?

Values falling under what concept should be excluded?

?

The ideal is primarily a state.

Is the ideal a state, pursuit, or guideline?

**Figure 1. An example of how different characterizations of the VFI could be visualized using the diagraming techniques developed in Palider et al. 2021. The figure compares the characterizations of the VFI provided by Douglas (2009) and de Melo-Martín and Intemann (2016) based on three of the nine questions provided in Table 1.**

The remainder of this section highlights two benefits that emerge from distinguishing all these different characterizations of the VFI: (1) it frames the literature on values and science in a more irenic and nuanced fashion; and (2) it suggests promising questions for future investigation.

First, consider how attention to different ways of characterizing the VFI could foster a more irenic approach to values and science. At present, discussions about the role of values in science tend to be framed in a dichotomous manner, such that scholars are divided into proponents and opponents of the VFI. There is a tendency to portray the proponents (e.g., Betz 2013; Hudson 2016) as being in a small minority that holds an implausible view while the opponents of the VFI are portrayed as the victors (see e.g., Brown 2024; Elliott 2022). Thus, the dichotomous approach to characterizing the VFI encourages a framing of the literature on values and science as an agonistic conflict that needs to be settled or a debate that needs to be won.

Once one recognizes that the VFI can be characterized in different ways, however, it seems more plausible to think in terms of a multiplicity of different positions about the roles that values should play in science. A benefit of this approach is that it shifts the debate from a two-sided battle between the proponents and the opponents of the VFI and frames it as a multi-faceted discussion about possible roles for values in science. For example, even opponents of the “traditional” VFI might be willing to accept characterizations of the VFI that preclude values from serving as a form of evidence in favor of a theory or hypothesis (for a defense of this alternative form of the VFI—although not expressed as such—see Douglas 2009; for criticisms of it, see e.g., Bluhm 2017; Brown 2020; de Melo-Martín and Intemann 2016; Lewens 2025). Some opponents of the traditional VFI might also be willing to consider accepting characterizations of it that strive to exclude scientists’ idiosyncratic values from scientific reasoning (for discussions of this issue, see e.g., Boulicault and Schroeder 2021; Elliott 2017; John 2015; Levy 2025; Wilholt 2009). On the other side of the issue, some proponents of the traditional VFI might be willing to reconsider their position if the VFI were distinguished into different characterizations. For example, some proponents might reject forms of the VFI that go so far as to exclude values from playing a role in assessing mixed claims (see e.g., Alexandrova 2018; Lewens 2025), but they might still hold onto forms of the VFI that exclude values from playing other roles in science. Similarly, proponents of the traditional VFI might be willing to reject alternative characterizations of the VFI that exclude values from playing a role in the conclusions that scientists “endorse” for the purposes of regulatory decision making (see e.g., Lacey 2017; Levy 2025). Once one recognizes the potential for these debates, it seems somewhat arbitrary to choose a particular characterization of the VFI and to divide everyone into two camps based on those who accept it and those who reject it. Instead, it might be more fruitful to explore the wide variety of positions that one might hold regarding the proper roles for values in science. This approach might soften the seemingly hardened positions of proponents and critics of the VFI.

 This leads us to the second benefit of clarifying different ways of characterizing the VFI, namely, that it highlights promising questions for further investigation. Consider three examples drawn from the preceding analysis. First, by highlighting all the different aspects of scientific reasoning that values could potentially influence, this analysis can spur closer attention to the relationships between these elements of science and the varying roles for values among them. For example, as noted previously, philosophers have been exploring how values operating in what seem to be “external” aspects of science (e.g., steering the details of the research questions that scientists investigate) can have a profound influence on the conclusions that scientists draw (which seems to be an “internal” aspect of scientific reasoning; see e.g., Elliott and McKaughan 2009; Holman and Bruner 2017; Lacey 1999; Okruhlik 1994; Winsberg 2018). There also continue to be debates (even among critics of the “traditional” VFI) about the extent to which values should influence what counts as evidence in the first place, so the analysis in this paper encourages further efforts to distinguish the appropriate roles for values among different activities like this (for discussion of this point, see Bluhm 2017 and Lewens 2025). A second example of questions opened up by this analysis comes from the way it highlights different groups (e.g., individual scientists, communities of scientists, policy makers) that could strive to keep their values out of scientific reasoning. This analysis encourages further research to consider the feasibility and merits of different options along these lines (see e.g., Boulicault and Schroeder 2021; John 2015; John 2025; Levy 2025). Third, figures like de Melo-Martín and Intemann (2016) and Stegenga and Menon (2023) have very fruitfully drawn attention to the possibility of thinking about the concept of an “ideal” in different ways. This raises very important questions about whether, even if scientists cannot or should not always exclude values from their reasoning, it could still make sense to hold up value freedom as a kind of ideal in some research contexts. The analysis in this paper highlights this issue as a crucial ongoing research question.

1. **An Objection**

There is an obvious objection that critics are likely to emphasize in response to the arguments in this chapter. This objection is that even if, *in theory*, there could be variations in how the VFI is characterized, ultimately there is only one main question at stake *in practice*, and that is the one that Douglas (2009) herself emphasized on the basis of her historical analysis of the VFI.[[15]](#footnote-15) This fundamental question is whether non-epistemic values should be excluded from scientific reasoning. As Brown recently put it, “[T]he VFI is an all-or-nothing affair—either social and ethical values should play a role in the internal phases of scientific reasoning, or they should not” (2024, 111). Thus, even if there is some potential for creating different formulations of the VFI, critics will insist that none of the variations ultimately matter very much compared to the core question of whether to incorporate non-epistemic values in scientific reasoning.

 I have taken steps throughout the chapter to forestall this objection, but it may be helpful to reiterate my response here. First, I would return to Proctor’s (1991) point that the VFI has taken different forms throughout history, depending on the interests and concerns at the forefront of people’s attention. Thus, even if philosophers of science during the late twentieth century were particularly concerned about whether social and ethical values should play a role in scientific reasoning, a new historical moment could justify characterizing the VFI in a different way. For example, the state of the debate over values in science has shifted in recent decades (largely in response to the arguments in Douglas 2009), so it is now difficult to argue that social and ethical values should never play any role in the “internal” stages of scientific reasoning. Nevertheless, one might still think that the influences of these values should be “minimized” or lessened in various ways (see e.g., Menon and Stegenga 2023; Stamenkovic 2024). Given Proctor’s point that the definition of the VFI is not set in stone, I do not see any reason why this goal of minimizing value influences could not be called an “ideal” of value freedom. This would be a different way of thinking about the notion of an ideal than philosophers have employed in the past when debating the VFI (after all, this would be the kind of ideal that can never be fully achieved), but that does not mean it is incoherent. Thus, I do not think that accepting or rejecting the VFI is an “all-or-nothing” matter; one could reject the characterization of the VFI that has been dominant in the recent literature while accepting another characterization that treats value freedom as something worth pursuing to the extent feasible. It is crucial, however, for the proponents of alternative characterizations of the VFI to be clear about how they are defining it so they can avoid talking past defenders of the “traditional” VFI.

My other response to critics is that the development of the literature on values and science in recent years has helped to sharpen our concepts, which makes it possible for us to develop more nuanced characterizations of the VFI than we were able to develop in the past. As a result, we are finding that the traditional VFI was somewhat ambiguous between different characterizations that are meaningfully different and that should not be glossed over. For example, as discussed above, there has been increasing attention to the different cognitive attitudes that scientists can take toward their hypotheses and representations. It is difficult to maintain that there is only one meaningful way of characterizing the VFI when one considers these cognitive attitudes. If my critics insist that there is only one fundamental question at issue in debates about the VFI, my response is that I am not sure which cognitive attitude this question involves. Is the crucial question whether scientists should prevent non-epistemic values from influencing their beliefs? Or is the question whether they should prevent values from influencing what they accept? Or does this question have to do with what they adopt, endorse, or impartially hold (see Lacey 2017)? Surely it makes more sense to acknowledge that there is not a single question at issue; there are multiple interesting questions that correspond to these different cognitive attitudes, and reducing them all to a single characterization of the VFI obscures this complexity.

This paper has also emphasized that it is becoming increasingly difficult to specify what counts as the “core” of scientific reasoning for the purposes of the VFI.[[16]](#footnote-16) Thus, there is ample room for disagreement about which of the following activities a proponent of the VFI should be keeping insulated from values: choosing research questions, choosing methodologies, formulating categories and concepts, developing study designs, collecting data, developing models, assessing models, interpreting data, assessing the amount of evidence in support of a hypothesis, determining whether there is sufficient evidence to accept a hypothesis, and deciding how to frame or communicate the outcomes of inquiry.[[17]](#footnote-17) Why should we accept that there is a clean distinction between the activities in this list that are “internal” or “core” to scientific reasoning and those that are not? And once one rejects, or at least problematizes, this internal/external distinction, then it seems relatively clear that the VFI can be formulated in a number of meaningful ways.

These are only two of the nine forms of variation described in Table 1, but they should be sufficient to show that different characterizations of the VFI are genuinely interesting and are not merely trivial variations on a single question. The other forms of variation in Table 1 add even more richness to the discussion. For example, as noted previously, deciding whose values should be excluded from science raises the question of whether the VFI should be focused on removing *everyone’s* values from science or only *individual scientists’ idiosyncratic values* (Boulicault and Schroeder 2021). This is a live question that may go back to Levi (see Boulicault and Schroeder 2021; Staley 2017) and that has been attracting new attention (Levy 2025). Therefore, to insist that there is only one legitimate definition of the VFI and that all other potential variations on it constitute misunderstandings seems like a missed opportunity to engage in fruitful conceptual clarification of this research area.

1. **Conclusion**

I have argued that even though philosophers developed a particular way of thinking about the VFI during the latter part of the twentieth century, it is conceptually possible to characterize it in a number of different ways. I have organized this variety of characterizations using a three-part framework that focuses on the values to be excluded, the ways in which science is supposed to be free of those values or their influences, and the nature of the ideal. Thinking about the VFI in terms of a variety of different potential characterizations rather than a single characterization is significant because it shifts discussions of the VFI from the dichotomous question “Should the VFI be rejected?” to more complex questions, like “What form(s) of the VFI should be rejected?” or “Is it fruitful to try to develop a form of the VFI that can still be maintained?”

I have argued that this shift in focus has at least two potential benefits. First, it has the potential to soften the oppositional framing that has emerged in the literature on science and values. Rather than creating an “in-group” (those who oppose the VFI) and an “out-group” (those who defend the VFI), my proposed shift portrays everyone as holding one among a multiplicity of different views about the appropriate roles for values in science and the ways they should be limited. Softening the oppositional framing might open up the critics and the defenders of the VFI to consider more nuanced positions among this multiplicity, and it might encourage those uncomfortable with the current framing of the literature to engage more fully in the discussion. Second, this shift in perspective could potentially help to broaden and nuance research on the topic of values and science. By highlighting the ambiguity associated with key concepts, such as what counts as an “internal” component of scientific reasoning or what counts as an “ideal,” this shift encourages new research questions and different ways of thinking about the relationships between values and science

This chapter should also encourage those working on the topic of values and science to consider the contexts in which the VFI serves as a fruitful way of framing the literature on values and science as well as the contexts in which the VFI is more likely to limit or obscure important issues and discussions. Once one begins to think about different ways of characterizing the VFI, it becomes clear that the VFI itself may be more confusing than it is helpful, especially for those outside the philosophical community. The dominant form of the VFI that emerged from philosophical discussions throughout the latter part of the twentieth century was already fairly nuanced and allowed for values to play important roles in science. Given the potential ambiguities associated with the VFI that this chapter has brought to the fore (e.g., what is meant by the “internal” or “core” elements of scientific reasoning, what cognitive attitudes the VFI involves, questions about whether it focuses on individual scientists or on some other group), it is unclear why ongoing discussions of values in science should revolve around this concept. Why not simply acknowledge that values have important roles to play in science—which even the proponents of the traditional VFI should be willing to accept—and proceed to discuss how best to manage values in science? Thus, although I am less likely than Brown (2024) to dismiss the VFI as indefensible, we ultimately come to a fairly similar conclusion, namely, that future work on values and science would do well to focus instead on questions about how best to manage values in science.

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**References**

Alexandrova, A. 2018. Can the science of well-being be objective? *British Journal for the Philosophy of Science* 69: 421-445.

Anderson, E. 1993. *Values in Ethics and Economics.* Cambridge, MA: Harvard University Press.

Anderson, E., 2004. Uses of value judgments in science: A general argument, with lessons from a case study of feminist research on divorce. *Hypatia* 19: 1-24.

Betz, G. 2013. ‘In Defence of the Value Free Ideal’. *European Journal for Philosophy of Science* 3: 207– 220.

Betz, G., 2017. Why the argument from inductive risk doesn’t justify incorporating non-epistemic values in scientific reasoning. In: K. Elliott and D. Steel (eds.), *Current controversies in values and science*, 94-110. New York: Routledge.

Biddle, J., 2013. State of the field: Transient underdetermination and values in science. *Studies in History and Philosophy of Science* 44: 124-133.

Bluhm, R. 2017. ‘Inductive Risk and the Role of Values in Clinical Trials. In: K. Elliott and T. Richards (eds.), *Exploring Inductive Risk: Case Studies of Values in Science,* 193-212.New York: Oxford University Press.

Boulicault, M. and Schroeder, S. 2021. Public trust in science: Exploring the idiosyncrasy-free ideal. In K. Vallier and M. Weber (eds.), *Social Trust: Foundational and Philosophical Issues,* 102-121. London: Routledge.

Brown, M. 2013. Values in science beyond underdetermination and inductive risk. *Philosophy of Science* 80(5): 829-839.

Brown, M. 2015. John Dewey's pragmatist alternative to the belief-acceptance dichotomy. *Studies in History and Philosophy of Science* 53: 62-70.

Brown, M. 2020. *Science and Moral Imagination: A New Ideal for Values in Science.* Pittsburgh: University of Pittsburgh Press.

Brown, M. 2024. For values in science: Assessing recent arguments for the ideal of value-free science. *Synthese* 204: 112.

Crasnow, S. 2024. Feminist perspectives on science. In: E.N. Zalta and U. Nodelman (eds.), The Stanford Encyclopedia of Philosophy (Spring 2024 Edition), forthcoming URL = <https://plato.stanford.edu/archives/spr2024/entries/feminist-science/>.

Currie, A., 2023. Epistemic Engagement, Aesthetic Value, and Scientific Practice. *The British Journal for the Philosophy of Science* 74 (2).

Daston, L. 2022. *Rules: A Short History of What We Live By.* Princeton: Princeton University Press.

Davis-Stober, C.P., Sarafoglou, A., Aczel, B., Chandramouli, S.H., Errington, T.M., Field, S.M., Fishbach, A., Freire, J., Ioannidis, J.P., Oberauer, K. and Pestilli, F. 2025. How can we make sound replication decisions? *Proceedings of the National Academy of Sciences* 122 (5): e2401236121.

de Melo-Martín, I. and Intemann, K., 2016. The risk of using inductive risk to challenge the value-free ideal. *Philosophy of Science* 83(4): 500-520.

DiMarco, M. and Khalifa, K. 2019. Inquiry tickets: Values, pursuit, and underdetermination. *Philosophy of Science* 86(5): 1016-1028.

Douglas, H. 2009. *Science, Policy, and the Value-Free Ideal.* Pittsburgh: University of Pittsburgh Press.

Douglas, H. 2013. ‘The value of cognitive values’. *Philosophy of Science* 80: 796-806.

Douglas, H. 2016. Values in science. In P. Humphreys (ed.), *The Oxford Handbook of Philosophy of Science*, 609-632. New York: Oxford University Press.

Douglas, H. and Branch, T.Y. 2024. The social contract for science and the value-free ideal. *Synthese.*

Douglas, H. and Elliott, K. 2022. ‘Addressing the Reproducibility Crisis: A Response to Hudson’. *Journal of General Philosophy of Science* 53 (2): 201d-209.

Dupré, J. 2007. ‘Fact and Value’. In: H. Kincaid, A. Wylie, and J. Dupré (eds.), *Value-Free Science? Ideals and Illusions,* 27-41. New York: Oxford University Press.

Elabbar, A., 2023. The curatorial view of assessment and the ethics of scientific advice: Beyond decisional autonomy towards distributive epistemic justice. *International Union for the History and Philosophy of Science and Technology (IUHPST)(Essay Prize in the History and Philosophy of Science).* Available online at iuhpst. org/media/pdf/Elabbar\_IUHPST\_Prize\_2023. pdf.

Elliott, K. 2011. *Is a Little Pollution Good for You? Incorporating Societal Values in Environmental Research.* New York: Oxford University Press.

Elliott, K. 2017. *A Tapestry of Values: An Introduction to Values in Science.* New York: Oxford University Press.

Elliott, K. 2022. *Values in Science.* Cambridge: Cambridge University Press.

Elliott, K. and Korf, R. 2024. ‘Values in science: What are values, anyway?’ *European Journal for Philosophy of Science* 14: 53.

Elliott, K. and McKaughan, D.J., 2009. ‘How Values in Scientific Discovery and Pursuit Alter Theory Appraisal’. *Philosophy of Science* 76: 598-611.

Elliott, K. and Willmes, D. 2013. ‘Cognitive Attitudes and Values in Science’. *Philosophy of Science* 80 (Proceedings): 807-817.

Fleisher, W. 2018. Rational endorsement. *Philosophical Studies* 175(10): 2649-2675.

Harvard, S. and Winsberg, E. 2022. The epistemic risk in representation. *Kennedy Institute of Ethics Journal* 32(1): 1-31.

Havstad, J. and Brown, M. 2017. ‘Inductive risk, deferred decisions, and climate science advising’. In: K. Elliott and T. Richards (eds.) *Exploring Inductive Risk: Case Studies of Values in Science*, 101-24. New York: Oxford University Press.

Hicks, D. 2018. Inductive risk and values in science: A comment on de Melo-Martín and Intemann. *Philosophy of Science* 85: 164-174.

Hilligardt, H. 2022. ‘Looking beyond values: The legitimacy of social perspectives, opinions and interests in science’. *European Journal for Philosophy of Science* 12(4): 58.

Holman, B. and Bruner, J. 2017. ‘Experimentation by industrial selection’. *Philosophy of Science* 84: 1008-1019.

Holman, B. and Wilholt, T. 2022. ‘The New Demarcation Problem’. *Studies in History and Philosophy of Science* 91: 211-220.

Hudson, R., 2016. Why we should not reject the value-free ideal of science. *Perspectives on Science* 24(2): 167-191.

Hudson, R. 2021. ‘Should We Strive to Make Science Bias-Free? A Philosophical Assessment of the Reproducibility Crisis’. *Journal for General Philosophy of Science* 52: 389-405.

Intemann, K. 2015. Distinguishing between legitimate and illegitimate values in climate modeling. *European Journal for Philosophy of Science* 5: 217-232.

Intemann, K. 2021. Feminist perspectives on values in science. In S. Crasnow and K. Intemann (eds.), *The Routledge Handbook of Feminist Philosophy of Science*, 201-215. New York: Routledge.

Ivanova, M. 2017. Aesthetic values in science. *Philosophy Compass* 12(10): e12433.

John, S., 2015. Inductive risk and the contexts of communication. *Synthese* 192: 79-96.

John, S. 2025. Weber’s elephant: Rethinking science advice. *British Journal for the Philosophy of Science.*

Kuhn, T. 1977. Objectivity, value judgement, and theory choice. In: T. Kuhn, *The Essential Tension,* 320-329. Chicago: University of Chicago Press.

Lacey, H. 1999. *Is Science Value Free? Values and Scientific Understanding.* New York: Routledge.

Lacey, H. 2017. Distinguishing between cognitive and social values. In: K. Elliott and D. Steel (eds.), *Current Controversies in Values and Science,* 15-30.New York: Routledge.

Laudan, L. 1984. *Science and values: The aims of science and their role in scientific debate*. Berkeley: University of California Press.

Levi, I. 1960. Must the scientist make value judgments? *The Journal of Philosophy* 57 (11): 345-357.

Levy, A. 2025. A (consequence-oriented) critique of the argument from inductive risk. *Philosophical Studies.* Forthcoming.

Lewens, T. 2025. Towards a direct role for values in the heart of science. *Philosophy of Science.* Forthcoming.

Longino, H. 1990. *Science as Social Knowledge.* Princeton: Princeton University Press.

Longino, H. 1996. ‘Cognitive and Non-cognitive Values in Science: Rethinking the Dichotomy’. In L. Hankinson Nelson and J. Nelson (eds.), *Feminism, Science, and the Philosophy of Science.* Boston: Kluwer.

McMullin, E. 1983. ‘Values in Science’. In P. Asquith and T. Nickles (eds.), *PSA 1982,* 3-28. East Lansing: Philosophy of Science Association.

Menon, T. and Stegenga, J. 2023. ‘Sisyphean science: why value freedom is worth pursuing’. *European Journal for Philosophy of Science* 13 (4): 48.

Morgan, G.J. 2013. The value of beauty in theory pursuit: Kuhn, Duhem, and decision theory. *Open Journal of Philosophy* 3(1): 9-14.

Nye, M.J. 2011. *Michael Polanyi and His Generation: Origins of the Social Construction of Science.* Chicago: University of Chicago Press.

O’Connor, C. and Freeborn, D.P.W. 2025. Industrial distraction. *Philosophy of Science.* Forthcoming.

Okruhlik, K. 1994. ‘Gender and the Biological Sciences’. *Canadian Journal of Philosophy* Supplementary vol. 20: 21-42.

Palider, K., Sarwar, A., Barseghyan, H., Patton, P., Da Silva, J., Doppelt, T., Levesley, N., Rapson, J., Shaw, J., Zhang, Y., and Zulfiqar, A. 2021. A diagrammatic notation for visualizing epistemic entities and relations. *Scientonomy: Journal for the Science of Science* 4: 87-139.

Parker, W. 2024. The Epistemic Projection Approach to Values in Science. *Philosophy of Science* 91 (1): 18-36.

Peters, U., 2021. Illegitimate values, onfirmation bias, and Mandevillian cognition in science. *The British Journal for the Philosophy of Science*. 72 (4): 1061-1081.

Philippi, C.L. 2020. Well-ordered science’s basic problem. *Philosophy of Science* 87: 365-375.

Polanyi, M. 1962. ‘The Republic of Science’. *Minerva* 1: 54-73.

Proctor, R. 1991. *Value-Free Science?* Cambridge, MA: Harvard University Press.

Ratti, E. and Russo, F. 2024. Science and values: a two-way direction. *European Journal for Philosophy of Science* 14 (1): 6.

Rooney, P. 2017. ‘The Borderlands Between Epistemic and Non-Epistemic Values’. In K. Elliott and D. Steel (eds.), *Current Controversies in Values and Science,* 31-45. New York: Routledge.

Shaw, J. 2021. Feyerabend, funding, and the freedom of science: The case of traditional Chinese medicine. *European Journal for Philosophy of Science* 11(2): 37.

Shaw, J. 2022. On the very idea of pursuitworthiness. *Studies in History and Philosophy of Science* 91: 103-112.

Shaw, J. and H. Barseghyan. 2019. Problems and Prospects with the Scientonomic Workflow. *Scientonomy: Journal for the Science of Science* 3: 1-14.

Sheykh-Rezaee, H. and H. Bikaraan-Behesht. 2023. Value-Free Ideal Is an Epistemic Ideal: An Objection to the Argument from Inductive Risk. *Principia: An International Journal of Epistemology* 27 (1): 137–63.

Solomon, M. 2001. *Social Empiricism.* Cambridge, MA: MIT Press.

Solomon, M. 2012. Socially responsible science and the unity of values. *Perspectives on Science* 20: 331-338.

Staley, K. 2017. Decisions, decisions: Inductive risk and the Higgs boson. In K. Elliott and T. Richards (eds.), *Exploring Inductive Risk: Case Studies of Values in Science,* 37-55.

Stamenkovic, P., 2024. Straightening the ‘value-laden turn’: minimising the influence of extra-scientific values in science. *Synthese* 203: 20.

Steel, D. 2010. ‘Epistemic values and the argument from inductive risk’. *Philosophy of Science* 77: 14-34.

Stegenga, J. and Menon, T. 2023. The difference-to-inference model for values in science. *Res Philosophica* 100: 423-447.

Ward, Z. 2021. ‘On Value-Laden Science’. *Studies in History and Philosophy of Science* 8*5*: 54-62.

Wilholt, T., 2009. Bias and values in scientific research. *Studies in History and Philosophy of Science* 40(1): 92-101.

Winsberg, E. 2018. *Philosophy and Climate Science.* Cambridge: Cambridge University Press.

Zhao, H. 2022. The nature of values in science: What they are and how they guide. Unpublished manuscript.

1. It is particularly fitting that I am writing this chapter for a book dedicated to Matt Brown because he started me down the path of thinking that it might be fruitful to distinguish different characterizations of the VFI. Matt participated in a workshop that I co-organized on “Cognitive Attitudes and Values in Science” at the University of Notre Dame in 2013. At the workshop, he pointed out that it wasn’t clear whether I was truly abandoning the VFI, given my inclination to limit the influences of social and ethical values to the cognitive attitude of acceptance rather than belief. (See Section 3 of this chapter for further discussion about cognitive attitudes and the VFI.) After reflecting on his question, I concluded that I was in fact abandoning the VFI because I regarded science as a pragmatic enterprise in which scientists are virtually always engaged in accepting claims for the purposes of guiding action, and therefore I regarded social and ethical values as being relevant to the central activities of scientific reasoning. Nevertheless, his questioning helped me to realize that I might be rejecting one characterization of the VFI while holding onto other characterizations of it. This chapter is my attempt to flesh out my long-running thoughts about different ways of formulating the VFI. [↑](#footnote-ref-1)
2. For some of the history leading up to this recent literature on values and science, and especially for the important role that feminist scholarship played in that history, see e.g., Crasnow (2024), Douglas (2016), and Intemann (2021). [↑](#footnote-ref-2)
3. Throughout the paper, I will often refer to “Douglas’s” formulation of the VFI because she developed the canonical formulation of it, but it is important to recognize that she developed this account on the basis of her historical analysis of previous work in the philosophy of science. [↑](#footnote-ref-3)
4. One might argue that there is no need to consider multiple characterizations of the VFI because (at least as Douglas envisioned it) contemporary accounts of the VFI are intended to state the specific view that a group of prominent thinkers held about science during a particular historical period (namely, the 1950s and 1960s). Thus, even if one could, in principle, formulate the VFI in different ways, the only formulation that matters is the one propounded by these influential figures during the mid-twentieth century. There are multiple problems with this argument, however. First, not everyone held the same views about the proper roles for values in science even during the mid-twentieth century. For example, as mentioned later in this paper, some figures held different views than others about the roles that ethical and social values should play in the context of discovery (see e.g., Polanyi 1962). Second, even if Douglas intended to focus on a particular historical characterization of the VFI, others are clearly not committed to interpreting the VFI in that particular way (see e.g., de Melo-Martín and Intemann 2016; Menon and Stegenga 2023); thus, it is important to consider the full variety of ways in which the VFI can be interpreted. [↑](#footnote-ref-4)
5. I’m grateful to Mousa Mohammadian for helping me think through this point. [↑](#footnote-ref-5)
6. One might respond to the fuzziness of the epistemic/non-epistemic distinction by adopting Daniel Steel’s (2010) approach, which defines epistemic values as those that promote the acquisition of true beliefs and non-epistemic values as those that do not. Although this approach creates a clear-cut distinction between epistemic and non-epistemic values, it can leave scientists with uncertainty about which values are genuinely epistemic or non-epistemic in a particular case until they have ultimately determined which beliefs are true or not. (After all, Steel emphasizes that whether or not a value is epistemic can be a contextual matter.) Thus, if the VFI is supposed to be action-guiding for scientists (a point I will discuss later in the paper), Steel’s approach may not provide an adequate basis for formulating it. [↑](#footnote-ref-6)
7. As Rebecca Korf and I note in our paper, this definition may be too broad as it stands because there are such a wide array of causal factors that could influence scientists’ decision making. One way to limit this concept would be to focus only on *psychological* causal factors and not on other sorts of causal factors. For the purposes of this chapter, though, I think it is best not to prejudge precisely which causal factors should count as values. [↑](#footnote-ref-7)
8. It is also worth emphasizing that the nature of the overlaps between these concepts could vary depending on how exactly one interprets them. For example, if one treated criteria for choice and beliefs about what is desirable as causal factors, then our first and third concepts of values would be subsumed as a subset under our second concept of values. However, if one treated criteria for choice and beliefs about what is desirable as reasons, and if one held the metaphysical view that reasons are distinct from causal factors, then our first and third categories of values would not overlap with the second. [↑](#footnote-ref-8)
9. I say that this is dispute is “partly” because different concepts of values are at play. Another crucial part of the dispute is that Hudson seems to think that whenever values affect the statistical standards of evidence for accepting a claim, those values play a biasing role. Douglas and I (2022) strongly resist this claim. [↑](#footnote-ref-9)
10. For example, as noted in an earlier footnote, Dan Hicks characterizes the VFI such that it prohibits values not only from influencing hypothesis acceptance but also from influencing the process of “gathering evidence” (2018, 166)—although one should keep in mind that Hicks is an opponent rather than a proponent of the VFI. [↑](#footnote-ref-10)
11. One might think that when scientific concepts presuppose or incorporate value judgments, inferences involving those concepts would also sometimes presuppose or incorporate value judgments, and thus those values would make a difference to inference. However, Menon and Stegenga (2023) dispute this conclusion and argue that scientific concepts could presuppose values without making a difference to inference. [↑](#footnote-ref-11)
12. One might think that there is no room for debate about whether values should be excluded from pre-determining the results of inquiry, but Uwe Peters (2020) has argued that allowing values to pre-determine inquiry at the level of the individual scientist could still allow inquiry to advance effectively at a social level. Thus, there would be room for genuine debate about whether or not to defend a characterization of the VFI that focused on excluding values from pre-determining the outcome of a scientist’s inquiry. [↑](#footnote-ref-12)
13. Observant readers might note that Ward’s list of four forms of value-ladenness has similarities to the list that Korf and I developed of four concepts of values. However, these lists should not simply be equated. Korf and I intended to develop concepts of what values *are*, whereas Ward focuses on what values can *do* or how they can *relate* to scientific judgments. Perhaps one could argue that different concepts of values arose in part based on the different relationships that can arise between values and other things, but that is a question that goes beyond the scope of this chapter. [↑](#footnote-ref-13)
14. Importantly, Matt Brown (2015) has rejected the belief/acceptance distinction on Deweyian grounds in order to reject this approach to maintaining a form of the VFI. [↑](#footnote-ref-14)
15. I thank Jacob Stegenga for helping me to clarify this objection. [↑](#footnote-ref-15)
16. Although I am blurring the distinction between the “internal” and “external” aspects of scientific reasoning by focusing on different scientific activities that could be either internal or external, one could also draw on the cognitive attitudes mentioned in the preceding paragraph to blur the internal/external distinction. For example, one might think that the attitude of acceptance counts as an internal aspect of scientific reasoning, whereas the attitude of pursuit counts as an external aspect of scientific reasoning. However, it is not clear that these attitudes are cleanly distinguished in published journal articles, thereby generating confusion about whether the activities described in those articles count as internal or external aspects of scientific reasoning (see e.g., Davis-Stober et al. 2025; Shaw and Barseghyan 2019). I am grateful to Jamie Shaw for sharing this insight with me. [↑](#footnote-ref-16)
17. For example, Dan Hicks appears to interpret the “traditional” VFI such that it prohibits values from influencing the process of “gathering evidence” (2018, 166), but it is not clear that this activity should actually be classified as “internal” to scientific reasoning, given that gathering evidence seems similar to selecting research questions or deciding what to study. [↑](#footnote-ref-17)