Evaluation and Value Management in Science

by

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I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

The nature of values has been an ongoing topic of discussion in philosophy, particularly in ethics. However, as the issue of how values should play a role in science has become more prominent, the discussion has not always paid due emphasis on clarifying the nature of values as perhaps it should have been. With the rise of arguments against the value-free ideal there has been an emergence of multiple accounts which aim to explain how values can be used in science while maintaining scientific integrity. I term these complex of approaches "value management." Value management as a normative idea stems from the notion that somehow values represent some kind of threat to the integrity of science, even if how exactly they present a threat is not clear. What values are, and how they are problematic isn't always explicit and there is no obvious definition of the term that is shared by philosophers of science. Competing visions of what values should play a role in science, and how they should play a role, may lack justification or be talking past one another if they do not share the same concept of value.

To address this, I argue that there needs to be a more precise articulation of what values are, and that once we develop a nuanced account of value, many of the concerns that value management accounts respond to change or disappear. Looking to some historical and modern discussions of values and valuation, I show that there are accounts of value that are compatible with scientific thinking as judgments of practice which emphasize problem-solving and the relationship between events rather than reducing to mere desire. I argue that once we focus on values as verifiable judgments of practice, they are actually a source of scientific integrity and that our attention should focus on how values are experimentally formed through the process of inquiry. My analysis reveals that science is a complex and highly developed form of value judgment and that consideration of what makes value judgments successful is the key to ensuring that science can maintain integrity despite the use of various scientific, ethical, and social factors playing a role in the outcome of a scientific judgment.

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Dedicated to Samantha who supported me
and makes me aspire to be a better
thinker and a better person.

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Chapter 1: Conceptions of Value and Normative Approaches to Values in Science

The problem of the place that values should play in science has been a contentious one for some time. Throughout much of the 20th century, the standard view in philosophy of science was the value-free ideal: the view that social and political values should have no influence over the reasoning of scientists, and that scientists should not concern themselves with such values (Douglas 2009, 1). In the last few decades, there has been an emergence of philosophical works that argue against this ideal. If we accept that values need to or should play a role in the process of scientific inquiry, then what role should they play? It is this normative epistemic concern that has encouraged various accounts of ways in which values should play a role in scientific inquiry and how to choose what values should play a role, all the while maintaining some claim towards scientific objectivity. My focus will not be on those arguments against the value-free ideal specifically, but what is suggested as a replacement ideal regarding how values should play a role in scientific reasoning. There are now numerous accounts that detail normative criteria regarding the place for values in science, but what concerns me is how each account conceives of what a value is. There is historical precedent in the debates of philosophy of science that suggests that concerns about the use of values in science has as much to do with what a value is taken to be as it does about the importance of maintaining scientific objectivity. In fact, what objectivity is taken to consist of may involve implicit assumptions about what it means to value.

In addressing the matter of what role values should play in science, I will argue that more precision in discussion of value and valuation is necessary in the science and values literature. It is necessary because there are competing visions of how values should play a role in science. To see why, consider a situation described by Helen Longino whereby competing theories can share common experiences and common meanings, and common modes of measurement, but a subject

can be multiply characterized and measured owing to differing background beliefs which can lead to incompatible and yet empirically incomparable findings (Longino: 2013, 2014). Now, imagine two competing normative accounts of values in science. The proponent of the first account argues that values should be limited in some form (however you may wish to imagine this) in conducting scientific inquiry, while the proponent of the second account argues that values should not be as limited in their use.

Proponents of each account may observe and agree on certain phenomena recorded within a given scientific inquiry: the scientist(s) had certain motivations, made certain judgments, expressed certain desires, feelings, or interests, and so on. The proponent of the first account notes the mere invocation of a feeling and concludes that a certain value was used and thus determines that the inquiry, by using such values, was poorly conducted. The proponent of the second account observes that certain interactions took place among the feelings, interests, and desires resulting in a value *being formed* and concludes that the inquiry was conducted properly.

Why would one side conclude that the inquiry was done properly while the other concludes that it wasn't? After all, both sides observed and recorded the same phenomena. The difference arises because despite each agreeing on their observations, both attended to different aspects of the inquiry. The proponent of the first account examines the mere invocation of a feeling and concludes that a value is being used. The proponent of the second account focusses on the interactions of feelings, interests, reasons, and desires and concludes that a value is being used; however, the mere invocation of a feeling would be insufficient to be considered a value according to them. While arguing about the roles that values do, can, and should play in inquiry, neither seems to understand that they don't agree on what a value is. The proponent of the first account doesn't believe that reason plays any role in valuing, it only provides the means of attaining what

is valued; for them the value just is the feeling. The proponent of the second account believes that value is a product of the way feelings, interests, desires, and reasons interact. The two may not even agree what the value being used is, or how it is being used. They are talking past one another until they adopt the other's conception of value.[1] For example, in Chapter 4 (4.6) I discuss a disagreement between Heather Douglas and Janet Kourany regarding how values should be used where each presumes something different by the concept of value and this presumption affects whether they consider value usage in certain cases to be problematic.

In the following pages, I will argue that a more precise conception of value will help clarify discussions of the roles for values in science. Proper evaluation of any normative account of managing values in science requires a clear conception of what a value is. It is possible to articulate such a conception of value that will clarify the discussion by presenting a nuanced understanding of how values come about and remains consistent with scientific thinking such that they are in principle verifiable. With such a model of valuation in place, we can evaluate existing normative accounts to demonstrate why it is important to be precise about what account of value is being made and how doing so can clarify discussion of normative accounts of values in science. Finally, using this conception of valuation I will suggest new methods for generating and testing normative proposals for resolving problematic issues involving scientific objectivity and values.

1.1. Background: Value Management

In recent decades, philosophers of science have paid increasing attention to the role that values play in science. In addition to feminist critics of science and sociologists of science who argue that scientists employ many kinds of values in their research, philosophers have begun reconsidering the largely standard view in the field: the value-free ideal. Heather Douglas (2009),

[1] I am not suggesting that actual philosophers subscribe to the position just discussed.

Helen Longino (1990; 2002), Philip Kitcher (2001; 2011), and Janet Kourany (2010) have challenged the ideal of value free science, arguing that values do play a role in science, and offered elaborations of *how* they should play a role.

In abandoning the value free ideal, philosophers have shifted towards articulating their own normative accounts of science to describe what good science looks like when values are being used by scientists in conducting their inquiries. While the word "ideal" has sometimes been attached to such accounts, I prefer to avoid the term due to its ambiguity. It can connote an end-in-itself, or an idea of perfection which may not be attainable. In the literature, it can sometimes also merely mean a heuristic that specifies certain minimal criteria. Thus, I will use the term normative account where possible, unless an account is specifically identified with the word.

In presenting such normative accounts, each philosopher tends to gravitate towards questions of, and prescriptions for, how to "deal" with values that may play a role in science. This complex of approaches is what I will call "value management."[2] Value management is a response to two basic questions: the first asks, given that values play a role in science, what kinds of values should we adopt? The second question asks, given that values need to play a role, how can we maintain some sense of scientific objectivity or integrity?

It is important to note that questions about value management arise because, even amongst those who argue that values are not only necessary but desired in scientific practice, the issue of values and valuation nonetheless seems to present problems for science. These problems can be formulated in the two questions mentioned. Furthermore, they are ongoing problems for scientific

[2] Kourany has called Longino's work the "social value management ideal" (Kourany 2010, 58; Longino 2002, 50), but my use of value management is slightly different. The concept of value management aims to capture what the project of all value ideals or normative accounts attempt to do, and so isn't specifically about Longino's approach to dealing with values. It more broadly captures an issue that Kourany focusses on, that is epistemic and social success concerns with reference to the role, use, and selection of values in the process of scientific inquiry.

practice. Science and its relationship to society and what it values is dynamic and changes over time, preventing any kind of once-and-for-all-time solution. The value-free ideal avoids the problem by arguing against the inclusion of values, at least in the justification of scientific claims, in the first place,[3] but since this option is not available to those who believe values need to be included, and since the problem is ongoing, the problems cannot be cured but can be mitigated by appropriately managing it; the same way one may manage chronic medical symptoms. The result is that value management accounts create rules or norms that direct us to resolve the problematic aspect of using values in science: they aim to determine what values to adopt and how they should be used.

In the remainder of this section, I survey four influential approaches to value management.

1.1.2 Helen Longino

Helen Longino's approach to value management focusses on intersubjective criticism (Longino 1990, 71). She argues that there is a gap between a given state of affairs (such as the level of mercury in a glass tube) and the hypothesis for which it is taken as evidence of. This gap is filled by background assumptions which allow us to take a given state of affairs as evidence for a hypothesis since they stipulate some regularity or relation. For example, red spots may be taken as evidence that I have the measles because of my belief that red spots are a symptom of the measles (1990, 41). Different background assumptions allow us to attend to different aspects of the same state of affairs to use as evidence for conflicting hypotheses (1990, 43). Because of this, where we have choices between background assumptions, and where there is no independent justification for the adoption of one over another, any decision is a product of a value, and there is a risk that theory choice will be driven by subjective preferences (1990, 61).

[3] This is a simplistic understanding of the value-free ideal in that it suggests that there are no values employed at all. Values may be used in deciding what research projects to engage in, and epistemic values can be used as well. For my purposes here, the simplification will suffice.

Longino argues that values can be managed to the degree to which they are subject to, and survive from, a process of transformative criticism from an epistemic community. In other words, values are acceptable to the degree that they are capable of surviving the critical processes she prescribes. In terms of value choice, Longino prefers certain kinds of values that are compatible with feminist science (1990, 1996) but she does not specify particular kinds of values *a priori* that we could rule out as unacceptable unless they are incapable of surviving criticism. It is only through the process of surviving such criticism that a value can be transformed from subjective into objective (Longino 2002, 129).

Longino's emphasis on criticism implies a community of inquirers to do the criticizing. She prescribes certain norms to govern such processes of transformative criticism including: open and recognized venues, uptake of criticism, public standards for discussion and criticism, and tempered equality (Longino 1990, 2002). While such standards would be those adopted by an ideal scientific community, we can still recognize that objectivity is a matter of degree and that science can remain objective to the degree that the community satisfies such norms (Longino 2002, 134).

Her recommended process aims to reduce arbitrariness and individual preferences and idiosyncrasies. Objectivity in science is thus maintained to the degree to which any background assumptions adopted based on a value is subject to control (Longino 1990, 74). Thus, the process of transformative criticism not only preserves the integrity of science, but determines which values to employ, thus answering the two questions that approaches to value management attempt to answer.

1.1.3 Heather Douglas

Heather Douglas presents a normative account for science that aims to accept a role for social and ethical values while protecting the integrity of science (Douglas 2009, 1). Focussing on the question of general moral responsibility and the authority of science, Douglas argues that science

(and scientists) should be concerned about and adopt values that ensure that they consider the consequences of potential error in their work and the risks to the public; that they should adopt values that allow for ethical research; and, more generally when it comes to issues of science and society (on matters like influence over public policy, public funding, etc.), that they should adopt values that allow for democratic accountability. On Douglas's account this need for values is not merely an unfortunate affair for in many cases we want scientists to be responsible in providing advice and engaging in ethically sound research. Thus, not only is the value free-ideal untenable, it is not desirable (2009, 85).

In rejecting the value-free ideal, Douglas pivots to the concern about what role values should play in science. She notes that, "the inclusion of social and ethical values in scientific reasoning seems to threaten scientific objectivity" (2009, 115). Thus, she recognizes the problematic nature of values that value management accounts aim to address. In response to concerns about the integrity of science given the influence of values, Douglas articulates a new normative account concerning values in science that focusses on the roles that values can play at different stages of inquiry (2009, 87). Values can play a direct role where they provide reasons that motivate our choices, and they can play an indirect role by determining the benchmark for how much evidence is sufficient to accept a hypothesis. Scientific integrity can be preserved so long as values only play a direct role at certain stages of inquiry, while values can play an indirect role at any stage (2009, 88).

Douglas supplements her account with a list of seven different forms of objectivity, occurring across the contexts of world interactions in inquiry, individual thought processes, and social processes. She argues that these forms of objectivity are conceptually distinct and not reducible to each other (2009, 132). By drawing attention to the different ways that objectivity can

be manifested, Douglas demonstrates that different forms of objectivity have their strengths and weaknesses, determining objectivity in specific contexts requires that we pay close attention to whether particular claims have certain desired forms of objectivity, and that objectivity has different functions within a given inquiry. Objectivity is thus possible even without the value-free ideal. Thus, Douglas emphasizes the need for objectivity in science, while her concern about the consequences of error draw attention to how we should determine what values to adopt.

1.1.4 Janet Kourany

Janet Kourany argues for an approach to value management which she refers to as the ideal of socially responsible science, arguing that given science's influence in, and dependence on, society, science should be an ally for equality and should include egalitarian values (Kourany 2010, 13-4). Historically, in exposing prejudices, science has served as an ally in the struggle for equality for women. However, it has also done much to perpetuate the problems of women such as attempting to prove their intellectual, social, and moral inferiority (2010, 4-12). Similarly, science can aid in the well-being of those of different races, ethnicities, sexual orientations, abilities, and other social justice matters, but it has also done harm to those groups. Thus, she argues that science should be an ally for equality since society is deeply affected by science and since society pays for science through taxes and consumer spending.

In contrast to traditional philosophy of science which primarily concerns itself with epistemic issues, she argues that a socially responsible science should raise questions that make the egalitarian ideals of human flourishing central. This affects not only evaluation of scientific programs in terms of what questions to pursue and how should scientific communities be organized, but also evaluations of research itself (2010, 15). Because of the kinds of questions that socially responsible science asks – like "should research of interest and benefit to women be prioritized?" or "Should ways of evaluating scientific research be adopted that favor egalitarian

views?" – it is obviously concerned about whether social values belong in science and whether science should be value free. The need for values in science is owing to the untenability of the value-free ideal. While she notes that the ideal has been considered promising for its potential to root out sexist and androcentric values, there is concern that it is not a viable idea for actual science (2010, 55). Also, feminist science seems more adequate and objective, yet was also shaped directly by feminist values. The idea that the value-free ideal would hold that such science is subjective is problematic, and thus, Kourany urges for a more adequate account of understanding scientific objectivity that is better equipped than the value-free ideal to deal with problems of sexism and androcentrism in science. Thus, an alternative conception of objectivity must account for how to achieve objective science while also providing a way to achieve social reform (2010, 57).

Socially responsible science requires rooting out sexist and androcentric values and replacing them with egalitarian ones that respond to the justice-related needs of society; scientific success must be defined in terms of social success that emphasizes human flourishing (2010, 68). Using the example of Carolyn West's research as a program controlled by sound social values but "equally controlled through and through by sound epistemic values" (2010, 70), she argues that this ideal can maintain objectivity. Kourany suggests that a scientist can maintain objectivity (an epistemic goal) by ensuring that social objectives are prioritized "as far as empirically possible," or in other words, the explanations, hypotheses, and methods used should be those that promote (or at least do not inhibit) egalitarianism unless and until they can be demonstrated to be false or unworkable for the research project as the empirical findings no longer make entertaining them reasonable. Egalitarian aims are not guaranteed to be successful (2010, 72). Research is to be judged by both social and epistemic standards, and importantly, a scientist cannot fulfil their social objectives if they do not fulfil their epistemic objectives (2010, 71).

1.1.5 Philip Kitcher

Philip Kitcher has argued for the inclusion of values within science, believing that there is need for value judgments within scientific practice. Even if science doesn't aim at being immediately applicable in terms of our well-being, certain projects may be chosen for their ability to play a role in future investigations or because it aids in the development of tools for further experimentation. All these assessments require judgments of value (Kitcher 2011, 31). While this is relevant to choosing projects, value judgments are part of the practice of inquiry itself because scientists need to make decisions about proceeding from one step of inquiry to another (2011, 34).

Kitcher also focusses on the relationship between science and society. Science does not aim to discover any kind of truth, but rather significant truths (Kitcher 2001, 65). Kitcher argues against the idea that science can always be thought of as being pursued for its own sake. We don't investigate all phenomena, only certain phenomena that is epistemically significant (Kitcher 2001, 66; Kitcher 2011, 31). What we find significant determines not only what projects to investigate, but also how we categorize the phenomena that is studied which thus provides us with different representations of reality (Kitcher 2001, 47). If what is epistemically significant is context-independent, then science could be isolated from social and moral values. However, Kitcher rejects that such a conception of epistemic significance can be found, thus he takes, "moral and social values to be intrinsic to the practices of the sciences" (2001, 65).

Science is affected by and affects society around it, meaning that science must address matters of the collective good. Kitcher uses the notion of a well-ordered science to consider the kinds of values that science should adopt. Since science studies what is significant, and since science affects society, society should have some input into what counts as significant. The ideal of a well-ordered science is supposed to capture public input to determine what are the aims of society (2010, 122-5). In recent years, however, Kitcher has amended his views by including an

account of valuation and "the ethical project" (Kitcher 2011b). In *Science in a Democratic Society,* he provides an account of valuation as a process of mutual engagement requiring ideal deliberation when it comes to value disagreements (Kitcher 2011, 50). The values that scientists should adopt are those that would be agreed upon by deliberators under such circumstances. Additionally, he sees the potential for value verification and ethical progress to protect the integrity of science. He explains, "Broad schemes of values can play a legitimate role in scientific practice, but they are required to be sustainable in an ideal situation" (2011, 59).

1.1.6 Summary

To summarize, four separate accounts of value management have just been examined regarding how they try to answer two questions: How do we determine what values to use? And, how do we ensure objectivity is maintained? For Longino, the answer to both questions is reflected in the idea of transformative social criticism and the limitation of idiosyncratic value use. For Douglas, the values to be adopted are the ones that permit ethical research and democratic accountability, and to maintain objectivity values should only play an indirect role in determining theory choice at certain stages of inquiry. For Kourany, the values that ought to be adopted are those that would be part of a socially responsible science. Objectivity is to be ensured by requiring both social and epistemic success in theory choice. For Kitcher, the values to be adopted are those that would address the public good, and objectivity would be ensured to the degree that values are formed by what would take place under ideal conditions of moral deliberation.

1.2. Conceptions of Values and Value Management

The accounts just provided are broad overviews. Eventually each will be addressed in greater detail, but for now these overviews provide examples of what I mean by value management. These four different accounts of value management have all yielded different answers in terms of what values to adopt and how to maintain objectivity or integrity in science once values are included.

Each is concerned about what to do or not to do about values, and each has slightly different emphases and goals: for example, Longino wants diversity in epistemic communities to keep idiosyncrasies in check, Douglas wants to avoid having values override evidence as a reason to accept a conclusion, Kourany wants to not only ensure that certain preferred values are included but also that specific values be excluded, while Kitcher wants to promote human flourishing and maintain altruistic tendencies in keeping with the ethical project.

Each account emphasizes different approaches and different aims. However, I believe that the account that each provides, and its relative emphases are in part informed by how each conceives of what a value is. Examining what each takes a value to be when it recommends how to manage values can not only provide insight into whatever problem their account seeks to redress, but it also suggests the importance of determining how we ought to think about values if any account of value management in science is to be justified.

In other words, how one conceives of a value may motivate the kinds of concerns that one may have as they discuss the role values ought to play in science. Some philosophers have noted this issue. Kitcher has taken note of the concern that "value judgments are subject to no standards at all, that valuing is a matter of taste" and this can affect answers to how we think about their place in science (Kitcher 2011, 39). Matthew J. Brown has criticized the position of the lexical priority of evidence over values, arguing that it "reduces the idea of value judgment to merely preferences rather than judgment properly so-called" (Brown 2013, 836). The idea that different conceptions of what a value is can affect what form an argument takes raises several questions. Is a value more than a mere preference? Do various proposed normative accounts of value management in science presuppose a conception of what a value is? Does changing that conception affect how we evaluate that normative account? Can we settle upon a conception of value as

something more than a mere preference; one that allows us to verify them with evidence, suggest some are better than others, one that provides a means to determine what values to adopt in an objective way? Would such a conception allow us not only to determine what values to adopt but ensure that objectivity in science can be ensured? To demonstrate that competing conceptions of what a value is can in part determine positions about what roles values ought to play in science, and how they should play such roles, I will next turn to conceptions of value that have affected historical discussions about values in science.

1.3. Historical Approaches to Values and Values in Science

Much of the analysis of early accounts of value and their role in the values in science debate I will discuss comes from Robert N. Proctor. Historically, the concern about values and knowledge was less problematic because according to the ancient Greek conception, values were a part of the world itself. According to the Aristotelian conception of the universe, all things moved towards natural ends and so everything moved towards what it ought to be (Proctor 1991, 39). With the development of modern-day science and the rejection of the teleological worldview came the idea of a mechanical universe that operates according to geometrical, Euclidean principles. The effect of this was a reconceived notion of what a value is as it no longer had a place in a mechanical universe (Dewey 1929, 95-6). So long as what was ultimately real were physical descriptions of size, shape and motion, values could not be ultimately real and were thus relegated to the category of secondary qualities. So long as the notion of moral values as fixed ideals (as the ancient conception had held) was retained, values would necessarily be distinct from natural science (Dewey 1922, 224).

A further effect of the scientific revolution was a revolution in views about values (Proctor 1991, 40). Hobbes, for instance, argued that values do not lie in the structure of the world, but are produced by humans (Hobbes 1962, 48). The different desires, passions, and feelings were

dependent upon humans; the judgment that a thing was good was nothing more than an expression of feeling (Proctor 1991, 44). Hume was also key to this change in the conception of value. He argued that moral claims are not susceptible of truth values because truth requires agreement with fact, while morality is not capable of this, thus morality cannot be an object of scientific study. When we examine certain cases, examining the facts will do no good. When it comes to morality, "You never can find it, till you turn your reflection into your own breast, and find a sentiment of disapprobation, which arises in you, towards this action. Here is a matter of fact; but 'tis the object of feeling, not of reason" (Hume 2000, 301). This shift in conception of value, or rather the adoption of a new "ethical ontology" had the effect of excluding values from science (Proctor 1991, 53). Science would have no business studying morality outside of sociology, anthropology, and psychology, and value claims had no business in determining facts or truths. The exclusion of values from scientific investigation was also a compromise with religious and political officials, creating a clear separation between facts and values (Proctor 1991, 38; Nelson 1990, 305).

The distinction between primary and secondary qualities in the 17th and 18th centuries was used to defend the idea of the exclusion of values from science since values as expressions of desires or passions were subjective (Proctor 1991, 62). By contrast, instead of conceiving of values as subjective and mental, there were those who took the nature of values to be something that had to remain fixed and absolute: there is a certain nobility to values that would be sullied by scientific study of them. Science needed to remain value free so that values could remain science free (1991, 8). This mode of thinking continued into the 19th century and early 20th century when the formation of social sciences sparked a debate about whether values ought to be part of scientific thinking. One such debate occurred regarding whether science should work for the betterment of the nation or whether it should be politically neutral.

Those, such as Werner Sombart, who argued in favor of neutrality in science in this debate did so on the basis that values are subjective. Social science could only be objective in so far as it excluded judgments of value (1991, 91). According to this view values were a source of bias, and a hindrance to objective knowledge (1991, 88). There were those who argued in favor of the use of values, for instance by interpreting "productivity" to include moral as well as empirical judgments to determine to what degree the well-being of people is served by economic activities. Their defence rested on the idea that values were objective forms of knowledge. Oscar Engländer argued that the search for universal, objective, and ultimate values was a legitimate task for economic science (1991, 90). Those who opposed the value-free ideal believed that values were objective, and that science could be used to improve valuation (1991, 97).

In the 20th century, the logical positivists mostly espoused a non-cognitivist account of ethics, holding that values were not verifiable. Yet unlike those who earlier had argued for value-neutrality on the basis of non-cognitivism, in the 1940s logical empiricists in the Unity of Science movement were motivated by issues involving science and society and did not advocate for value neutrality in science. In 1934, Rudolf Carnap argued that moral claims are disguised imperatives. While "killing is evil" has the grammatical form of an assertive or representative proposition, it is in fact an imperative rule. It is this confusion which has led philosophers to believe that such statements are either true or false (Carnap 1935, 24). A claim like "killing is evil" is merely an expression of a wish. From such a statement, we cannot deduce any proposition about future experiences and thus it is not verifiable and has no theoretical content (Carnap 1934, 5).

Later, Carnap admitted that certain statements about values are factual statements; these included the psychological, historical, and sociological study of values, as well as statements about means-ends relationships and use (Carnap 1963, 999). However, Carnap argues that in any value

statement, eventually one could find a pure "optative" or wish component that had no cognitive meaning (Mormann 2005, 140). A sentence like "let us take road a rather than road b" must be a pure optative because such an utterance doesn't imply any reasons for its adoption (for example, that one road is shorter than the other) (Carnap 1963, 1002). Carnap's non-cognitivism was based on a strict distinction between the practical and the theoretical which can be divided into two different kinds of questions. Internal questions are theoretical matters for science and can be tested empirically, while external questions are practical. Carnap makes it clear that the decision to use a framework for inquiry is an external question and as a practical question it is "although itself not of a cognitive nature, will nevertheless usually be influenced by theoretical knowledge" (Carnap [1956]2011, 251).

Otto Neurath was also a non-cognitivist. He believed that values arise from human wants. In an analysis of ethics, he notes that "if all metaphysical elements are removed from ethics […] then what remains is only either statements about certain ways of behavior of men, or their commands to other men" (Neurath 1931[1983], 81). He distinguished between unconditional and conditional value statements. The unconditional statements express "subjective opinions" which can be accepted as data, while conditional statements are empirical testable assertions regarding the appropriateness of a given means toward a given end (Cartwright et al 2008, 113). However, he dismissed any reference to 'ought' statements as found in ethics. For Neurath, "what sets unconditional values and fixes the final ends of human action is will—conation, not cognition" (2008, 132). Any use of fixed ends lies outside of science and are instead matters of the "social will" of those concerned.

These are only two outlines of value shared by some of the logical empiricists, but their non-cognitivist approach to value did not prevent either Carnap or Neurath from accepting the use

of values in science. For instance, Neurath believed that when theory choice was underdetermined by logic and evidence, then social and political reasons should play a role in theory choice (Howard 2003, 43). Carnap could allow for the use of values when it came to determination of answers to external questions about what frameworks to adopt, and that these matters could in some cases be determined by convention (Carnap 1936; 1937).[4] Further, logical empiricists within the Unity of Science movement argued that their job should be to provide institutional support for unified sciences, to build a rapport with the public, to use the new logic to clarify scientific thinking, and to clarify the humanitarian goals they shared over regressive, or conservative philosophies which sought to set limits on scientific thought (Richardson 2007, 303).

While the logical empiricists insisted that there cannot be value judgments, the American pragmatists insisted that science was impossible without verifiable value judgments (Silk 2018, 109). The pragmatists fought a long battle with non-cognitivism; believing not only that values were objective, but that values had a place in science and science had a place in resolving value disputes (Proctor 1991, 177). John Dewey (1903; 1915; 1938; 1939) spent years articulating a theory of valuation and argued that values were inherently part of any form of inquiry as inquiry is a form of practice, and that all judgment is a judgment of value (MW8: 23). C.I. Lewis argued for a similar position (Lewis 1941), insisting that knowledge, action, and evaluation are essentially connected (Lewis 1946, 1). The pragmatists took their conception of values to mean that values had a necessary and inherent part of all scientific inquiry. Further, this conception of value not only meant that values are needed for science, but that science had a responsibility to improve social conflicts by improving our capacity to value by replacing dogmatic impulses and instilling a scientific attitude. As Dewey notes:

[4] Note that Carnap contrasts convention with objectivity.

> If [science] is incapable of developing moral techniques which will also determine these relations, the split in modern culture goes so deep that not only democracy but all civilized values are doomed. […] A culture which permits science to destroy traditional values but which distrusts its power to create new ones is a culture which is destroying itself (LW 13, 171-2).[5]

Thus, the pragmatists see science as having ethical responsibilities that are in some ways similar to what the logical empiricists advocated for, but in other ways are quite different.

During the Cold War, many within the logical empiricist camp began to advocate for value neutrality. George Reisch (2007) has argued that pre-1950 scientific philosophy was concerned with society and values, but later transformed itself into a philosophy of science that was only concerned with logical and epistemic concerns. There was also a recognition of the need to "soften the rhetoric of *Wissenschaftliche Philosophie* and become Philosophers of Science" (Giere 1999, 222). This was due to the Cold War politics of anti-communism and McCarthyism. The political pressures of the 1950s led to the transformation of logical empiricism from a politically engaged movement to one that shed its cultural and social engagements (Reisch 2007, 6). It is noteworthy that this change in logical empiricism was a way to adapt to the new political climate: for the movement to "grow and thrive in the age of the Red menace, [it] would have to appear […] free of ideological contamination" (2007, 355).

By the 1950s there was a growing sense that logical empiricism espoused non-cognitivism and that normative claims were not to be included within philosophy of science. In 1951 Hans Reichenbach articulated an account of values as something volitional and subjective and based on self-justifying axioms which are not testable (2007, 356). Only ethical implications and not basic

[5] John Dewey, The Collected Works, 1882–1953 spans thirty-seven volumes which are grouped into the following sets: The Early Works, The Middle Works, and The Later Works. References to the Collected Works in this Dissertation will indicate the year; whether it is noted from his Early Works (EW), Middle Works (MW), or Later Works (LW); and the volume number within that grouping of his Works, followed by the relevant page number(s) in the volume.

axioms were testable and thus capable of logical proof. Herbert Feigl adopted Reichenbach's axiomatic account of values to argue for the isolation of values from philosophy of science. In other words, it wasn't just that values were subjective, but that they now were believed to have no logical justification (2007, 362). Eventually, Hans Reichenbach's distinction between the context of discovery and the context of justification provided for the claim that the epistemic value of scientific theories lies with their relationship between logical relations and evidence, and that politics and values are not relevant to science (2007, 355).

The differing conceptions of values between the logical empiricists and the pragmatists would affect how each theory could respond to Cold War pressures. Notably, while some logical empiricists argued for the inclusion of political aims within science, their non-cognitivist views meant that their aims were not justified by their conception of science. As Reisch explains, "The scientific world conception did not need logical justification because it was already, as an empirical fact, alive and poised to dominate modernity" (2007, 378). According to Feigl, the embrace of values that aim at social improvement were indirectly adopted since science could not justify them (2007, 360). Because the values espoused by the Unity of Science movement was not justified by science, it may have been easier to give those up to transition to an apolitical stance that seemed necessary during the Cold War. Carnap, for instance, adopted the approach of keeping his political preferences and scientific philosophy apart given that they were two different kinds of enterprises (Mormann 2007, 131; Reisch 2007, 382).

Ronald Giere has attempted to explain the decline of social engagement amongst logical empiricists, arguing that the intellectual thinking of the logical empiricists in Europe was not continuous with the later thinking in North America (Giere 1991, 218). Giere notes that in Europe they were just as radical as the pragmatists, "But these facts were left buried in the past. Once in

America, the Logical Empiricist philosophers of science pretty much stuck to their Ps and Qs" (1991, 233).

For the pragmatists however, elimination of values was more problematic. Because valuation is inherently part of their conception of inquiry, they could not give up discussion of values as easily. For Morris and Lewis there was "the fear that a too restrictive meaning criterion might transform some areas of philosophy they took as essential into meaningless topics. These areas include ethics" (Limbeck-Lilienau 2012, 91). Dropping social concerns for pragmatism was more problematic as social context drives inquiry and inquiry aims at melioration, and thus social values and concerns play an inherently stronger role; they could not be dropped.

What we can conclude from the history of 20th century philosophy of science is that competing conceptions of values would lead to different conclusions about how science should be conducted. For the pragmatists, an empirical cognitivist conception of values meant that it was science's business to improve valuation in social and political relations. While earlier logical empiricists shared the idea that science should benefit society, as just discussed, their justification for this claim was different. Further, while they did leave room for values to play a role in scientific inquiry itself, what function they were to play differed. For Neurath, values were used only where evidence was insufficient to provide an answer. He thus adopted what Brown calls the lexical priority of evidence over values (Brown 2013, 830). For Carnap, values were only used for external questions where evidence couldn't determine an answer. This stands in contrast to the pragmatists, for whom such divisions between evidence and values were untenable; their conception of values influenced a completely different understanding of experience, evidence, and science (Silk 2018, 90). Eventually, during the Cold War many logical empiricists not only abandoned the social and

political goals of the Unity of Science movement, but also used the axiomatic conception of values to argue for the exclusion of values from science altogether to advocate for the value-free ideal.

Thus, by the second half of the 20th century we see a dispute between some logical positivists who would eventually support the value-free ideal on the basis of a non-cognitivist conception of value during the Cold War, and the pragmatists who rejected the value-free ideal on the basis of their cognitivist position. Clearly then, differing conceptions of value can and have affected differing normative accounts concerning values in science. While not every logical empiricist supported the value free ideal, clearly non-cognitivist conceptions of values were used to argue in favor of either the limitation or exclusion of values. In addition, the pragmatists' conception of values meant that values were not only important but necessary for successful science. Thus, when we examine the historical debates arising after the fall of teleology, we clearly see that different conceptions of values can influence different accounts of value management. Even in more recent years, philosophers have drawn attention to the possibility that values may not be subjective to argue that values need not be a threat to objectivity (Kuhn 1977, 335; Intemann 2001, S513; Brown 2013, 836).

1.4. "Scientific Values" and Science

The previous section has established that it is at least plausible that differing conceptions of values played a role in how philosophers of science have historically argued for or against the inclusion of values in science. This raises the question as to what kind of conception of value might be appropriate if values are going to be used in science. Unlike debates in the 19th century, when those who believed in objective values often argued on the basis of a reductionist account espoused by Bentham, or a Kantian conception of universal reason, the pragmatists and other 20th century philosophers attempted to draft more nuanced and scientific approaches to value and valuation consistent with developments in experimental thinking.

Scientific philosophers[6] like Richard Rudner urged for the development of a "science of ethics." He argued that values needed to play a role in science, and since "scientific method intrinsically requires the making of decisions" (Rudner 1953, 6), to pretend as if we don't make evaluations will not lead to objectivity. His concerns warranted a "radical reworking of the ideal of scientific objectivity" and the view "that a science of ethics is a necessary requirement if science's progress towards objectivity is to be continuous" (1953, 6). Meanwhile, other philosophers such as Abraham Edel (1961) and the Columbia naturalists including John Herman Randall Jr, Herbert W. Schneider, Irwin Edman, Horace L Friess, and James Gutmann (Jewett, 2011) explored a scientific and naturalistic approach to ethics and values. The account to be developed in this dissertation will be consistent with such a naturalistic science of ethics because such a "science of ethics" will be continuous with scientific methods.

According to Owen Flanagan, naturalistic ethics specifically rejects the use of the supernatural or relying on rationales for moral claims based on a priori dictates of a faculty of pure reason (Flanagan 1996, 120). Indeed, the methodological commitments of naturalistic ethics include the fact that any claim cannot be shielded from empirical testing, and that there can be no sharp distinction between moral investigations and those in other disciplines; in other words, ethical science must be continuous with other sciences (Flanagan, Sarkissian, and Wong 2016, 20). In making this connection between moral thinking and scientific thinking, naturalists argue that morality needs to be fallible, eschewing foundational, absolute, or context-independent truths or a priori algorithms in making judgments (Johnson 2014, 21).[7]

[6] Scientific philosophy is a term scholars have used to describe an early 20th century approach to issues of science and philosophy which included a number of schools including (but not necessarily exclusively) the logical positivists and the pragmatists (Reisch 2005; Richardson 2003).

[7] Indeed, much of these commitments are in keeping with the various possible ways that Ray Lepley tells us that values can be experimental as discussed in Chapter 2.

Those who are skeptical of the use of values in science may have their skepticism rooted in relying on concepts thought to be alien to scientific methodologies; either because they believe that the components are so subjective so to as not permit of verification or testing (ex. Values as mere wishes, preferences, biases), or so universal and absolute that experimentation is considered irrelevant to their validity (ex. Values as ideologies, dogmas). It is because the naturalist commits to provide an account of values continuous with scientific methods, and Rudner's urging that in accounting for values in science we should form a science of values, that a naturalistic account of values is a good hypothesis by which to start providing precision to the term as it is used in science.

Flanagan argues that naturalistic ethics contains two components: a descriptive-genealogical component which specifies the capacities and propensities of Homo sapiens to explain how we come to feel, think, and act about moral matters, and a normative component which explains why some norms, virtues, and values are better than others (Flanagan 1996, 119). For example, Paul Churchland argues that moral truths are as objective as other instances of truth, and that all knowledge acquisition is a process of learning *how:* how to recognize a wide variety of complex situations and how to respond to them appropriately, and that this contrasts with the idea of correspondence between internal ideas and external facts (Churchland 1993, 298). Our ability to make immediate discriminations in our observations is a product of refining our perceptions, cognitions, and responses from exposure to various situations. He argues, for example, that the development of a social consciousness in the learning process of a child is not dependent upon internalizing abstract principles, but through learning how to navigate the structure of a complex social environment, and that this is a genuine case of learning about objective reality (1993, 300). He argues that refinement of the best ways to organize and administer our collective and individual affairs are driven by factors arising from our continuing social experience of

conducting life under existing moral frameworks; these processes of learning through experimental refinement is not dissimilar from science (1993, 302).

Similarly, Flanagan argues that ethics as a science is a part of human ecology and is concerned with articulating what contributes to the well-being of humans' natural and social environments, and on this basis, we can discern the difference between good and bad ideas (Flanagan, Sarkissian, and Wong 2016, 30). Mark Johnson argues that values and standards of good practices come from within those practices and are modified through a practice's development (Johnson 2014, 32). According to him, moral evaluation is a form of imaginative problem solving (2014, 4). Still, both Flanagan and Churchland admit that there will be traditional objections, namely that while descriptive-genealogical ethics can be naturalized, normative ethics cannot be; that one cannot use so-called descriptive facts to derive normative facts.[8] However, naturalists like Johnson argue that this distinction relies on the myth that moral judgments are essentially distinct from other judgments such that descriptive judgments must either be completely distinct from or even irrelevant to moral thinking (2014, 40). Also, to presume there is a sharp difference between what is descriptive and what is normative requires adhering to the fact-value dichotomy. In the coming Chapters I will examine how naturalized scientific moral evaluation can be worked out and address the fact-value dichotomy, and this will form the basis of the conception of value I intend to use when considering the use of values in science.

1.5. Overview of Thesis

While Proctor's work demonstrates how competing conceptions of values played a role in the development of the value-free ideal, I will not be challenging the value-free ideal in this dissertation. Some of the philosophers I have mentioned (Douglas 2009; Longino 1990; Kitcher

[8] Mark Johnson notes that non-naturalist theories tend to presume that scientific knowledge has no relevance to normative evaluations (Johnson 2014, 20).

2002) have already provided arguments against either the tenability or the desirability of the value-free ideal. To that end, I begin from the starting point that values are embedded in science at various stages of inquiry. Those looking for a defence of the idea that values play a significant role in science here will be disappointed. Rather, my interest is in how those who reject the value-free ideal have responded to how values should be a part of scientific inquiry. The idea that values need to play a role in science in certain ways is still seen as problematic for reasons that are not dissimilar from some of the historical grounds we have seen for the rejecting of values in science. Namely, to some theorists, values can represent a potential threat to scientific integrity. I will examine whether that threat exists, and in what ways it can pose a problem for science.

As mentioned, value management is a response to a perceived problem: specifically, a perception that values are problematic when it comes to their use in science. However, in many of the accounts offered by defenders of values in science, the discussion of values themselves tends to be limited, unclear, or lacking in sufficiently careful analysis in most cases. Unlike historical figures like Sombart or Engländer who directly acknowledged their competing conceptions of value, contemporary philosophers of science often do not pay sufficient direct attention to what is meant by value. When values are discussed, certain words tend to crop up in association with the potential issues of their use in science. For example, values are often associated with "wish," "desire," "judgment," "subjective," "bias," "useful," "like," "enjoy," "optative," "will," etc.

But in what way might a value be a wish? In what way is a wish different from a desire according to those who argue for the use of values in science? Perhaps they are the same? Are all value claims subjective? Is a value different from a value judgment? Whether something is useful can be true regardless of whether we like it, so is a value something we like or something that is useful? Is it both? Neither? Without clarity about what is meant by value when we consider

potential approaches to value management, we begin to run into problems. Values are clearly considered problematic, but just what is problematic about them remains ill-defined. This can lead to difficulties for reasons that have been mentioned; it makes it difficult to compare different accounts of value management. It can also be difficult because if an approach to value management relies on a conception of value which holds, for example, that values are essentially the expression of a wish or an imperative, and this conception of value does not hold up well under philosophical scrutiny, then it makes the justification of any prescriptions about values difficult. Thus, we are faced with problems from different directions. There is the problem of how to resolve tensions between differing accounts of value management, the problem of how justified any account may be given the conception of values it adopts, and the problematic nature of values themselves.

Resolution to these problems, it seems, must begin with a philosophical analysis of valuation. Sorting out the differences between desires, wishes, feelings, and so on will put us on firmer ground upon which we can begin to address exactly what is the nature of values and what is problematic about their use in science, and this is the kind of precision I aim to provide. As John Dewey notes in his analysis of inquiry, a problem well put is half-solved (Dewey 1938, 108). In other words, being more precise about values and what they involve will allow us to determine exactly what is problematic about their use in science; it will provide a means of comparison between competing conceptions of values adopted or implied by various approaches to value management to determine if their respective concerns are warranted; and will allow for us to see how various approaches respond to similar concerns and where they differ.

In Chapter 2, I will address the issue of valuation directly. My aim is to provide an analysis of valuation that will present different possible meanings with regards to concepts typically attached to what is meant by value and present a conception of value that can resolve some of the

problems in philosophy of science just discussed. Such a conception will be compatible with and can be integrated into scientific practice by virtue of it being a conception of value judgment that is cognitive, capable of verification in the face of evidence, and is opposed to an idea of values that are fixed or external. I will therefore draw from a period in the 20th century when philosophers of science began to call for and attempt to provide such scientific accounts of valuation.

I will begin my analysis by considering the accounts of valuation developed by the pragmatists in the mid-20th century, including the work of John Dewey, Clarence Irving Lewis, and Ray Lepley. In providing such an account, I will begin by examining their unique approach to thinking about experience and its relationship to value. Essential to understanding both Dewey's and Lewis's account of empirical values is understanding their approach to experience and its relation to knowledge. I will draw attention to their broad distinction between two kinds of experiences -- those that occur immediately and without reflection, and those that involve reflection. Rather than focussing on individualized sensations, the pragmatists operate within an account that recognizes moral experiences, aesthetic experiences, cheerful experiences, scary experiences, and so on.

In addition to these pragmatists, I will be examining the work of other philosophers who have developed naturalistic accounts of valuation that are compatible with scientific deliberation and which can be of use in resolving problems of value management. I have already discussed some modern philosophers on the issue of naturalistic ethics, but I will also discuss Kitcher's account of valuation based on what he calls "the ethical project" (Kitcher 2011b). The aim of the chapter will be two-fold: one is to provide an analysis of the various components believed to be involved in values such as desires, emotions, and wishes; the second will be to argue for an account of value that incorporates insights from the accounts of value just mentioned that I believe will

expose the problematic aspects of value management in science. By providing such an analysis, I will be able to examine the claims and concerns that contemporary philosophers have had in their accounts of value management later on.

In Chapter 3, I will shore up the account of a framework of values explicated in Chapter 2 by addressing the issue of what it means to confirm or verify a value judgment. While in Chapter 2 I will offer an account of empirical value, in chapter 3 I will expand on that account by examining the issue of verification. To do this, I will discuss Dewey's concept of warranted assertability as it pertains to both verification and to patterns of inquiry in general. I argue that the concept of warranted assertability is compatible with and can strengthen even non-Deweyan accounts as it is similar to elements of Kitcher's work as well as to the work of philosophers like Longino and her account of conformation (Longino 2002, 120). By clarifying what warranted assertability is and how it plays a role in inquiry, I can clarify what it means to verify a value judgment.

By adopting Dewey's account of the pattern of inquiry, I aim to show not only what it means to verify a value judgment, but also how deeply embedded value judgments, as judgments of practice, are to any form of inquiry. For Dewey, a proposition is neither true nor false but merely useful in so far as our actions within inquiry can move forward towards a final judgment and resolution of the problem. I will argue that verification of a claim, including a value claim, does not lie with the direct testing of a sentence, but with a value judgment's ability to successfully allow for the transition of an inquiry from one that is less problematic to one that is resolved or closer to resolution. Value propositions are not independent of a situation or judgment such that they permit verification in the way philosophers typically tend to use propositions or think about value judgments as propositions. With these clarifications, I will present a three-fold division of value and articulate what is distinctive about values relative to facts.

In Chapter 4, I will use the analysis of value articulated in the prior two chapters to discuss the conceptions of values entailed by the value management accounts of Longino, Douglas, Kitcher, and Kourany. I will examine each of their accounts in turn and will reveal what conception of value each adopts for use in their account and will compare this to the account of values I adopt in Chapter 2. I will argue that to the degree that any value management account relies upon a conception of value in order to determine what is problematic about value, we can evaluate that account by evaluating the conception of values used.

For instance, if an account of value management entails or presupposes a simple account of value, say "all values are just X" (emotions, preferences, measurements of utility, biases etc.) [9] or even a thin account such that values can be explained as things we care about, I can compare that to the account I articulate in order to suggest that we have reasons to believe that values are more sophisticated than this. My aim is not necessarily to demonstrate that these alternate conceptions are mistaken, but that given that there is a plausible account that may reject simple conceptions, further justification of the conception is necessary. The analysis provided in Chapter 2 can aid in clarifying aspects of value that are left unclear in current value management approaches, and if those approaches were to use the account of value judgments which I propose, I argue that some of the concerns and perceived problems that motivate such approaches are not warranted and do not have to be taken as being problematic.

To do this will require unpacking the various accounts of value management to determine what conception of values are suggested by them, analysing the intuitions underpinning such conceptions of value, and noting how an alternative account of value can affect what we may think

[9] I am not suggesting that the accounts I have discussed in detail do at this point. This is merely an example.

of a given approach to value management. I will examine all four accounts of value management in this way.

In Chapter 5 I will elaborate how the conception of values I explicate in Chapter 2 and 3 affects the issue of values in science. I will argue that once we adopt the conception of values I articulate, then values and valuation must play a role in every judgment made throughout the process of scientific inquiry. To make this argument, I will examine accounts of actual scientific practices. I will then focus on the question of how we can allow values to play a role in science while maintaining the integrity of science.

Philosophers who have addressed the values in science debate are often concerned about the relationship between values and evidence. These concerns revolve around what to do when values and evidence conflict, and whether values should play a role where evidence is insufficient. With an adoption of the naturalistic account explicated in Chapters 2 and 3, I believe that such discussions are more complicated than they are typically considered to be. Values and evidence need to be understood in terms of the functions they play in inquiry rather than being understood as two concepts that stand in opposition to each other. This complicates the standard discussion about values and evidence.

My account will also allow me to articulate what constitutes improper forms of inquiry in the abstract sense. While value judgments need to be based on, and revisable in the face of, evidence, preferences that are based on dogma or habit and are maintained come what may, and which represent a fixed end for inquiry as opposed to an end-in-view are what can lead inquiry astray. These are not good value judgments. Ultimately then, what is necessary for science is not any sets of epistemic or non-epistemic values at all, but value judgments specifically. Once we understand that a value judgment is controlled by the experimental processes of inquiry and that

proper inquiry into what practices we ought to engage in in science means that a value claim cannot be absolute, subjective, or not capable of revision, many of the concerns about the use of values in science are no longer valid.

Ultimately this mode of thinking suggests that once we understand values as being controlled by inquiry, they no longer need an external management process. Values are already subject to control and modification through the process in which value judgments are formed. Properly understood, they are not ready-made antecedents for which processes of value management need to address their problematic elements. What is argued for, therefore, is that we ought to transcend the notion of value management, and focus on the notion of experimental value formation, or in other words, the processes by which value judgments are made rather than how to manage them after the fact.

I will conclude by noting that accounts of what values are can and do affect how we think about the role that values do and ought to play in science. Various value management accounts discussed in the debate tend to presume, or at least are ambiguous about, what is meant by a value. Even if the account of value I adopt is ultimately not convincing, there can be important take away lessons to be learned. Disputes between positions that argue that values should play a larger role or a smaller role in science can be discussed more clearly if we make our views explicit whether values are just preferences or are objective. Until those considerations are made explicit and are discussed, we can be reasonably concerned that various participants in debates about science and values may be talking past each other.

Chapter 2: Empirical Accounts of Values and Valuation

The adequacy of any approach to value management will in-part depend on the extent to which its conception of what a value is can be considered adequate. If a conception of value is insufficiently adequate, any account that argues the values should play a limited role in scientific inquiry in order to maintain objectivity on the basis of that conception (for example because of their subjective, metaphysical, idiosyncratic, or expressive nature) will be problematic.[10] Despite the importance of having a precise conception of what constitutes a value, in-depth discussions of this sort are mostly missing from the values in science literature. My aim in this chapter is to present several accounts of value and value judgments emerging from scientifically-minded philosophy in the 20th century which sought to provide what Rudner might characterize as a "science of ethics" and to affirm such an account for further use in analyzing value management. The survey of different accounts will both demonstrate that it is possible to articulate sophisticated and nuanced approaches to value judgments compatible with scientific experimental thinking, and to draw from these accounts a conception of values that will serve as useful for the values and science debate today.

Examining sophisticated analyses of the nature of valuation presents an opportunity to examine alternatives to any thin accounts of value which may be presumed in the literature and to gauge which type of account is more likely to be able to resolve tensions between values and science and will be more accurate to scientific practice. Additionally, drawing on naturalistic accounts will allow for the integration of an approach to value judgments that is compatible with scientific practice, avoiding what Kitcher calls "spooks" (Kitcher 2011, 40). In other words, the aim is to talk about values in such a way that avoids absolute, fixed, or purely metaphysical conceptions of values that would be alien to scientific inquiry; values should be treated as fallible,

[10] A detailed account of how values are described in modern literature will be found in Chapter 4.

experimental, and verified in experience. I submit that if such an account of values were accepted, it would go a long way in alleviating concerns about the risks that values in science present, an argument that I will make at greater length in Chapter 5. Before discussing these accounts in detail, I want to begin by discussing the nature of values and experience as it will be relevant to understanding where some of these accounts are coming from.

My commitment is to keep values within the realm of the empirical. An empirical account of value must avoid dialectical manipulation of pre-conceived notions of values as non-empirical[11] and begin with value as it is experienced, and valuation in terms of its function within experience. For instance, according to Dewey, valuation is characteristic of experiences of "all activity into which alternative possibilities enter. For wherever they enter a difference between better and worse arises" (Dewey 1922, 278). I will begin by considering a general account of experience, one that understands value as arising within adaptations by an organism within an environment, as an active process rather than a passive reception of sensory data. The accounts of Dewey and Lewis articulate value as it relates to experience and to these adaptations, and parse the various phenomena associated with values. I will also discuss the account by Ray Lepley who provides a survey of values in relation to factual claims to determine whether they possess any inherent properties that would distinguish them in experience, and Philip Kitcher's account which relates values to shared social experiences as a long term evolutionary project. I will conclude by affirming an account of value that I will utilize in the following chapters.

One will notice that each account stresses the importance of looking at concrete conditions of valuation and the relation that valuation has to such conditions. As Lepley notes:

> Valuation is commonly conceived as a terminal response, as a choice or preference which ends deliberation and determines a course of action. When so conceived, attention is

[11] Hilary Putnam addresses such conceptions at length; such conceptions usually begin with an understanding of value which inherently makes it incompatible with empirical knowledge (Putnam 2004)

> focused so exclusively upon the immediate act of choice that we lose sight not only of the processes which may have provided data which makes the choice itself more than subjective but also the processes of testing which may follow as effects of the actions which flow from the choice. (Lepley 1944, 182)

I submit that were a specific empirical account of values accepted in philosophy of science, it would go a long way in alleviating concerns about the risks that values present if used in science, an argument I will make at greater length in Chapter 5.

2.1. Values and Experience

In the next two sections I will be discussing John Dewey's and C.I. Lewis' accounts of value, but before this it is beneficial to discuss their conception of experience first. Contrary to conceptions of experience found in traditional empiricism and its focus on sense data and spectator accounts of knowledge, the pragmatic theories of Dewey and Lewis are broader in scope. Some relevant elements of Dewey's conception of experience are presented in the *Reflex Arc Concept in Psychology* (EW5). There, Dewey argues that we should not think about sensation, ideas, thoughts, or actions as fixed distinct entities, but rather as functional distinctions within a sensory-motor circuit. These circuits are part of a coordination that is undertaken between an organism and its environment.

Rather than assuming that sensations are merely stimuli to action, we must think of activity as primary. The movement of body, head and eye muscles determine the quality of what is experienced. Sensation comes because we engage in the act of seeing and in turn the quality experienced conditions motor responses. Our immediate experiences are a result of our motor activities which determine the "this" as the subject of judgment and changing our actions will change the experience (MW3: 16).[12] Using the example of a child seeing a candle light and

[12] This connection between experience and practice has obvious implications for the function that valuation can play in modifying our behavior. Thus, experience becomes a matter of judging the worth of an immediate experience given a specific end.

reaching for it, Dewey articulates how sensation and action play a role together. What is sensed is so because of the act of looking. Reaching is controlled by vision and in turn the act of reaching further controls how we fix our gaze. Thus, seeing and reaching are not separate, but part of a coordination of seeing-for-reaching (EW5: 98). Once the flame burns the hand, this quality becomes part of the circuit as well. The original optical-ocular experience is enlarged and transformed in its value; we undergo a change. It is not just a seeing but a, "seeing-a-light-that-means-pain-when-contact-occurs" (EW5: 98).

What Dewey suggests is that experience is not just isolated sensations, but rather consummatory in that various qualities are controlled and transformed as part of a coordinated circuit of activity and sensation which gives meaning to what is sensed. Experience is a result of an interaction with a creature and its environment. Because of this interaction, there is reaction and transformation of what is experienced. This transformation is an undergoing of a reconstructed relationship between an organism and its environment which determines future activities (LW10: 48-50). This is true of transformation of the original experience of the candle light. Further, because what is sensed is tied to a coordinated activity, the activity will drive what the quality of an experience will ultimately be. Hearing a loud, unexpected noise will have a different "psychical value" depending on whether one is reading a book, performing a chemical experiment, or hunting. The quality of the experience does not precede the motor phase but is determined by it.

These remarks are crucial because it means that experience for Dewey is not passive but active, and that rather than sensations being isolated they are ultimately linked together and transformed through activity. This means that experience will be broader and will be of different kinds depending on the activity, including the possibility of distinct value experiences. That experience has this active element leads Dewey to join William James in arguing that experience

is "double barreled," including not only what is experienced but how we experience: the processes of experiencing (Dewey 1925, 8). Because experience is active, or rather interactive, involving organisms and their environment, and since we are not distinct from nature, experience is "*of* as well as *in* nature […] things interacting in certain ways are experience; they are what is experienced. Linked in certain other ways with another natural object—the human organism—they are how things are experienced as well" (1925, 4a). Thus, for the pragmatists, experience is not purely mental or psychological. It is not experience that we experience, but nature itself. Experience also is neither necessarily private nor subjective as we are social beings who engage in shared activities and shared communications with each other (Hildebrand 2008, 36).

Thus, experience in its "unanalyzed totality" includes act, material, subject, and object with each distinguished from each other through reflection to serve a functional purpose. This initial unreflective form of experience is what Dewey calls primary experience. In contrast to this is secondary experience, or those experiences which are a product of reflection as certain qualities are singled out in inquiry for the purposes of regulation. Primary experiences are immediately had prior to reflection and secondary experiences are reflective and aim to explain and understand primary experience (Dewey 1925, 4-5). Primary experience includes not only what is sensed but also what is enjoyed or suffered; they are *experiences had* while secondary experiences are *experiences known* (1925, 21).

Lewis shares with Dewey many similar positions. He argues that we first experience things in an immediate "thin sense" that is free of interpretation and which has no cognitive content or epistemic status. There is also a "thick sense" that contains all experience as interpreted and it is used to justify and explain our beliefs (Lewis 1946, 53). Like Dewey he argues that the distinction

between objectivity and subjectivity are later classifications of experience rather than either one being a quality inherent to experience itself (1946, 408).

This distinction between an unreflective and a reflective form of experience is important because both Dewey and Lewis argue that not all experience has to do with knowledge or is inherently a form of knowledge. Seeing a stick bent in water does not mean one knows that the stick is in fact bent. An unreflective experience is an appearance of something, leaving it up to us to interpret what it means. We choose to interpret the stick as bent because it serves as a better interpretation for inquiry not because it represents the "real" object (LW3: 70). As Lewis notes, "If I look across the top of my glasses and 'see two inkbottles', what I see is not misleading in itself […] It is the interpretation put upon given appearance which is verifiable or falsifiable" (Lewis, 409). As David Hildebrand notes experiences had may or may not become known experiences (Hildebrand 2003, 117). Differences in immediate forms of experience are not to be labelled as phenomenal or mental, or personal but rather are a product of a physical existential relation, not an epistemic relation (LW3: 58).

This broadened scope of experience also means that there are distinctly different kinds of experiences. There are known experiences, but there are also aesthetic experiences, moral experiences, economic experiences, and so on (MW3:161). That I experience something as being valuable is not just my subjective feeling on the matter. As Dewey notes, "If experience actually presents esthetic and moral traits, then these traits may also be supposed to reach down into nature, and testify to something that belongs to nature as truly as does the mechanical structure attributed to it in physical science" (Dewey 1925, 4). This idea that value is something that is a part of experience is shared by Lewis who argues that we can experience value immediately just as we experience any other apparent thing; value-disvalue is a mode of experience (Lewis 1946, 407).

Dewey indicates that moral experiences have the characteristics of having a sense of conflicting and incompatible aims, a need for activity, and thus a sense of the worth or desirability of certain results (MW5: 194).

Providing this outline of experience draws attention to two important issues. One is that value can be a part of immediate experience. Because of this, we have no a priori reason to claim that values are inherently unempirical. In contrast, an alternate conception of experience found in traditional empiricism may argue that since experience is a matter of atomized sense data, and since we cannot "see" value then it is not empirical; that is not the framework in which the pragmatists operate. If value is part of experience, then it is to that extent empirical, and thus to that extent able to be investigated by scientific methods. Secondly, the distinction between unreflective and reflective experience tells us that what we immediately experience is not a form of knowledge. Dewey argues that this applies to the matter of values as well. He believes that we can experience value and thus good or bad independent of judgment: "a point similar to one I have made frequently about the subject-matter of perception as such—that explicit presence in experience is not equivalent to knowledge" (Dewey 1922a, 327). In other words, just as the experience of a bent stick is not knowledge that the stick is bent, experience of value does not mean that the thing experienced is in fact valuable or worth attaining. Only a value experience as interpreted and judged upon is capable of truth or falsity (Lewis, 408-9).

2.2. John Dewey's Account of Value

Dewey took considerable efforts to develop an account of values and valuation that is naturalistic and necessarily integrated into the practice of science. For him, a value judgment is just a case of a practical judgment about what to do—a view he contrasts with the idea that value judgments are supposed to conform to "some ghostly thing called value-objects" (MW8: 30). As mentioned, valuation in Dewey's account involves conflicting impulses as the basis of moral experience.

Before I discuss this further, we should consider what use Dewey can be in considering the different factors and phenomena involved when we think about value. This includes different possible meanings of the term "value," the relationship between phenomena such as liking and wishing to valuing, differences between liking something and a judgment of value, on what basis such judgments should be made as a means of engaging in intelligent action, and the difference between means and ends as they relate to instrumental value and inherent value. Thus, I will begin with his analysis of the various concepts connected to value and the phenomena they describe.

2.2.2 Different meanings of "value"

There are four different kinds of values to initially consider. The term "value" could indicate something being of intrinsic or of instrumental value. In terms of judgment, value "may be found without judgment, without implying cognition […] we may also, however, subject values to knowledge and judgment" (Dewey 1922a, 326). For example, we may treat an object as a useful means and in that regard esteem it without a judgment. In other words, there is the possibility of instrumental values and immediate values, both where there is judgment or cognition and where there isn't.

Dewey emphasizes the distinction between finding something to have value and judging that it is valuable (valuation). It is the confusion between an experience of good and a judgment of value which has created difficulties in discussions of value (MW8: 23). He explains:

> I am convinced that contemporary discussion of values and valuation suffers from confusion of the two radically different attitudes—that of direct, active, non-cognitive experience of goods and bads and that of valuation, the latter being simply a mode of judgment like any other form of judgment, differing in that its subject matter happens to be a good or a bad instead of a horse or planet or curve. (MW8: 26)

In his discussion of the distinction between an experience of value and a judgment of one, Dewey recalls the point about the relationship between experience and knowledge; something immediately experienced does not constitute knowledge of it. Thus, an experience of value is not

the same as a judgment; it is not cognitive. He argues that there is a big difference between evaluation as a critical process and an ordinary experience of good or evil, noting, "finding a thing good apart from reflective judgment means simply treating the thing in a certain way, hanging on to it, dwelling upon it, welcoming it and acting to perpetuate its existence […] It is a way of behaving towards it, a mode of organic reaction" (MW8: 26). This mode of valuing is what Dewey calls prizing. According to Dewey "value" can designate both prizing something in the sense of having a high regard or appraising something as having or assigning a value (Dewey 1939, 5).

2.2.3 Prizing and its associated phenomena

Valuing or esteeming something denotes an affective attitude rather than an intellectual one (Dewey 1922a, 326). This distinction is important because when it comes to values in science it will be useful to be able to distinguish between something we value without judgment (esteeming, valuing) and something that we consider to be valuable because of judgment (appraisal/valuation). However, if valuing is considered to be the primary or only form of value possible, it may warrant skepticism about values playing a large role in science since they would not be open to empirical criticism, whereas when appraisal is included this may not be the case. Dewey argues that rather than being opposing, valuing and valuation can be complementary with prizing constituting a particular kind of valuing which is bound with appraisal[13] and so I will recount the process of prizing first and the phenomena it describes.

Prizing is an active form of liking or disliking something. Here the emphasis is on action and behavior with regard to liking, or what is referred to as "affective-motor." Liking as a form of behavior could mean being devoted to, caring for, cherishing, and so on. This distinct behavioral take on liking can be contrasted with "enjoying" something apart from any activity. Instead, liking

[13] See section 2.2.3 for his account of this.

is a form of enjoyment where one is concerned to invoke effort or energy to bring about or maintain the existence of something. Thus, liking is not taken to be a mere feeling or affective quality (Dewey 1939, 14). When liking is taken as affective-motor it has reference to specific existential situations, allowing for specific observations of a lacking which is perceived along with observations of what motor activity is taken to procure that lacking. A mother who claims to prize her child but neglects it is deceiving herself (1939, 15).

Since prizing is affective-motor and thus describes active phenomena, it is crucial to recognize what the activity is a response to. In situations which require effort, there is a situation with certain foreseeable consequences, some of which are considered to be problematic or would be objected to: a breakdown in the equilibrium of energies which determine the interactions of an organism and its environment. Prizing occurs only when it is necessary to bring something about lacking, or to conserve the conditions which would otherwise be unstable, necessary to maintain something (1939, 15). Because there is something wanted and there is energy taken to bring it about, valuation involves desiring. Is this any different from a wish? Are values merely a matter of wishing, and if not, what distinguishes them from a desire? According to Dewey prizing and wishing describe different phenomena since where there is prizing there will be effort. We may wish for a golden throne, but if there is no effort taken to obtain it or to consider what may be required in the way of efforts needed, it remains just a wish. Are we led then to defining values in terms of desires?

Yes, but with a certain caveat; like Lepley's point about terminal responses tells us, desiring is not something complete in-itself. For Dewey desire is never isolated in this way. If it were isolated, we would have no basis to distinguish desires from each other. If desire is just a desire, at that point it becomes merely personal. Instead, Dewey takes desiring in its active sense

to be relational to the situation in which it arises. Objects of desire exist because of the contexts and the activities undertaken where there is something lacking. The function of such a desire is to resolve that tension. Rather than being merely personal, desire "is an active relation of the organism and the environment" (1939, 16). In fact, Dewey considers prizing more in terms of a spatial-temporal event, as a relationship between an organism and its environment, than anything else. He notes, "There is nothing particularly 'personal' about the prizings […] which are subject matter of those inquiries that result in evaluations" (LW16: 316). Dewey argues that the reason we take desire to be inherently subjective or personal is because of a false psychology that does not focus on what function desire has for practice. A desire or preference for a certain form of action is just a character of action and not something merely mental or private. As such, desire is a product of tensions that exist between an organism and its environment where there are conflicting possible courses of action. It gains an intellectual or mental character where it becomes part of a logical process of judgment (MW8: 34).

Dewey notes, "Practically all of the fallacies in the theories that connect valuation with desire result from taking 'desire' at large" (Dewey 1939, 17). A desire is not, for example, a mere impulse but rather is caused by impulses; they are modified impulses occurring in situations where something prevents immediate execution of action and involves foresight of consequences. Because Dewey takes values to be connected to desires, which are not personal but relational, a value cannot be merely personal, despite personal tendencies causing our desires. He notes, "The view that 'a value is any object of interest' must also be taken with great caution. On its face it places all interests on the same level. But, when interests are examined in their concrete makeup in relation to their place in some situation, it is plain that everything depends upon the objects involved in them" (1939, 18). Thus, it is simply not the case that all interests or desires stand on

the same footing with regards to their function in a given situation. So, while values involve interests or desires, it does not follow that *any* personally held interest or desire is equally adequate. These distinctions will serve as useful to the analysis of values in science in later chapters.

Thus, it becomes crucial to consider how we talk about desire in different contexts and the function it serves in different situations, whether we are talking merely about its function in an organic process or in a logical process. The adequacy of a desire depends on its adaption to the needs and demands imposed by the situation. For instance, if I were dying of thirst in the desert, my desire for salty potato chips might be inadequate. Because the function of a desire is to bring about what is lacking, verifiable propositions about the value of such desires are possible. Thus, so far Dewey's account has parsed the phenomena connected with valuing including desiring and liking, while excluding wishing. It has also established that valuing is relational and not merely personal, and thus their adequacy will depend on examination of those relations. Dewey's point here mirrors the point Lepley has made: we cannot think of values as being isolated terminal responses or impulses; they arise from and respond to contexts and situations. If we don't notice this, we are more likely to think of values as being inherently subjective.

2.2.4 Appraisal, Ends and Means

The central aspect of valuation involves appraisal. It is possible to verify whether someone does prize something. But this is only one kind of judgment we can make about values. A second form of judgment involves determining value where there is uncertainty about whether something really is valuable (Dewey 1922a, 326). We may at times be uncertain about whether something really is valuable despite our experience that it is and so we must take a critical eye towards it. Dewey notes, to judge is to look beyond the thing experienced as self-sufficient and enclosed and to consider its relationship to other things and its potential effects and consequences (MW8: 28). In other words, whereas prizing is a term that describes a kind of behavioral attitude, appraisal

involves examining a prized thing in terms of the consequences to which it can lead where there is doubt about which consequence should be realized. In appraisal, we compare what will be the different consequences of different forms of prizings. We must consider whether propositions about prizings are capable of being appraised so as to determine their worth or whether "some acts of prizing are *better* than others" (Dewey 1939, 20). Thus, where there is appraisal there is valuation, whose central character involves a "change of mode of behavior from direct acceptance and welcoming to doubting and looking into" (MW8: 30).

Dewey argues that valuations are no different in logical form from other judgments, contrary to other accounts of valuation which labels valuations as emotional and thus distinct from other forms of judgment like scientific judgments. The difference lies in the subject matter of the judgment, where valuation considers prizings which happen to be affective. The prizing is the subject matter of appraisal because it is in doubt about whether it is valuable. Despite the fact that the subject-matter of valuations are affective prizings, this does not mean that the judgment itself is distinctly emotional in contrast to other kinds of judgments (LW 16: 314-6). Appraisal as a form of judgment is thus not different from other kinds of judgment; Dewey expects them to be about existential matters, and to be carried out in such a way that avoids blind biases or prejudices.

If there is no logical difference between value judgments and other judgments, what is the basis of appraising value? A common feature found in considerations about judging behavior is the means-ends relationship. If I want to bring about a certain consequence, a certain course of action is needed, and thus certain means judged to be of value. These hypothetical imperatives can form generalized normative rules which are capable of scientific verification. If I plan to build a bridge, there are certain principles of engineering that I should abide by and these determine how I ought to behave. So, certain norms or rules of appraisal are not a matter of personal preference

but can be as experimentally justified as impersonal subject matter (Dewey 1939, 22). Thus, one form of appraisal can be a matter of judgment to determine whether certain means are fit to produce certain ends and is determined through experimental inquiry. The only alternatives are proceeding through blind trial and error, or there is no end entertained at all and only blind action.

One concern here is that so long as appraisal is only a matter of determining whether something is good as a means to an end, then we have no way to judge which ends are worth attaining. In other words, a hypothetical imperative only works so long as we know what end we ought to be trying to achieve. This is where Dewey offers his distinct approach to valuation. Rather than thinking about ends as fixed things independent of inquiry, an end entertained or aimed at is part of, and functions within, inquiry. It is not a general idea or concept, but rather a specific consequence that we try to bring about. An end is actually only an outcome, while what we entertain within an inquiry is an end-in-view. For example, a doctor who heals a patient does not have health as an absolute end-in-itself, but rather a specific goal of "restoring a patient to health" which would involve rectifying the problem or symptoms they present with. Dewey notes, "We cannot seek to attain health, wealth, learning, justice, or kindness in general. Action is always specific, concrete, individualized, unique" (Dewey 1920, 167). An end-in-view is not only a concrete aim, but as an idea; its function is to stimulate deliberation and action. They, "are not, as current theories often imply, things lying beyond activity at which the latter is directed" (Dewey 1922, 223). For this reason, Dewey will have something unique to say about how the ends are adopted according to how we value certain means.

An end-in-view as an idea or aim are what Dewey calls "terminals in deliberation." They function as potential resolutions to the ongoing tension that causes us to deliberate about what to do. An aim within inquiry is supposed to ultimately stimulate activity, at which point an action

continues onto another aim. They are turning points in activity. For example, a sailor may have the aim of reaching a harbor but reaching it will not lead to a cessation of activity, but a redirection of it as new ends-in-view are considered. Thus, ends are also beginnings of new action (1922, 226). An end-in-view also gives activities a meaning as it aims to bring something about. As Dewey notes, "an end-in-view is a *means* in present action; present action is not a means to a remote end" (1922, 226). Also, while Dewey argues that ends-in-view are turning points in activity and lead to redirecting pivots in action, another relevant yet not explicitly mentioned fact, is that they represent pivots in deliberation as well as we consider each aim, the means required to obtain it, and what those actions or outcomes mean to us.

But if an end is not a fixed end, and things are evaluated in terms of whether they function well as means to an end, on what basis do we have to appraise whether certain ends-in-view are better than others? A means can clearly be appraised, and an end-in-view can be prized, but what else can be said? I have already mentioned that a certain prizing can be evaluated to the degree that it responds to the needs of the situation it arises in, but Dewey makes an additional point. Desires or interests are not considered independently of how we consider the means required to obtain them. Considering the means can modify the ends-in-view or aims we have, something Dewey thinks bears out when we consider actual deliberative activity (Dewey 1939, 25). He notes when we consider an end, if we find that it would take too much time, too much energy, or if attained would bring about too many other problems, we would appraise that as a bad (or rather worse) end for the given situation (1939, 23).

The fact that means and ends cannot be sharply distinguished from each other and evaluated separately is because of what is included in the meaning of an end-in-view. Recall that what distinguishes a desire or interest from a mere wish is that there is an active interest to bring a

certain aim about. What makes the end "in view" is that it is considered in terms of what that aim would concretely look like. As Dewey notes, when it comes to an end-in-view as a potential course of action, "we can judge its nature, assign its meaning, only by following it in to the situations wither it leads, noting the objects against which it runs and seeing how they rebuff or unexpectedly encourage it" (Dewey 1922, 192). An aim forms when there is a reaction against existing conditions and we cannot act in a satisfactory way given those conditions. We could imagine a scenario of conditions where we would be satisfied, but if we do not consider the activities needed for making such changes, we only engage in fantasy. An end-in-view is formed, "only when it is worked out in terms of concrete conditions available for its realization, that is in terms of 'means'" (1922, 234). Such an aim is only warranted to the degree that we do survey existing conditions and their capacity to act as means. Notice again how Lepley's point about values being relational and not terminal responses is again salient.

Focusing so much on the specific contexts in which desires are formed and the consequences they produce is important for Dewey, because anything less than focusing on actual situations in which appraisals take place is likely to lead to notions of fixed ends or that values are subjective as already discussed. He believes that misconceptions in our thinking about value are because we fail to take account of "an empirical analysis of concrete desires and interests as they actually exist" (Dewey 1939, 29). Dewey's analysis insists that in concrete cases, a desire only occurs where there is a problem because when things are going smoothly, there is no need to desire nor form an end-in-view. However, the presence of a problem is merely a necessary condition for valuation, but not a sufficient one. An impulsive or habitual response is always possible once a problem is encountered. When there are conflicting impulses however, such that there is a question of which response is worthier, these impulses will need to be transformed into desires with an end-

in-view. The intellectual "ideational" component found in an end-in-view as the aim of a desire is that transformation. These points suggest that since valuation involves desire and since desires form only where there is a problem, valuation only takes place where there is a problem and there must be an intellectual factor in its resolution (1939, 34).

2.2.5 Reasonable and Unreasonable Desires: Valuation as Intelligent Behavior

A response to a perceived problem can follow two paths. It can either be a matter of impulse or habit, or it can proceed by forming an end-in-view about how best to resolve the problem faced. As a concrete aim, it will account for the means necessary. As Dewey notes, "It is simply impossible to have an end-in-view or to anticipate the consequences of any proposed line of action save upon the basis of some, however slight, consideration of the means by which it can be brought into existence" (1939, 35). Thus, the activity is mediated by the anticipation of consequences of the end-in-view and this will modify the desire.

Crucially, Dewey takes valuation to be connected to desires and interests in the active sense previously discussed. An active desire or interest is "ineffectual" unless it takes account of environing conditions. The end-in-view "is warranted in the precise degree in which it is formed in terms of these operating conditions" (1939, 29). In fact, ends-in-view formed in this way are often considered wise and a sign of maturity, while ends adopted without considering their requirements or effects are usually considered immature and shortsighted. To judge value, in other words, is to judge that something fulfils certain conditions, and in considering these conditions what is initially immediately valued is revised.

On this basis we can again distinguish between various desires and interests, rather than lumping them together or considering them of equal worth (1939, 26). Dewey notes that the difference between reasonable and unreasonable desires is that a reasonable desire will be formed on the basis of existing liabilities and resources, while an unreasonable desire is one that arises

casually and is not altered by further consideration of existing conditions (1939, 29). Maturity consists in not giving into casual or immediately felt desires but in "remaking [them] in their first manifestation" by considering the consequences of our desires if acted upon. In fact, an unconsidered or immediately felt desire is not a desire at all, but rather what Dewey calls an impulse, which is a product of organic tendencies. For there to be a desire, there must be a modification of the immediate impulse. Or, in other words, the difference between a desire and an impulse is that in the desire there is an end-in-view (1939, 30).

The necessary relationship between ends-in-view and consideration of means is important for Dewey because this is how we can claim to have verifiable value judgments. Through experimental trials and errors, noting both where we fail to bring about the ends desired and where we succeed, where certain conditions make certain ends possible, we make possible through intellectual means the creation of desires which are better suited given the conditions available for realizing them. This intellectual component of appraisal thus produces new or modified prizings. As Dewey notes, "wherever there is an end-in-view of any sort whatever, there is affective-*ideational*-motor activity; or, in terms of the dual meaning of valuation, there is a union of prizing and appraising" (1939, 31). According to Dewey, values created as a product of judgment are just as immediately felt or experienced, but they have an added dimension. The end has integrated with its means and altered its meaning; the immediate value has a different quality (Dewey 1922a, 328). If we admit to verifiable propositions about evaluations of means, and if "these propositions enter into the formation of the interests and desires which are valuations of ends, the latter are thereby constituted the subject matter of authentic empirical affirmations and denials" (Dewey 1939, 30).

This intellectual or ideational component is what it means to form an end-in-view. It is possible to enjoy something without an end-in-view and thus to take account of means required.

There may be active intent to bring something about, but it doesn't rise above mere impulse or blind habitual response without some form of judgment; some formation and modification of an end-in-view. Thus, we can establish now an overview of the different forms of valuing. Where there is only immediate experience of value, there is enjoyment but no judgment, no formation of an end-in-view. There is valuing but no valuation. In these circumstances the only judgment possible is a judgment about value, such as "Mary values X." In cases where what should be valued is uncertain, where there is critical reflection, there is prizing where an end-in-view is formed and thus a union of prizing and appraisal. This is possible because valuation has taken place. The key point that Dewey emphasizes is that valuation is possible, that new values come to be where there is uncertainty, and it doesn't reduce to cases of valuing; judging does not merely record prizings but changes them. Valuation is about the intelligent formation of a new determinate value.

2.2.6 Instrumental and Immediate Values and the Ends/Means Continuum

Since, for Dewey ends are evaluated relative to the needs of a situation and in view of the means required for their attainment, his position does not hold that there are ends-in-themselves, or ends that retain their worth regardless of any means or consequences involved. The end-in-view is only relative to a situation. Recall that an end as an aim is a means to a direct pivot in activity or that an end-in-view is means to present action (Dewey 1922, 226). Activity does not cease when an aim is attained, it is merely redirected to something else. Thus, an end as an outcome is also a beginning. This means that the distinction between ends and means is temporal and relational, that every end is also a means to further ends and since every means to an end has to be brought about to be a means, it is also an object of desire and an end-in-view (Dewey 1939, 43). Thus, any distinction between an end and a means is always a functional distinction for the purposes of inquiry and a present activity, not a static property.

The lack of a fixed distinction between ends and means also means that there is no fixed distinction between instrumental values and inherent, or perhaps more accurately, immediate values. For Dewey inherent value is redefined as a quality of the value experienced. If something is experienced as a value, it has that quality inherently or immediately. But, the distinction is between immediate and instrumental is intellectual, but not a logical or existential distinction (Dewey 1922a, 327). Anything valued immediately is capable of being judged in its capacity as means to future ends. By the same token, instrumental goods can be valued as immediately good. If a means is not a mere means but indispensable, it is capable of being an end-in-view, of being valued for its own sake as an integral part of the total end. Dewey notes, "Every condition that has to be brought into existence in order to serve as a means, is in that connection, and object of desire" (Dewey 1939, 42). Thus, instrumental goods are capable of also being inherently or immediately good. This matter is relevant to what Dewey has to say about the nature of intrinsic goods. If something is found to be immediately good, it has that quality intrinsically in experience. In other words, if we prize it, it has immediate worth. We cannot interpret that as indicating that that means that its value is out of relation to anything else, or that it is an end-in-itself independent of means or contexts. On Dewey's account since value is connected to desires and interest, and since those are relational, there is no such thing as a value independent of its relation to anything else (Dewey 1939, 28). Therefore, if we desire something to serve as a means it has an immediate value.

It is because values arise as desires and interests in response to the tension between an organism and its environment that values will always be relational and never fixed or isolated goods in themselves. Thus, Dewey rejects fixed ends. On his view, the failure of philosophers to notice this is because they do not pay attention to concrete desires as they actually exist. So long as values are relational and functionally determined, we can be more empirical about determining

what to value. Dewey notes, "If the notion of some objects as ends-in-themselves were abandoned, not merely in words but in all practical implications, human beings would for the first time in history be in a position to frame ends-in-view and form desires on the basis of empirically grounded propositions" (Dewey 1939, 43). This will be relevant to discussion about the use of values in science because the notion that values held dogmatically or absolutely is to be rejected; instead their status and worth will have to be experimentally demonstrated.

The claim that means can also be ends, and ends can also be means and that both exist along a continuum raises the concern that there is no logical point at which to cut off evaluation when making a judgment. Dewey's response is to point back to the issue where evaluation began which is with the problem currently faced. He notes that control of the transformation of an impulse into a desire and formation of an end-in-view is found when we consider the needs of the actual situation as observed. He notes, "The 'value' of different ends that suggest themselves is estimated or measured by the capacity they exhibit to guide in making good, satisfying, in its literal sense, existing lacks. Here is the factor which cuts short the process of foreseeing and weighing ends-in-view in their function as means" (1939, 46). In any deliberation on a given question, the question itself provides the end, where "end" here means the terminating limit of judgment. The situation we face is what forces the question and thus terminating limit. For example, we may deliberate about the worth of buying a suit and if so what kind of suit, but the end of judgment exists where we make the decision about what to do because the situation demands that we make a decision one way or another (MW8: 44). In other words, inquiry begins with a problematic situation, and our judgment is justified by considering potential means and consequences which will resolve the problem and resolve the tensions within the situation without creating further problems for us.[14]

[14] This model of judgment will be expanded on in the following chapter.

To summarize, Dewey's account of value allows us to distinguish between the concept of wishes or impulses at large and desires and interests which are formed in response to concrete problematic situations and include concrete aims or ends-in-view. Valuation relates to desires and interests which take place within contexts and situations and not as isolated phenomena. Because desires exist in relationship to a situation which either will or will not be resolved by acting on that desire, and since that situation has objective factors and requirements needed for resolution, we do not have to treat all desires as equally adequate or assume that how we ought to respond to the objective needs of a situation is a merely subjective matter. Values must be considered not just as terminal responses, but in terms of their functional relationship to a situation. The felt problem facing us is not merely psychological, but a factor of the situation itself, and convincing ourselves otherwise will not resolve the organic-environmental tensions facing us (Dewey 1938, 106). Thus, we do not have to accept the claim that values are either inherent or fixed (and thus unscientific), nor do we have to accept that value is merely a matter of impulse, wish, or desire or interest at large. We possess the means to discern between adequate desires and interest and inadequate ones and we can measure whether the formation of an end-in-view is an adequate solution.

2.2.7 Summary

The issues Dewey raises are important when we discuss the role that values play in science and the concern that surrounds their use such as their relationship to desires, fantasies, wishes, likings, and preferences. Dewey's account is thus relevant to parsing phenomena typically connected to the concept of value such as whether we are willing to take action to bring about what we want, or whether we consider the needs of the situation and the effects of action. Some of this terminology differs from their established use in philosophy of science, but it presents the opportunity to consider the merit of making clear distinctions between these phenomena and adding greater precision to our terminology. Dewey's account also provides a basic model for

thinking about the logic of value judgments in terms of the relationship between means and ends and our ability to critically analyze and experiment with proposed plans of action which we have desire to pursue. Dewey's articulation of the basis of critical analysis of prizings will be relevant towards the end of the chapter, while his account of the logic of such judgments will be discussed in the following chapter.

2.3. C.I. Lewis' Account of Value

Clarence Lewis joins Dewey in offering a naturalized account of valuation, although he is far more emphatic about the necessity of such an account to make sense of knowledge. Dewey's account will serve to provide a broad understanding of values, but it also focusses on individual experience and thus does not explain variance in value experience from person to person, or how we disagree about value in any great detail. Thus, in explaining Lewis' account here I will focus on his analysis of similarities of value judgments and knowledge judgments and their necessary connections, and the different ways values can be experienced, verified, and predicated in greater detail. According to Lewis, "Evaluations are a form of empirical knowledge, not fundamentally different in what determines their truth or falsity, from other kinds of empirical knowledge" (Lewis 1946, 365). To make sense of this claim, it will be necessary to examine his account of knowledge first.

2.3.2 Knowledge, Value, and Action

Lewis believes that knowledge, action, and evaluation are essentially connected; knowledge guides action, while action is determined upon the basis of evaluation (1946, 3). Knowledge involves the process of taking what is experienced as given, or in "thin experience," as signifying something else which is capable of being realized in future experience through action. Knowledge thus serves as a guide for action; its function is that of an instrument enabling transition from one immediate experience to another, "from the actual present to a future which is desired

and which the present is believed to signify" (1946, 4). The control which knowledge provides to our action is for the sake of realizing what we value and avoiding what is undesirable.

Because of this close connection between knowledge, action, and evaluation, Lewis argues that the purpose of knowledge is to allow us to alter the future content of reality; it permits deliberate action. If we were incapable of assigning value to future possible outcomes, then deliberate action would be pointless.[15] It is in these connections that knowledge for Lewis, as for Dewey, is not merely a mental exorcise, but a process of adaptations between an organism and its environment. Lewis notes, "No attitude, feeling, or other conscious state of the organism could be assigned a significance of empirical cognition except such as are responses to some character or item of the environment" (1946, 12). These points thus not only echo the points already made by Lepley and Dewey in that values are not isolated but responsive to a situation, but also establish the point that valuation is necessary for knowledge. The latter point will be further developed in the following chapter.

2.3.3 Experience and Meaning

As noted in section 1, Lewis believes in a form of experience free of interpretation which is immediately given. However, this immediate experience is necessary for knowledge, but is not a form of knowledge-in-itself. For an experience to be cognitive, we must use what is given as an interpretation to get an indication of some future experience beyond what is currently presented. This constitutes the meaning of what is experienced. Meaning is restricted to what is verifiable; a meaning is verified if, upon the adoption of a mode of action, the newly presented experience is in accordance with what is anticipated.

[15] Note that Lewis is broadly talking about deliberate action as action where one is aware of what is going on and aware of it being alterable in contrast to knee-jerk reactions or mere physical responses. Thus, not all action requires explicit conscious appraisal and decision (it can be habitual), but rather the behavior could have been initiated by appraisal and decision and would have been if the question of consequences and desirability were raised (1946, 8). See pages 5-9 of his book for further information on his account of action.

For Lewis, for something to count as empirical knowledge, it must be verifiable (1944, 26). The predictive function of perceptual knowledge where a meaning is found in interpreting a given experience is as follows: with what is given, if I act in such a way, the subsequent experience will have a particular eventuality (1946, 16). When such circumstances occur, and where action is taken, and the result is as anticipated, "the pragmatic signification of the perceptual apprehension is verified, and the object, or character of the object, which it mediates is found to exist or to be real" (1946, 16). However, when what is given is separated from any interpretation of it, such an apprehension is not verifiable (1946, 26). As noted, only where there is interpretation of a given experience, can there be verification. Without interpretation of experience (without meaning), what is experienced can only be enjoyed or suffered (1946, 14). Because there can be no knowledge where there is no possibility of error, and since apprehension of immediate experience is not susceptible to error, it cannot be a form of knowledge.

According to the account of meaning Lewis adopts, the total meaning of any belief is the experienced consequences which would follow were certain operations performed and which would stand as evidence for or against the belief. For example, when I examine a white paper before me, I predict that if I move my gaze to the left, the image of the paper will move to the right relative to my visual field. If I were to fold the paper in half, the paper would crease. If these consequences were to occur as anticipated, it would corroborate my belief that there is a real piece of paper before me. However, for Lewis for any claim about an objective fact ("there is a real piece of paper before me") there are an infinite number of potentially testable claims.[16] He notes, "It seems clear that in so simple a case as the white paper supposedly before me, the number of [implied consequences] is inexhaustible […] there will never be a time when the fact—or non-

[16] It may be worth noting that this position is identical to Carnap's in his outline of confirmation (Carnap 1936, 426).

fact—of this piece of paper now lying on my desk will not make some trivial difference" (1946, 176). Even the most trivial real event will always make some conceivable trivial difference which could stand as evidence for or against a belief.

This matters because it means that beliefs about objective facts will never be completely confirmed. At best, any verification presents probable corroboration of a belief. It may be confirmed to a degree of practical certainty, but never absolute certainty. Because of this, Lewis points to an important difference in two kinds of empirical judgment. One kind will involve phenomenalistic judgments about immediate experience as presented, a knowledge of sense perception. This category includes claims like "If I move my eyes to the right, the image that appears to be a piece of paper will move to the left." The second kind will be about an objective fact, about the objective piece of paper, such as "A piece of white paper is before me." With this division, Lewis argues that there are three classifications of empirical statements: formulations of present immediate experience, terminating judgments, and non-terminating judgments.

2.3.4 Three Classifications of Empirical Statements

Rarely do we explicitly formulate statements of present immediate experience (or thin experience), which would be entirely phenomenal if expressed in linguistic form. Any verbal formulation would denote appearances rather than assert any objective fact. For example, such a formulation might be "I see what appears to be granite steps" rather than "I see granite steps." Nevertheless, despite the potential difficulty in formulation and general unnecessity of explicit formulation, they are necessary for empirical judgment. Lewis notes, "there is such a thing as experience, the content of which we do not invent and cannot have as we will but merely find" (Lewis 1946, 182). According to him, "Without such apprehensions of direct and indubitable content of experience, there could be no basis for any empirical judgment, and no verification of one" (1946, 182). This given content is part of perception but is not cognitive-in-itself. It involves

only direct experience, not including anything that we see, hear, or learn from experience that we could conceivably be mistaken about. Apprehensions of the immediately given are not judgments, nor are to be classified as knowledge, because there is no possibility of error. Such statements about the given can only be true or false insofar as we can lie in our reports of them (1946, 183)

The second classification is terminating judgments. Terminating judgments are predictions about future possible experience. Beginning with what is immediately given, they prescribe a test by way of acting, regarding what would a further experience be like. They take the form "Given a certain sensory cue (S), if a given action is taken (A), then an expected consequence in experience (E) will result." Because E is an eventuality of immediate experience, and not something describing an objective fact, these kinds of judgments can be known with certainty (1946, 184). For example, "If I look at what appears to be a ketchup bottle, I will see what appears to be red" can be known with certainty because all it describes is what appears in experience, and not an objective fact. Terminating judgments only assert what would be found in experience as presented; they make no assertions about reality (1946, 204). According to Lewis, it may still be possible that I am dreaming and that there is no such bottle, but that I am directly experiencing a quality I call red[17] is beyond doubt. Unlike formulations about the given, these judgments are predictive in their nature and thus capable of verification. Thus, for Lewis, they are a form of knowledge.

Finally, there are non-terminating judgments. These are judgments about objective reality. Objective judgments about things can be translated into a series of terminating judgments for the purposes of testing, but for reasons noted earlier, there would be an indefinite number of such judgments necessary for full verification. Recall, that the meaning of a claim, such as about a white

[17] Notice that it is the quality as expected, not necessarily that I can call it red that is important. Lewis is skeptical about the degree to which such phenomenal qualities can be given a linguistic formulation without some interpretation being involved.

piece of paper, includes all the conceivable effects or implications it could produce in experience; in other words, any objective fact is translatable into a series of predictive statements. For example, if the paper were real, we could say that if it were folded it would crease, if it were left alone it wouldn't randomly disappear, and so on. To test these effects, we would translate them into terminating judgments about what would be found in experience. To put it another way, the sense meaning of any objective claim must be put in terms of the terminating judgments implied by it. However, as Lewis notes, "no limited set of particular predictions of empirical eventualities can completely exhaust the significance of an objective statement" (1946, 184). The claim that a piece of paper is white, rather than just appearing white, always has implications for further possible experience beyond what at a given time have been found to be true. Lewis explains, "Theoretically complete and absolute verification of any objective judgment would be a never-ending task: any actual verification of them is no more than partial" (1946, 185).

Each verified terminating judgment adds to the degree of verification of the objective fact, which thus makes the judgment more probable. However, this will only be a matter of degree. We may be practically certain that there is a piece of paper before us, but in so far as further empirical tests can be done, then there is always a degree of theoretical uncertainty (1946, 187).

Lewis' account of the nature of empirical judgment is developed and then applied to values to demonstrate that values are also empirically verifiable. As previously noted, Lewis believes that value judgments are a form of knowledge no different from any other. He claims that this fact has been obscured by a failure to distinguish between mere apprehensions of good in experience from predictions of possible realizations of value and appraisals of objective-value quality in existing things. Resolving this requires paying attention to the nature of value and how we can distinguish between subjectivity and objectivity in value-ascriptions.

2.3.5 Three Classifications of Value Statements

According to Lewis scholar Charles Baylis, Lewis' value theory parallels his account of empirical knowledge (Baylis 1964; 565). Lewis articulates three types of value claims, each corresponding to the three classifications of empirical statements. First, there are value claims about what is found in immediate experience. For example, to say "this is good" is just to report the directly experienced character of what is presented, however this is merely to say that there is apparent value to what is experienced. Formulations of these kinds of experience intend nothing more than this apparent quality (Lewis 1946, 374). While not intending to describe objective properties themselves, such direct value-apprehensions are necessary for the determination of value. Like any expression of immediate experience, these formulations of value are not a form of judgment and thus not a form of knowledge.

Lewis explains that value as phenomenally experienced is a general mode of presentation that is subject to degree in the sense that we could say that other modalities would be better or worse, but without being able to make decisive comparisons or calculations. The attempt to assign any kind of numerical measure to an experienced good or bad would be arbitrary.

The pleasure of good company and a concert combined would not be equal to the sum of the pleasure of the company and the concert apart from each other; it would be the total pleasure found in the total state of affairs; the constituent experiences only combine into the whole such as to qualify the total value-character (1946, 491-4). The value found in an experience of an event is not a sum of the components that went into it, but rather form a temporal *Gestalt* (1946, 487). Thus, there can be no strict measurement and no calculus of what is immediately good. Instead, the immediate good is characterized as, "that mode or aspect of the given to which desire and aversion are addressed: and it is that by apprehension of which the inclination to action is normally elicited" (1946, 403). This characterization is similar to Dewey's description of prizing.

It is also worth noting that he does not equate value or disvalue with pleasure or pain. He argues that terms like "liked," "wanted," "good," and "bad," are good indices of what is immediately experienced as value, but that "pleasure" and "pain" are poor indices because they are too narrow, and generally their connotation suggests a qualification of the subject experiencing and their "organic sensations" rather than the content of the presentation (1946, 404). Thus, Lewis' view is not a form of narrow hedonism.

The second type of value claims are evaluations which are terminating judgments. These predict, given certain circumstances, what an immediate experience of value would be if a certain action were taken. For example, "If I taste what is before me, I shall enjoy it." These are judgments which are capable of verification, and capable of error, and thus they are a form of knowledge. Also, like any other terminating judgment, they can be decisively verified.

The third type of value claims are evaluations as non-terminating judgments. These are an, "ascription of the objective property to an existent or possible existent" (1946, 375). What objective property is judged in this case are, "ascriptions to some actuality, or to some conceived actuality, or to some *kind* of entity, of a potentiality for contributing to a value-quality to experience" (1946, 397). Like any kind of non-terminating judgment, they are never decisively verified, and always retain the possibility of further significance for future experience and are capable of further confirmation. As Baylis notes, "a person can at most make probable judgments about values which are independent of his wish" (Baylis, 562). Thus, like any claim about an objective fact, they can never be determined to be completely true or false, only to a degree we might consider practically certain. Also, like any non-terminating judgment there is nothing in the meaning of them which isn't translatable into terminating judgments. There is no limit to the number of such translations, each of which can add to the degree of confirmation. Lewis notes,

"Any particular confirmation of such a judgment comes by way of finding true some terminating judgment which is a consequence of it" (Lewis 1946, 376). Thus, any confirmation of any objective value must be realizable in a value experience of the first type of value claim mentioned.

2.3.6 Valued Versus Valuable

The distinction between these three kinds of value claims, particularly the first and third kinds of value claims, is crucial because like Dewey, Lewis argues that much of the confusion about values has to do with immediate experiences of value and judgments of value. He argues that there has been a "failure to distinguish mere apprehensions of good or ill in experience from predictions of the possible realizations of these qualities in particular empirical contexts, and from appraisals of the objective value-quality resident in existent things" (1946, 365). By making this distinction, we can separate what is desired and what is desirable. An immediate experience of good is unmistakable, but we can be mistaken about objective properties. It is possible, "to desire what is not in its real nature desirable; to have an interest which is mistaken; to believe that a thing will conduce to satisfaction when in fact it will lead to pain" (1946, 398). This idea only becomes clear if we distinguish between what is valuable as being directly prized, and what is valuable because it is judged as being capable of realizing such a quality in experience (1946, 398).[18]

Lewis' conception of value is naturalistic since it holds that we do not need anything more than natural insight to make evaluations; all that is needed is what can be learned from the experience of life in the natural world rather than relying on transcendental norms (1946, 399). He also makes it clear that it is not subjective or relativist either. He notes that he "does not intend to

[18] Lewis notes that he borrows the terms "prized" and "appraised" from Dewey, but uses them differently (1946, 398). Dewey uses prizings to refer to a kind of behavior and to an extent so does Lewis, be he seems to emphasize prizings in terms of their connection to an immediate given quality in experience. For Dewey, appraisal is not completely distinct from prizings, but for Lewis appraisal seems to be a completely separate form of judgment dealing with objective properties rather than immediate experience. Outside of this section, when I use the terms I will be referring to Dewey's meanings.

put evaluations which the fool makes in his folly on par with those of the sage in his wisdom" (1944, 399). Truth or falsity of value judgments is independent of what we may wish: the value predicates are not determined by immediate liking, or desire, or interest, "but determined independently of what one may think or feel about them" (1946, 399). Rather, truth or falsity is determined by reference to natural consequences of acting in accordance with that is judged.

2.3.7 Subjectivity and Objectivity in Values

Lewis stresses the importance of rejecting subjectivism when it comes to values. He believes that value judgments are a form of cognition directed towards facts which determine their correctness just like any other form of knowledge. On his account value as immediately experienced is apparent and it is this factor which allows for the distinction between subjectivity and objectivity. If one bites into an apple, one cannot be mistaken about the good or bad taste of the present bite, but we could be mistaken if on this basis alone we judge the apple to be good or bad. Immediate experience is not classified as subjective or as a mere appearance only such that we would consider it non-veridical (1946, 408). Every empirical apprehension is first an apprehension of an appearance. What is considered to be subjective and objective is a product of a later classification of apprehended content with reference to the relation of the content to further possible experience rather than being inherent. If an immediate experience, gives rise to a belief which later experience corroborates, it is considered objective in the sense of being veridical. If not, then it is subjective and illusory (1946, 408). This relationship between the apparent and the objective is no different from any other form of knowledge.

This matter demonstrates that immediate liking or disliking does not necessarily allow us to conclude the objective value properties of existent things. Like the apple example, upon hearing a piece of music or seeing a painting, we cannot be mistaken about our present enjoyment or distaste, but any conclusion we attempt to reach in terms of the music's or painting's future effects

can be subject to error. For example, the painting may be hung in poor lighting which obscures the image; thus, we may like it momentarily, but ultimately be mistaken about its objective value (1946, 411). But this is not to claim that immediate values are inherently subjective, for immediate values have the capacity to be veridical and objective values can only be verified through them. According to Lewis, the idea that immediate values are inherently subjective, rather than being a later classification, is a mistake that leads to the criticism of naturalistic conceptions of value because of the presumption that we cannot infer objective value from subjective experience (1946, 414).

For example, we may find out through investigation that the reason why an immediate value-experience has the quality it does could be owing to matters of personal history, make-up, or attitude on this particular occasion. We must admit "as objective any datum which has the character of a normal and common human apprehension in the presence of the object in question, and to regard as subjective only those which deviate from this by reason of something which is a personal or temporary characteristic of the individual subject" (1946, 420). These personal factors are present in all experiences and can affect other qualities as well such as shape, colour, and size (1946, 416). The reason an experience could be considered subjective is because we may be misled about the value-possibilities of similar future situations, or we may infer that others would find the same value under like conditions. Despite personal factors having such effects on experiences, we still don't need to consider the subjective experience non-veridical.

Subjectivity as a factor of experience does not have to lead to adverse effects on our ability to make objective judgments. Lewis argues that idiosyncrasies of apprehension may exist without affecting our ability to discriminate and analyze related elements of experience in the same way as others. For example, a color-blind person may experience a quality which is commonly

described as green despite not experiencing it as others do. Despite this, they may learn to say "green" when others do. In this case the personal character of the visual data marks it as subjective, but it does not prevent them from correctly interpreting the experience as clues to objective fact (1946, 420). No apprehension, whether it is subjective or objective, is inherently misleading; only an interpretation of what is apprehended can be misleading.

In fact, Lewis goes so far as to claim that subjectivity of data not only characterizes much of our experience, but that it can also be a continuing characteristic of an individual's experience. Yet, so long as it is recognized and compensated for, the subjectivity of their apprehension is no more likely to lead to a misjudgment than objective apprehension (1946, 421-2). If value apprehensions were not veridical, if there were no correlation between what we experience as value to objective value-properties, then it would be impossible to learn and ameliorate our experiences. Lewis points out, if there is such a correlation, "then the law of it will determine what kinds of objects, under what circumstances, possess potentiality for conducing to our enjoyment or our pain—their objective value qualities" (1946, 424).

Because of the argument Lewis presents on the nature of subjectivity, his outline permits a great degree of variability in what can be immediately experienced as value, while still retaining the possibility for objective value. He notes how factors like context, habits, and anticipations can all affect the value quality experienced (1946, 426-8). There is also more variability, not just moment to moment within an individual, but from person to person. In response to the claim that there seems to be a greater variance on value-qualities experienced to other qualities, Lewis argues that often the matter has to do with how we detect differences. For many qualities experienced, it is usually more important to express agreement on color than on whether we like it, and failure to experience as others do may even go unnoticed. For example, the color-blind person who says

"green" when everyone else does makes it difficult to detect idiosyncrasy (1946, 419). Also, we should not overemphasize agreement over physical qualities and disagreement over value qualities to infer an inherent difference. As Cheryl Misak points out, this view distinguishes value judgments from sensory judgments in degree, not by kind (Misak 2013, 189). Lewis notes, "those who would think to discover an absolute difference between value-apprehensions as flatly relative to the individual and other empirical findings as unqualifiedly universal and common, must obviously be very thoughtless or excessively naïve" (Lewis 1946, 419).[19]

When it comes to the verification of objective value properties, Lewis' argument that there can be objective value despite variation in personal experience suggests we do not need to conclude that objective value-judgments are exclusively determined by the possibility of direct value-experience. For instance, we may believe that a neighbor is a good musician because of their renditions of flawless passages despite the music itself not being personally satisfying (1946, 377). This would also be true of our finding that a chisel is good because it is sharp, which is learned by cutting oneself. Lewis notes, "Just as one may find evidence that a thing is round or is hard in other ways than by seeing it round or feeling it hard, so too the objective value of a thing may be confirmed 'indirectly' in other ways than by what would be called 'experiencing the value of it'" (1946, 376). Thus, the formulation of objective tests may allow for confirmation, without depending on personally experiencing a value-quality.

2.3.8 Value Predication

Lewis provides an important analysis regarding objective values and value experience prediction between potential and actual value predicates. Recall that something has objective value if it contains a permanent possibility of leading to a value-experience that is attributed to the object

[19] In the following section, we shall see that Ray Lepley presents a similar argument concerning how variance in fact questions just as in value questions should make us skeptical about inferring inherent differences.

apart from conditions which are merely personal or peculiar. These qualities exist in the object even if this capacity for value-experience is never tested, just like a nugget of gold may have a particular value even if never unearthed. On the other hand, values are often considered to be relative to actual circumstances, just like we may also claim that the gold is worthless if it is never unearthed. Lewis makes sense of this by distinguishing between value predication as potential versus actual. In potential situations, we rely on subjunctive clauses which specify the value-experiences that would occur if certain conditions were satisfied. This is no different than claiming that salt is soluble because if it were placed in water it would dissolve, even if we never actually test this. Lewis notes that values predicated in this mode are objective values (1944, 519). In actual predications of value, however, we are concerned with what can be predicated given actual rather than possible conditions.[20] Thus, to say that something is or isn't valuable is what can be said given present circumstances. In the case of the unlocated gold, given actual conditions, it is of no value to anyone. Lewis terms values in this mode of predication as values-in-fact (Lewis 1946, 520).[21]

This distinction is important because it allows us to make sense of how seemingly contradictory claims likes "that gold is valuable" and "that gold is worthless" can both be true. Lewis describes various kinds of values-in-fact. The first are values relative to persons, or values-in-fact relative to personal circumstances. For example, a concert ticket may not be used by a person if they have another engagement. In this case the ticket has objective value, but not to that person (1946, 522). By that same reasoning we can explain why something may be of value to one

[20] Lewis doesn't use these terms, but it may be helpful to borrow some of the language used by Carnap. According to Carnap a claim may be confirmable if we know of the conditions that would confirm the claim even if those conditions do not actually exist (i.e. If we could locate the gold, if the gold produced a value-experience, it would have value). On the other hand, a claim is testable if we know of the procedure by which we could confirm it (Carnap, 1936). If we were to state that a testable claim must reference actual conditions, then a value claim could be confirmable but not testable.

[21] For Lewis, actual predications do not change the object or its qualities. The relativity of values predicated in this way are relative to circumstances, not relative to the object or to people.

person and not another. Lewis argues that this can allow us to distinguish between what is relative and what is subjective. While personal circumstances may prevent a value from being realizable to a person, so long as these circumstances are accidental to rather than characteristic of the subject experiencing it, the value is not subjective. Subjectivity in value apprehension is due to a limitation of the realization of a value due to conditions "characterizing the nature and capacity of the subject in question" and thus the finding of value by this subject is not indicative of the possibility of value-finding on the part of others, and is unreliable and likely to mislead the subject in the future (1946, 529).

On the other hand, a value may be considered comparatively speaking as being better than average, better than other things, or better than nothing. According to Lewis, a value is objectively good if it is more good than bad overall, but it is possible that something can be genuinely valuable even if it is bad overall but is not completely worthless. For example, a broken tool can still be better than no tool if there are no alternatives. Thus, something can be genuinely valuable to a person, despite it being objectively bad (1946, 526). Lewis emphasizes that objective values are based on impersonal findings, but this does not entail that most people would enjoy something of value. He notes, "majority votes prove nothing—except concerning what is relative to majorities" (1946, 526). Thus, what is impersonally valuable is not the same as what is generally valuable. This outline of values-in-fact allows for a clear distinction between what is relatively valuable compared to what is subjective. Thus, we can say that something can be objectively valuable, but not valuable to a person; something can be not objectively valuable but valuable to a person; something can be objectively valuable, but not to most people; and something can be valuable to a person, but only subjectively so.

This framework by Lewis provides tools needed to make sense of the various forms of value predication. He notes, "Objects are assessed in many ways and from many different points of view, with results which would oftentimes appear incompatible with one another if this diversity of the specific meanings of 'value' as applied to them should not be recognized" (1946, 539). Because of this:

> there is no such thing as *the* value of an object or objects, which is either relative or absolute, subjective or objective. Instead there are all these various modes in which the value of objects commonly is—and for good reasons—must be assessed; each having its own specific meaning and corresponding criteria of correctness. (1946, 530)

With this in mind we can understand relativity without denying objectivity. For according to Lewis all value depends on an object's relation to actual or possible experience. While the possibilities of experience are partially dependent on the subject, the qualities of experience an object may induce depends on the object itself. The character by which it will or would under appropriate conditions produce satisfaction is on that basis not relative (1946, 532). The closest thing to a final kind of valuation would require considering a thing as eventually contributory to satisfaction in some whole life or lives (1946, 540).

This thinking should go a long way in reply to arguments that disagreements about value or worth must be simply a matter of subjective taste. Something may have objective value, yet this may not always be realizable in every context. This manner of thinking is not unheard of in philosophy of science either. Nancy Cartwright has argued that a number of physical laws such as Snell's law are examples of ceteris paribus laws, or laws that are only true under ideal conditions, but under actual conditions are false owing to "disturbing factors." In other words, there are a number of generalizations that can be considered objectively true but may not be realizable. Despite the limitations, Cartwright argues that scientists have legitimate reasons for relying on them (Cartwright 1983, 48). Additionally, Longino argues that successful use of such

generalizations should count as knowledge (Longino 2002, 110). A scientific study of value, thus, can be similar to physical science in that it can involve the systematic study of the conditions upon which generalized relationships do hold, and in a way that doesn't require us to understand value as being any more subjective than Snell's law.

This framework also permits an account of improper reasoning when it comes to such predications. For example, a tax hike could be both fiscally prudent and economically dangerous. Both premises may be true but are insufficient to determine the issue overall. Arguing to a conclusion regarding overall desirability or comparative value from a premise implying some value only is what Lewis calls the fallacy of epithet (Lewis 1946, 536). For example, tax cuts can be deemed something valuable, but that alone does not imply its desirability compared to other policy options. Another fallacy, the fallacy of attribute, occurs when both a conclusion and a premise are comparative in nature. For example, "a good pistol" could indicate a good weapon. In an absolute sense, where it means that it is better than no weapon, then this makes sense, but comparatively a better than average pistol can still be a poorer than average weapon. Alternatively, a better than average pistol can still be a poorer than average thing overall (1946, 537).

2.3.9 Summary

In summary, Lewis' account of value has some similarities to Dewey, and much of his independent analysis corroborates Dewey. But the relevant things to take away from his account is not necessarily where he differs from Dewey, but what he chooses to emphasize. What we gain from Lewis that we don't find as much in Dewey is a detailed analysis of the relationship between the content of immediate experience and the nature of subjectivity and objectivity in value judgment. We also gain a careful understanding of the various ways in which value can be predicated and what we should take such predications to mean under various circumstances and contexts and what this can tell us about subjectivity in values. Once again this serves to

demonstrate the need to think of values in relational and concrete terms instead of isolated terminal responses in the form of mere preferences, or desires. This serves in helping to address misconceptions that tend to arise in discussions of value and dispel reasons for thinking that they must be subjective, such as why there may or may not be competing experiences of value. Lewis' account of possible fallacies associated with value judgment round out the development of an account of the logic of value judgments. These ideas will be relevant to understanding the ways in which scientists may end up incorporating values in different, possibly conflicting ways without falling into idiosyncrasies or subjectivism.

2.4. Ray Lepley's Account of Value

Ray Lepley was a student of Dewey, who devoted much of his work to the matter of values and valuation. His account of value is also useful to consider. Unlike Dewey or Lewis, who focus on the deliberative processes by which value judgments are made, Lepley offers a broader account of the status of values, including the different forms they take, their relative empirical ability to be verified, and their relationship to factual judgments. Consider some basic questions that he addresses like, does the term "value" in the context where we mean "to value" mean the same thing in all contexts? Does "verifiability" mean the same thing in all contexts? If values are to be experimental, does "experimental" mean the same thing in all contexts, or does it denote different possible things in a given inquiry? Consider a relatively simple conception of value: Ralph Barton Perry argued that a value was any object of any interest (Perry 1926).[22] But as we have already noted from Lepley's quote at the chapter's beginning, we cannot think of an interest as a terminal response and so we need to ask ourselves: what does an interest designate in a given context?

[22] Perry, like Dewey who similarly connects values to interests and desires, defines an interest as active, that it is affective-motor. His account is similarly complex (Perry 1926, 115).

2.4.2 Meanings of "Value," "Experimental," and "Verification"

Lepley argues that on the broadest or most inclusive conception of value, it would include all goods and evils. This would include economic, scientific, aesthetic, moral, religious, and recreational goods and evils, including the value of truth (Lepley 1944, 3). He refers to this meaning of value (rather unhelpfully) as value(1), however I will refer to it as the inclusive conception of values. Then there is the meaning of values as that which are contrasted with factual matters in terms of judgment, what he refers to as value(2) and what I will refer to as the fact-value conception of values. Finally, there is the meaning of value that is reserved for moral and ethical matters, what Lepley refers to as value(3), or what I will refer to as the ethical conception of value. These distinctions in the meaning of the term "value" are relevant in the sense that we not only should be aware what we are talking about when we talk of values in specific contexts, but also that the degree to which a value is verifiable may differ given which conception of value we are talking about. For example, some may grant that those values falling under the inclusive conception are more easily verifiable than those falling under the ethical conception of value.

If our aim is to provide an account of values in science that is compatible with a scientific outlook, it is also helpful to consider the various ways in which values can be experimental. According to Lepley, we can consider "experimental" as being that which contrasts with what is absolute, fixed, or universal. It can also indicate a process of operational testing not wholly determined by a priori elements, or fixed laws of understanding (1944, 4). Both conceptions of "experimental" can be contrasted with what is metaphysical. A third conception employed involves the careful search for data, control of variables, and use of objective methods of measurement and observation. Finally, "experimental" might include all the three previous conceptions. While scientific knowledge is experimental in this sense, these distinctions are relevant in so far as we can ask to what degree values are experimental, ranging from the first

conception to the fourth, and to what degree might they need to be experimental if they are to be adequately and responsibly employed in scientific inquiry.

Lepley believed that there was a growing sense in the early 20th century that various and even conflicting philosophical treatments on values were at least becoming more experimental to varying degrees, and that this signaled the potential for a reconstruction in value theory to be continuous with science. Historical issues regarding that philosophical trend,[23] and the question as to how fruitful this course of inquiry can be, aside, an important question is whether the lack of advancement in an experimental approach for fact-value or ethical conceptions of value indicates an inherent difference between inquiry into values and scientific inquiry (1944, 11). Lepley argues that we need not accept that conclusion given other possible explanations for the lack of experimental advancement such as historical factors like the desire to avoid taking a scientific approach to moral, ethical, and religious matters in return for greater freedom for science in other areas. This conclusion is confirmed by Proctor (Proctor 1991, 33). Lepley notes this has enforced harder distinctions between the mental and the physical, the practical and the theoretical, and the material and the spiritual when it comes to moral matters than in other areas (Lepley 1944, 11).[24] Thus, it is best to reserve judgment about inherent differences until a more sophisticated analysis can be made.

Lepley points out that the basis of an experimental approach to knowledge involves the testing or verification of hypotheses. An experimental viewpoint for values would mean, "that values—moral values as well as scientific facts—are suggestions relatively verified and therefore

[23] Accounts of values that were coming from scientific philosophy of the time seems to dissipate after the mid 20th century. It's possible that this is due to the growing hesitancy to talk about values in philosophy of science during the Cold War.

[24] This raises not only historical factors as being relevant, but logical factors as well. When it comes to inquiry into values, a received notion that they are purely mental to the exclusion of the physical is obviously going to affect how successful we think experimental approaches to value will be.

in some sense and degree verifiable" (1944, 17). Thus, a value can only be known in so far as it is verified. This raises the question to what degree are values verifiable? And, are they verifiable in the same manner as "factual" matters? If so, it would seem possible that values are as objective as any scientific fact and not a matter of mere personal preference (1944, 13). Lepley is interested in whether there is a general pattern of verification common to scientific, artistic, and moral value claims and whether that pattern holds of descriptive "factual" claims as well. He chooses to adopt a "liberal" meaning of verification, denoting "any testing or confirmation, of whatever kind and degree" (1944, 19). In essence, Lepley adopts a model of verification that is in contrast with a notion which requires "final and demonstrable proof" of a claim (1944, 19).[25]

Lepley admits that the question of what is meant by verification can go a long way in determining what it means for a value to be verified compared to a fact. For some, the question of verification is the active testing of a hypothesis to determine whether it is accurate or inaccurate according to the "hard facts" as the final step in reflective thinking. Lepley's preferred broader notion of verification when it comes to science includes considering the entire process of scientific inquiry as a practice. This involves an interrelated process of operations of reflective thinking and observation, the testing of ideas at various stages, and acknowledges the idea that scientific testing is not confined to exercises of observation and experimentation, but also exercises of critical thinking, mathematical testing, and social discussion (1944, 21). He notes, "verification permeates all the processes of critical and creative inquiry; these processes are integrally interrelated." Thus, for Lepley verification consists in any process of testing through thought or action, "whether

[25] Unlike the potential idea of demonstrable proof when it comes to facts. Pointing out the contrast here, however, is to clarify his position relative to other possibilities not to stand in contrast with a particular position advanced by others.

individual or social, to whatever extent these processes may yield 'evidence,' 'confirmation,' 'reasonable presumption,' 'established knowledge,' or 'proof.'" (1944, 21).

Further, Lepley indicates that the term "verification" can be limited in that it suggests an exclusive interest in truth or correctness, while in moral or artistic matters, formulations may be better said to be "adequate." He chooses to include this notion of adequacy into the concept of verification, noting that it could mean testing with respect to truth, "or with regard to relative adequacy, fruitfulness, or ability to lead on to other significant experiences" (1944, 22). It should be noted that verification functioning as a success term for relative adequacy rather than merely capturing a binary between truth and falsity even when it comes to scientific matters is not out of step with other philosophers of science. While pragmatists accounts of truth are often built on adequacy rather than capturing static states, Rudolf Carnap emphasizes the importance of "confirmation" to capture relative degrees of verification, while Helen Longino uses the concept of "conformation."

2.4.3 Verification of Factual and Valuative Claims: A Common Pattern of Judgment

Lepley argues that verification among the various kinds of claims that could be commonly identified as values which fall under the inclusive conception of values (like truth in science, beauty in art, or goodness in ethics), and verification of claims which could be commonly identified as factual follow a methodology with the same general structure. This common structure is a matter of a "problem-solving adjustment" (1944, 23). Following the general pattern of problem solving described by Dewey, Lepley argues that inquiry begins with a felt difficulty, defining the problem, proposing solutions, evaluation of the solution, and experimental testing leading to a settled state. To test whether this general structure holds true of both factual and valuative

judgments, including those found in science, art, and ethics, he studies simple problems from each category, including instances that could be considered "purely factual" and "purely valuative."[26]

Lepley provides a series of examples of each formulation of a judgment in each category. Scientific examples include: "This will make the Bunsen burner light" (factual), and "The burner will burn well" (valuative). Artistic examples include: "this paint is red" (factual), and "this tube is good paint" (valuative). Moral[27] examples include: "the desk is 1 meter long" (factual), and "This is the best place for my desk" (valuative). In each case, he argues that judgments of each kind follow the same general pattern of inquiry and verification in terms of starting with an unsettled problematic state and moving to a settled one. Lepley notes that the value claims in these instances, for instance reference to a burner burning well, indicate a reference to a purpose ("burn well for what?") which doesn't seem to be present in the factual judgments. What is noteworthy is that the purpose itself arises in and is tested by previous operations and interactions and helps inform our expectations about how a burner "should" burn such that we are in a position to judge if one is burning well (1944, 26). Thus, we are in a position to make simple value judgments following a hypothetical imperative pattern of reasoning.

Secondly, the reference to a purpose or interest is not unique to value judgments. What stimulates and holds certain perceptions and investigations into factual claims are matters of interest; there is no perception without interest (1944, 97). According to Lepley for any attention paid to an event, there is both an interest in the event in terms of its nature, but also an interest of the event in terms of its capacity to serve as means. He argues that this should cast doubt as to whether there are purely factual or purely valuative problems, arguing for the even stronger point

[26] Lepley casts doubt whether there can really be such things. Rather distinguishing between the two kinds of judgment is more functional depending on the interest when making the judgment; whether it be a matter of knowing the nature of an event as opposed to considering the event as a means.
[27] Lepley describes moral judgments as relating to personal or social welfare.

that any valuative question can be translated into a factual question and vice versa. For example, "will this burner burn well?" can also be read as "will this burner burn with a specific flame?" Thus, he argues that any event can be experienced both as a fact and as a value (1944, 32).

The survey indicates that on these now relatively simple judgments that could be considered "purely factual" and "purely valuative" that there is a common pattern of judgment. However there still remains open questions about more complex judgments, and whether values are just as verifiable as facts. Verification of factual and value judgments do however take place through a process of operations which eliminate a felt difficulty which can be expressed as a formulation. Lepley notes, "facts and values are here actually formulations and that these are in some degree established or confirmed through complex interactive operations of and among logical, psychological, physiological, and physical events […] formulations are treated as suggestions" (1944, 33). A fact or a value is thus experienced as verified suggestions regarding either a claim regarding an existence or a worth of something.

According to Lepley the interactive operations of inquiry are able to test factual and valuative formulations because they are tests of events that have definite properties which are disclosed by interactions. These indicate certain consistencies of structure and behavior which can be taken as uniformities of existences, or of worth. Certain events, objects, or behaviors are experienced in the same or similar way day to day. This uniformity allows for formulations to be made and tested through continuing inquiries.[28] He notes, "Such verification as is possible is…to be attributed to the somewhat uniform or individual 'isness' of events as experienced in and of interactions" (1944, 43). Verifiability depends on certain physical and logical conditions.

[28] Notice the Peircean insight here in that continuity of inquiry can lead to more definite conclusions over time.

2.4.4 Factors that Affect Degrees of Verifiability

Lepley's analysis of the empirical possibilities of verification considers the nature of events as they affect performability of operations of inquiry (testability). This empirical analysis proposes a scale of degrees of possible verification from those formulations which would be easily verified to those which may be unverifiable, considering factual and valuative claims in the fields of science, art, and morals. His interest in the analysis is to determine what factors determine the degree of verification, whether the same factors which determine the degree of verification for facts also determine the same for values, and to see how the two sets of claims fall on a scale of frequency distribution with respect to the degree of verifiability. On the left of the scale are those claims which are definitely verifiable. These are claims where it is possible to easily test and find definite conclusions. On the right are those claims which are probably unverifiable. These are claims where it may (but not necessarily) be impossible to perform operations whose conclusions are open to public inspection and which would be free of biased inquiry, however there may be limited or restricted types of verification. Two-thirds from the left are those claims which are long-term verifiable (LTV); they would require a lifetime or longer to verify. Between those easy to verify claims and those which would take a long time are claims testable in the short term which would permit testing of alternative hypotheses (ASH). In such occasions, we can relatively quickly test out multiple alternative suggestions. I have compiled the examples of Lepley's survey into the following graphic.

Figure 1: A continuum of different levels of verifiability from the definitely verifiable, the alternate short-term hypothetical (ASH), the long term verifiable (LTV), to the probably unverifiable.

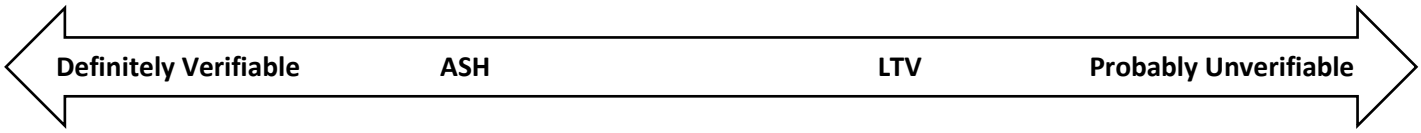


Figure 2: Examples of each of the levels of verifiability including factual and valuative claims.

		Definitely Verifiable	**ASH**	**LTV**	**Probably Unverifiable**
Science	Fact	"This burner will burn."	"Present experiments on infantile paralysis will be successful."	"Research if carried over a few generations will determine the relationship between inherited traits and adult success."	"Consciousness is merely neuro-muscular functioning."
	Value	"This burner will burn well."	"This experiment will be a crucial and significant one."	"It is worth it to spend a lifetime investigating the inheritance of susceptibility to cancer in rats."	"The events to which formulations in physics refer are better conceived as subjective than objective."
Art	Fact	"This is red paint."	"This paint will appear darker than that one."	"Virtual reality will continue to grow as an important form of media."	"Beauty is delightful perception."
	Value	"This is not a good paint for this purpose."	"This color is too bright for a unified effect."	"The Beatles will prove to be the most influential band in the history of 21st century music."	"Not all forms of art are equally adequate modes of expression."
Morals	Fact	"My desk is 1 meter long."	"Tax A will produce more revenue than tax B."	"The importance of the United Nations will decline in the 21st century."	"There is no cosmic purpose to life."
	Value	"This desk will fit in my office. This is the best location for it."	"The social effects of tax B will be better than tax A."	"I will live a more successful life as a teacher than as a philosopher."	"The right is the will of the stronger in force and foresight."

With the series of factual and valuative claims provided which would be scientific, artistic, or moralistic in nature, we note that those claims which are definitely verifiable are the most

simplistic, where the valuative claims tend to include reference to a purpose. Those claims which are considered probably unverifiable may change over time as the specific concepts employed in each claim may become more possible to test at a later time where this may not seem possible today. Longer term claims may be easily testable, but their temporal references are to matters that would require a long time to verify. The content of the claim may not exist yet, or we may lack the appropriate reference necessary to come to a conclusion. For alternative short-term hypotheticals complete duplication of trials may be impossible and thus conclusions would be less definite.

Lepley's analysis reveals that both factual and valuative claims vary in degrees of verifiability as opposed to factual claims only falling at one end and value claims falling on the other; it does not indicate that value claims are equally verifiable as factual claims, but rather that both vary. He acknowledges that on a frequency distribution, that given a larger number claims, if the factual ones will cluster towards the left while value claims cluster to the right, it would indicate that values are generally less verifiable than factual claims (1944, 50).[29] However, any conclusion on this matter requires consideration of what factors determine the degree of verifiability. Lepley argues that the factors which determine the degree of verifiability have to do with the nature of the event to which the claim applies and is tested, those making the inquiry, and the interactions that take place between them. He divides these factors into three categories: the nature of the subject matter, purpose, and frame of reference (1944, 51).

2.4.5 Factors Affecting Complexity of Value Verification: Subject Matter

An event can be characterized along a series of dimensions like simple to complex, accessible to inaccessible, quantifiable to unquantifiable, controllable and uncontrollable, and so on. Events which are inaccessible, unquantifiable, and uncontrollable in various combinations

[29] See Figures 3 and 4.

make it difficult to perform the operations necessary to get "the facts of the case" (1944, 52). Lepley suggests that where we can control for proper logical considerations like correctly identifying the problem and carefully considering potential solutions, it is the traits of the subject matter constituting the event which can affect the degree of verifiability. Since an event can be experienced both as a fact and as a value, this factor can affect the degree of verifiability for both factual and valuative claims.

Given that events can vary in complexity and that this can affect the degree of verifiability, the next thing to consider is what is the subject matter of events which typically concern values compared to facts. For example, value formulations are more likely to have wishes as their subject matter than facts. Values are also more likely to deal with personal or social matters. If it were true that these subject matters are more complex, and thus formulations about them are harder to verify, then values would be less verifiable than facts. However, since there are complex physical subject matters and simple social subject matters; events of all kinds vary in complexity and thus are not inherently more complex or simple than others. Further, new forms of inquiry into social or psychological matters have increased the degree of verification possible than what was once considered possible (1944, 56). Thus, differences in subject matter should not lead to knee jerk conclusions that values, particularly ethical ones, are less verifiable.

2.4.6 Factors Affecting Complexity of Value Verification: Purpose

The second factor that can affect the degree of verification is purpose. We need to consider the degree to which purpose is relevant in verification of facts compared to values. For example, in definitely verifiable value claims there is a direct reference to purpose which does not exist in factual claims. Thus, one may conclude that this makes facts more verifiable. However, Lepley points out that when we consider the interactions necessary for verification (those problematic adjustments which are the catalyst for inquiry), it would not occur without purpose for there is a

desire to adjust the situation. There are also more specific purposes where there is a need to define the nature of a problem and find solutions. Lepley notes, "Delimitation of a problem and determination of techniques and procedures, even in scientific experimentation, are in each case matters of selection with reference to the most promising results" (1944, 58). Choices are necessary for any inquiry, and they are not unconditioned or unaffected by other elements in a given situation. Purposes and choices are formed, informed, and reformed by critical reflection, social criticism, and by the effects of previous actions (1944, 58).

The tendency to claim that factual claims are only descriptive while valuative claims deal only with purposes or ends, Lepley argues, is due to taking abstract descriptive or valuative judgments out of the setting in which they were formulated (1944, 59). This argument, as previously noted, is not distinct from Dewey's claim that we ought not hypostatize claims or consider static propositions independently from the situation from which the propositions were formed as a judgment in response to a concrete problem. Purpose is an important factor in the motivation and direction of inquiry, and of the selection of suggestions for both factual and valuative inquiries. It can also affect eventual verifiability of a claim in that our aim may at times be to find a definitive factual claim where we might expect it, or it may be to propose something more tentative and hypothetical, or to help direct further inquiries (1944, 60). These purposes will determine if a claim falls more to the left or the right on the verifiability scale.

In light of a potential objection that the subject matter of valuations reference purposes in the form of wishes (while factual judgments exclude wishes) and thus valuations fall on the right end of the scale, Lepley considers the role that wishes play in valuations. Comparing his views on the matter to other philosophical accounts of valuation is advantageous. Lepley doesn't adopt the same technical description of wishes that Dewey does, using the term in a more colloquial sense

that could also include prizings or desires. However, he makes similar arguments to those previously discussed. We must "not confuse 'wish' as subject matter with 'wish' as a factor in the final determination of choice," he notes (1944, 54). A wish is not isolated as an anticipated satisfaction, but rather something which if achieved will result in certain effects which can be judged as beneficial or detrimental when considering other wishes and long-term success. Thus, presence of a wish does not make a judgment inherently less verifiable.

He argues that in an inquiry, wishes express themselves as criteria, of what is wanted in or from the subject matter of inquiry (1944, 59). As such they can be evaluated accordingly as adequate or not for adjustment of the problem that exists between the organism and its environment. Like Dewey, Lepley notes the importance that maturity can have on valuations. In the degree that one is mature about what they want, they will consider the effects of wishes as objectively and realistically as possible and inquiry and testing of wishes will inform choices about what wishes to fulfill. Thus, while Lepley employs the term "wish" in a way Dewey does not, Lepley treats wishes similarly to prizings which can be affected and transformed because of appraisals. A wish is also an event, which means that factual and valuative formulations are capable of being made with regard to it. So, while the subject-matter of valuations may often have reference to a purpose in the form of wishes, wishes as an objective event, are not inherently less likely to allow for verifiable judgments to be made about them.

Given these points, Lepley argues that choices and wishes are a part of any inquiry. He argues, "Viewed thus as suggested goods undergoing verification in total courses of adjustment, facts and values will be equally verifiable so far as purpose or wish is a factor. All thinking is 'wishful'—pervaded by wishes" (1944, 59). However, wishes as a subject matter may be more prevalent in valuative problems than in factual ones, and it is also true that in such problems there

is a tendency towards "wishful" thinking in a bad sense of the term as uncritically trying to create a solution and the basis of a final determination of a choice. However, Lepley notes that this depends on individual habits which form the basis of a frame of reference. Purposes like other subject matters for inquiry can increase complexity and thus make verification more difficult. They are also subject to experimental expression and testing and can vary in their determinateness. Thus, purposes affect values according to the inclusive conception of values equally, while values considered under the fact-value conception of values may be more likely to be adversely affected by uncritical "wishful" thinking.

It is crucial to recognize, however, the importance that wishes can have for inquiry. As they function as criteria for inquiry, wishes properly scrutinized and in interaction with other scrutinized events give rise to suggestions and assist in appraising the outcomes of further action within an inquiry (1944, 59). Lepley's analysis is helpful because it provides a basis to distinguish between what can be meant by the term "wish" according to different accounts of value and the different contexts of valuation, and given these possible distinctions the necessity of "wishful thinking" in inquiry. In terms of Lepley's examination of the nature of purpose, despite values being more likely to include wishes or purposes, the conclusion he reaches is that we have no reason to think that the subject matters of values make them inherently less verifiable. The immediate danger of a wish lies with it being interpreted as a terminal response. This will be relevant in later chapters as we consider the potential problem of values in science being a matter of "wishful thinking."

2.4.7 Factors Affecting Complexity of Value Verification: Frame of Reference

The third factor which can affect the degree of verifiability is the frame of reference. Lepley notes that personal factors can affect observations and that experiments are created with reference to the interest of the investigator. Also, "facts themselves are different when viewed in different

frames of reference" (1944, 61). The frame of reference can affect verifiability because an inquirer or group thereof are finite and thus limited to particular times and places. Complexities and uncertainties regarding purposes, wishes, and meanings in addition to the physical subject matter affect the difficulties faced when it comes to verification. Thus, both kinds of factors can create degrees of indeterminacy.

For the inquirer, the frame of reference denotes the personal factors which affect verifiability. Lepley notes, "scientific verification usually excels that [found] in other pursuits with regard to the care taken in building up and fostering the growth of sensitivities, habits, attitudes, and other personal elements which give shape to a total dynamic viewpoint" (1944, 62).[30] This experimental attitude of flexibility, creativity, and critical-mindedness isn't exclusive to science, nor always used there, and Lepley suggests that there are varying degrees of competency in all forms of inquiry. It requires that we "bring to each situation sensitivities, habits, interests, curiosities, modes of affective and reflective response, and powers of or persistence in inference which make possible such analysis and appraisal as are finely discriminative and widely sympathetic" (1944, 62).

This attitude is the opposite of relying on dogma, routine, conventionality, and unfounded credibility and it is essential for verification. The ability to perform operations needed for optimum verification is in proportion to which the frame of reference of the inquirer has these attitudes. According to Lepley, this attitude's higher prevalence in science is not inherent, but due to historical, environmental, and social factors. Because of this, scientific facts and values are more thoroughly and carefully verified. However, this is no reason to think that values falling under the

[30] For these pragmatists, these would encapsulate a "scientific attitude" which is central not only to science, but also, as they urged, should be spread into the moral and political sphere as well (Silk 2018, 101).

fact-value conception of values or values falling under the ethical conception of values are inherently and forever less verifiable (Lepley 1944, 63).

When it comes to ethical values, there is increased difficulty. Individuals and groups frequently disagree on evaluations of the affairs of life. To what degree can verification be possible? Lepley argues that we need to be careful about what is meant by science and verification when we claim that scientific facts and values are more verifiable. For instance, the conception that science only discovers invariant relationships or general averages and uniformities and that verification involves just those tested invariant relationships rather than considering context is inaccurate.[31] He argues that when we consider the nature of verification more broadly in terms of the events which are subject matters of both factual and valuative formulations, irreconcilable differences "arise from the unique traits of each situation of choice": traits both personal and environmental, both internal and external (1944, 64). Indeed, we have discovered from Lewis why this can be so. Despite this, however, there are many cases where there is more constancy among events to allow for discoveries of uniformity.

Nor are all choices equally adequate. While some facts in each situation are dependent upon the individual needs and interests, it is also possible that the factors of the situation can be misjudged. In each situation there is some determinateness regarding biological needs, social conditions, and individual and cultural matters. It is also possible that an inquirer can be short-sighted in their perceptions. We may verify that we have an immediate experience of good, but any further verifications of what is good will require critical reflection, discussion, and action.[32]

[31] Note that Dewey makes a similar argument in *Logical Conditions of a Scientific Treatment of Morality*.
[32] Note the similarities to Lewis and Dewey.

2.4.8 Possible Differences as Functional Instead of Inherent Nature

Lepley also responds to a series of arguments to the effect that logically speaking, value judgments are less verifiable than factual ones. Consider, for example, the claim that facts and values have independent types of meaning. He responds that while factual and value judgments can differ in reference and function, this does not support a claim that they are essentially different, particularly the claim that values are merely expressive. He argues:

> the tendency to contrast some valuative statements which commonly have a high degree of emotive stimulus-capacity with factual statements which ordinarily have a high degree of descriptive stimulus-capacity and then to regard this as an "inherent" or "irreducible" difference between factual and valuative statements shows failure to recognize that all events and relations may be subject matter for both factual and valuative statements and that in different contexts and with different intents each form of statement varies from the completely descriptive in reference and function to the completely expressive […] in reference and function. (1944, 82)

In other words, we have no reason to assume that valuative statements are independent in the sense that they are only expressive, because the different kinds of both valuative and factual claims vary widely.

In considering what a large survey of factual and valuative claims might look like if placed on a scale of verifiability, I have created some graphs where the x axis represents the degrees of possible verification and the y axis represents whether the claim could be considered more factual or more valuative in nature.[33] Those who claim that facts are more verifiable than values would expect a clear trend towards unverifiability the more valuative the claims are (Figure 3). Lepley argues however that when we consider the three factors of subject matter, purpose, and frame of reference, that things are less clear. The same factors with respect to subject matter affect values and facts. With respect to purpose, wishes are a more common subject matter for artistic and ethical

[33] Given Lepley's argument that something can be experienced as both a fact and a value, it is possible that he would not so readily accept that something can be more factual or more valuative in nature. Yet, as we note from the quotation from page 82, he argues that we functionally distinguish between claims that are purely descriptive to purely expressive.

claims than scientific ones, but properly pay no greater part in intellectual inquiry than in science (1944, 67). With respect to frame of reference, science has the advantage of the experimental attitude. If we consider what is possible without reference to current limitations, then en masse facts and values have the potential to be equally verifiable (Figure 4). When we consider what current practices and limitations are, the inadequacies of outlook and methods in morality makes moral values less verifiable than scientific ones.

Figure 3. A frequency distribution where facts are more verifiable than values. Claims which are more factual and verifiable fall in the top right while more valuative and unverifiable claims fall in the bottom left.

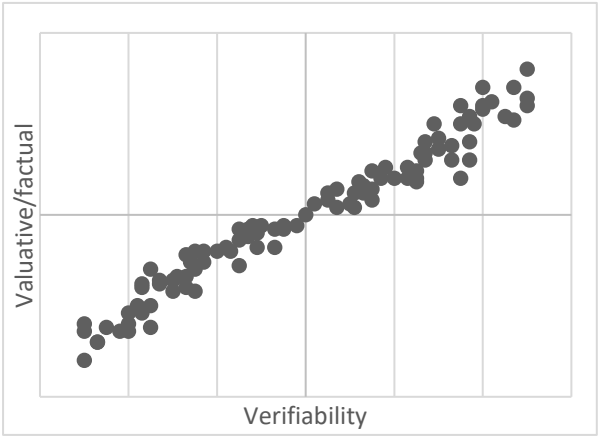
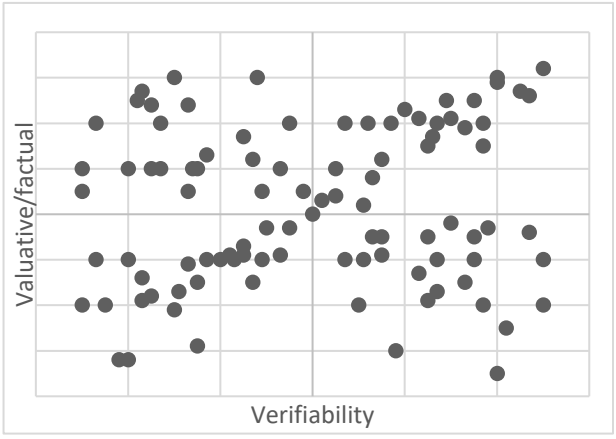


Figure 4. What Lepley believes a frequency distribution of factual and valuative claims would look like. Facts and values are equally verifiable. In current conditions, moral claims are more likely to be found in the bottom left.



Thus, Lepley argues that once we consider the empirical and logical possibilities of inquiry, in so far as both factual and valuative claims vary in degree of their verifiability, we cannot conclude that facts are essentially different from values. Ruling out the idea of essential differences as affecting their potential for verification, Lepley examines the processes by which each formulation comes to be. It is generally thought that facts are formulated through a process of knowing, while values are formulated through valuation; the former is generally considered objective and impersonal, while the latter is considered to be subjective and personal (1944, 89).[34]

[34] Lepley notes that these characterizations are not universally held and, as pointed out in the first chapter, are subject to change throughout history.

Both knowing and valuation as processes can both be conceived of in narrow ways (for example involving only the use of sensory data or self-evident ideas for knowing, and a final choice or preference for valuation) or they can be conceived of in broad ways, including the total process of inquiry involving complex processes of investigations into, and evaluations of, possibilities and effects, as it begins with the study of conditions, suggestions of solutions, and studies and appraisals of effects.

2.4.9 Values as Terminal Responses Versus Broad Processes

It has been noted by Lepley, and by Dewey and Lewis, that many of the arguments which suggest that values are inherently subjective or unverifiable do not focus on the concrete organism-environmental interactions in which valuation takes place. Lepley argues that historically we tend to think of valuation in that narrow sense, as a process confined to a mere choice or preference of a liking or disliking (as terminal responses) separate from any operations done which led to that choice. Thus, historically, valuation has been treated as a process of expression of personal interest or preference (1944, 92). On the other hand, on a broader conception of valuation including overt and non-overt operations of inquiry into a situation, the suggestion of solutions, the evaluation and testing of those solutions, the use of a mere wish or preference devoid of critical examination and testing is "not worthy of being called 'valuation'" (1944, 92).

Because of the progress of scientific methods in the processes of knowing, we now generally conceive of knowing in the broader sense just described. Alternatively, the lack of similar experimental approaches to valuation means we tend to think of the valuation process narrowly. However, if we were to accept a broader conception, then the process of valuation would include all the perceptions, judgments, overt acts, feelings, desires, and preferences that are utilized in experimental operations aimed towards arriving at tested solutions. If so, then Lepley asks, does the distinction between knowing and valuation not blur or break down? Both function as "problem-

solving movements" as "valuation as well as knowing involves or is constituted by a felt difficulty encountered and the attempts made to define or to locate the problem, to find suggestions, to elaborate and test these candidate solutions mentally, to act appropriately, and to note and profit from the effects of so acting" (1944, 94). The processes between knowing and valuation are similar, even if the purposes, subject matters, or methodologies differ.

For instance, while Lepley acknowledges that perception plays a stronger role in knowing while wishing and preference plays a stronger role in valuation, with those elements being emphasized to determine what is knowing and what is valuation, it would be a mistake to simplify things. We cannot claim that all knowing processes only involve perception or that all valuations involve only preference because of the varying complexity of cases which we face. Nor does perception take place in a vacuum independent of inferences. Given the complex processes of knowing and valuation, we should also be careful not to reduce either process to just perception or just to prizings (1944, 97). Perceptions are just as inherently part of the process of valuation as preferences and interests are part of the process of knowing. Differences between the use of perception and preference when it comes to valuation and knowing are relative ones.

Thus, when considering valuation and knowing in a broad sense, Lepley argues that we can determine relative but not absolute differences between facts and values. It is only when we conceive of these processes narrowly do we find that dualisms arise which leads to confused value theory (1944, 100). Knowledge is confused as a process emphasizing sense perception, intuition, and self-evident truths. When it comes to values, ends, duties, and standards become isolated concepts. Lepley notes:

> we only have to call the roll of such great historic theories of the good, the right, or the beautiful […] to recognize that rational insight, conscience, practical reason, will, self-evident truth, pleasures, and consequences have for the most part been taken as having existence and determinate value apart from experimental interactions in total

> situations.[…] Valuation, even more than knowing, has been treated as something *sui generis*, as cut off in existence and potency from the complex interactions through which probably all desires and ideas have their direct and indirect rise and testing. (1944, 101)

This isolation of valuation is still present in views which isolate value propositions from inquiry and testing, or which suggest or affirm that judgments and its processes are something which can be studied apart from their conditions and effects. Worse yet, these dualisms between fact and value maintain the existence of conditions which gives this view credibility; without careful examination of the experimental processes of value formation, the process of valuation cannot advance in the same way that the processes of knowing have (1944, 104-5).[35]

What Lepley's argument advances here is the important fact that insofar as philosophers of science who advocate for an understanding of scientific knowing as not being an isolated process, that knowing is a much broader process than sometimes conceived, and instead involving a reflection of various interests and values and which take place in a socially embedded world, and is not just a matter of marrying sense data for specified propositions, they need to extend that same understanding to the process of valuation. In other words, the more we advocate that values play an important part in the operations of inquiry which transform problematic situations into resolved ones, the more we need to recognize that a narrow conception of values is not only inadequate but a product of an inconsistent logic. If we can accept a broader conception of knowing, we can accept a broader conception of valuation, and thus have no good reason to believe they are determined by processes which are inherently different.

2.4.10 Summary

The themes discussed in this section have been found in the accounts of Dewey and Lewis as well. Lepley demonstrates how accepting that in actual contexts value claims and factual claims will vary in their complexity and possible confirmability, thus any arguments which attempt to

[35] This is echoed by Hilary Putnam, who holds that such dualisms block the path of inquiry (Putnam, 2004).

provide a priori accounts of the nature of facts and values and their respective logics are inadequate. In addition, Lepley's work tells us a great deal about how the terms that are associated with values and experimentation can also vary and thus discussion of value will be unclear unless we keep our meanings and terms explicit. This theme will continue in Chapter 3 and its applicability will be demonstrated in Chapter 4.

2.5. Philip Kitcher's Account of Value

Philip Kitcher has taken steps to offer a naturalistic account of ethics and values in his two 2011 books, "*The Ethical Project*" and "*Science in a Democratic Society*" in the spirit of the accounts discussed so far. What makes Kitcher especially interesting is his discussion of how a naturalistic account of valuation can fit within scientific inquiry. While *The Ethical Project* is primarily about ethics, there are elements of it that fit within a broader account of valuation, so I will begin there. Kitcher's account of ethics is as a project began by our ancient ancestors to respond to the difficulties of social life, a position he calls "pragmatic naturalism" (Kitcher 2011b, 3). According to him, in a preethical age our hominid ancestors developed the capacity for psychological altruism: the capacity to adjust desires from what would normally be desired in solitary situations to match the desires of others for non-self-interested reasons (2011b, 21). The development of such capacities is explained through kin selection and a tendency towards reciprocation which would have been evolutionarily beneficial.[36] With the eventual development of social cooperation, and community stabilization, the capacity for altruism also proved beneficial. Altruism enables, "the organisms to function as a population, to live in the same place at the same time and to encounter one and other daily without too high an incidence of social friction and violence" (2011b, 67). However, altruism also has its limits as various inequitable circumstances, environmental

[36] Kitcher has an in-depth analysis as to how these two factors promote specifically psychological altruism, but I won't discuss them at any length. See §8 of Chapter 2 for more details (Kitcher 2011b).

pressures, and the opportunity for exploitation can limit any potential for altruistic responses. When the stakes are high enough, altruism disappears entirely.

Kitcher argues that ethics is a response to the threat of altruism failure, a situation where one acts based on selfish desire instead of altruistically as they normally would (2011b, 74). He explains, "the tensions and fragilities of hominid (and chimpanzee) social life arise from limited altruism of the participants. Altruism failures lead to conflict, to pain inflicted, to rough discipline, and lengthy peace-making […] Remedying altruism failures is the original function of ethics" (2011b, 222). This potential problem was addressed by developing systems of normative guidance, early forms being rudimentary commands, guidance, and punishments to at least establish behavior that looks like altruism (2011b, 82). Eventually such guidance became internalized through processes of socialization, leading to a desire to follow commands either because of fear or a desire to fit within approved regularities of conduct (2011b, 94). The reaction to previous ethical failures and the desire to avoid new ones led to the establishment of ethical codes as a social product, with their internalization beginning "the ethical project" (2011b, 97).

2.5.2 Values as Relational and their Possibilities for Judgment

As noted, the details of the ethical considerations are less relevant right now than what the account tells us about valuation. Kitcher discusses altruism primarily in terms of desires. He focusses on desires because, like Dewey, he believes that desires are connected with intentions and actions (2011b, 20).[37] Additionally, Kitcher stresses that altruistic adjustments, or in other words, adjustments of what you desire, are a response to foreseeing consequences of what those actions would be; "Because you see the consequences for others of what you envisage doing, the psychological attitudes you adopt are different" (2011b, 20).

[37] One will note how every account mentioned, from Dewey, Lewis, Lepley, and even Perry consider desire to be an active process, not merely an isolated mental phenomenon.

This stresses that at the heart of valuations of desires, not only are actions inherently relevant, but are judged by what consequences they lead to rather than by some a priori standard, or merely being a subjective terminal response. This idea is stressed in every naturalistic account mentioned so far. His account also admits of a range of various possible altruistic responses, from egoism to golden-rule altruism to self-abnegating altruism, requiring that we call attention to the weighing of values determined by factors like the definiteness of conditions, and whether a certain more assured but less preferred result is more overall valuable than a less assured but more preferred result both for me and for others. Thus, valuation is judged in terms of consequences actions are likely to produce. The degree of altruism that is or should be offered will require such value judgments (2011b, 24).

Value judgments are necessary because altruism does not always demand endorsing all possible desires of others. Like other accounts discussed, Kitcher recognizes that not all desires are the same or of equal value and that we should have some means of discernment. How altruism may manifest itself may differ in terms of responding to the mere wishes of the beneficiary or responding to what is in their best interest. Kitcher notes, "A current wish diverges from a real interest when the wish would give way to the preference marked by the interest, were the person relieved of some current misconception or form of ignorance, and when the modified preference would be retained in light of further knowledge" (2011b, 133).[38]

According to Kitcher there are occasions where being altruistic in terms of what is in someone else's best interest may be appropriate, such as a child who doesn't want to take their medicine, and there may be cases where it isn't. Evaluation of the best way to proceed would depend on whether there is evidence that the person in question has thought about their own

[38] Once again, an account suggests that there is a vast difference in what may be immediately valued and what may be valued given a level of maturity where there is intelligent consideration of effects.

valuations of the outcome, whether they are missing crucial information and there is no opportunity to present facts and change desires (2011b, 134). This is relevant not only because our own valuations will depend on what evidence we have, but also because valuations in general can be distinguished based on whether reflection was involved in their formation or not. Such mechanisms of discernment also include questioning whether a desire is endorsable or not. In addition to asking ourselves whether it is what would be desired in a "cool hour" of reflection, we can ask whether it could be satisfied for all members of a community or is in keeping with adopted ethical codes. Desires to commit murder or to lie freely would not be endorsable.

2.5.3 Constraints on Values and Ethical Progress

Kitcher also devotes significant effort to establishing the basis for measuring success in such valuations. On the topic of ethical codes, he resists the idea that such codes involve "mere-change" without any upward trend; that changes to our ethical thinking involve no connection to truth, progress, or knowledge (2011b, 138). He suggests that for most philosophers the response to the mere-change view is to insist that ethics is responsible to some external constraints, and that ethical progress consists in replacing ethical falsehoods with truth. However, he also argues that the view that ethical truth is determined by some new insight is flawed in that it is not accurate to the historical record during times of what we would consider to be ethical progress, such as abolishing slavery or extending rights to women. He notes, "The psychological processes these people seem to undergo differ radically from the forms of evidence conjured in typical philosophical accounts of ethical justification. There are no special abstract forms of reasoning, nothing reported as a moment of 'perception' or 'intuition'" (2011b, 179).

Kitcher argues against the idea that ethical truth is determined by some direct perception of an "ethical reality" which would act as an external constraint. For example, he rejects the notion that someone may see a boy dousing a cat with gasoline and igniting it and *see* the wrongness of

the act, form an immediate judgment, and gain knowledge in the same way we gain knowledge about cats, gasoline, and boys through similar perceptions. Such ethical perceptions providing for new insight of external constraints are not found in historical records of ethical reformers. He notes, "there is simply no evidence of times and places at which some sense of these constraints modified ethical practice, allowing for the institution of reliable techniques for everyday 'observation'" (2011b, 185). In attempting to explain the nature of any constraints on ethical thinking, Kitcher is critical of realist and constructivist approaches to ethical truth.

Kitcher characterizes the realist position as holding that there are preexistent divisions between what is right and wrong (2011b, 190). Kitcher argues that in discussing the idea of immediate perception of right or wrong, there are no satisfactory answers as to how one could perceive some ethical property and reliably convince others to do the same. In addition, changes that do occur can be better explained by social factors. In essence, Kitcher argues that realism is not accurate to the historical record, has an unclear account of how ethical perceptions take place, and must account for how social forces affect ethical deliberation. Thus, in rejecting a realist position that one can immediately perceive right or wrong, he rejects the idea of externally fixed truths or nebulous contact with some external standard (2011b, 190). The constructivist approach to ethical truth as he characterizes it holds that reference of ethical predicates is a matter of conventional determination, or in other words that we are the masters of what is ethically true or false (2011b, 191). Kitcher focusses on constructivist accounts that favor the determination of right and wrong through particular procedures such Kantian universal reasoning or a social contract. Here again, Kitcher asserts there is an absence of reliance on such procedures (even basic ones like "what if everyone acted like that?") according to the historical record (2011b, 202).

In failing to find a reliable external standard by which truth could be determined, the notion that progress occurs by replacing falsehoods with truth remains problematic. Kitcher contends that pragmatic naturalism endorses the idea that progress is prior to ethical truth; truth is what you get by making progressive steps (2011b, 210). For Kitcher progress in ethics is similar to progress in technology. Progress in technology is understood in terms of a problem and a desire to resolve it; it is this desire which grounds the function of the device. Functional refinement consists in satisfying the desire more reliably, completely, and by generating fewer problems for potential users. Normative guidance is a social technology responding to the problems faced by our ancient ancestors. Ethical progress consisted in functional refinement, first by solving original problems more reliably, but with this progress the background problem changed, which generated new functions for ethics to serve. For our ancestors, their focus shifted away from mere survival to eventually articulating a good life and addressing issues standing in the way of it.

Thus, for Kitcher, progress is articulated prior to truth. Ethical truth for Kitcher is conceived of similarly to the approaches of William James and Charles Peirce. He explains that ethical rules, "count as true just in case those rules would be adopted in ethical codes as a result of progressive transitions and would be retained through an indefinite sequence of further progressive transitions" (2011b, 246). Claims count as true in virtue of the fact that they have entered into and remain in ethical codes that have unfolded in an ethical sequence. We are never at the end of the ethical project. We can confidently assert some ethical statements, but those claims may not be enforced by our successors; nevertheless, the confidence is that what our ethical statements express will be upheld in later progressive transitions. This may be because certain themes are discovered and upheld repeatedly (such as banning murder and having some prohibitions on lying), or that certain rules make it difficult to conceive of a society having an ethical system capable of reducing

social tensions without them (2011b, 246). Ethical truth occurs to an idea in its practice rather than being a fixed relation. Kitcher notes, "There is no prior conception of ethical truth, so that people make ethical progress when they discover independently constituted ethical truths" (2011b, 246).

2.5.4 Standards of Ethical Progress

Above all, Kitcher's account of the development of ethics and its progress in terms of social development in response to social tensions and problems aims to avoid reliance on what he calls "spooks," including concepts like a moral law within, faculties of practical reason, perception or intuition of the good, or an abstract realm of values (Kitcher 2011, 41). In *Science in a Democratic Society*, Kitcher ties the ethical project into a more general account of values as they relate to science. He notes for instance, that part of the mistrust of the use of values in science presupposes the idea that at bottom value judgments are subject to no standards at all, that valuing is a matter of taste. Instead what is needed are standards of valuation. He explains, "everything depends on the character of the value-judgment, on the schemes of values and how they are applied, on the ways in which schemes of values are adjusted" (2011, 40). With such standards we can separate religious opponents of evolution and hired guns of industry in science from genuine experts (2011, 40). Kitcher believes that his account of ethical progress can more generally serve as an account of the standards that value-judgments should satisfy (2011, 45).

As ethics progresses it responds to new problems and takes on different functions. Pluralism arises where in cases of functional conflict, there are alternative ways of compromising between ameliorating different problems with different priorities assigned to each. The fact that functional conflict can result in difficulty in reaching agreement is a potential cause of the idea that value judgments are subject to no standards at all (2011, 48).[39] During the beginnings of the

[39] Notice that this issue has been addressed both by Lepley and Lewis.

ethical project, the only vehicle available for the arrival of judgments about values was a discussion in which all participants come as equals and in which the goal is to satisfy all (2011, 49). Kitcher proposes, that our deliberations about values be similarly egalitarian. He argues that ethical conclusions to be endorsed are those that would emerge under an ideal conversation, one satisfying the conditions of mutual engagement, and that these conditions are the core of his proposal for a method of investigating values (2011, 51).

In other words, ethical deliberations are adequate to the degree that they reach conclusions that would have "resulted from an ideal deliberation under conditions of mutual engagement" (2011, 51). Mutual engagement would require that participants not rely on false beliefs about the natural world, that they recognize the consequences of actions and arrangement, and can identify the desires of other participants. It would also require certain affective conditions; genuine engagement requires an expansion of sympathies so that the desires of others can be given equal weight to our own. These, and further proposals[40] ultimately allow for the correction of altruism failures. Kitcher suggests that in areas of conflicting theories motivated by conflicting values, resolution to such conflicts lies in determining whether a conflicting scheme of values which supports a particular explanation would be sustainable in an ideal conversation (2011, 60). If it is not possible for a discussion under conditions of mutual engagement to endorse those values, they must be given up, and thus any reason to insist on conflicting explanations. Further discussions of how these matters relate to science will be eventually discussed in detail, but for now we can recognize how Kitcher attempts to fit a naturalistic explanation of deciding on values can relate to

[40] Since my account here is merely to survey what naturalistic accounts of value entail, I will not go into as much detail here. Instead, further discussion of Kitcher's specific proposals in terms of their role in science will be discussed in Chapter 4.

science. Conflicting desires and preferences can be determined through the same processes that shape the ethical project.

2.5.5 Summary

Kitcher's account reiterates claims found in the other accounts I have discussed, namely, that values are relational. However, Kitcher's account also serves to speak to more modern debates within meta-ethics, specifically realism and constructivism. As a naturalistic account, he reminds us that our understanding of values should echo our actual deliberation and changes in the way we value. He also tells us that the idea of values as a problem-solving adjustment allows us to speak of verification in a way that doesn't require a correspondence theory, a theme that will be repeated in this chapter and in the next.

2.6. More Precise Conceptions of Value

This chapter has provided a survey of various accounts of value which aim to be scientific and experimental in nature. The purpose of this survey is not to insist that any one particular account is correct or to make some grand meta-ethical point, but to present the various *possible* ways we can think about values once we think about their concrete uses. Philosophers of science have the resources to think about values in nuanced ways. As I have previously noted, discussion of values in science tend to be associated with terms like "wishes," "desires," "likings," "preferences," "biases," and so on. The survey I have provided tells us that, given the various possible accounts out there, we cannot just assume that values do or should always refer to these terms in the same way, nor treat them as interchangeable concepts all containing the same content or figure in the same way in a given reasoning process, without any ability to be more specific about our meanings. The phenomena associated with valuing is complex so we can't just assume that these terms will always mean the same thing and perform the same function when considering the usage of values. Nor can we assume that any given term will always mean the same thing from one account to

another. Finally, we must pay careful attention to how any of these concepts as they are involved in concrete conditions affect, and are effected by, the situation in which valuation takes place.

To presume that values are uncomplicated and thus do not require much precision or nuance in our treatment of them is to beg the question. Philosophy of science has generally tried to provide precision to descriptive aspects of science, from what makes something a scientific fact, to the nature of evidence, to trying to articulate accounts of empirical, experimental, and predictive success. This is true of the earliest attempts of the logical empiricists to reduce scientific claims to observation statements to more modern attempts to articulate what is required for something to count as evidence (Longino, 1990), explaining the nature of explanatory, predictive, and experimental success (Solomon 2001) and empirical success (Lacey 1999), to explaining what minimal predictive competence entails (Douglas 2013). To argue that we should be (at least to some extent) precise about these concepts and what processes of empirical inquiry can account for factual or descriptive judgments because of their complexity, but that we do not need to be precise about what we mean by value and the processes by which value judgments are made because of their simplicity is to presuppose that facts and values are essentially separate. Even if we want to claim that values themselves are complex, but we only need a thin account for the purposes of science, it still presumes a difference between facts and values that would require further justification to validate employing any thin account. If we accept the accounts discussed in this chapter, the relationship between facts and values is already blurred and so such a distinction cannot be merely assumed, and as I will discuss in the following chapter, there can be no sharp dichotomy between facts and values.[41]

[41] See Section 3.4 for Putnam's discussion of dichotomies between facts and values and for the account of how I make distinctions between facts and values.

Philosophers of science who have advanced the argument that values need to play a role in science have already done much to undermine the fact/value dichotomy anyway. As Mark Johnson notes, much of the history of philosophy of science has involved attacking the notion that science can be accounted for by appeal to foundational empirical claims; data is theory-laden and choices about what theories are accepted and thus what constitutes a scientific fact depends on values (Johnson 2014, 21). Much of these kinds of arguments undermine the original reasons for the fact-value dichotomy in the first place. If philosophers of science are willing to argue that values need to play a role in science, and that descriptive facts are partially a function of (a result of) values, then they should be willing to accept the possibility that it goes both ways: that values are also partially a function of descriptive facts. If this is true, the risk of rampant subjectivism is reduced. Philosophy of science has been rigorous about the logic of science and its various empirical components and their meanings (vis-à-vis the nature of observation, reasoning, judgment, and what makes something a fact, a piece of evidence, etc.), so to admit a whole new component as necessary (social and ethical values), and then not be equally rigorous about its components and meanings is asymmetrical to a degree that requires explanation. One example which will be discussed in further detail in Chapter 4 can be found in the work of Helen Longino. Longino provides a detailed and sophisticated account of how something can count as evidence for something else but does not provide much analysis of what she means by value and why. One characteristic of philosophy of science is that it tries to provide as precise analyses as possible of the various factors that go into scientific thinking, and, especially given the potential for incommensurability in value discussion, we should aim for as much precision as possible in discussion of values in science.

However, even if one is not prepared to accept some of the claims of naturalism or wants to insist that facts and values are essentially different, there still needs to be further precision than

is typically offered about the nature of values. Unless one wants to be a relativist about values and claim that all value claims are equally adequate (even a cultural relativist would not assert this), I suspect most would accept the fact that we do have some ability to discern between certain values as being better than others. For example, we might claim the value I have for eating junk food is worse than the value I have for eating healthy foods. So long as we make distinctions between certain kinds of values, we need to account for how we can make such discernments and on what basis those judgments make sense because even this raises important questions for how we ought to think about how values are used in science.

This chapter has presented four detailed accounts of values, all chosen because they were intended to also account for how values can be used in science. Each of these accounts, in what I have chosen to emphasize, offers something unique and will prove useful. Dewey, for instance, provides an account allowing us to think about individualized deliberations and valuations. Lewis provides an account of how to talk about values in social terms and disagreements and the ways that various situations affect their realization. Lepley provides an account of the various possible kinds of values that exist, their relationship across various kinds of inquiries, and suggests the different possibilities for verification. Kitcher's account reminds us that verification as a matter of correspondence is implausible because values are not eternally fixed parts of the world.

All of these accounts offer something to a potential conception of values in science moving forward. This includes the ideas that values are not inherently subjective; they suggest the possibility that we have the capability through reason and intelligence to criticize value claims without relying on mysterious or nebulous criteria and that once we pay attention to the concrete conditions in which valuation takes place, we can judge value according to the conditions and effects involved. So, I will adopt the following as the basis of an account of values moving forward:

1. An account of value should focus not only on the terminal response or the immediate act of choice. Considering the concrete conditions of valuation will require us to consider the antecedent and consequent processes and conditions that valuation is a part of and responsive to.
2. Valuation proceeds through a problem-solving pattern of inquiry.
3. Valuation as a form of criticism involves, as described by Dewey and Lewis, both immediate experiences of value and appraisal, where appraisal is considered along an ends-means continuum to come to a determinate judgment of what is valuable.
4. Words typically associated with values such as "wish," "desire," "like," "taste," or "preference" are not all necessarily connected to valuing in the same way, and each may have distinct meanings which are testable. For example, for my purposes moving forward, I will use the terms "wish" and "desire" as Dewey tends to use the terms (with the former designating a non-active preference and the latter an active preference), however I may make reference to ways that Lepley uses the terms as well.
5. There is a difference between what is valued (valuing) and what is valuable, where the latter is or could be determined by a process of valuation (inquiry), and thus I will adopt Lewis' ideas about the difference between apparent and objective value.
6. Values are not narrowly confined to the ethical. As Lepley points out, values can range from the narrow confines of ethics to a broad range including concepts like truth.
7. Value judgments are not essentially different from other kinds of judgments and can be warranted or be considered true, but not, as argued by Lepley, Churchland, and Johnson, by resorting to a notion of correspondence or by relying on reductions to immediate sensory

perceptions. I will accept Lepley's idea that values just like facts are relatively verifiable depending on the nature of the claim and the nature of the situation.

8. Valuation can be a long-term process conducted by social groups which furnish us with generalized ends which have a history of being verified. "Value" can imply either valuing behavior, valuation (judgment), or a generalized end.[42] Discussion of generalized ends will be examined in the following chapter.

A conception of value entailed by these 8 points, and as further explicated in the following chapter, could always be more precise. However, the conception is precise enough for my purposes in that it establishes that values are complex, including many possible meanings, where the many concepts attached to it are conceptually distinct, and that values can vary in degree of objectivity and verification. In Chapter 4, when I discuss other conceptions of value these points are not as precisely put in those conceptions, and this lack of precision is problematic. As I further explicate this account it will be worth considering to what degree is it possible to employ scientific methodologies in such an approach to value. According to Abraham Edel, for scientific method to be applicable to values and ethics, there must be concepts of moral phenomena and moral experience which mark off an area of inquiry as distinctively valuative or moral, a set of moral and value terms which permit of definite ways for linking them to these phenomena, some meaning for generalization or systematization which would permit of possible regularities or law-like isolation of phenomena, and some modes of application and decision so that such generalization will have relevance to the application of values and morality (Edel 1961, 323). I believe that with the accounts discussed some of these conditions have been met, with further elaboration of the experimental nature of value to be discussed in the next chapter.

[42] See Figure 5 for the eventual full description of these terms.

An account of values like this is not to be taken as final or singularly "right." My purpose in drafting such an account of values is not to stake a claim to ultimate meta-ethical correctness, nor to establish that this is the only correct framework for thinking about values in science, but rather to attempt to provide one way of providing precision to the concept of value in order to evaluate accounts regarding how values ought to be used in science and to help resolve potential conflicts and misconceptions when it comes to competing accounts. My notion of values thus has the status of a hypothesis and is affirmed on the basis of a practical decision. This is not to suggest that other potential accounts of values couldn't or shouldn't be used so long as they are coherent and fit with the practice of science at least to some degree. Ultimately to determine the test for validity of any account of values as applied to the values in science debate, I believe we should consider Lepley's suggestion: that a viewpoint be tested by its ability to assist in clarifying, integrating, or extending theory with respect to any single issue (Lepley 1944, 18). In other words, the test of my conception of values will lie in its ability to resolve or dissolve existing problems, integrate conflicting views in the field, and suggest further clarifications, and developments.

With regards to the final idea of my adopted conception of values, that values are warranted or verifiable and that such judgments are not essentially different from other kinds of judgments, it requires further explanation. If a conception of values like this is adopted, I believe it requires a radical rethinking of the nature of how values relate to the process of inquiry. It also requires a more specific account of how values can be verified, where any such account would be especially useful if it can be integrated into some of the contemporary discussions of the nature of scientific verification. Finally, it will require us to consider in what ways values can be distinctive at all. In the next chapter, I will discuss these issues through the relationship of values to forms of judgment both descriptive and normative and on what basis we can think of values as being verifiable.

Chapter 3: Judgments of Practice and the Verification of Values

The account of value adopted in the previous chapter is one in which value is not confined to what is ethical but applies to many areas of deliberation such as to the sciences and to epistemic concepts like truth. Following the lead of Dewey, Lepley, Kitcher, and Churchland, it also affirms that value inquiries follow a pattern of problem-solving, and that value judgments are not essentially different from other accounts of judgments and can be verified in similar ways. In addition, the account affirms that verification will not follow based on a correspondence notion of truth. All these positions require further elaboration, both for the sake of clarifying how values are capable of verification, but also to consider what are the consequences of adopting an account of values like this when it comes to any kind of inquiries. This chapter thus has two aims: the first section will explain how the notion of values as a problem-solving mechanism allows us to understand how valuation is a broadly used phenomenon which applies to all forms of inquiry. To do this, I will utilize Dewey's argument that all judgments are practical judgments and Lewis' argument that valuation is essential to knowledge production as they explain these issues in the most detail. The second aim is to explain in what way values can be considered to be verifiable. To do this I will argue that we can best understand value verification through Dewey's concept of warranted assertability, as it pertains to a pattern of practical judgment as the final outcome of a process of adjustment of a problematic situation. Once all this is understood, it will become clearer how an account such as this enables us to make better sense of the relationship between valuation and scientific inquiry.

3.1. Judgments of Practice

Dewey argues, "all controlled inquiry and all institution of grounded assertion necessarily contains a practical factor; an activity of doing and making which reshapes antecedent existential material which sets the problem for inquiry" (Dewey 1938, 160). Thus, there is a particular form of

judgment which functions in determining what to do to execute a needed controlled existential transformation of an indeterminate problematic situation into a determinate resolved one. An indeterminate situation is one that is questionable, ambiguous, confused, conflicting, obscure, and so on (1938, 105). Resolving such indeterminacy requires existential operations which modify objective matter to bring about a change in belief.[43] Because such situations require that something should be done yet are indeterminate with respect to what might or should be done, one must therefore form a judgment as to how to act to facilitate such modifications. Thus, such judgments occur only where what to do is called into question and there is lacking a clear impulse to act in a particular way.

The intellectual question of such judgment is "what sort of action the situation demands in order that it may receive a satisfactory objective reconstruction" (1938, 161). In other words, there are judgments which take place whenever we encounter a situation where resolution will require taking some action, and it isn't clear what that action should be. As Dewey notes, these kinds of inquiries are not exceptional or infrequent as many deliberations in our daily lives concern what we should do, and to deny that such judgments occur would be to claim that action is determined either by impulse, habit, caprice, or convention. He explains, "Unless the decision is arrived at blindly or arbitrarily it is obtained by gathering and surveying evidence appraised as to its weight and relevancy; and by framing and testing plans of action in their capacity as hypotheses: that is as ideas." (1938, 161).

3.1.2 Basic Account of the Nature of Practical Judgment

Practical judgments require descriptive claims regarding the nature of the situation. Dewey explains, "what should be done depends on the conditions that exist in the given situation and

[43] Dewey explains that transformation of the situation, "cannot be attained by conjuring with mental states. It is an end brought about only by means of existential changes" (1938, 162).

hence require a declarative or enunciatory proposition: 'The actual conditions are so-and-so'" (1938, 162). Thus, the business of inquiry is to "determine that mode of operation which will resolve the predicament in which the agent finds himself involved, in correspondence with observations which determine just what the facts of the predicament are" (1938, 168). Accuracy of the practical judgment depends on an accurate survey of conditions to determine obstacles to be overcome and resources to be utilized. However, this does not include every condition. Rather, judgments require that we determine what is relevant for deliberation. Thus, any declarative propositions are hypothetical with respect to their relevancy and adequacy for the judgment at hand; they function as instrumentalities for providing the needed control. For example, predicting the return of a comet does not just require accurate data, but determining which data is relevant or irrelevant (and thus used) for such a prediction (MW 8: 22). Declarative propositions involving facts or concepts are instruments to be used in eventual judgment and action.

Lewis echoes this notion in his own work. According to Dewey, all judgments of fact have a reference to courses of action to be tried and to the discovery of means for their realization (MW: 23). Such factual claims function as means within practical judgment to ground the judgment that a particular act is the one best determined to produce the desired effect on the basis that they yield probable predictions of possible outcomes. Lewis argues that the purpose of knowledge is to allow us to anticipate the future where action will make a possible difference (Lewis 1946, 4). Action is an attempt to determine or control a particular outcome and therefore knowledge is important. He notes, "The principle function of empirical knowledge is that of an instrument enabling transition from [one kind of situation] to the other; from the actual present to a future which is desired" (1946, 4). Thus, for Lewis any descriptive fact about the world has practical import and is part of practical judgment: "knowing is for the sake of doing" (1946, 3).

Thus, in a case of practical judgment there is an indeterminate situation whose resolution will only take place with an existential change in current conditions. Something will happen, but exactly what will depend on conditions which will be determined by some action which can produce change. What should be done is in question, or is indeterminate, and thus the final outcome will be determined by some inquiry. In such deliberations, there will be observations of existing conditions and a tentative determination of descriptive propositions, concepts, or rules and their relevance as means towards resolution. Eventually a hypothesis or end-in-view will form which will suggest a plan of action which will introduce the conditions needed to yield a transformation of the situation into a resolved determinate one. The end-in-view or goal must be specific to the situation to be a means of continually regulating a specific behavior once a judgment is made. One does not have a goal of safety at large, for instance, but getting to a specific place of safety. Dewey notes, "unless the anticipation or end-in-view is idle fantasy, it takes the form of an operation to be performed" (Dewey 1938, 166).

The final judgment will then serve as a determining factor in the subsequent form of events. If this hypothetical mode of action, when carried out, has the expected effect, it is verified. The final issue is, "some new situation in which the difficulties and troubles which elicited deliberation are done away with; in which they no longer *exist"* (1938, 161). This serves as the standard of judgment. The truth or falsity of such judgments is determined by the outcome since the subject matter of the judgment is the determinate situation (MW22). This outline will serve as the basis for understanding a logic built on the notion of a problem-solving adjustment to make such practical judgments and how experiences and concepts can serve in different logical functions towards those adjustments with further details to be filled in in section 3.2.[44]

[44] It is worth noting that such a logic will borrow heavily from Dewey whose logic is uniquely distinct from traditional formal sentential logic. Dewey's logic focusses on inference as a matter of problem-solving, with

3.1.3 Valuation as Practical Judgment

We now have an outline of what the logical process of a judgment of practice is, and it is important to note that Dewey argues that evaluations are of this form. Values are not subjective, Dewey notes, but practical (MW 8: 34). Recall from the last chapter that valuation involves two essentially different components. Prizing describes a kind a behavior, a matter of finding a thing to be good such that we welcome it, dwell upon it and so on as a matter of organic reaction to immediate experience. To appraise something is a form of judgment, a process of eventually judging something to be good and eventually knowing it (MW 8: 27). Notice that outside of valuation in cases of affective-motor behavior, there are no propositions formed other than what is experienced, or what Lewis calls empirical value statements.[45]

Where there is judgment, however, it is important to note, as has been pointed out by Dewey, Lepley, and Lewis, that "good" or "bad" as terms in a judgment are relational concepts, rather than being self-sufficient or irreducibly simple, we consider something in terms of the concrete situations in which they arise and the consequences they permit. The good that is experienced is because of an organic reaction, and thus involves relations to what caused such a reaction. Inference involves examination of the experiential finding of good or bad in terms of such relations. *Judging* that a thing *actually is* good instead of merely experiencing it to be good involves "ceasing to look at it as a direct, self-sufficient thing and consider it in terms of its consequences—that is, in its relations to a large set of other things" (MW 8: 29).

In other words, an inference is made when we use the experience of good or bad to predict certain consequences; what Lewis would call terminating or non-terminating judgments. To make

various experimental operations employed in such inferences, and how such operations function within such a logical inference. References to the logical functions of various concepts may thus indicate a meaning that departs from traditional understandings. For more information see Brown 2012.

[45] See Lewis' section of the previous chapter.

such an inference that a thing found good will actually bear out and be considered to be good in light of certain consequences is to form a practical proposition; to consider how something, if acted upon, will operate in promoting a particular course of action (MW 8: 30). In light of certain consequences, we are able to form judgments about the value of a thing despite this being different from how it is found now, just as we judge that getting a flu shot is valuable despite the discomfort. Such judgments involve comparisons between different potential consequences, determining which should be promoted or avoided, and whether we are capable of such promotion or avoidance or not. In other words, in appraisal we evaluate various prizings, which are behavioral in nature; thus, how we should behave. Since valuations are a determination of what to do, they are a form of practical judgment.

In valuation, there is a determination of the desirability of separate potential actions as a means to separate possible outcomes. As Dewey notes, "valuing [valuation] denotes a passing judgment upon *acts* with reference to their connection to other acts" (MW 8: 31, emphasis added).[46] Valuation constitutes a form of practical judgment. Because of this, value is not something previously given but is determined through inquiry and realized through action. Judgment is required because it is indeterminate in terms of what influence various qualities should have over our eventual behavior. In other words, because of conflicting tendencies between various possible actions, with each outcome and each means having an influence on us, valuation is not merely about recognizing the influence of something on us but determining the value of that influence relative to incompatible aims so as to determine what to do. So long as we know what to

[46] It is important to note that Dewey here uses the term "valuing" to describe a judgment, whereas beginning in Section 3.3, I use the term differently to describe a behavior apart from judgment. An explanation for this discrepancy for this is owing to changes in how Dewey uses these terms over the course of his career.

do, there is no valuation needed and no determination of value made; valuation, and thus determination of value, is a matter of determining what we want.

Dewey explains, "To judge value is to engage in instituting a determinate value where none is given. It is not necessarily the case that antecedently given values should be the data of valuation; and where they are given data they are only in terms in the determination of a not yet existing value" (MW 8: 36). This once again presents a warning sign when we use the term "value" as predicated of certain generalized terms like "honesty" or "simplicity." Since valuation exists when there is indeterminacy over what should be valued between conflicting aims, it is not a matter of conforming to a pre-established ideal but comparing these options with one another (MW 8: 39).[47] The value can only be determined by determining what to do, by forming a practical judgment.

As noted, an end-in-view is not a general concept, but specific to that situation. Every such situation is specific; it is not merely incomplete; the incompleteness is of a specific situation (MW 8, 46). Thus, valuation is never merely a matter of applying a fixed or determinate value to be judged outside of the situation to the competing goods within a situation. As Dewey notes, the more completely the notion of an aim is fixed and formed, "outside and irrespective of the specific conditions which the situation of action presents, the less intelligent is the act" (MW 8: 40). Any standard we use will be determined within the judgment, otherwise if a standard is already given there only remains "its mechanical application to the cas e in hand […] genuine moral uncertainty would be impossible" (MW 8: 40).

While existing standards can be formed prior to the process of judgment within a given situation, the usefulness of such standards is limited to the degree that those standards emerge from

[47] It is important to note how this differs from the account of value from Hugh Lacey discussed in the following chapter.

situations similar to one being faced.[48] As Dewey notes, "The experimental character of moral judgments does not mean complete uncertainty and fluidity. Principles exist as hypotheses with which to experiment. Human history is long. There is a long record of past experimentation in conduct, and there are cumulative verifications which give many principles a well earned prestige" (Dewey 1922, 239-40). Recurrence of similar situations allow for the formation of generic ends which possess some prima facie claim to use. However, "value-standards are only presumptive. Their status depends […] upon the extent to which the present situation is like the past" (MW 8: 47). Thus, such standards are means of aid in deliberation (though do not replace it) which allow for examination of a situation, but Dewey stresses the dangers of allowing habits to overlook differences and presuming that the standard should apply when it doesn't. This is because "every moral situation is a unique situation having its own replaceable good" (Dewey 1920, 163). Any prior standard is only as useful as it was critically formed and verified at the time, and as it properly applies to the situation at hand.

3.1.4 Perceptions as Practical Judgment

So, valuations are forms of practical judgments as Dewey defines them. However, there are other aspects of judgments of practice worth considering. For example, sense perceptions are involved in judgments of practice. As discussed in the last chapter, experience is active and so, "sensory quality becomes specific only in motor response. Red, blue, hot, ect. as immediate experiences, always involve motor adjustments which determine them" (Dewey 1903, 123). In other words, if you change your behavior or activity, the experienced quality changes. Also recall that according to Dewey and Lewis, immediate forms of sense perception are not forms of knowledge; they exist and while statements about their occurrence can be false in the sense that

[48] More on this idea will be taken up in the following section.

one could lie about them, the perceptions are neither true nor false (MW 8: 51). With this in mind, Dewey argues that most sense perceptions are functional within practical judgment in that the function of perceptions are to be taken as signs[49] which suggest different possible actions. For example, the observation of a red light is a term within practical judgment suggesting that one should stop. In other words, we observe in order to perceive various signs which suggest what to do. As noted, immediate experience is not cognitive; experience only becomes cognitive in so far as we take what we observe to be a sign which suggests something besides the observation itself.

Because perception has this capacity to present signs, perception becomes a practical affair. We may observe a great deal of content which is not cognitive, but which may become cognitive if we judge that it is a sign relevant to potential action. This is relevant not only because observation can suggest action, but that actions inform our observations. Certain activities will prioritize seeking certain kinds of signs and thus making certain kinds of observations in order to get certain specific information. For example, Sharon Clough notes that in primatology studies, a gender-laden word like "harem" predicated to primate groups containing one male affected observations of researchers as passive female behaviors became overreported and aggressive female behaviors became underreported (Clough 2004, 112). If we recall Dewey's arguments about the arc reflex concept from Section 2.1 of the previous chapter, observation and action are not distinguished from each other. Observation is not merely passive, but active in that a child may see-to-reach and so that observation and action guide each other. Even mere observation of a flame guides the eyes to observe in certain ways.

Dewey's argument is that sensory data only takes on a cognitive character because of its role within practical judgment. Lewis makes a similar point: taking an immediate experience as a

[49] Here "sign" has logical significance as understood within the field of semiotics. Signs indicate something else.

sign allows for the regulation and control of an outcome through action. Judgments about immediate experience are for the sake of action and would have no use otherwise (Lewis 1946, 3). Sensory data is significant because it suggests consequences to be had, controlled, avoided, and so on. Actions thus drive the kinds of discriminations we make in how we observe phenomena and involve a process of determining what is relevant and what isn't for future outcomes. Even scientific propositions about sensory data, which are used to determine causes and events, have reference to "inferences regarding consequences to be effected. They are means of securing data which will prevent errors which will otherwise occur, and which facilitate an entirely new crop of inferences as to possibilities—means and ends—of action" (MW 8: 57). Thus, sensory propositions are judgments of practice in so far as they function both within practical decision making but are also a result of ongoing action. In other words, sometimes perceptual judgments will be a practical phase of inquiry as a means to pursue some larger question ("to find an answer, I should look there in this way"), or sometimes inquiry itself will concern itself specifically with the question of where and how to perceive something ("the answer *is* to look there in this way").

3.1.5 Inference as Practical Judgment

Even what questions we choose to ask are a form of practical judgment. When we are faced with an indeterminate situation, it may be so indeterminate that we are unaware of what problem we face and thus we need to judge what is the right question to ask. Dewey argues that determination of what questions to ask and how to ask them is a matter of determining what should be done to secure the materials, facts, and concepts necessary for the resolution of a problematic situation (Dewey 1938, 170). Not only are judgments of this nature common amongst every day judgments, but within many fields, such as law, medicine, mechanics, art, and agriculture, determining the right questions to ask is significant for progress in inquiry. So far, Dewey, has argued that everything from moral judgments, evaluations, everyday deliberations, sensory

perceptions, and judgments about what questions to ask are all forms of practical judgment. However, Dewey also argues that inference is ultimately a matter of practical judgment as well.

According to him "instigation to behave towards the remote in time and space is the primary trait of the inferential act; descriptively speaking the act consists in taking up an attitude of response to an absent thing as if it were present" (MW8: 70). To clarify, inference is a matter of relating what is presently experienced to some future expectation. If one affirms the presence of a snake, we are affirming potentialities going beyond what is actually given, that what is given will react in ways characteristic of the concept. Concepts, are thus necessary for inference, and are practical in nature. This is because the concept of something is detached from the given thing it applies to. A concept "preserves the meaning-force of the situation and detaches it from the immediacy of the situation" (MW8: 76). As Dewey explains it, physical things do not have implications, but the idea or concept of things do. Seeing a light, we can accept it as a comet, but it remains light as given and thus does not imply anything. Such an inference can only be tested if something is implied by it. If we have a concept of "comet" it can tell us what a comet would be if it were there and what other things would be indicated if it were a comet (for example, that it will follow a certain kind of orbit, that spectrographic analysis will determine a certain chemical makeup, etc.). Concepts and ideas are thus tools of inference which prescribe and regulate operations of inference, where inference aims to determine how to orient oneself to something implied but not yet present. Refinement of such concepts are a practical means of guarding and improving inquiry and thus their development is a practical affair as well. This, of course, is relevant to science as well.

3.1.6 Science as Practical Judgment

Science also involves the use of abstract concepts to suggest possible meanings. Abstract conceptions are adopted for the sake of inquiry because they permit a greater control and greater

degree of testing and manipulating. Thus, focus is shifted away from immediate qualitative aspects of experience. Ideas used in science allow for manipulation and understanding of relationships which permit further experimental acts of inference that may not be relevant to common-sense inquiries. Identification of physical water and its immediate qualities allows for little inference, but "H_2O" suggests all kinds of relationships which permit experimental testing.

Dewey's point is that measures of scientific safeguarding such as discriminatory analysis and the shaping and modification of abstract concepts are ultimately for the sake of practical judgment.[50] Operations like breaking down experienced qualities and employing abstract meanings are tools which are designed for the sake of a better controlled inference. Thus, the concepts and methods of science are chosen for practical reasons; they exist to suggest and control operations of inquiry (Dewey 1903, 121-2). According to Dewey, science is controlled inference and yet the specific inferential tools developed by science makes it a "highly specialized industry. It is such a specialized mode of practice that it does not appear to be a mode of practice at all" (MW8: 79).

Yet Dewey argues, "The conduct of scientific inquiry […] is a mode of practice; the working scientist is a practitioner above all else and is constantly engaged in making practical judgments: decisions as to what to do and what means to employ in doing it" (Dewey 1938, 161). As noted, determining what question to ask is a practical decision, and this is true in science as well. But such decisions are not just about asking what is of interest for research, but also play a role in determining the best methods of observation, experimentation, and conceptual interpretation (1938, 170).

[50] This point is echoed by others in philosophy of science such as in the operationalism of Percy Bridgeman (1927), and in the work of Philip Frank (1950).

In so far as judgment involves choosing concepts, deciding on subject matter, and determining methods of testing and verification, "activity shows itself at every critical point in the formation of judgment" (Dewey 1903, 121). According to Dewey the scientist:

> has to decide what researches to engage in and how to carry them on—a problem that involves the issue of what observations to undertake, what experiments to carry on, and what lines of reasoning and mathematical calculations to pursue. Moreover, he cannot settle these questions once and for all. He is continually having to judge what is best to do next in order that his conclusion, no matter how abstract or theoretical it may be as a conclusion, shall be grounded when it is arrived at. (Dewey 1938, 161)

In other words, scientific inquiry proceeds on the basis of determining what to do when inquiring.

Moreover, such judgments must be continually made as the scientist must decide the relevancy of any concept or observation, and whether and how to proceed through each step of the process. Thus, even judgments about purely theoretical concepts are practical judgments in the sense of how they should be utilized. Such judgments are only tentatively affirmed until a final judgment is made and an action can be taken towards resolving indeterminacy.[51] Dewey explains:

> The scientific worker has continually to appraise the information he gathers from his own observations and from the findings of others; he has to appraise its bearing upon what problems to undertake and what activities of observation, experimentation and calculation to carry out. While he "knows," in the sense that understanding, systems of conceptual material, including laws, he has to estimate their relevancy and force as conditions of the particular inquiry undertaken. (Dewey 1938, 174)

Modern philosophers have also echoed this point, that methodological decisions about durations of studies, the appropriate makeup of test subjects, and the selection of biological endpoints depend on value judgments (Intemann and de Melo-Martin, 2010; Wickson and Wynne 2010). Thus, judgments of practice take place throughout the entire process, whether it involves judging what question to ask, what materials, observations, and concepts to invoke, what testing processes to make, whether such testing is sufficient, whether the results are sufficient and relevant to the

[51] See 3.2.3 for more information on the difference between affirmations and final judgments.

original question, whether the original question is still well formulated, and so on. For example, standards of evidence are not "pre-theoretical" but evolve as theories and investigations evolve (Nelson 1990, 313). Since a standard is normative in nature, it means that valuation of what those standards ought to be occur throughout inquiry. Determination of whether something should be singled out as subject matter, or whether certain concepts will be used will be determined by the end-in-view as each are brought into a logical relationship with the other (Dewey 1903, 121).

Dewey holds that all inquiries involve judgments of practice, and that science is a practice. The process of scientific inquiry thus will always involve practical judgments. However, it is important to recognize that a scientific inquiry will not only involve practical judgment, but that it is a form of practical judgement itself. Recall that inquiry is about transformation of an indeterminate situation into a determinate one, and such a transformation is not a matter of removing personal doubt, but understanding what operations are necessary for responding to one's environment and being able to do it. In the following section I will discuss judgment in more detail, but Dewey's conception of judgment has been characterized as a matter of "attributing a predicate to some subject" (Burke 1994, 145). The subject of a judgment is the piece of the world the judgment is about, but for Dewey, "the predicate of a judgment will be the process or course of action settled upon as being what is appropriate and fitting for that situation" (1994, 145). Returning to the example of the comet, if a scientific judgment was primarily concerned with determining what a light in the sky is, the judgment that we can predicate the concept "comet" to the subject matter (the light), is a matter of putting us in a position to take the light as signifying a "comet" and, as just discussed, understand by that how one should respond, whether this means actual actions or potential actions. As Dewey reports, "To say that something is to be learned […]

is to say that something is to be done" (MW 8: 66). Thus, science not only involves practical judgment, but is itself a form of practical judgment. This carries true for all factual judgments.

3.1.7 All Factual Claims as Practical Judgments, as Evaluations

Dewey presents several cases that would fall under the umbrella of a judgment of practice. Everything from moral judgments, to sensory judgments, deliberations, scientific judgments, evaluations, interrogative judgments, and so on all are practical. Early in his analysis, Dewey questions whether all judgments of fact remain hypothetical in that their relevance to a situation is not fully determinate until action is taken. He suggests that all factual judgments have reference to a determination of courses of action to be tried and to the discovery of means for their realization and these judgments are verified in so far as they produce expected consequences which occur as a result of intelligent action (MW8: 23). In other words, descriptive or declaratory propositions are not isolated or self-sufficient, but function within inquiry as hypotheses which suggest the need and advisability for performing certain operations as a means of resolving an indeterminate situation (Dewey 1938, 178). Thus, the validity of any such claim rests with their leading to the expected outcome; while the subject matter of the proposition may be purely declarative, the proposition itself is not. Dewey's survey of this fact in various kinds of judgments serves to confirm his claim that "there is no inquiry that does not involve judgments of practice" (1938, 174).

While we may know certain facts, and certain rules or principles may be accepted as standards, they are not necessarily decisive in any particular judgment. Applicability of facts, rules, principles, and laws always enter into any judgment and choice has to be made among them. Consequently, "in order to obtain a grounded final judgment there has to be evaluation or appraisal of principles" (1938, 173). Because of this, Dewey remarks, "Such evaluative judgments are clearly an instance of judgments of practice; or, more strictly, all judgments of practice are

evaluations, [because they are] occupied with judging what to do on the basis of estimated consequences of conditions […] A point still more important for logical theory is that these evaluative judgments […] enter into the formation of *all* final judgments" (1938, 174).

3.1.8 Judgments Are Evaluations

If Dewey's analysis of judgments of practice are correct, we can confirm that all judgments involve judgments of practice, and that all judgments of practice are evaluations. This allows us to understand the claim from the previous chapter that value judgments are not inherently different from other kinds of judgments, for, "the net conclusion is that evaluations as judgments of practice are not a particular kind of judgment in the sense that they can be put over and against other kinds, but are an inherent phase of judgment itself" (1938, 179). Nonetheless, it is possible to identify certain judgments as being distinctly "value judgments." Judgments about means and ends-in-view may be so pertinent that the evaluative aspect is more dominant and in this relative way a judgment may be called a value judgment, but since evaluation is an inherent phase of any judgment, the difference is in emphasis not in kind (1938, 179). This claim would validate Lepley's suggestion that the difference between factual judgments and value judgments are a matter of emphasis rather than inherent difference. Thus, we can now understand the claim that value judgments are not inherently different from other kinds of judgments.

3.1.9 Value Judgments Necessary for Knowledge

Perhaps more importantly, we can come to understand the necessity of value judgments being verifiable. Since practical judgments involve the existential transformation of a given situation, it is not the case that valuation is merely a personal mental exercise (Dewey 1938, 159). Judgment is concerned with an objective situation involving both the person doing the judging as well as various other conditions and consequences external to the self which are involved. It is on this necessary basis that we can understand that such judgments can be objective (MW8: 16).

Dewey notes, "deliberation, as a tentative trying-out of various courses of action, is outlooking. It flies toward and settles upon objective situations not upon feelings" (Dewey 1922, 202). According to Dewey, to doubt that such judgments are capable of verification, or to suggest that one couldn't judge an objective situation and determine what is better to do is to deny that intelligence enters into any form of practice; that any judgment is irrelevant (Dewey 1938, 160). In other words, since inquiry requires judgments about what we should do, those judgments are either made out of habit or impulse, or they are made on the understanding of the effects that will follow from them and confirmed on the basis of those effects. Without such verification, successful inquiry would be a matter of luck.

Lewis, in accepting the claim that in the process of making practical judgments one must affirm certain facts and make use of them, argues in more explicit terms that the denial of verifiable value claims would lead to relativism. According to Lewis, "Knowledge, action, and evaluation are essentially connected. The primary and pervasive significance of knowledge lies in its guidance of action: knowing is for the sake of doing" (Lewis 1946, 3). An active creature is one who takes an interest in securing certain aims or desires and avoiding others, thus it aims to bring about certain outcomes. Determinations of what action to take is rooted in evaluation, while determination of how to secure those ends are rooted in knowledge.[52] In the *Quest for Certainty*, Dewey makes a similar argument (Dewey 1929, 389). Recall that for Lewis, something presented as being cognitively significant is so because it signifies something else capable of being realized in future experience. To know, "is to apprehend the future as qualified by values which action may realize" (Lewis 1946, 4) Whether a particular action will be performed or not will depend on the

[52] He notes that a creature who was incapable of altering the processes of reality would have no use for knowledge and would be incapable of comparing values. It would only be capable of esthetic enjoyment or suffering.

evaluative processes brought to bear in judgment and will be controlled by the degree that it makes reference to anticipated possible experience of something desired or to be avoided.

In the previous chapter, I explained how Lewis' account made the case that value judgments are not completely distinct from other forms of judgment. However, Lewis' argument that evaluation, action, and knowledge are connected makes the stronger case that evaluations must be verifiable for knowledge to have meaning. He argues:

> The denial to value-apprehensions in general of the character of truth or falsity and of knowledge, would […] invalidate all action; because action becomes pointless unless there can be some measure of assurance of a valuable result which it may realize. And this negation, if it be carried out consistently, likewise invalidates all knowledge; both because believing itself is an active attitude which would have no point if it were not better to be right than wrong in what one believes, and because knowledge in general is for the sake of action. If action in general is pointless, then knowledge also is futile; and one belief is as good as another. (1946, 366)

In other words, if we were unable to verify whether one action is empirically better than the other, we would have no use for knowledge since we use knowledge to determine what effects an action is likely to take. If we were unable to verify a value judgment by gauging whether the consequences agree with the hypothesis, one belief would be as good as any other. As Cheryl Misak explains, "If it were not better to be right than wrong in what one believes, why bother about your belief or your grounds for it?" (Misak, 185). Dewey echoes this by noting that without an end-in-view, there is no guide for observation, there would be no control over the practice of inquiry and any fact would be as good as any other (Dewey 1938, 497). Lewis' points also highlights a point similarly made by Dewey, that belief itself is a value-object, that beliefs are deemed good or bad based on the consequences which they give rise to if acted upon (Dewey 1925, 403-6).

If we accept Dewey's analysis of judgments of practice and Lewis' argument regarding value, knowledge, and action, we thus come to the same conclusion. If knowledge involves practice, it must require verifiable value judgments regarding how to conduct ourselves within an

inquiry or else inquiry would be a process of impulse, habit, or convention. If knowledge is for practice, then values must be verifiable or else the declaratory propositions or knowledge claims that certain objects produce certain effects would be pointless. Thus, value verification is not only possible, but necessary for the practice of inquiry. Once we understand Dewey's point that the practice of science includes determination of what experiments to perform, what apparatus to use, and what calculations to engage in, we understand that science is about establishing the controlled and intelligent regulation of action, for it establishes a method best suited to securing what is valuable (Dewey 1929, 36). Thus, science represents a sophisticated form of intelligent ways of acting and thus of making evaluations. In turn, science provides the knowledge necessary to improve our judgments about values, to regulate them, and make them more secure (1929, 39). Sharyn Clough has also noted this relationship between science and values (Clough 2004, 111). The notion that science is free of value judgment is thus not only false logically, but the argument here suggests the desirability of valuation in science. If intelligent action as a judgment of practice is a product of controlled evaluation, science does not become less objective by relying on such value judgments, for the alternative is reliance on habit, impulse, and convention; rather science becomes more objective the more we use evaluation in the practice of inquiry, so long as evaluation is itself subject to controlled and experimental processes and is verified.

3.2. Value Propositions and the Meaning of Verification

Recall from the last chapter that verification of values is an issue of contention. Verification of values doesn't seem possible if it must be in terms of a narrow conception of fact or truth. As Lepley noted, verification is better captured in terms of adequacy rather than truth, and Kitcher argued that value verification can be understood as progress in resolving problems. The nature of the verification of value judgments and their relationship to judgments of practice can be further clarified using Dewey's concept of warranted assertability and its relationship to the propositions

involved in inference. Eventually, I will argue why such a concept is not only beneficial for understanding the nature of verification of values, but also compatible with current thinking in philosophy of science. I will begin by explaining what warranted assertability is and its relationship to the rest of inquiry as it can pertain to valuations.

3.2.2 Verification as Warranted Assertability

According to the broad conception of value adopted in the previous chapter, I affirmed the notion found in every account of valuation considered, which is that valuation occurs through a problem-solving pattern of inquiry. As Lepley suggested, verification can be limited to truth (however this may be defined) but he opts instead for a liberal meaning of verification which can include truth but also include adequacy and the ability to transform significant experiences. Lepley provides few details beyond this, so instead we will look to Dewey. According to Dewey, the recognition that inquiry is in response to some trouble, conflict, problem, or doubt means that it ends in the institution of conditions which removes that trouble, conflict, problem, or doubt.[53] Dewey uses the term "warranted assertability" to describe this objective state of affairs where the issue is no longer doubtful or indeterminate, but rather settled such that one is prepared to act (Dewey 1938, 7-8). In other words, warranted assertability describes the objective end or completion of an inquiry, and thus serves as the terminal state of inquiry rather than an end-in-view (1938, 167). This will serve as a model of value verification.

Two important aspects of warranted assertability are that it involves reference to a particular inquiry for which the assertion receives warrant, and that while it is a product of competent inquiries, the settlement produced by that inquiry is no guarantee that the conclusion

[53] It should be noted here that my aim is to apply a Deweyan framework where applicable in order to clarify how values can be verifiable, rather than insisting on instituting Dewey's logic as a whole. Thus, I will neither attempt to defend Dewey's logic nor feel obligated to remain wholly consistent with it given that I am incorporating concepts from different accounts of value into my framework.

reached will remain settled. Thus, while warranted assertability designates a success term for inquiry, it is not permanent, nor fixed, but progressive. Dewey explains, "The 'settlement' of a particular situation by a particular inquiry is no guarantee that settled conclusion will remain settled […] It is the convergent and cumulative effect of continued inquiry" (1938, 8). This holds true for science as well since, "[i]n scientific inquiry, the criterion of what is taken to be settled, or to be knowledge, is being so settled that it is available as a resource in further inquiry; not being settled in such a way not to be subject to revision in further inquiry" (1938, 8).

With these two aspects understood, we can see that warranted assertability is potentially a broader concept than truth since it designates nothing fixed nor absolute, but something temporally determined to be successful based on the inquiries which have been conducted and operations which continue to be reliable. According to Dewey scholar Tom Burke, it is possible that an assertion may be warranted yet ultimately prove to be false. For example, if one judges that a certain mode of action will repair a broken vehicle, it is the continued moving of the vehicle which would contingently warrant the judgment that the problem has been resolved. In such cases the judgment, "is not necessarily made all of a sudden and once and for all, but is simply further and further warranted the farther and farther the car moves [….] but if the car soon stops moving again due to overheating, the warrantability of that judgment is undermined" (Burke 1994, 201-2). Our ability to determine the warrant of a judgment is based on its success so far, and further bolstered or hindered upon further and wider tests, thus warranted assertability admits of degrees rather than static binary values.

Also, because warranted assertability is inherently connected to the inquiry from which it emerged, it avoids the suggestion of hypostatized claims about the nature of the world, but rather is a product of inquiry where certain perspectives, decisions, interests and so on are involved; a

warranted claim cannot be separated from them. Warranted assertability is to be understood as a logical concept, not as a metaphysical or ontological one. If we suggest that a judgment is warrantedly assertable, it is because it references concrete and objective conditions and operations as they pertain to the resolution of a particular inquiry. As Burke points out, "One thing that which recommends the notion of warranted assertability as a working concept in logic is that the warranted assertability of judgments is tangibly certifiable by means of one's concrete actions in the world, whereas the truth of one's assertions remains at bottom a metaphysical idea" (1994, 239). Thus, the beauty of using the concept in this context of value judgment is that it does not demand a commitment to any one metaphysical or meta-ethical position regarding concerns like the ultimate standing of any truth claims.

3.2.3 Propositions and Judgments

According to Burke, a key element to understanding the concept of warranted assertability is Dewey's distinction between propositions and judgments (1994, 157). According to Dewey, judgments are identified with the settled outcome of an inquiry.[54] They concern themselves with the concluding objects that emerge from inquiry and thus have direct existential import (Dewey 1938, 120). An example Dewey provides is a literal judgment found in a court of law. The judgment is a settlement of an issue initially taken to be problematic and the settlement is one of its existential consequences. While a judgment may take linguistic form, any sentence which captures the content of a judgment serves to direct future activities which bring about a determination of what was formally indeterminate when inquiry was taking place.

Judgment is distinct from propositions, which rather than being direct and existential, are intermediate and representative. According to Dewey, a proposition suggests something proposed

[54] It is also noteworthy is that Dewey's use of terms like "judgment" and "proposition" were formulated during a time when their meanings in contemporary logic were not so settled, and thus appear idiosyncratic (Brown 2012, 67). Despite this, I think the distinction is logically beneficial.

or propounded for further consideration within a given inquiry (1938, 286). Propositions function to determine the facts *of the case* at hand, and thus have no status independent of inquiry. They include observed data which determine the material conditions of the problematic situation allowing for the consideration of possible interactions, and of conceptual matters that suggest possible operations that will yield additional data and solutions to the problem at hand (1938, 288). Propositions are symbolic and allow for consideration of possibilities without direct action being necessary, allowing for further deliberative consideration of outcomes before a judgment is made.

Thus, we see a significant functional distinction between propositions and judgments. Propositions function to determine that certain facts are facts *of the case*, to suggest the nature of the problem at hand, and to propose experiments and operations which will eventually yield a solution, while a judgment is a settlement on a course of action which will yield existential change and resolution to the problem. However, short of a final settlement of the issue, any proposition merely serves to suggest actions to aid in the determination of a judgment. Therefore, propositions are instruments or tools of inquiry in the sense that by articulating factual or hypothetical details of the situation they can suggest alternate courses of action or ends-in-view (Burke 1944, 202). Propositions as intermediate and instrumental are thus means, and therefore "since means as such are neither true nor false, truth-falsity is *not* a property of propositions" (Dewey 1938, 287).

Rather, propositions are affirmed in inquiry. Affirming a proposition suggests that something should be taken for use in connection with what it may lead to as a means to an end (1938, 120). Thus, propositions are determined on the basis of provisional evaluations of existences and conceptions as means of instituting a final judgment according to criteria of being "effective, or ineffective; pertinent or irrelevant; wasteful or economical" (1938, 120). For example, a proposition may be ineffective because it may insufficiently delimit the problem and

thus poorly indicate what kind of solution may be relevant. As Burke notes, the validity of an affirmation is not determined by truth, but relevance, salience, coherence, and persistence in further inquiry (Burke 1994, 206). An affirmation is only tentative; propositions function as suggestions meaning that they may be subject to revision as inquiry proceeds and previous affirmations may prove to be irrelevant or badly conceived. For example, if I am facing a computer problem, I may eventually affirm that it is a software problem. Such a proposition not only functions as a descriptive fact of the case and as a characterization of the problem itself, but by affirming it, it suggests certain courses of action to then take such as an operating system scan.[55] In time, however, it may be that I am forced to revise this and affirm that I am facing a problem that involves both hardware and software.

While propositions are affirmed, judgments are asserted, where an assertion is taken to mean that there is a final determination in adopting a course of action. Thus, assertion is taken not in a purely linguistic sense, but in an active sense; one asserts a judgment by acting in accordance with its dictates (Burke 1994, 159). While a final judgment is the determinate factor in bringing inquiry to a close, inquiry can also involve many partial judgments which can determine intermediate propositions. For instance, in deciding that I am facing a software problem and that a scan would be an appropriate measure to take, the act of scanning will depend on a partial judgment which will yield further information[56], and thus further propositions.

3.2.4 Warranted Assertability as a Model of Value Verification

So far, the framework of warranted assertability, with its distinction between judgments and propositions allows us to understand (1) the nature of the verification of a judgment such that

[55] Notice that one understands the meaning of the proposition by the operations that follow from it. Thus, it forms the basis of an end-in-view.

[56] Burke goes to far as to claim that propositions just are symbolic units of information and that Dewey's theory of logic is built around the notion of information (Burke 1994, 176).

it can be called warrantedly assertable, (2) why valuation is an inherent part of inquiry, and (3) why valuations must be verifiable. To the first claim, the reason why warranted assertability recommends itself as a model for understanding the verification of value judgments is that it is a success term that doesn't rely on metaphysical assumptions, but rather is governed by logical considerations. A judgment is individual, or in other words, occurs in individual situations which governs the adequacy of the judgment. As I argued, all judgments are judgments of practice and so our understanding of the process of verification of a value judgment is identical.

Recall from the previous section that such judgments take place where there is a need to bring about a transformed situation that is different from the problematic conditions which give rise to inquiry such that it is determinate. The benchmark for adequacy of a judgment is that the problem or indeterminacy which led to investigation is done away with as the situation becomes determinate. As Dewey explains when it comes to confirmation, while we may have an interest in seeing our hypothesis confirmed or disconfirmed:

> verification, or the opposite, is attained only because experimentation effects a transition of a problematical situation into a resolved one […] As far as the objective course of knowledge is concerned, as distinct from the personal interest of the investigator, this result is the important one; in comparison with it the verification of a hypothesis is secondary and incidental. (Dewey 1929, 190)

In other words, while we have an interest in seeing a hypothesis confirmed, what is essential in terms of confirmation of a judgment is that it resolves the problematic conditions which necessitated judgment, and which provides added depth, range, and meaning to our experience.

More specifically, the standard by which judgment is evaluated is a specific particular problem with concrete conditions and relationships; did the judgment resolve *this* problem being faced? Verification is not going to be a matter of personal interest or satisfaction, but it will be gauged in terms that are measurable and concrete in terms of whether there is resolution for a specific problem. In other words, the standard of verification is in terms of its success in resolution

of the problem which the judgment attempts. The question is less a matter of whether a value is true (whatever that may mean), but the question becomes "Does judgment resolve the problem for which the value is invoked to aid in resolving?" Thus, a notion of verification of a value judgment as a warranted assertion doesn't rely on demonstrating the truth of trans-empirical value facts.

3.2.5 Values Inherent to Inquiry

To the second claim, that valuations are inherently part of inquiry, the distinction between propositions and judgments make this clear. Not only is the final judgment a form of evaluation, provisional evaluations are required to affirm a proposition. Propositions are affirmed on the basis of evaluations which determine whether a factual or conceptual claim is useful in the determination of judgment. It should also now be clear why judgments of practice are so necessary and indispensable in any inquiry, and why verifiable evaluations are the rule and not the exception in inquiry. Recall that even factual matters are a product of evaluation; declarative propositions are hypothetical with respect to adequacy and relevancy. As Dewey notes, "Facts may be facts, and yet not be facts *of* the inquiry at hand. In all scientific inquiry, however, to call them facts or data or truths of fact signifies that they are taken as the relevant facts of the inference to be made" (MW 8: 23). He explains further, "The need for selective discrimination of certain existential or factual material to be data proves that an evaluative estimate is operating," and this selection or weighing of data as facts of the case is a matter of evaluation (Dewey 1938, 497). Calling something a fact is the product of a value judgment concerning relevancy and adequacy concerning the situation at hand. This is similar to Lepley's claim that something can be experienced as both a fact and value depending on whether the active response of the judgment is emphasized or the description of the event.

As noted, propositions about matters of fact or courses of action are not self-determined or self-sufficient but are "determined with reference to an intended future issue and hence are

instrumental and intermediate […] their validity depends upon the consequences which ensue from acting upon them" (1938, 164). Information is selected and contextually determined, "for data, on this view, are always data of some specific problem and hence are not given ready made to an inquiry but are determined in and by it" (Dewey 1941, 180). As noted, evaluation requires the formation of ends-in-view which is why data must be situationally specific. In order for such a concrete determination of means, there must be an affirmation of resources available and obstacles to overcome. Such descriptive propositions are thus means to evaluation. When we deliberate, we tentatively affirm things during each step of inquiry which suggests alternative courses of action.

Descriptive propositions are never purely descriptive. They are affirmed in functional correlation with other propositions suggesting a course of action as a means of forming an end-in-view and a final judgment, and thus what is descriptive is never merely self-sufficiently descriptive; while the subject matter of a proposition may be descriptive, its logical function never is. For example, if one is faced with a situation in which they are having health issues, A proposition like "I am seriously ill," "is without point if taken to be final and complete" (Dewey 1938, 164).[57] It is affirmed on the basis that one recognizes a problem and desires some resolution. In other words, the logical function of a proposition like that would be limited if it merely described a fact. Once such a proposition is affirmed, further propositions like "I should see a doctor" can be formulated and affirmed where it wouldn't make sense without it. The relevancy and weight of factual propositions in a specific situation "is the matter to be determined by inquiry before an evaluative appraisal can be grounded" (1938, 174). Thus, because the logical function of a descriptive fact lies in its ability to suggest proposed courses of action, the test of their relevancy

[57] Kristen Intemann has similarly suggested that what seems like purely descriptive claims in their meaning may have normative import. For example, the meaning of "clinical depression" may include "ought to be treated" (Intemann 2001, S512).

lies with whether those facts and suggested actions are well suited to address the matter at hand. Therefore, it is now clear why descriptive propositions are never purely descriptive for their importance is often not only whether the claim is accurate, but adequate.

The affirmation of descriptive or factual propositions not only characterize the initial problem and thus allow for the proposal of various courses of action, but as experimental operations are performed, and new data becomes apparent, further operations can be suggested. Consider some problematic situation where it is determined that one must find something red. In such a situation, we may formulate a proposition like "the ball is red." Dewey denies that this proposition has any true or false value, but rather that we deem that such a proposition is a useful characterization of a given perception to characterize a fact of the situation, and also we appraise that such a proposition is useful for the formulation of some proposed solution. Thus, we can see how strongly the notion of valuation plays a role in inquiry. Such a proposition is judged useful in formulating the end-in-view of the situation, the need to find something red, for example. Because of this, the propositions "the ball is red" and "I ought to pick up this ball" are linked within the situation as a means to a solution to the problem (needing something red) rather than being completely distinct, self-sufficient, or in the case of "I ought to pick up this ball," as a terminal response interpreted as a mere preference. By acting in such a way, and having such an action resolve my problem, I can say that my judgment is warranted.

This framework acts as a response to the notion that one cannot derive an ought from an is. In the previous chapters I noted arguments that undermine any sharp distinction between "oughts" and "is-es" but here we take note of the logical function of these kinds of claims. A factual or descriptive "is" claim is not purely descriptive, but hypothetical. They suggest that certain facts are relevant to the issue at hand. Their relevance lies with, and is tested by, their ability

to suggest various courses of action. Factual claims are means of making practical judgments, for the factual and normative claims develop in functional correlation with each other and are tested by the consequences they produce once a final judgment is made.

Examples of how affirming various descriptive claims as relevant to addressing some problem can be found in the real world. Consider the example of Robert Ballard's discovery of the Titanic. Prior attempts at discovery involved using sonar to scan for the ship itself using a laborious method of scanning back and forth across a search area called "mowing the lawn" (Yount 2009, 43). Ballard's team had only twelve days to scan and so didn't have the time to conduct such a search. His prior successful discoveries involved looking for a debris field instead of the ship, which also necessitated the use of cameras instead of sonar. With conflicting information about whether the ship split during the sinking, Ballard affirmed certain then-controversial eye-witness evidence that the ship split which would mean that debris would have come loose during the sinking, and thus there would be a debris field to model and find. Upon affirming the fact that the ship split, the recorded ocean current became relevant in terms of suggesting how large such a field might be, and this became the basis of building a model. Using these facts, Ballard was able to avoid the need for a laborious scanning method by looking for debris instead of the ship and using video camera scanning instead of sonar. This example demonstrates the need for affirming that certain facts are relevant when determining a course of action. Upon affirming that the ship split, other facts like the current became relevant as well, and by affirming the fact that there would be a probable area where such a debris field would be, Ballard was able to decide that a less rigorous, but less laborious method would be better suited to the task.

The point can be demonstrated in other fields as well. In medicine, a differential diagnosis requires that a list be made of the symptoms that the patient presents with. At that point the

clinician must decide which disorder to pursue in a selective fashion. They may choose to focus on what disorder is more likely, what is more serious if undiagnosed, or what is more responsive to treatment (Guyatt et al. 2008, 401). The clinician thus must first affirm whether something should be considered a symptom or not. For instance, a clinician may determine that certain symptoms are "all in their head" or the statistical unlikelihood of a serious but treatable illness which may lead to delayed testing (Kennedy 2013, 494). Whether abnormal behavior could be considered a psychological symptom or a neurological symptom will affect what tests will ultimately be conducted or other operations performed. If it is considered a neurological symptom in addition to other symptoms, then the explanation for all of the symptoms will change, and thus so will any proposed testing.

In each case, the affirmation of a descriptive fact is not done merely for the sake of being descriptive. The ship splitting in two suggests searching for debris is a viable strategy; the observation of abnormal behavior suggests one should test for disorders with a neurological component; the statistical likelihood of an illness suggests whether it would be prudent to test given time and resources. The affirmations are not merely that a proposition accurately describes a fact, but that the fact so described is a fact relevant to some course of action one should follow to serve as a resolution. In some cases, it will be more tentative (such as Ballard's example) whether the proposition should be affirmed or not, but the test for their inclusion lies in the results which their inclusion eventually leads to.

3.2.6 Verification of Values

Notice that warranted assertability with its distinction between propositions and judgments, and its requirement that we consider individual judgments in individual situations calls for careful attention paid to how we analyze values and what it might mean to "verify a value." This concern is especially valid when considering a sentence containing a value claim; we must ask whether we

are talking about a value proposition or a value judgment and depending on which adjust our expectations accordingly so that we do not make a category mistake by asking whether a value proposition is true or not.

Typical meta-ethical discussions center around whether value judgments can be propositions or whether such propositions can be true or false. According to Dewey, a value proposition, properly understood, is neither true nor false, but a value judgment can be. He notes that propositions, "are means, instrumentalities, since they are the operational agencies by which beliefs that have adequate grounds for acceptance, are reached as the end of inquiry […] truth or falsity are properties only of that subject-matter which is the *end*, the close, of inquiry by means of which it is reached." (Dewey 1941, 175-6). A judgment is always particular; one can verify that this simple answer is correct, or that generous action was warranted, but does this mean that generic or universal value claims are unverifiable, and if not, what is their status?

3.2.7 Generalized Ends

When one judges what is best, they are judging an individual situation, not a generic or universal claim. Take, for instance, a value commonly discussed in the context of science like simplicity, which is taken to be a characteristic feature of good scientific theories (Kuhn 1977, 323). When one affirms a value proposition like "simplicity ought to be a feature of scientific theories," such a universal or generic proposition serves to suggest potential courses of action which may eventually become the end-in-view. In other words, simplicity suggests a course of action. One judges a simple theory, not simplicity at large. Thus, the decision to choose a simple theory is potentially warranted and verifiable, while simplicity itself doesn't permit of verification.

In Section 3.1.3, I discussed the fact that value was not previously given and that antecedent value claims are data used towards the determination of a not yet existing value. General values are never merely to be mechanically applied to any given situation, and to the degree this is done

is to the degree that action becomes less intelligent. Each situation is unique, and while general moral concepts or principles can be useful for the formation of an end-in-view, they must be evaluated in terms of their relevancy to the specific situation at hand. By contrast, the alternative to using values as instruments of inquiry is having them act as fixed ends to be attained. Dewey notes, "when ends are regarded as literally ends to action rather than as directive stimuli to present choice they are frozen and isolated […] Set up as complete and exclusive, as demanding and justifying action as a means to itself, it leads to narrowness; in extreme cases fanaticism, inconsiderateness, arrogance and hypocrisy" (Dewey 1922, 227). This may be particularly problematic in science, such as so-called epistemic values like simplicity, or in other situations with an ethical good like generosity.[58] Such values are not "goods to be possessed as they would be if they expressed fixed ends to be attained. They are directions of change in the quality of experience. Growth itself is the only moral 'end'" (Dewey 1920, 177).

As previously noted, we never seek a value in general, but some concrete and specific action. Dewey notes, "To say that a man seeks health or justice is only to say that he seeks to live healthily or justly. These things, like truth, are adverbial. They are modifiers of action in special cases" (Dewey 1922, 169). So, judgments are never about the status of a generalized value, however there is benefit to analysis of such generalized ends. Dewey continues, "The *value* of this systematization is intellectual or analytic. Classifications *suggest* possible traits to be on the lookout for in studying a particular case […] they are tools of insight; their value is in promoting an individualized response in the individual situation" (1922, 169). This tells us that there is an alternative way to understanding values as fixed ends and that skepticism about whether a generalized value like simplicity can ever be verified is to commit a category mistake.

[58] Dewey specifically says that the scientist would find no guidance in appealing to fixed ends (Dewey 1929, 264). Douglas has also suggested the dangers associated with using so-called epistemic values improperly.

It also tells us the function of such generalized ends in inquiry. In discussing the nature of generalized ends, Dewey explains:

> All principles are empirical generalizations from the ways in which previous judgments of conduct have practically worked out. When this fact is apparent, these generalizations will be seen to be not fixed rules for deciding doubtful cases, but instrumentalities for their investigation, methods by which the net value of past experience is rendered available for present scrutiny of new perplexities. Then it will also follow that they are hypotheses to be tested and revised by their further working. (Dewey 1922, 241)

That a generalized value's function in inquiry is not to be rigidly applied is also discussed by Kuhn who argues that the suggestive rather than deterministic nature of values are part of the essential nature of science (Kuhn 1977, 330).[59] He argues that values function as effective guidance in the presence of conflict which specify, "what each scientist must consider in reaching a decision, what he may and may not consider relevant, and what he can legitimately be required to report as the basis of the choice he has made" (1977, 331).

Thus, for Kuhn values are suggestive; they are not rules that determine choice. This echoes Dewey's point that, "morals is not a catalogue of acts nor a set of rules to be applied like drugstore prescriptions or cook-book recipes" (Dewey 1920, 169). Short of an application to a specific context, the meaning of a value has limited content. Recall from the previous chapter that every judgment is a concrete judgment: "the activity of judging does not exist in general, but is of such a nature as to require reference to an initial point of departure and to a terminal fulfilment" (Dewey 1939, 125). Thus, it is not generalized ends that we evaluate, but specific actions.

As Kuhn notes, simplicity could suggest a theory which involves less labour than another theory, or it could suggest a theory which involves simplified conceptual apparatus (Kuhn 1977, 324). Ballard's hypothesis that the ship split in two and left a debris field was more complicated

[59] It is interesting to note that Kuhn makes a similar distinction between rules and values and their logical function as Dewey does. According to Dewey, "Rules are practical; they are habitual ways of doing things. But principles are intellectual; they are useful methods of judging things" (Dewey and Tufts 1909, 334).

in that it required more complex modeling, yet it simplified the methods of search. So, any generalized value like simplicity, while helpful, is never by itself the basis of decision, but functions within inquiry. As Brown notes, Dewey's use of the term "proposition" is closer to the etymological roots, where a proposition is taken as a proposal or a "provisional account of what is going on or what could be done" (Brown 2012, 67). Value propositions are therefore proposals: they propose potential responses, but they do not determine them. Simplicity is proposed as being relevant to a solution, and the validity of any such response is determined by its actual effects.

A generalized end like simplicity thus develops overtime, where it is determined that looking for simple theories can often be beneficial towards warranted assertability. When one affirms a value proposition like "I ought to use a simple theory" (which itself may be the result of a partial judgment), they affirm that simplicity is relevant to a potential solution. This is an affirmation that the situation under consideration is sufficiently similar to other situations where simplicity was relevant and suggests what kinds of facts and hypotheses to consider. But that such a value is considered, and may even be relevant, doesn't determine the judgment by itself. For example, if one were deliberating over seeing a doctor when faced with an illness, they may affirm that in past cases it was better to "let nature take its course" as opposed to going to a doctor, yet it is by no means obvious that the present situation is like previous kinds of cases. Even if one does affirm that a proposition like "if one is ill, they should see a doctor" is relevant, further considerations like whether one can afford it, or whether a good doctor is available may lead to further revisions and refinements, or even a rejection of the initial proposition before there is an inference made regarding a course of action (Dewey 1939, 163). The same is true of other values like simplicity as well, and the validity of using such a value is determined by the consequences it produces vis-à-vis its ability to aid in resolution of inquiry.

However, while such generalized values are useful for inquiry, they can also be dangerous if they are acted upon out of rigid habit instead of careful scrutiny. As Dewey notes, "Only with a habit rigid to the point of immobility could exactly the same good recur twice" (Dewey 1922, 212). Where a value is no longer taken in its suggestive force in inquiry, and instead a general value is habitually invoked as an end-in-itself regardless of the context, it becomes a fanatical pursuit. Dewey argues that subordinating every case to the pursuit of some general good leaves its specific traits shut out, leaving action to be dogmatic and rigid instead of flexible. He explains, "This ill is just the specific ill that it is. It never is an exact duplicate of anything else. Consequently, the good of the situation has to be discovered, projected and attained on the basis of the exact deficit and trouble to be rectified" (Dewey 1920, 170).

The fact that generalized ends or values act as suggestive hypotheses regarding how to resolve a dilemma points to the development of an experimental approach to valuation. Valuation is not merely about immediately experienced value or prizing, but rather concerns itself with appraisal. The question becomes a matter of understanding the conditions which give rise to experienced goods and their consequences with a goal of understanding how to find a more secure and significant experience of value (Dewey 1929, 259). Recall that this is what distinguishes what is valued from what is valuable. Experimental application of generalized ends is a means to such an understanding.

Dewey notes that qualities of values experienced are something to be investigated, and the more connections and interactions we ascertain the more knowledge we have; it is in this respect that values provide intellectual assistance in order to direct action; "judgments about values are judgments about the conditions and the results of experienced objects" (1929, 265). Generalized ends are thus operational, suggesting modes of action to take. However, "Such a causal and

operational definition gives only a conception of a value, not a value itself. But the utilization of the conception in action results in an object having secure and significant value" (1929, 259). In other words, part of the work of moral science is not only the development of generalized ends or values such as simplicity, but in the experimental application of them to understand the conditions and contexts in which they are warranted or require refinement. This is an important point which I will speak further on at the end of this Chapter.

Dewey explains, "What is needed is intelligent examination of the consequences that are actually effected by inherited institutions and customs, in order that there may be intelligent consideration of the ways in which they are to be intentionally modified in behalf of generation of different consequences. This is the significant meaning of transfer of experimental method from the technical field of physical experience to the wider field of human life" (1929, 273). Such an experimental approach however requires fallibilism and eschews rigid or dogmatic application. Dewey continues, "A moral law, like a law in physics, is not something to swear by and stick to at all hazards; it is a formula of the way to respond when specified conditions present themselves. Its soundness and pertinence are tested by what happens when it is acted upon" (1929, 278). This view is similar to that of feminist philosopher of science Sharyn Clough, who argues that, "value judgments just like any other, just *are* empirical hypotheses" and that judgment about using a value is about its relevance to a scientific question at hand; whether a value is relevant is an on-going empirical question which needs to be determined on a case-by-case basis (Clough 2008, 273-8).

Thus, the application of experimental and scientific logic to values becomes more natural under such a conception, and such an account may satisfy Rudner's desire for the development of a science of ethics. That valuation may permit of the systematic experimentation with general or

abstract ends also satisfies one of Edel's requirements which would allow for a scientific treatment of value and also the broad form of "experimental" as defined by Lepley.

To summarize this view, propositions are instruments of inquiry, affirmed for the purpose of determining what facts are relevant and suggesting possible courses of action. Because of this function, descriptive facts are never purely descriptive but products of tentative value judgments. Value propositions, like any other proposition, are not true or false, but rather useful or not useful. Generalized value propositions like "one ought to use simple theories" or "one ought to be generous" either affirm that in similar cases such values were beneficial, or they suggest that they should be invoked in the case at hand. However, such affirmations are tentative, and subject to revision and refinement as other considerations are made. The logical value of such propositions lies in their determination of relative relevance and their suggestive force for forming an end-in-view, rather than being deterministic or absolute. Thus, they are instruments of inquiry, and again not verified by any one judgment whose nature is particular. One verifies that a particular simple theory works out: one does not verify simplicity.

Even an inference to a proposition like "I ought to use this simple theory" is merely affirmed. For in surveying all of the relevant data and considering possible modes of response that may lead to resolution, one may infer such a proposition. However, "while to infer something is necessary if a warranted assertion is to be arrived at, this inferred somewhat never appears *as such* in the latter; that is, in knowledge. The inferred material has to be checked and tested" (Dewey 1941, 173).[60] Thus, the judgment must be actual and concrete in order to be warranted, where the warrant stems from the actual conditions that follow action taken to resolve the problem at hand.

[60] This point will come up again in Section 4.1.5.

This analysis of generalized ends as values introduces a third meaning of the term "value" as necessary to distinguish. In *The Fate of Knowledge* Helen Longino uses a tripartite distinction of the term "knowledge" to help diagnose problems that occur when thinking about social and rational factors of knowledge: knowledge as knowledge productive practices, knowledge as a cognitive attitude, and knowledge as content (Longino 2002, 77-85). In the previous chapter I drew attention to the distinction between "value" as valuing, which primarily is concerned with prizing and non-cognitive affective-behavior, and "value" as valuation, which is primarily concerned with appraisals or value judgment. The analysis of value judgment in this chapter provides for yet another distinct sense of "value" which is value as generalized ends. Perhaps not surprisingly, each can correspond to the three senses of knowledge as well. Valuing denotes primarily a cognitive/behavior attitude, appraising is concerned with value production, and generalized ends are stored content of previous judgments which can serve as hypothetical heuristics for future inquiries. Just like Longino, I will argue in coming chapters that making careful use of these distinctions will serve to resolve problems in discussions about values.

3.2.8 Warranted Assertability and Science

Having made clear the distinction between propositions and judgments, we can now understand the nature of the verification of a value judgment. Only judgments, which are particular, are verifiable in the sense that they can possess the property of warranted assertability. Warranted assertability is a success term where success is relative to the problem any judgment sets out to resolve and which any inquiry is conditioned by. Dewey explains, "Inquiry, as the set of operations by which the situation is resolved […] has to discover and formulate the conditions that describe the problem in hand. For *they* are the conditions to be 'satisfied' and the determinates of 'success'" (Dewey 1941, 181). Everything from the data collected to the concepts used and eventual judgment is determined with reference to the specific problem at hand. What warrants any judgment is its

ability to satisfy as a resolution of the problem. As Matthew Brown explains, "this is not the vulgar pragmatism that would measure the truth of a claim according to whether the consequences of believing it are congenial. Rather, the consequences in question are tied to the consequences *intended* by the judgment" (Brown 2012, 69).

Because judgment is determined to be successful where success is operationally defined in terms of some specific existential outcome, it becomes clear why this is naturalistic and why judgment must be active rather than being purely intellectual. As Burke explains, warranted belief is not a middle ground between the problem and doing something; rather, it is the resulting state achieved by virtue of modifying activities until a solution to a problem is settled upon (Burke 1994, 117). We do not achieve knowledge and then act, but rather we achieve a state of knowledge in a given inquiry by stabilizing the situation which ensures that the consequences of ongoing actions continue to agree with given as well as expected experience (1994, 119).

This understanding of warranted assertability and the function of propositions is applicable to science as well. According to Burke, whatever existing knowledge we have from past inquiries can be drawn upon in its application to some novel situation. He explains, "A nuclear physicist will use basic knowledge about mathematics, about familiar features of macrophysics, even about some more or less resolved aspects of microphysics, in the course of inquiring into unresolved aspects of microphysics; but none of these more basic pieces of knowledge, alone or lumped together, constitutes knowledge about these unresolved aspects of microphysics as such" (Burke 1994, 118). One cannot assert that any of these broader claims constitutes knowledge about particular microphysics problems until such time as they are applied to test their relevancy and warranted application in novel situations. This applies to application of generalized values as well.

Warranted assertability is to be understood as a naturalistic conception of success that allows us to understand the nature of the verification of value judgments. Whether the concept of warranted assertability, a success term that designates testable relationships between a judgment and an intended outcome, has room within a philosophy of science is the issue. The temptation may be to suggest that science deals with what is true or false and that other success terms are not needed or wanted. However, there is good reason to think that this is not the case.

As noted in the previous chapter, Kitcher believes that we must understand ethical progress as existing prior to ethical truth, and thus insofar as values play a role in science, it would necessitate a success term indicating progress in value judgments besides truth. Kevin Elliot argues that besides truth as a goal, science can ask pragmatic questions about the relationships between scientific representations and their fit with a user's needs (Elliot and McKaughan 2014, 6). This raises questions about the adequacy of a theory overall, rather than just whether it is true or not.

Other philosophers of science such as Helen Longino have argued, just as Lepley did, that truth is too narrow of a term and that other success terms should be understood as playing a role in science. She argues that the concept of truth works quite well in certain contexts, but less so in others. For example, we know what it means to say "the cat is on the root" is true or not. Beyond easily ascertainable facts, however, truth becomes more complicated. For instance, the laws of physics, if taken literally, are false. Laws are idealizations and to count as true, they would require an indefinite number of qualifying clauses that would specify those ideal conditions (Cartwright, 1983). Doing so, however, would destroy the explanatory value of these laws as they apply to the real world where non-ideal conditions exist. Despite being literally false, however, we wouldn't deny that such ideas about relations do not count as knowledge.

According to Longino such laws are representations which are "supremely successful at what they are intended for—to guide our interactions […] in order to produce from it what we want" (Longino 2002, 110). She explains: "the role of laws in physics, and hence their utility, is such that they cannot correspond in the sense of directly conforming to some single matter of fact or collection thereof in the physical world without forfeiting their utility" (2002, 112). What Longino is describing fits with Dewey's claim that propositions are affirmed on the basis of their use in inquiry rather than because they are true or false. The laws, however, warrant the individual judgments that make use of them.

In addition to problems like this, there are scientific theories which she argues cannot be best understood as formulated in linguistic propositions but are better understood as models to which the standard understanding of truth or falsity are difficult to apply. Instead, we can understand adequacy of a model in terms of the structure it represents being identical to a structure in the world. Thus, the models aim at isomorphic or homomorphic success.

To discuss the success of non-propositional content, of isomorphic, homomorphic success, as well as truth, approximation, fit, and similarity in terms of representative success, she argues for a more general encompassing notion that she calls "conformation" (2002, 115). She explains, "This term conveys in a less tendentious and less problematic way than does 'true,' what the relation between some content—a representation—and the object of that content might be. It can apply to laws and to statistical claims that are not literally true, but can capture the relations in which we are interested" (2002, 115). The arguments of Longino and Elliot tells us that there are ways of thinking about success in science that do not reduce to truth as commonly understood and thus there is wiggle room for other ways of gauging success in science, potentially including warranted assertability as it applies to value judgments. Thus, even if we are unprepared to declare

that a value or value judgment is true (given whatever is metaphysically and metaethically understood by that), we can articulate a success term that permits us to declare that a value judgment can be verified.[61] Thus, warranted assertability can function within a scientific framework so long as it captures a degree of adequacy that scientists may find useful.

3.3. Three-Fold Division of Value

If we are trying to determine the meaning of value verification, it will depend on what the function of any value claim is. A general value proposition like "one should be generous" is merely suggestive, and its warrant is only a function of its being relevant to an individual judgment or assertion that is warranted. Any value judgment, properly understanding what judgment is, is individual and is warranted to the degree it resolves the conditions the judgment aims to redress. Warranted assertability, once understood, allows us to articulate how value judgments can be verified in a scientific context since it is operationalized in terms of observable and experienced effects of concrete actions in concrete situations. Thus, it better satisfies the need for an account of value compatible with scientific methodology.

It also introduces yet another important distinction we must be careful about when discussing values; in addition to the distinction between valuing and valuation, we must take note of whether a value is being affirmed or asserted. In order to capture these distinctions, I suggest an elaboration of point 8 to the account of value adopted in the previous chapter into a three-fold division of the meaning of value: "value" can now designate, valuing, valuation, and generalized

[61] Comparing conformation to warranted assertability can also be beneficial. For example, Dewey's conception of proposition does not require that it be linguistic and thus could include models. Nor does Dewey require that a proposition count as literally true, but merely useful and thus a law of physics just like a generalized value serves a function within inquiry as suggestive in nature. One could either claim that warranted assertability can do the same work as conformation, or if that is too far, that warranted assertability can be included among the other success terms as part of conformation.

ends, and these divisions allow us to understand what logical function each possesses.[62] Understanding these distinct meanings not only will allow us to avoid misunderstandings, but reminds us that values can be experimental. Generalized ends are affirmed in inquiry, while valuations are asserted. Valuing constitutes an affective attitude towards something, however this can also be distinguished between valuing as prizing and valuing as impulse or habit.

Figure 5

"Value" meaning	**Valuation**	**Generalized End**	**Valuing**	
Logical status	Judgment	Proposition	Valuing as prizing. Involve reflective consideration of what is valued as an end-in-view: *Affective-ideational-motor behavior*.	Valuing as an unreflective habit or as an impulse. As *merely affective-motor behavior*, it is not logical.
			Propositions about values possible (i.e. Mary values X).	
Logical function	Asserted	Affirmed	Overlaps with valuation.	Impulses or habits can give rise to prizings. They are non-logically asserted (but not warranted).

While the division between valuing as prizing and valuing as non-reflective behavior is meant to capture the fact that valuing can designate any affective-motor behavior, for my purposes moving forward, given that prizing overlaps with valuation, when I refer to "valuing" I will be referring to the non-reflective behavioral form that it takes. It is important to also bear in mind that this division is not meant to be fixed or absolute; there may be a number of useful ways to make such distinctions. With these divisions in place, and with an account of logical judgment clarified, I am now in a position to clarify the fact-value distinction.

[62] My distinction here is my own, and so while the language borrows from other accounts discussed in the previous chapter, I do not necessarily use it in the way they might.

3.4. Fact/Value Distinctions

The previous chapter outlined the meanings of values and valuation, while this chapter has developed the logical functions of values and their verification. In doing so, the line between facts and values has blurred. Here I will discuss the issue of the fact/value distinction directly, and, now that I have distinguished between different meanings of "value," will close this section with how I will be drawing distinctions between facts and values moving forward. Hilary Putnam has argued against the fact/value dichotomy, suggesting that it is one of the final dogmas of empiricism. He notes, "The idea that 'value judgments are subjective' is a piece of philosophy that has gradually come to be accepted by many people as if it were common sense" (Putnam 2004, 1). Yet, he rejects this thesis that value statements are outside of the sphere of reason. The historically presented reasons for such a dichotomy are in fact reasons that most philosophers would reject despite still supporting the thesis itself (2004, 14).

For instance, Hume's argument that all ideas are "matters of fact" or "relations of ideas" is ultimately a metaphysical distinction, and on this metaphysical basis he concluded that an "ought" cannot be derived from an "is." In other words, it is not due to canons of formal inference that Hume distinguishes "ought" claims from "is" claims, or why he argues that we cannot derive and ought from an is. Instead, an "is" claim is one that describes a "matter of fact" and on that basis, we cannot derive an "ought" from the "is", so the argument depends on how "matters of fact" is conceived. According to Putnam, Hume presupposes a "pictorial semantics," a conception of an idea that it can only represent a fact if it is picturable. While something like an apple is picturable, a concept like right or good is not, and thus cannot represent a fact (2004, 15). In other words, his

distinction of fact and value depends on "discredited seventeenth-and eighteenth century talk of 'ideas'" (2004, 15).[63]

According to Putnam the later arguments of the logical positivists that value claims are cognitively meaningless rely on similar arguments. For something to be cognitively meaningful, it must be analytically true or "factual," and the logical positivist's confidence that values are not factual was derived from their confidence that they knew what a fact was; "it is the conception of the 'factual' that does all the philosophic work" (2004, 21). Yet, as they were forced to revise their notion of "fact" further and further, they destroyed the very basis of their fact/value dichotomy.[64] Hume's notion of a "fact" is something of which there can be a sensible "impression" and on this basis, since we do not sense value, they cannot be factual.[65] While the logical positivists in similar fashion initially insisted that a fact must be certified by observation, scientific progress in atomic theory forced an eventual liberalization of the notion of "fact" as more than just a sensible impression (2004, 22). By 1938, the notion that an individual fact must be observable, or even reducible to observable predicates was given up. Putnam notes, "the logical positivist fact/value dichotomy was defended on the basis of a narrowly scientistic picture of what a 'fact' might be, just as the Humean ancestor of that distinction was defended on the basis of a narrow empiricist psychology of 'ideas' and 'impressions'"(2004, 26).

[63] Putnam notes that in contrast to this idea of experience as value neutral, and thus that values must be a product of the mind, "pragmatists in particular have always emphasized that experience isn't 'neutral,' that it comes to us screaming with values" (2004, 103).

[64] Don R. Bowen (1977) echoes this point that the debate about the need for value-free science is a function of the distinction between facts and values articulated by Hume and Max Weber, and later reinforced by the logical positivists. The philosophical underpinning of value-freedom on the basis that science only deals with what is verifiable and thus values should be excluded was undermined by the positivists themselves just as this notion of value-freedom came to prominence.

[65] Putnam notes the irony in that people who believe that Hume "showed" that there was no such thing as an ethical fact used the same reasoning to demonstrate that there was nothing factual about the notion of causation either (Putnam 2004, 22).

The collapse of the various initial grounds on which the fact/value dichotomy was defended has not led to the demise of the dichotomy. Instead, Putnam asserts, the reasoning behind it has shifted to metaphysical grounds (2004, 40). The most prominent metaphysical account he discusses is physicalism and the arguments of Bernard Williams. This is the view that the world-in-itself is independent of all observers and can only be discussed using the scientific terms of physics. According to Williams, the only convergence of conclusions will have to be in the language of physics, and thus would describe the world in primary qualities alone; since value judgments could not be part of any such absolute conception of the world, independent of any perspective, they are not capable of being true. However, Putnam argues the dichotomy between what is absolutely true and what is only relatively true (relativism) is indefensible (2004, 42). He suggests, "recognizing that our judgments claim objective validity and recognizing that they are shaped by a particular culture and by a particularly problematic situation are not incompatible. And this is true of scientific questions as well as ethical ones" (2004, 45).

Putnam suggests in a manner similar to Dewey that we can recognize objective truths in value judgments through intelligent inquiry as a means of resolving problems through criticism of what is valued, and that for such solutions to be reliable they must be related to objective reality. One can accept the possibility of objective truths without believing that such truths must be absolute or represent an Archimedean point or the absolute conception of Bernard Williams (2004, 45). He suggests that the fact/value dichotomy is tempting because it is much easier to claim that "that is a value judgment" means "that's just a matter of subjective preference" than it is to "do what Socrates tried to teach us" and examine our convictions to see if they hold up to scrutiny (2004, 44). The danger with the fact/value dichotomy is it may lead us to give up on attempting to resolve value disputes through further discussion and examination. He notes, "the worst thing

about the fact/value dichotomy is that in practice it functions as a discussion stopper, and not just a discussion stopper, but a thought stopper" (2004, 44). To put it in Peirceian terms, assuming values are just subjective blocks the path of inquiry.

Given Putnam's argument, and those covered in the previous chapter, are we to conclude that there is nothing distinctive about values and that our linguistic habits of discussing facts and values separately ought to be abandoned? There is a sense in which Lepley suggests an affirmative answer to these questions given that according to his view, factual judgments and value judgments judge the interrelations between conditions and their effects, thus the two "are actually but different modes of expressing the same properties, or interdependencies, of the same events" (Lepley, 216). He even suggests that factual formulations and valuative formulations can be translated into the other without adding or losing anything and that retention of the notion of a difference is a matter of habit. That is one possible answer. Alternatively, Putnam insists that abandoning a dichotomy between facts and values does not mean that there may not be useful distinctions to be made, so long as we understand that such distinctions are instrumental and logical in character rather than fixed or absolute (Putnam 2004, 9).[66]

For example, Putnam notes that there is a useful distinction to be drawn between ethical judgments and other judgments just as there is a difference between chemical judgments and non-chemical judgments, "but nothing metaphysical follows from the existence of a fact/value distinction in this (modest) sense" (2004, 19). We can recognize a modest distinction between claims that are trivially factual in nature and trivial valuative in nature.

[66] We may be skeptical whether Putnam and Lepley really disagree here; it may come down to a matter of emphasizing the importance of different formulations, or the interim sociological importance of drawing distinctions given our habits.

When it comes to choosing some position ranging from modest distinctions to no distinctions, nothing for my purposes in this dissertation requires me to claim that we can never make any distinctions between facts and values. Also, affirming that there is no distinction to be made and giving up those linguistic habits risks adopting a position that will seem so foreign to the modern discussion of values in science so as to seem completely inaccessible. Given this, what distinctions are there between facts and values? One important reason not to give up the distinctive language of values is because it includes both valuing and valuation. Lepley's remarks are targeted towards the fact-value conception of values, which specifically relates to judgment or valuation. However, values as valuing are distinct from facts in that one relates to behavior specifically while the other relates to events. Thus values, including valuing, can be distinguished on this basis.

How we choose to distinguish between facts and values further is open to future possible uses, so long as we do not make absolute distinctions. There are no judgments which are purely factual and no judgments which are purely valuative. This follows from the account of judgments of practice I previously discussed since valuation is required for facts to be facts *of the case* for a given inquiry, and likewise valuation will depend on us understanding the factual relationships between means and consequences to formulate an end-in-view. With this in mind, I will distinguish between facts and values according to the logical functions they perform within inquiry. Valuations function to determine the nature of the problem and select those aspects of experience as relevant to a possible solution judging what to do on the basis of estimated consequences of a proposed action, while the function of facts is to serve as determinate subject matter for such a judgment. Whereas values are in a sense future oriented, considering behaviors needed to be changed or maintained, factual formulations of subject matter are concerned with past or present

events or what will follow from those events given what is known. This will be further elaborated in Chapter 5 when I discuss the relationship between values and evidence.

It may also be useful to distinguish between facts and values as they relate to a specific subject matter of the judgment. Any scientific judgment contains a moral element of honest inquiry, but there are specific issues and problems that are more easily identified as ethical in nature. For example, ethical standards of experimentation are usually matters more easily identified as ethical rather than factual and so in this way we again may wish to make distinctions.

For my purposes, focusing on distinctions such as valuing behavior as distinct from judgment, of the different functions that facts and values can play within judgment itself, and of the general subject-matter of the judgment is sufficient. These are functional and not absolute distinctions, and these distinctions could be collapsed or distinguished in different ways for different inquiries. However, once a value judgment is tested and verified, there is a factual claim in saying that the behavioral response did "in fact" resolve the problem (thus warranted judgments count as a subset of facts), and likewise any factual claim is affirmed in inquiry because it is considered suitable for its purpose. We cannot detangle facts and values completely, even as we do make distinctions. Thus, the motto is distinctions if necessary, but not necessarily distinctions.

3.5. Conclusion

This chapter had two central aims: the first was to better explain the process of valuation and its place within inquiry as a problem-solving mechanism. The second was to explain how values and value judgments can be verified. Neither aim is completely distinct from the other and their elaboration further clarifies the logical meanings of values. According my account, valuations as judgments of practice are an inherent part of all inquiry because all inquiry aims at determining some course of action. The fact that in any inquiry it is not sufficient to state the facts, but to

evaluate that the facts are indeed relevant to the case at hand demonstrates that valuation is inherently part of any inquiry.

Value judgments are the basis of controlled activity in inquiry and thus are indispensable to it. The concept of warranted assertability is well suited as a means of understanding the process of value verification given that it fits with the problem-solving pattern of value affirmed in the previous chapter, and because it is compatible with various ways of understanding verification in science. It also requires that when we consider a value judgment, we consider the concrete conditions in which judgment takes place and is warranted. This is doubly beneficial in that it not only provides a context by which to understand verification, but also reminds us not to understand values as terminal responses, thus tempting us to consider them as mere preferences, or desires. With an account of values as described in the previous chapter now better articulated, we can now consider and compare this account with respect to the various approaches of value management.

Chapter 4: Values and Value Management

According to Michael Scriven, "If there is one set of arguments worse than those put forward for 'value-free science', it is those put forward against it. Both sets have one common characteristic […] and that is the failure to make any serious effort at a plausible analysis of the concept of 'value judgment'" (Scriven 1972, 219). Taking Scriven's point seriously, this Chapter will address recent accounts of values in science to consider how the concept of value judgment fits. Previous chapters have been devoted to outlining a way to think about values, particularly in terms of the concrete conditions in which valuing takes place, and the logic behind such valuing. It is my view that any account of how values should be used in science presumes, and is to an extent justified by, a certain conception of what a value is, and if that conception of value is imprecise or lacks sufficient justification, then the account will require logical reconsideration of the relationship between values and science. As noted in Chapter 1, differing accounts of what a value is can affect what is considered problematic about values and thus the prescribed role for values in science. If the conception of value used lacks precision or justification—indeed, insufficient attention has been paid to what is meant by "value" when discussing their usage—it undermines the justification for the understanding of the problem and the prescribed solution. In some works, there is no explicit mention of what "value" means. In others, it is only briefly discussed. For example, a paper by Daniel Steel on the subject gets half way through before mentioning, "Finally, I should say something about how the term 'value' is used here" (Steel 2010, 21). If the conception of value can affect the validity of the argument, we should be more clear and upfront about it.

This Chapter has three primary aims: the first is to point out that there is insufficient attention to what is meant by "value" despite entire arguments being formulated regarding how they should be used. The second is to try and unpack how the concept of value is being used in the various accounts of value management previously discussed in Chapter 1. The third is to compare

these conceptions of value with the account of value outlined in the previous two chapters and to demonstrate that problems are understood given a conception of values and motivations for accounts of value management dissolve once the conception of value I have adopted is replaced with their own, or, at the very least, require further qualification to only apply to certain kinds of values. In other words, the aim is not to demonstrate that other potential accounts of value are necessarily wrong (or that mine is necessarily right), but that what is taken to be problematic about values and what is understood as a good way of managing them are not necessarily appropriate when a conception of value is traded for another such as my own. Because of this, it raises questions like what justifies using one conception of value over another? How might a value management account require qualification if a conception of value is limited? And, what revisions might a value management account need? I will thus unpack the various conceptions of value that value management account rely on, and how these conceptions affect the account. I will consider some potential problems with the conception of value used, and how alterations to the initial conception of value can affect how we appraise the ideal that relies on it.

4.1. Survey of Discussion of Values in Philosophy of Science

Scriven notes the concept of value has had some questionable ideas attached to it. Value judgment has often been synonymous with a "dubious, unreliable or biased judgment" or one that is identified with "prejudice or intolerance" and this view has supported the value-free ideal (Scriven, 219). I have already discussed historical examples of how values have been characterized in philosophy of science, but since the recent emergence of challenges to the value-free ideal, there has been more modern attention paid to how values can play a role in science, either in defense of or in criticism of the ideal. By examining recent discussions, we can consider how values are characterized and how they differ with each other. Thus, I will provide a survey of these accounts whose focus will be specifically on characterizations of value rather than an evaluation of the over-

all epistemic projects of the authors discussed, and while it's focus isn't intended to be critical, I will discuss potential areas of contention that arise when these accounts of value are compared to my own.

4.1.2 Values as Biases, Tastes

Starting with some more straight forward instances, some philosophers adopt an implicit conception of values when expressing concern over their use in science, but do not explicitly define values. When feminist scientists began using feminist values in place of sexist values to influence their research, there was a concern that this made feminist science just as subjective as the sexist science it was to replace, and according to Kourany, some accepted that this was the case and that objectivity is an impossible goal (Kourany 2010, 57). Susan Haack is critical of this "cynical" abandonment of objectivity, arguing for the value-free ideal and against the idea of values determining theory choice. Even if we cannot be entirely without prejudice, she claims, "It doesn't follow that it is proper to allow prejudice to determine theory choice" (Haack 1993, 36). While it is unclear in her paper whether Haack's characterization of values as a prejudice is her own characterization of value or it is how she believes those she is criticizing would characterize values (as Kourany suggests), we need to be careful about how we characterize the problem; values need not be merely prejudices and we do not need to accept that it would ever be "proper" to allow prejudice to determine theory choice.

Scriven argues that the notion that values are mere prejudices is a flawed understanding of values, and, as we have learned from the previous two chapters, it doesn't follow that all values are a form of prejudice. Prejudice can occur in cases of valuing without appraisal, in other words, where one acts according to impulse without judgment. It can also occur in appraisal where it becomes a matter of rigid application of fixed general values instead of the careful appraisal of competing ends-in-view. Valuation, however, understood in its logical form is about the

determination of value where it is indeterminate, so a value judgment is the opposite of prejudice since the value does not exist prior to judgment. Valuation that takes place where value is already determined is valuation in name only. So, there is no reason to assume that all valuation results in prejudice determining theory choice. With this in mind, the discussion is clarified because we do not need to be compelled to accept that advocating the use of values in theory choice in science means that we have to accept that it is proper to allow prejudice to determine our choices.

Other examples of values characterized this way can be found as well. In his 2009 paper, Torsten Wilholt argues that in weighing cases of inductive risk, scientists are susceptible to preference bias, or unduly having results reflecting the researcher's preference. However, identifying preference bias requires that we be able to grasp some impartial balance between two judgments of inductive risks independent of a researcher's preference. It is interesting that Wilholt sees Rudner's arguments for value judgments in cases of inductive risk as undermining a possible impartial balance, and thus our ability to recognize preference bias. He explains, "The controversial aspects of preference bias would seem to arise on the level of value-judgments. […] It seems to follow that we could only accuse [a biased researcher] of having made a mistake or having applied an improper test procedure in the same sense in which we might also be prepared to say that someone makes a mistake or acts improperly by not holding the same values we do" (Wilholt 2009, 95). He rejects this notion, urging that epistemic shortcomings cannot be a matter of "personal value-judgments." Once again, given the outline of values affirmed in previous chapters, we have no good reason to conclude that values are merely personal, or would lead to relativism, or the inability to detect bias.

Robert Hudson's defense of the value-free ideal affirms the notion that (at least non-epistemic) values are a matter of taste, bias, and personal likes and dislikes, citing Kuhn to support

his argument (Hudson 2016, 174). However, we do not have to conclude that values are merely a matter of taste, bias, or likings, and this doesn't reflect Kuhn's position either since in the passage cited Kuhn doesn't address non-epistemic values, but instead states that values as evaluations have the character of judgment, that judgments about values do not reduce to mere matters of taste, and that the invocation of idiosyncratic factors in the application of values does not mean setting aside facts and deferring to personal likes or biases (Kuhn 1977, 336-7).

Gregor Betz seems to claim that values are a matter of "arbitrary choices", coming into play to help make decisions that are not empirically or logically determined, noting that "one inevitably buys into non-epistemic value judgments by making an arbitrary, non-objectively determined choice with societal consequences" (Betz 2013, 210). Perhaps paradoxically, he also claims that value judgments need not be arbitrary in the sense of being irrational or unjustifiable, that they can be supported and justified through moral reasoning, and are "non-arbitrary from a broader, non-epistemic perspective" (2013, 210). It's unclear whether this means that values can be justified, but not in an epistemic way (i.e. values are not epistemic), or that values can be justified in an epistemic way, but "epistemic" is being used in a narrow sense in this context. Either way, suggesting that values are epistemic or can be legitimately counted as part of a "non-epistemic perspective" raises more questions than it answers when it comes to how values and sciences interact or what it means for values to be arbitrary from an epistemic perspective but non-arbitrary from a non-epistemic perspective. The notion that values must be arbitrary, a matter of taste, bias, or personal likings, seems to be implicitly presumed rather than defended, and it reduces values to mere terminal responses instead of being responses to, and responsible to, a context.

4.1.3 Values as Socially Esteemed

Moving beyond implicit conceptions of value that arise in discussion, there are also cases where direct discussion of the nature of value has been limited and imprecise. Steel[67] defines values in the following way: "Values are factors that motivate decisions in a particular direction, are positively regarded within a community or population, and which tend to be relevant to a variety of contexts" (Steel 2017, 50). Why this definition of values? It comes from the paper mentioned in the introduction of this chapter. There he takes up Miriam Solomon's argument that values function as one of many kinds of decision vectors that influence the outcome of a decision (Steel 2010, 22). Unlike Solomon, however, Steel specifically points to social esteem as a quality values have.[68] On this basis, he would exclude sexism as counting as a value in a population where sexism is frowned upon (2010, 21).

This conception is difficult to employ for several reasons. It is unclear whether one can find a meaningful distinction with this conception between what is valued and what is valuable. If we assume Steel means that something counts as a value if a population values it, then the definition he provides leaves no room to understand what is valu*able* instead of just what is valu*ed*. If a population valued being wasteful of natural resources, it would not follow that this is valuable nor that we would not be able to identify it as such. It would be a form of relativism, where what counts as a value is based on what the population subscribes to. There is nothing in the definition that would seem to allow for legitimate criticism of values held by other populations, or even by individuals or minorities within that population. Also, if an individual preferred racist ideas in a population where racism is frowned on, then it would seem odd to claim that that person did not value racism. On the other hand, if what is meant is that if something is positively regarded in a

[67] I will be further discussing Steel's work on epistemic and non-epistemic values in the following chapter.
[68] See the following subsection for further clarification.

population then it is valuable, and not just valued, it would solve the issue of claiming that the racist did value racism, but it isn't clear why well regard of the population makes the difference between that and what is valued, nor is it clear what is the benchmark for what counts as valuable; is it unanimity, consensus, a majority favored position?[69] Answers to these questions would need to be forthcoming before we would be in a position to evaluate to what extent "social esteemed motivating factors" is a precise enough characterization of values and their associated phenomena when considering how values should be used in science and what its limitations might be.

4.1.4 Values as Decision Vectors

As mentioned, Steel takes his concept of value from Miriam Solomon. Solomon considers values to be a subset of what she calls "decision vectors" which influence the outcome of a decision in science (Solomon 2001, 53). She coins the term after noting that in addition to traditional so-called epistemic values like simplicity or fruitfulness, other "biasing factors" can be conducive to empirical success such as competitiveness, desire for credit, or ideology. And since she affirms that any practice which can lead to empirical success is scientifically rational, these factors should count as rational (2001, 52-4). Wanting to avoid the irrational connotation of "biasing factor" she opts for "decision vector" instead. But why is value only a subset of such vectors? She argues that decision vector is broader than the concept of value, and that concepts like cognitive bias or motivational bias are not value driven.

To clarify with some examples, cognitive biases include decision vectors like availability of data (preference for a theory with data), while motivational biases include egocentric bias towards one's own data. In addition, there are "social factors" such as ideologies, and "motivational factors" such as pride or competitiveness. Amongst the vectors classified as values

[69] This is a point that will come up again in Section 4.2.5 in discussion of Longino where I will recall Lewis' point about what is valued by a majority.

include examples like elegance or simplicity. How are values then differentiated from these other kinds of vectors? Unlike Steel, Solomon does not claim that values are vectors that are popularly well regarded. When she does discuss values, she refers to things like "traditional scientific values" (theoretical values) and claims that these "function as heuristics drawn from plausible theory or pragmatic goals" (2001, 21). Given this and given that she characterizes motivational biases as not value-driven, I presume that her conception of values is restricted to these general values which she characterizes as functioning as heuristics. Because of this characterization, values function as generalized ends that arise from past inquiry and are intellectual and logical in force. They are not a priori or fixed but are testable according to their ability to produce empirical success and can be given up if they do not (2001, 20).

This, however, raises the question as to whether this is a good characterization of values and what limitations it may face if used in the broader values and science discussion. I would argue that biases are value-driven in that they are a form of valuing. As noted from Chapter 2, valuing or prizing is an important element of the concept of value. Behavioral attitudes like prizing, cherishing, dwelling upon, and so on (or their opposites) were widely recognized as a form of valuing by those I discussed at length, in addition to the accounts of value of Perry and Scriven. According to Solomon, a decision vector is physical rather than abstract, that is, it physically or materially "influence[s] the outcome (direction) of a decision" (2001, 53-4). This is consistent with the characterization of valuing since it is affective-motor rather than being merely mental, and according to Dewey, bias is a tendency to behave in certain ways rather than another since "preference is originally only bias in a given direction" (MW8: 33). Immediate experience of value occurs wherever there is a liking, interest, or bias, and thus any form of bias constitutes valuing

(Dewey 1925, 429). Therefore, if motivational biases or cognitive biases manifest in our physical behavior, it is because their object is an experienced value and so such biases are value-driven.[70]

The fact that we prize something just means that we are biased towards it until such biases are held in check by other valuings or by inquiry (Dewey 1922, 193). Other factors she identifies such as birth order is the factor most predictive of scientific choices between competing theories (Solomon 2001, 60). Birth order is not a value, but it does, as Solomon notes, affect our tendencies towards radicalism, and this is a form of valuing. The fact that values are not just generalized concepts is belied by Solomon's frequent language which suggests that scientists "value" things (rather than just adopting general values). All decision vectors as Solomon defines the concept are a form of valuing, and recognition of this can avoid ambiguity and confusion about why certain general ends qualify as values. In essence, her account can be improved by including all of the distinct meanings of "value" which can also include valuing and valuation.

One obvious example of how her account can be improved by including all the distinct meanings of "value" in her definition of the term involves her arguments regarding the values as an empirical or non-empirical vector. I just mentioned Solomon's point that theoretical values like simplicity are testable, yet when she distinguishes between what she calls empirical versus non-empirical decision vectors, values are categorized as non-empirical. Empirical decision vectors cause us to prefer theories with empirical success, while non-empirical decision vectors are other causes or reasons for choice (2001, 56). An empirical vector must be directly tied to the empirical success of the theory rather than happenstance or luck. Preferring a complex theory over a simple

[70] It is also helpful to keep in mind that bias is not always negative (in the same way) since it merely describes a behavioral tendency. As Dewey notes, "bias for impartiality is as much a bias as is partisan prejudice, though it is a radically different kind of bias" (Dewey 1998, 212).

theory is non-empirical because whether a theory is true or not is independent of its complexity (2001, 57).

Nevertheless, she also claims that whether a vector is empirical or not is itself an empirical question. She notes, "if simple theories could be shown to be more successful than complex theories (either as a matter of logic or by induction), then simplicity would count as an empirical decision vector" (2001, 59). Speaking to this matter, Sharyn Clough argues that certain values, such as those used by feminist scientists, have already demonstrated that they are empirical in that their use has directly led to more empirically successful theories (and not through luck) (Clough 2008, 269; also see Clough, 1998). Lynn Hankinson Nelson also argues that feminist scholarship has demonstrated the unfoundedness of sexist values by subjecting them to empirical control, thus establishing the point that not all values are equal, and that science can be improved by consciously evaluating the values it does use. (Nelson 1990, 248-9;).[71] Focusing on the fact that value judgments are responsive to and tested against our experience of the world, Clough argues that value judgments cannot only be informed by, but can be used as evidence in support of, other judgments (Clough 2008, 274). If so, then values are directly relevant to empirical success. However, lumping all values as non-empirical risks treating feminist values and sexist values as equally irrelevant, despite the success that feminist values have had (2008, 270).

Clough's argument suggests that the question of whether values as decision vectors are empirical or not will depend on what kind of value we are talking about as well as its subject matter. Valuing will not count as empirical (unless we are talking about propositions about valuing such as "Mary values X") because liking something doesn't make it any more likely to be true. However, value judgments can be empirical, and general ends may have a better track record for

[71] Also see 4.2.5.

empirical success as we will recall from Lepley's spectrum from Chapter 2. Therefore, if we include all three conceptions of value we can clarify in what cases values will count as empirical.

Justin Biddle does not employ the term "decision vector" but employs Neurath's concept of an "auxiliary motive" to similar effect in discussing factors that affect epistemic decisions that are broader than values. Biddle uses this concept to argue that values are one of many contextual factors that can influence our epistemic appraisals. He notes that "some of these factors might be properly characterized as values, while others clearly are not" (Biddle 2012, 131). He considers certain factors like tradition to be a value, but when it comes to something like doing "something or other" or "waiting to see," "Clearly, these motives are not properly characterized as values" (2012, 131). Like Solomon, he claims values are one amongst many factors that affect decision making.

Some of these factors "might be consciously adopted ethical or political values; they might be unconsciously held subjective preferences or ideological assumptions, and so on. Some of these factors, again, are properly described as values, while others are not" (2012, 132). If we take this approach, it is unclear when something would count as a value. It would seem that a value must either be a general end taken from tradition or be consciously adopted. Contextual behaviors like "having a hangover" or waiting to see do not count. However, I would suggest that any of these factors are valuative. For example, having a hangover isn't a value but does affect what and how we value, both in terms of our valuing and our valuation. "Waiting to see" can be a valuing behavior, it can be an end-in-view decided to be the best course of action after careful assessment, and or it can be a general response given habitual prudence. Either way, these all involve values of one form or another and they don't always perform the same function in coming to a judgment. The benefit of recognizing all such factors as values is that it avoids the need to concern ourselves

if a factor is a value (and why that might be) and provides a framework by which to assess the logical status and function of such factors.

4.1.5 Values as Personal Desires

Hugh Lacey has the most advanced articulation of values out of all the accounts I will discuss. An in-depth analysis or criticism of his account may be fruitful but is not necessary for my purposes here which is to survey some of the ways that values have been discussed in the literature. Nevertheless, it may also be useful to point out how his account of value differs from my own. Lacey has defended the value-free ideal, however he devotes significant effort to discussing the nature of value. He notes the historically meta-ethical and logical views of value on their influence on science. The meta-ethical view that values are subjective preferences which are not open to rational appraisal was as source of argument for value-freedom (Lacey 1999, 6). The logical view holds that statements of fact do not entail values and statements of value do not entail statements of fact. He argues that one view does not entail the other, noting, "'Value does not imply fact,' seems to me to be correct and not dependent on accepting the above metaethical view" (1999, 7). The separation of fact and value influences Lacey's later account. His account also sharply distinguishes between personal and epistemic values, so I will discuss the former first.[72]

In his chapter devoted to the topic, Lacey notes that "value" has varied uses, including ends that one pursues, a quality that gives goodness, or an object of value that is constitutive of a worthwhile life and one's personal identity (1999, 23). His account of value starts with an understanding shared by many already discussed, namely that values are linked to desires which influence our actions. However, his account differs in important ways. According to Lacey, a value is a reflection on our desires. He explains, "Holding values, then involves second-order desires

[72] Lacey also distinguishes between personal and social values. However, for my purposes here it is sufficient to discuss his interpretation of personal values and their relationship to science.

[…] which represents one of a person's fundamental goals" (1999, 24). In the case of a personal value it is that one's first-order desires be the kind that produce a life marked by a quality that makes it fulfill, and is constitutive of, one's identity. Values are personal and are thus tied to one's "most fundamental desires and to one's deepest feelings" (1999, 24).

Because values are reflective, they are objects of investigation, of reflection, of discussion, and critical argument. They are also expressed in modes of action. Lacey points out, "values have no reality apart from these modes […] personal values cannot be reduced to mental representations or simple conscious phenomena" (1999, 27). They develop over time, they are not merely given. Because values are about actions and are goal oriented, they must be consistent with constraints imposed by reality to be intelligible. One can be critical of values by taking note of the effects they produce and whether they meet expectations. There can often be a gap between what we intend and what is possible, and failure to take note of constraints in action will lead to bewilderment and a failure to realize desires (1999, 30). While some of these elements are consistent with my account developed in previous chapters, there are important ways in which this account is at once both too broad and too narrow.

Firstly, it is too broad because Lacey's account of value is tied to the notion that they affirm something about what we conceive of the good life, or function as the core of our personal identities. While it is certainly plausible some values fit this definition, he doesn't demonstrate that this describes all values that relate to personal endeavors. My evaluation that I should buy a cheaper suit that is compatible with different occasions over a more expensive one that isn't doesn't necessarily reveal something deep about my personal identity or how I understand the good life (or that I even have such a conception); valuations of this sort may merely be about addressing local contextual problems not relevant to one's ideal life or one's deepest feelings.

More evidence is required in concrete contexts to establish that all personal values should have such a broad scope or be reflective of one. Alternatively, to deny that determination of what suit to buy constitutes evaluation since it may not appeal to deep feelings would seem counter to ordinary uses of the concept since to appraise and determine the value of an item is a common element of the concept of valuation.[73] Second, his account is too narrow because it only includes reflective values. For instance, in his 2005 book he claims that holding a value is considered equivalent to a value judgment that a certain quality be manifested in something (Lacey 2005, 61). Holding a value involves desiring that something have a particular quality, that this is constitutive of a good, and we are committed to enhance or to maintain this manifestation. This is certainly consistent with prizing, and since prizing is connected to (although not equivalent to) valuation this is partially consistent with my account, but it doesn't include non-reflective valuing.

Further, Lacey suggests that a value is constitutive of a good, where good tends to imply an ideal: a general comprehensive good (2005, 63). Something has value in so far as it manifests this ideal. But it isn't clear how ideals with respect to personal values, are objective. For example, if an ideal is constituted[74] by a collection of personal values, whose main criterion is that they must be deemed good and that they be intelligible according to empirical facts, then their warrant seems to be based on the fact that they are consistent with concrete conditions concerning their possible manifestation (they are intelligible), and they are desired according to our deeply held beliefs and our personal fundamental goals. This may be why he claims that personal values can express

[73] It may be that Lacey and my account may simply then have two very different and incompatible conceptions of value. However, I believe mine is more suitable to discussing values in science because it specifically looks to verifiable relations between events and experiences rather than deep personal feelings which is precisely what tends to make many skeptical of their legitimate usage in science.

[74] Lacey claims that values are constitutive of (or subordinate to) an ideal (Lacey 2005, 63).

differences but not disagreement. As Lacey points out, empirical investigation can inform but not entail whether something is valuable (2005, 64).

In contrast, my account requires that values are adequate to the extent that they resolve the objective difficulties encountered between an organism and its environment; empirical investigation in the form of valuation *does* entail what is valuable.[75] In other words determination of what is valuable goes beyond the fact that it is intelligible and consistent with some conception of human nature and that it is desired. Because of this, my concern is that when Lacey claims that values are personal, he gives the impression that they are *merely* personal (as I will explain). It would be no surprise then that he doesn't believe they are relevant to determining whether to accept or reject a theory. Further evidence that he sees personal values as merely personal arises in his characterization of personal and epistemic values.

Epistemic values are similar to other kinds of value except that they pertain to second order desires about what we desire our beliefs to be like (2005, 46). However, these values are not personalized, but rather apply to everyone impartially. He notes that unlike personal values "where holding different values represents only difference and not disagreement, since different people properly aspire to lives into which different personal values are woven, differences in the cognitive values that are held always represent disagreements. One's personal identity is not linked with having one's 'personal' set of cognitive values" (2005, 52). For him, what constitutes a good theory has to be independent of what constitutes a good life, and since cognitive values are impartial in this respect, they are necessary for science to be impartial. In fairness, I should note that Lacey explicitly states that values are not subjective preferences (and I am not necessarily saying this is

[75] This only points to difference in our accounts. It does not, nor is it intended to, imply correctness of my account. In depth criticism of his account of value is outside of the scope of this dissertation, however it is worth considering the methodological differences between our accounts; my account began with values in experience, whereas his began with a series of definitions.

his position), but the way he sometimes characterizes personal values, such as disputes being differences rather than disagreements, I believe suggests too strongly that personal values are merely personal. This will become relevant in the following chapter when I discuss his account of cognitive and non-cognitive values.

4.1.6 Values as Empirical Statements

Elizabeth Anderson argues that philosophers have taken value judgments for granted. She notes, "This undertheorization of value judgments has made it hard to identify precisely the concerns of advocates of value-free science. It has impeded the development of criteria to distinguish legitimate from illegitimate uses of values in science" (Anderson 2004, 2-3).[76] She has argued that the case for value-free science depends on the notion that value judgments are science free, or that empirical observation can't count as evidence for a value claim, and that "arguments for neutrality depend on contradictory or crude models of how value judgments work" (2004, 7). The real worry when it comes to using values in science is not that they are used, but that value judgments can be made dogmatically (2004, 9).

According to Anderson, there is nothing inherent in the nature of value judgments that a judgment be asserted regardless of evidence that can be brought to bear for or against them. She argues that we can appeal to "emotional experiences" which are affectively colored experiences of persons or events. These experiences can constitute evidence for a value judgment if they have cognitive content, exist independently of value judgments they are taken as evidence for, and are accountable to the way the world is. For example, one may judge that politics is worthwhile, only to have this judgment undermined upon taking office (2004, 10). We are also capable of determining that our interpretation of an emotional experience is defective. One may find that a

[76] Note that this echoes Putnam's point about blocking the path to inquiry.

certain experience is too limited or narrowly interpreted to stand as evidence for a value judgment, and a more long-term outlook is needed. Because of this, she argues that value judgments need not be dogmatic, and that we can recognize evidence that may undermine them or drive inquiry to a predetermined solution. To demonstrate a valid use of value judgments in science, she uses a case study of feminist research on divorce. The study spearheaded by Abigail Stewart adopted conceptions of divorce that included both positive and negative dimensions (as opposed to only negative conceptions) and this informed the kind of study conducted to include a longer temporal perspective than in previous studies. Despite this, Stewart's team made every effort to be as rigorous in their analysis of unwelcome findings as welcome findings (2004, 17).

Anderson's work on the subject is interesting and consistent with some of the positions I have adopted. However, her point can be further refined by noting that dogmatic value judgments (valuation) are not the only problem that can occur when using values in science. Dogmatic judgment is an obvious concern, and perhaps a major component as to why philosophers are so wary of their use, but it isn't the only concern. Valuing without a value judgment is also a concern; one may act on impulse, habit, or be capricious in using values without reflection. So, a legitimate concern about using values is that they are not being evaluated. Second, even when there is judgment, the risks extend beyond just dogma. For instance, like any judgment, evaluation may be improperly done. For example, one may be fallible about the ends to be pursued but misjudge how to pursue them. Judgment may be too narrow or too broad, it can be done carelessly; this isn't the same thing as being dogmatic. A careless inquirer may not come to a pre-determined answer; they might change their minds if they considered evidence they didn't bother to consider.

Her account of emotional experience, while valid in some ways, can also be improved with further explanation. As we have learned from Lewis, whether one may experience certain values

while others may experience another may be highly dependent on environmental factors that don't necessarily bear on the objective value. Value may require certain existential conditions to be realizable. Thus, the emphasis must not just be placed on the experience as experienced (or interpreted), but on what operations and consequences stem from how those experiences are interpreted and the potential for idiosyncratic value predication. The account that we get from Lewis can aid in further elaborating Anderson's argument that our emotional experiences can be held accountable to the way that the world is.

4.1.7 Competing Meanings of Value

Some of the issues and accounts discussed in this section will be addressed in the following chapter. The survey just provided including to the authors above, as captured in Figure 6, demonstrates a range of ways of thinking about value. For some of these philosophers only generalized ends may be recognized as values; a decision like "waiting to see" may count as a value to one (being a valuing), but not to another that doesn't recognize such valuings as being values. Thus, as I suggested in Chapter 1, there is a real risk that philosophers wouldn't identify the same things as values. These accounts can also be too imprecise and limited compared to the accounts described in the previous two chapters. This is not to suggest such accounts are wrong or mistaken merely because they differ from my account, but that there is insufficient attention to important conceptual elements and phenomena that go into values that my account does address. While this gives us an idea of how values are considered in philosophy of science as a whole, next I will turn to how they are treated in the accounts of value management discussed in Chapter 1. Particularly, I want to consider the connection between what is meant by "value" to what is taken to be problematic about values in science and how this influences the perceived need for management and the prescriptions offered.

Figure 6

	Haack	**Wilholt**	**Hudson**	**Betz**	**Steel**	**Solomon**	**Biddle**	**Lacey**	**Anderson**
Broad description of values	Prejudice, desires	Preference, bias	Taste, bias, personal liking/disliking	Arbitrary choice	Socially well-regarded decision vectors	Decision vectors	Auxiliary Motives	personal desires	Empirical statements
"Value" meaning	Valuings: prejudice choice	Valuings: Determine theory choice	Valuings: Determine findings, distort truth	Valuings, "non-epistemic" judgments: Determine choices	Valuings, generalized ends: motivate decision choice	Generalized ends: traditional cognitive values	Generalized ends: cognitive values	Prizings, Judgments: indicate personal wants, not facts, which constitute an ideal	Valuations: Provide reasons for and guide decisions
Primary logical status(s) in inquiry	Non-propositional impulse/ habit	Non-propositional impulse/ habit	Non-propositional impulse/ habit	Non-propositional impulse/ habit	Non-propositional impulse/ habit, propositions	propositions	propositions	propositions assertions	assertions

Before I begin, consider Hugh Lacey's claim that if values are allowed in science "We would be thrown back on merely 'wishing' the world to be a particular way or 'the back and forth of biases with only power to settle the matter" (Lacey 1999, 214-5). This claim would only make sense to someone else if they shared that particular notion of value.[77] If one does not share that conception, if one thinks that the concepts of values and wishing are conceptually exclusive, the claim won't make sense. If I say, "Don't go see a university-trained doctor; we can't merely wish the world a certain way" such a claim will be puzzling unless one sees a conceptual link between what a university-trained physician does and mere wishing. A claim about the dangers of values, and thus how we should use them, will only make sense if we can assume the person reading a claim understands values like they do, and they would only agree with the claim if the conception is justified. Thus, when faced with alternative plausible and justified conceptions of value, we must ask for justification when a particular conception is used. In the remainder of the chapter I will explicate the conception of values that value management accounts presume and will compare them to my own account. I will argue that if my conception of value is used, many perceived problems either dissolve or change. This suggests that further use of a conception of value requires justification, or that the prescriptions offered require qualification given that they may only work given certain conceptions of value.

4.2. Value Management in Helen Longino

As mentioned in Chapter 1, Helen Longino's ideal of a well-functioning science emphasizes the use of social criticism to ensure that science can both use values and maintain objectivity. In this analysis of values in Longino's work I first consider her explicit discussion of value, and then try

[77] I discuss the problem of wishful thinking directly in the next chapter.

to articulate what conception of value she uses. Longino is correct in explaining that evidence is an outcome of both factual and valuative considerations. However, when I compare her conception of value to my account, I will demonstrate that Longino doesn't always clearly distinguish different meanings that values can have, that this can make her arguments regarding the potential problems of values require further justification. However, modifications to her account consistent with my conception of value can strengthen her position.

4.2.2 How Values Are Characterized

Longino does not explicitly define what she means by "value" in the way that philosophers such as Lacey or Steel do. Thus, I will begin with what direct analysis she does provide of values before attempting to ascertain what she means by the term. Longino identifies certain values that stem from the goals of scientific activity called constitutive values (Longino 1990, 32-5). In contrast to these are contextual values, which are values that are personal, social, or cultural in nature. Longino's central claim is that not only are "scientific practices and content on the one hand and social needs and values on the other are in dynamic interaction but the logical and cognitive structures of scientific inquiry require such interaction" (1990, 4-5).

The only other direct discussion of values comes from her 1996 paper "Cognitive and Non-Cognitive Values in Science: Rethinking the Dichotomy" where she challenges the notion that there can be purely cognitive (or epistemic)[78] values and argues that we cannot maintain the dichotomy between cognitive and non-cognitive values. Cognitive values are values which are conducive to truth, while non-cognitive values are values that are political and social in nature (Longino 1996, 41). When she compares traditional cognitive values to values utilized by feminist

[78] Longino, and many other philosophers use these terms interchangeably. This is especially unfortunate given that in meta-ethics cognitive values and cognitivism denote something different entirely.

science, both sets of values have a political and social valence and thus we cannot maintain that only one set is purely cognitive while the other is political and social (1996, 51).

In many occasions there is overlap between the two types of values as cognitive values are identified as constitutive, and contextual as non-cognitive. In *Science as Social Knowledge*, she characterizes values like truth, accuracy, simplicity, predictability, and breadth as constitutive and later as cognitive values, while contextual and non-cognitive values are characterized as social, political, and personal. So, what is the difference between the two sets of distinctions?

Longino argues that contextual factors like social and value-laden assumptions can affect science as the "very character of reasoning in science makes it vulnerable to the influence of context" (1990, 83). Nevertheless, Longino notes that a "contextually fixed" set of goals "provides some measure of protection against individuals' idiosyncratic values […] community adherence also protects the daily practice of science from contextual incursion, especially from the direct encoding of socio-economic needs into scientific hypotheses" (1990, 100). So, constitutive values are internal to a scientific community and can include non-cognitive values. While they can vary over time, they are more stable than external values. So, despite overlap, the cognitive/non-cognitive distinction deals with whether values are purely truth promoting, while the constitutive/contextual distinction deals with values internal or external to a scientific community.

Longino's comparison of traditional cognitive values and an alternative feminist set of values is a second major explicit discussion of value. In her criticism of the distinction between cognitive and non-cognitive values she claims that her aim is to "cast doubt on the very idea of a cognitive value or virtue, where we mean by that a quality of theories, models, or hypotheses that can serve independently of context as a universally applicable criterion of epistemic worth (1990, 42). Her argument is that traditional cognitive values "in certain contexts of scientific judgment

imports significant socio-political values in those contexts […] I don't want to say that traditional values are always politically regressive, but the fact that they sometimes are means that we cannot treat them as value-neutral grounds of judgment" (1990, 54).

Longino's criticism that all values are contextual is an important one. When we compare her discussion of the use of values to the account affirmed in previous chapters, it should become clear that the use of any value should be context dependent. If not, then the value is treated as a fixed end-in-itself rather than an end-in-view and inquiry becomes closed and thus action becomes less intelligent. However, her point should have gone further by arguing that no value should be a ground for judgment (as a fixed end), since the point of a value judgment is to determine a value where it is previously indeterminate. Her argument that both traditional values and her alternative values are desiderata suggests "value" in this context is meant as a generalized end. The values mentioned like consistency, novelty, simplicity, and ontological heterogeneity are general (or generalized ends). Yet, Longino also seems to imply that generalized values, such as cognitive values, are deterministic of choice such as in her claim that we ought not be "hamstrung" by traditional sets of values (1990, 51). In other words, general ends are treated as something to be asserted, rather than affirmed. This contrasts with my argument in Chapter 3 that generalized ends are suggestive, not a fixed end-in-itself and this folds the notion of "value" as a generalized end with "value" as a judgment.[79] Thus, her point can be expanded by explicitly distancing herself from values being used in this way. Her explicit discussion of value does not obviously indicate what she means by the term. Next, then, we will have to move beyond explicit discussion of values and consider how values are characterized in her work.

[79] I will return to this point later.

4.2.3 Logical Status of Values as Characterized

The previous section addressed Longino's specific characterization of different functions of values within inquiry, but it is still unclear how Longino would characterize the concept of value and its related phenomena. Thus, I will attempt to articulate a best guess of such a conception using her discussion of values in science. Longino never clearly connects values and interests. When she discusses the use of values in science, she is always careful to list values as separate from interests (1990, 12, 13, 48, 51, 83, 143, 184, 193). Previously discussed accounts of value define valuing through interests, where interest implies an active impulse to make some change or preserve some state of affairs. Recall that when values are tied to interests as behavioral phenomena, whereby they imply valuing, other philosophers have been able to make a distinction between valuing and valuation. When we consider her discussion of preferences, we find something closer to these accounts.

As mentioned, Longino believes that cognitive values are supposed to function as grounds for preferring one theory over another (Longino 1996, 44). That the values are *grounds* for preferring and not a preference in themselves suggest that values are intellectual rather than something that can be described as purely behavioral (i.e. they have a logical function). However, after arguing for the need for background assumptions not reducible to observation, her primary concern (and the reason for her criteria of a well-functioning scientific community) is the need to block "subjective preferences" (Longino 1990, 51, 64, 65, 73, 82, 216). Should we conclude, then, that Longino treats values and preferences as distinct? I do not believe so.

The idea that preferences are not a form of values can be rejected since the chapter where she presents her criteria for blocking subjective preference is entitled "Values and Objectivity"; clearly, she believes that preferences are a form of value, although at this point it is not yet clear how they are related to those values that are a ground for judgment. If we accept this, then we must

accept that values can act both as grounds for preferences, but also as preferences themselves. All accounts discussed in Chapter 2 (from Perry[80] to Dewey to Lewis and Lepley) tie valuing to preferring, where preferring is usually taken as a behavioral matter of selection and rejection. If we accept this idea of preferring here, then for Longino value can count both as a motor-affective preference, but also as an intellectual concept used to determine preference. Thus, it is possible that she makes distinctions in the term "value."

What evidence is there for the fact that Longino believes that there is more to the concept of value than mere preference or valuing, and how does it figure into her normative account? The only aspect of her work which suggests that there may be a difference between what is valued and what is valuable lies in her analysis of the process of transformative criticism. The idea is that by subjecting scientific research to transformative criticism, we can minimize "the influence of subjective preferences" (Longino 1990, 216). Longino states "the greater the number of different points of view included in a given community the more likely it is that its scientific practice will be objective, [and] less characterized by idiosyncratic subjective preferences" (1990, 80).

Given that she clearly sees that individual values are idiosyncratic and harmful, while social values are those that inform, and presumably are informed by, transformative criticism, it may be that this is the basis for finding what is valued and what is valuable. Idiosyncratic values are merely valued, while social values are valuable. However, there is a problem here because while she prescribes a process by which social values either are, or are what determines what is,

[80] Perry makes a distinction that the others discussed do not make. He notes that when someone says, "I prefer A over B" this can either imply a judgment that "A is better than B" or it can imply a motor-affective liking; in other words preference can imply both valuing and valuation (Perry, 597). However, this would be problematic for Longino since if what is considered a value is a grounds for a preference, then the value would no longer be identified with the judgment (instead as a grounds of one) or the valuing. If the value can no longer be identified with either "value" as valuing or valuation, it isn't clear how it could be considered a value at all.

valuable, she does not state what is entailed in a value judgment as such and thus what criticism is responsive to.

Longino discusses various general values, claiming they are grounds for preferring a preference, and if "grounds" is interpreted as "reason for" then, according to the account I have affirmed, value can designate generalized ends and have the status of propositions. Preferences as she describes them seem to mirror the concept of value as valuing, thus values can take on the form of assertions either arbitrarily or through habits. Mere valuing has no logical function since inquiry doesn't occur in such cases. But then where is the discussion of the third understanding of value as valuation or value judgment?

As I will argue, Longino's discussion of social criticism is insufficient in terms of how it allows for the determination of what is valuable. Without a precise way to determine the difference between what is valued and what is valuable, it undermines Longino's argument that social values are any better than an "idiosyncratic value," why an individual value must be idiosyncratic, or why idiosyncratic values are problematic to begin with. Thus, lacking a precise account of value judgment opens the door prematurely to a potential harm presented by value use. However, she uses this potential harm to justify her normative account.

4.2.4 Value Management

Longino uses an argument from underdetermination to advocate the use of values in science. The general structure of scientific inquiry is shaped by theoretical frameworks which are necessary to engage in the construction of reasoning and without them there is a gap between what is present to us and the processes we suppose produce the world that is present to us. Thus, data alone (for the most part) can be consistent with different and conflicting hypotheses (Longino 2002, 125-6). Data by itself points nowhere since states of affairs do not carry labels to indicate that they stand as evidence for some other proposition. Data can be taken as evidence for a

hypothesis only using a general relation or "background assumption" which provides for the link. For example, the assumption that red spots are a symptom of measles allows for observations of red spots to counts as evidence for the conclusion that someone has measles (Longino 1990, 41).

According to Longino, background assumptions are not empirically reducible to observation, and this leaves an opening for values to justify their usage. While philosophers might object that background assumptions are empirically verifiable themselves, she argues that projects that have attempted this such as the logical empiricists' attempts at reducing or translating theoretical claims into observational claims have been a failure once we move beyond rudimentary observational generalizations (Longino 1990, 52; 2002, 125). Further, reliance on empirical confirmation of all background assumptions would be too restrictive. Scientists do not confirm every assumption, but rather they select background assumptions based on their relevance to the explanation of phenomena under consideration rather than on their being directly confirmed. Also, processes for direct confirmation of such hypotheses are often not available until after a theory has been developed and adopted (Longino 1990, 51-2).[81]

Without direct empirical support, "there are no formal rules, guidelines, or processes that can guarantee that social values will not permeate evidential relations" (Longino 2002, 50). Notice that her argument suggests that values can only legitimately come into play into theory selection where evidence leaves off, suggesting not only a fact/value distinction[82], but it also echoes Brown's point about a lexical priority of values mentioned in Chapter 1.[83] While she ultimately argues for the legitimate use of values in science, on numerous occasions she notes that without a

[81] Notice the similarities of this analysis to the analysis of propositions from the previous chapter.

[82] Longino's work doesn't always suggest this, however. In *The Fate of Knowledge* she details a number of cases, for example of how scientists make observations which suggest that what counts as facts will depend on values (Longino 2002, 99). On the other hand, at no point does she suggest the alternative, that values can be factually verified.

[83] It also echoes points made by Intemann, de Melo-Martin, and Nelson discussed in the following chapter.

guarantee against the use of values in science, (at least at first) there "seems no way to block the influence of subjective preferences" (Longino 1990, 48 50, 61, 73). In other words, if one opens the door to choosing background assumptions by using values, there seems to be an immediate danger of the influence of subjective preferences, necessitating some normative ideal. According to Longino, "My aims are to show both how broadening our conception of that inquiry from an individual to a social activity enables us to see that the sciences are not, nevertheless, hopelessly subjective" (Longino 1990, 37).

This is clear evidence that her conception of values as being connected to subjective preferences motivates her perceived need of a normative account, and this need is recognized on the basis that using values presents a problem; in other words, her conception of values motivates her need for value management. In laying out her account of social criticism as a solution to this problem, Longino states that it aims to "block the influence of subjective preferences at the level of background beliefs" (1990, 73), and that criticism is a way to make sure that authors have interpreted their data free from such preferences (1990, 69).

4.2.5 Subjective Preferences and the Logical Functions of Values

If we reject the premise that there is an immediate threat of using subjective preferences as values to determine choices of background assumptions, then the need for such account seems less obvious. Because of a lack of precision in terms of how valuing relates to mature valuation, it is less clear how values present a threat to science. Longino doesn't provide enough justification for a conception of value such that, short of her prescribed critical process, all choices should count as subjective. In essence the issue isn't that subjective preference can't be a problem, but in how Longino characterizes the problem. It is important to point out that it doesn't follow from Longino's argument that science must be at risk for subjective preferences just because we accept the need for background assumptions. Longino's argument that we choose background

assumptions based on their relevance to a solution, that we affirm rather than confirm such propositions, is entirely consistent with the account of practical judgment adopted in the previous chapter. Thus, Longino's argument does not demonstrate that science must be (or is even likely to be) at risk of subjective preferences.[84] What it does prove is that there is a practical element and thus a need for practical judgment in science (emphasis on the judgment). Only if we accept that practical *judgment* is (or is likely to be) connected to subjective preferences, particularly in cases without her normative criteria being followed, can we conclude that subjective preferences are a threat merely because a practical choice has to be made.

Unfortunately, Longino hasn't said anything about the nature of practical judgment to allow for that conclusion. As Sharon Clough has argued, Longino's construal of how background assumptions are chosen requires that values emanate from subjective, internal minds (Clough 1998, 106). However, on my account even though practical judgment can be influenced by subjective preferences, as described in Chapter 2, it does not follow that there must be, or even is likely to be, a significant threat that this will be the case. There is always the potential for risk of reliance on subjective preferences, but so long as value judgments are objectively verifiable, then then mature valuation is the best option to limit reliance on subjective preference. Thus, if background assumptions are chosen using values, the threat to science is a lack of, or bad, value judgment, not values in and of themselves and good value judgment may not depend on communal criticism. If we were to say that the proper recourse when selecting background assumptions is mature valuation and never mere valuing, then the motivation for her normative account as a means of mitigating subjective preferences dissolves, particularly if communal criticism isn't required for

[84] This could take the form of an empirical study regarding how likely it is a scientist would proceed by subjective preference when faced with a practical decision instead of valuation. And even if most value judgments were poorly made, it still wouldn't follow that they are following subjective preferences.

mature judgment. However, much of her account of communal criticism can be built into a methodology of making objectively verifiable mature value judgments.

The fact that there may not be direct evidence for a background assumption does not mean that there isn't evidence for the decision to use it. Thus, it does not follow that because background assumptions are not empirically confirmed that a reasonable alternative is using subjective, or as she characterizes them, idiosyncratic preferences. Longino makes the distinction between what is individual and thus idiosyncratic, and what is social and objective (or more accurately intersubjective). But, recall from Lewis' analysis that idiosyncrasy in value predication is more complicated than just being an individual matter. Whether an individual will have an idiosyncratic value experience will depend on a number of factors of a given context, and even if they do, they may still be able to predicate values in a way that we deem objective. By contrast, it isn't obvious why what a social group or community finds valuable will be any more objective: "majority votes prove nothing—except concerning what is relative to majorities" (Lewis 1946, 526).[85]

Nor is it clear what is inherently wrong with a value being a matter of an individual preference. Only if we take preference as being a mere preference as a terminal response does this seem like an immediate problem. And, as Dewey notes, we cannot take desire to be inherently subjective once we take note of how it arises in concrete situations. Preferences should not be thought of as preferences at large, but as relationally responsive to some situation. Preferences formed in response to objective factors of the situation allow for objective criteria by which to judge that preference. Preferences, if acted upon, produce consequences by which we can test a potential solution. It is here, as I will discuss, where social criticism can be helpful.

[85] This point isn't necessarily confined to majorities, but rather what is valuable to a group.

As noted, Longino doesn't sufficiently clarify the distinction between subjective preferences which are valued and value judgments. Presumably, valuation is implied at the point that values become social values because they have been criticized; they are what is preferable rather than what is just preferred. If not then the only significant difference between idiosyncratic values and social values are the number of people involved; criticism, it seems, is employed to determine fitness. But without precisely articulating the nature of value judgment in this way, we have no reason to accept that an individual scientist wouldn't rely on carefully considered value judgments when adopting a background assumption rather than relying on subjective preferences. If this is so, values seem less problematic and the need for the social ideal Longino prescribes seems less necessary. Also, without a clear conception of what goes into a value judgment, it isn't obvious why a social value is any better than an individual one (as I will soon argue).

While we have no reason to assume that scientists will rely on subjective preferences instead of considered value judgments, there is no guarantee that they won't either. Just like calculation errors, or failure to follow proper procedures, scientists can fail to judge, or evaluate badly, but this doesn't mean that the use of values in science are an inherently more problematic factor than any other way that a scientist could go astray. However, Longino's prescribed critical process is not incompatible with one that makes clear room for value judgments, for as articulated in Chapter 2, experimental and critical analysis of various prizings is part of what valuation entails. Using my conception of values, it becomes clearer why criticism can be key to better value usage.

When we analyze valuation, we find that social critical analysis and widespread experimental testing of value judgments allows for stronger verification of such judgments. Dewey, for instance, reports that conceptual frameworks (what Longino would call background assumptions) "tend to be taken for granted after they come into general currency. In consequence

they either remain implicit or unstated [and failure to examine them is] the greatest single defect that can be found in any field of inquiry" (Dewey 1938, 507). These conceptions can be experimented with and tested by the consequences they produce. He adds that an inquirer will depend on a community of fellow inquirers for confirmation and correction of results and without this "the conclusions that are announced by an individual inquirer have the status of an hypothesis" (1938, 490). This mirrors Longino's point that the social practice of science allows for the correction of defects and modification of findings, and for the graduation of a hypothesis into an accepted piece of knowledge. This point also echoes Lepley's point from Chapter 2 that choices and purposes can be formed, informed, and reformed by critical reflection and social criticism.

While Longino's social process is, thus, not invalid, it is insufficient without a more precise articulation of how social criticism leads more adequate value usage. Longino does not establish how verifiable value judgments are reached through social means, other than the fact that there are more diverse perspectives, and in fact it isn't clear whether she believes that such judgments are empirical in most cases. She notes that background assumptions may not be supported by "the same kinds of data" that would confirm empirical testing of a hypothesis. The kinds of support and criticism that will be offered will be conceptual or metaphysical in nature rather than empirical (Longino 1990, 73). When we compare her reasoning for this to the account of value judgment described in Chapters 2 and 3, it is clear why background assumptions can be based on empirical adequacy and that her account of social criticism makes more sense because of this and thus is improved by it.

Longino's argument regarding the limitations of empirical support for a background assumption assumes a reductive account of confirmation found in the work of the logical empiricists. She notes that background assumptions "may not be subject to empirical confirmation

or disconfirmation" and since they are "infused with metaphysical and normative considerations, it would be a mistake to identify the objectivity of scientific methods with their empirical features alone" (1990, 75). Her reasoning follows her criticisms of the logical positivist model of syntactic and deductive relationships between hypotheses and observational data. Lynn Hankinson Nelson also attributes Longino's position that evidence cannot be brought to bear in deciding between background assumptions to a skepticism about whether values are subject to empirical control, but holds that Longino's view is unfounded (Nelson 1990, 248).

Indeed, the model of verification of values described in Chapter 3 does not follow a positivist empirical conception. For example, Lepley's liberal notion of verification claims that scientific testing is not confined to observation and experimentation, but exercises in critical thinking and social discussion as well. Dewey argues that it is problematic to think of conceptions being formed or "proved" based on summaries of what has been observed for the value and function of such conceptions are retrospective: "Such ideas are dead, incapable of performing a regulative office in new situations" (Dewey 1929, 166). Concepts, should be thought of as hypotheses: as anticipatory plans for future reconstruction (hence ends-in-view) of the situation and "their worth has to be tested by specified consequences of their observation" (1929, 167). As such, they are confirmed to the degree they permit transformation of the situation. As mentioned, choice of background assumption is ultimately a practical choice, and like all practical judgments they can be empirically confirmed based on the consequences they are fitted to produce.

Thus, even though Longino argues that there are no formal rules to choose background assumptions, it does not follow that we should reasonably expect choice to be based on subjective preference; successful value *judgments* are what shield science from such preferences. Once we amend Longino's account to include the precepts of practical judgment developed in previous

chapters, we now have a clear justification for the claim that social values are better than subjective preferences where they are interpreted as valuings. Criticism can be made validly based on the practical consequences which follow from using certain background assumptions and conceptual schemes which have a chance to be more widely tested and criticized by a social community than by an individual alone.[86] Thus, my account strengthens Longino's, but at the cost of requiring some modification to her scheme. In addition to the four criteria of Longino's social critical approach we can add that their criticisms must be empirically adequate; in other words, criticism must be based on whether a conception proves itself in the way of producing expected consequences determined through a process of valuation leading to warranted assertability.

In fact, others have already made the point that Longino is wrong to relativize choice of background assumptions because they rely on evidence. Lynn Hankinson Nelson argues that sociological or political claims or theories can constitute evidence for a theory and that feminist scientists have demonstrated this (Nelson 1995, 405). Sharyn Clough argues that feminist political values are beliefs with empirical content that can provide good reasons for rejecting other background assumptions. When androcentric values influence theory choice, she notes, "analysis of past scientific practices has revealed what is by now a well-documented pattern, namely that theories of human bodies and/or behavior that ignore women's bodies and/or behavior have proven to be inaccurate" (Clough 1998, 107).

While some may argue that my account proves no better than the logical positivist model since empirical adequacy means that tests of background assumptions requires further background

[86] In fairness, Longino's concept of conformation could allow for this. She argues, for example, that the adoption of a method of reading tea-leaves is unlikely to allow for conformation of content to its intended object (Longino 2002, 160). However, she applies this to knowledge claims, not to judgments about background assumptions or value decisions. Criticism of them will be conceptual and metaphysical rather than empirical.

assumptions, and so on, it is worth noting that my account isn't supposed to be reductive or foundational in anyway. I don't consider it problematic that empirical testing of the practical choice of using/affirming background assumptions may require further background assumptions since I am not promoting understanding their empirical adequacy as a matter of a formal relationship between observation and hypotheses.

Finally, it is important to pinpoint why Longino's account can be problematic because she does not always precisely distinguish between the three interpretations of the term "value" and as a result, her argument that her account is needed because science is at risk to subjective preferences since we must choose background assumptions is not warranted. Values as generalized ends are treated as valuations, as self-affirming judgments by which we are "hamstrung." Because of this the distinctive notion of "value" in terms of valuation, as distinct from such general ends, is absent. This is in turn further difficult since her arguments about the problematic use of cognitive values as generalized ends leads to the further collapse of "value" into values as valuing. This is evident at the end of the 1996 paper where she concludes that since cognitive values can't be the self-affirming universal concepts they are supposed to be, that there is the risk of "cognitive anarchy" to which her answer is to reaffirm her normative criteria (Longino 1996, 55). In other words, since the general value chosen must be contextual rather than self-justifying, their choice is a matter of preference. If Longino had better distinguished the three interpretations of "value" then none of these conclusions follow; generalized ends are not self-affirming, and their affirmation is through a process of judgment. Thus, by carefully analyzing Longino's approach to value I have shown that Longino's arguments are not always warranted, but alternatively, once we do carefully pay attention to the concept of value, her account can be modified and improved.

4.3. Value Management in Janet Kourany

Recall from Chapter 1 that Janet Kourany's ideal of socially responsible science (SRS) emphasizes that science should be an ally for the struggle for the equality of women, exposing prejudices and rooting out sexism and androcentrism by being informed by egalitarian social values. According to this ideal, science ought to be evaluated according to whether it is both epistemically successful and socially successful. While rarely discussing the nature of values directly, it entails a more robust use of value than other accounts. Like the previous section, I will begin articulating an explicit conception of value consistent with her discussion. When we analyze Kourany's conception of value, we will find that it directly shapes her approach to value management, and that lack of a clear conception of valuation leaves her account open to dogmatism.

Kourany's primary goal is to appraise science in terms of an egalitarian ideal in which human flourishing is central (Kourany 2010, 13-5). This is different from other accounts in that it doesn't start with an analysis of scientific reasoning and conclude that values in science are either necessary or desirable, but rather insists on value usage to fulfil the aims of SRS. Her benchmark for an ideal is whether it can satisfy certain epistemic and social criteria, and it is this broader concern that motivates her criticisms of alternative ideals and her support for her own account.

4.3.2 How Values are Characterized

Kourany seems to be of two minds when it comes to the nature of values. Initially, her characterization of values is similar to the one discussed by Haack, suggesting that they are merely biases or forms of prejudice. The reason she considers the value-free ideal promising is because it specifically promises to root out political commitments like sexism and androcentrism, which lead to "biased science" that jeopardizes it "as a source of objective knowledge" (2010, 54). Values like racism or sexism function as biases and prejudices, and their effect in research are considered in the examples of studies of heart disease and PMS. Feminist scientists responding to this seek to

eliminate them from science (to "avoid the problem of bias") as they lead us away from the truth (2010, 6, 51-3, 55). So, since commitments like sexism and androcentrism count as values, and since they are dangerous as forms of bias and prejudice, it follows that some of the problems with values are that they can be forms of bias and prejudice.

However, Kourany doesn't discuss all values as a form of bias, and this is important to her overall argument. She describes values as a perspective, and ultimately what she wants is the replacement of prejudice with "a more adequate perspective" (2010, 4). This is why, despite her relative praise of it, she rejects the value-free ideal for it casts all values as equally subjective and bias. She argues that adequate science has been produced by feminist scientists informed by feminist values, but "if feminist science was shaped by feminist values, then according to the idea of value-free science this should have made feminists' science just as subjective and inadequate as the sexist and androcentric science it was designed to replace" (2010, 56). Notice two important things in this point: the first is that she clearly believes that not all values are subjective, and secondly it is this specific understanding of the nature of values that leads her to reject the value-free ideal rather than whether it is practically workable.[87]

She rejects the empiricist ideal of science for similar reasons. It holds that we should look to successful science instead of a priori reasoning to determine acceptable value use in science. If a value contributes to scientific success it would therefore count as scientifically rational. Kourany's problem is that this "treats feminists' egalitarian values as merely causally relevant 'social factors' or 'social biases,' on a part with other factors such as competitiveness or the desire for credit or other values such as sexism or racism" (2010, 66). In other words, she believes that

[87] Kourany does discuss how practically difficult it is to apply the value-free ideal in practice and that value-informed science is "all but inevitable," but this does not tarnish its reputation for her because it still recommends removing sexist values (2010, 55-6).

feminist values are not only "more adequate" than sexism, but she clearly rejects the notion that all values are a form of mere bias. She rejects Longino's ideal as well for its neutrality that entails potentially accepting any value. Longino's ideal counts as neutral since it welcomes and encourages all social values, and that they all be subjected to criticism. Yet, Kourany argues that there is no guarantee that the values she deems more adequate will be reflected in scientific inquiry, and this lack of a guarantee leads her to reject both Longino's and the empirical ideal. Kourany insists that we choose specific values to enter science instead (2010, 68-9, 79). Thus, she characterizes values in two ways: those that are mere biases and make science subjective, and those that are adequate and are acceptable in science.

While Kourany believes that certain values are the right values to adopt, while others are the wrong values to adopt, it is unclear, based on her account, how we determine how to choose which values to adopt. Her account of the justification of values acknowledges that inquiry can play a role. She notes that the development of codes of ethics will *begin* as an empirical project, collecting information from various disciplines including their aims, funding arrangements, structural and institutional conditions, and the concerns of those affected, however she states that the development of codes is "first and foremost—a *normative* project" (Kourany 2013, 95). The fact she compares something beginning as an empirical project and then contrasts it as an overall normative project suggests that she doesn't see valuation as entirely an empirical affair.[88]

In addition, development of codes of ethics can be a complex interdisciplinary exercise. However, this presents a problem, because whether values are chosen because of their explicit inclusion in a code of ethics or by general agreement, there is the possibility that the agreed upon values may not be egalitarian. Thus, agreement or discussion in the formation of a code of ethics

[88] This is in contrast with my view that adequacy of values is an entirely empirical matter.

can't be a sufficient criterion of whether a value is justified or not. The process she describes may help us determine what values to adopt, but it doesn't justify the values themselves. So, what does normative justification consist of according to Kourany?

4.3.3 Logical Status of Values as Characterized

Two clear characterizations of value emerge from Kourany. Values are either biased or prejudiced perspectives, or values are perspectives which can be adequate and not be a mere social bias. This also establishes two clear logical functions that values can have in inquiry. First, values can function as biases which serve to lead us away from the truth and can produce inadequate science (Kourany 2010, 9-12). In discussing values as a form of bias, she quotes Ruth Hubbard who links these biases to implicit or unconscious beliefs (2010, 55-6). That these values are biases which are unreflective (prejudiced) and informed by implicit beliefs suggests that they can take the form of habits. That values function as habit which leads to selective emphasis and bias towards certain aims, suggest that Kourany's first characterization of values is a form of values as valuing. As such, these values allow for arbitrary or habitual assertion of action.

Her second characterization of values as adequate suggests that they do not function as biases, but are intellectually directive in inquiry, chosen as tools of inquiry in the aim of achieving epistemic and social success. They become "inner resources" that direct theory choice such as novelty, fruitfulness, fertility, progressiveness (2010, 25). The first time Kourany mentions values positively contributing to science, her examples are either the traditional so-called cognitive values, or feminist alternatives like novelty, ontological heterogeneity, and complexity (2010, 54). In her own ideal values perform a "controlling function" over scientific programs, and the values are adopted on the basis that they fulfil social objectives. So, values are no longer biases, but "standards," "principles," and "codes." That values are supposed to function as intellectual instruments for the control of a situation is consistent with values as generalized ends and as such

propose directions in inquiry through the use of propositions. Given her characterization of general ends, it seems like they have the logical function of being affirmed rather than being judgments by themselves to be asserted.

But what about values as valuations? Is there discussion of particular value judgments? The examples of values that she believes have a positive influence over science are generalized. I have already mentioned values like novelty, but even more specific values mentioned like "Black women deserve the same opportunities as white women to live in such partnerships" are general; they formulate ends, not ends-in-view. It is telling that Kourany begins her book by suggesting that if we are willing to put aside the idea that values do not belong in science, her first question is "which values belong?" rather than something like "on what basis can we determine how to appropriately make value judgments in a scientific setting?" As I will argue in the following chapter, the latter is a more fruitful question.

Kourany does discuss values as ethical codes. But the question for her is how might "adequate ethical codes be developed?" (Kourany 2013, 95). For example, what constitutes "fraud" in the case of scientific research isn't always clear (Kourany 2010, 110). Most of her discussion of vague codes, however, is concerned with making these codes more specific, and as I previously mentioned specific general values are still general and not substitutes for value judgments. Kourany seems to recognize this as she states that a code of ethics cannot function "as a comprehensive algorithm for ethical decision-making" (Kourany 2013, 98).[89] Yet, the solutions she addresses include developing conference sessions, workshops, publications, curricula, and educational materials. While education is likely going to be important in developing skills of valuation, this isn't going to be helpful without understanding valuation in the first place.

[89] Although it is still unclear whether "decision making" should include decisions about ends to pursue, or just about how to practically fulfil pre-determined ends prescribed by the code.

4.3.4 Value Management

Kourany's SRS Ideal is a response to the questions that are posed by the goals of SRS, some of them being "what entails scientific objectivity, and what threatens it?" (Kourany 2010, 14). She thus considers a new "adequate understanding of scientific objectivity" that is better equipped than the value-free ideal and then argues for her own ideal (2010, 57). Her account aims to not only understand what scientific objectivity entails given the use of values but is especially concerned with what values will be used. Because her conception of values distinguishes between values that are already deemed adequate and those that are bias, and we must root out biased values, using values in science presents a problem. This is consistent with the articulation of value management in Chapter 1.

Kourany's division of values into those which are mere biases and those which are adequate affects how she understands what a well-organized science looks like and thus her approach to value management. At the outset, certain "morally justified" values should be adopted, and other values should not (2010, 78). Egalitarian values that promote social justice and human flourishing should be adopted (2010, 68). So, unlike Longino, who treats all values (initially) the same and suggests that values can only be objective to the degree that they survive intersubjective criticism, Kourany deems that certain values just *are* acceptable and others unacceptable.

Because Kourany differs from Longino in her conception of values, she has a different conception of the role that values should play in science. Unlike Longino's approach where values need to be accountable to a certain process to be acceptable in science, for Kourany science needs to be accountable to certain values to be acceptable.[90] Values for Longino are naturally subjective and thus they must be chosen, revised, and used carefully, whereas Kourany believes she has

[90] As noted successful science needs to meet both social and epistemic objectives.

identified the values we ought to use and those we would be wrong to use. Thus, values play a more prominent role in Kourany's account than that found in other accounts.

Both Longino and the empirical ideal treat values in a neutral way initially and grant that their legitimate use in science can be demonstrated: in Longino's case by surviving social criticism, and in the empirical ideal's case, by being utilized in successful science. In Kourany's case her favored values are already deemed adequate and better than other values. For example, in her analysis of the empirical ideal, while acknowledging that feminist values have contributed to successful science and thus would count as scientifically rational, she rejects the idea that feminist values should be taken as serving the same functional role as any other value. The adequate values she describes can serve the function of being generalized ends, but also important is that her ideal requires that science fulfil both epistemic criteria *and* the social criteria supplied by these values. In other words, they serve as an end-in-themselves, as they "control" programs by establishing criteria rather than being merely instruments of inquiry, or by having such criteria determined within inquiry as a process of adjustment of a problematic situation, and this leaves her account open to the charge of dogmatism.

4.3.5 Dogmatism and Ends-in-View

That Kourany's conception of values are pre-determined is pointed out by Brown who notes, "SRS requires that values are settled ahead of time […] value judgments are prior to, rather than a part of inquiry" (Brown 2013a, 74). Because value is determined prior to inquiry means that Kourany blends "adequate values" to function as both generalized ends and as value judgments. Brown's concern is that SRS does not appear to sanction revision of our values in order to resolve potential conflicts in inquiry. Kourany compares using values in the way she prescribes as motivating a Lakatosian research program where the values are part of the "hard core" of its theoretical assumptions, and that according to this view, it can be rational to abandon such

degenerating research programs yet still uphold the value. However, Brown points out that while it can be rational to abandon a degenerating research program, it is never irrational to stick with it either (2013a, 75). Also, Kourany has such a sharp distinction between biases and adequate values, she doesn't seem to acknowledge that the outcomes she favors can either be prescribed by generalized values *or* by valuings; in other words, that they could also be a matter of biased pursuit without adequate consideration or possibility of revision. Thus, dogmatism is a concern. Because their adoption isn't to be based on their critical defence or empirical success, but rather by their own pre-determined adequacy, there is a risk of absolutism and a weakening of intelligent inquiry. On the other hand, if she argued that the outcomes she favors as being anticipated results of following warranted value judgment, her account can avoid some of these problems.

Recall from Chapter 2 that empirical adequacy of a value judgment requires noting of the concrete conditions under which desires arise and their adequacy as a response to a doubtful situation. Kourany's account seems incompatible with this. Valuation is about determining the adequacy of valuings as prizings, but her account rejects the notion that adequate social values can count as valuings because they would function as social biases. If the values that she supports can't count as valuings at all they lose their connection to concrete situations in which desires arise and conflict for it is in such situations that prizings arise, thus making formulations of ends-in-view impossible. Despite her efforts to spell out the development of value codes, nothing specifies their application in concrete conditions, what conditions they should respond to, and what actions they should stimulate, and their potential limits. Recall that in a specific situation one judges a place of safety (and end-in-view), not safety (a general end) itself; the same is true for any value judgment, and this is going to be relevant no matter what account of value one adopts. This gap in her account

makes it difficult to understand how values can be adequate or what adequacy in a given context even means, an issue I will address shortly.

Without a clear sense of the concrete conditions that values are responsive to, and with values being held up as valid external to inquiry, values become fixed ends. As noted in Chapter 2, this makes inquiry less intelligent. A doctrine of fixed ends limits intelligent examination, encourages insincerity, and "puts a pseudo-stamp of moral justification upon success" (Dewey 1922, 231). It establishes a situation where judgment is merely about apprehending and determining the means to a pre-determined end, and it can cause narrowness and fanaticism.

This problem is enhanced because an unclear understanding of value judgments means that not only are general ends not questioned, but how they are to be achieved and understood in specific situations can be a matter of dogmatic interpretation. For example, Kourany's cites values like "Black women deserve the same opportunities as white women to live in domestic partnerships." She believes that in application the value mandates that any study must assume differences between black communities and white communities can be explained by factors like racism and poverty and not by perpetuating the stereotype that black Americans are inherently more violent than other groups (Kourany 2010, 70). The important question she considers is what if the stereotype is true? Kourany responds that this could eventually be discovered since differences must be explained *as far as empirically possible* in terms of other social differences.

But we should not assume the stereotype is true until necessary since studies demonstrating inferior intellectual abilities in women is more likely to encourage the view that inequalities in the participation and lack of success of women compared to men shouldn't be troubling and we shouldn't bother to change that situation (2010, 6). However, this doesn't follow as a value judgment any more than the judgment that since humans don't have wings, they shouldn't try to

fly. Indeed, like all decisions about what to do given new information, everything depends on the quality of the value judgment made. Kourany even acknowledges this point, arguing that the truth of the stereotype could lead to a redoubling of efforts against domestic violence in black communities given that they deserve the same opportunities as whites (Kourany 2013, 101). If the stereotype were true and we did redouble our efforts, then these efforts may achieve our social ends more effectively than by assuming the stereotype is not true. If that were the case, then assuming the stereotype is not true could make society worse off than assuming it is and would not be socially successful.[91]

If this is true, then it isn't clear a priori that we should understand the values that Kourany favors as being applied in the way she favors, especially without a clear understanding of valuation. Without an account of how values are to be judged in practice, dogmatism can creep in not only in that the value as a general end will always be affirmed, but even how it is to be pursued in practice as an end-in-view. Kourany acknowledges that values cannot be applied algorithmically, but given that the same general value can generate conflicting ends-in-view where each could consider the other to be socially unacceptable, this is a significant problem. And, so long as each can declare their adequacy without critical or empirical criterions like we find in Longino's and the empirical ideal, each is free to be dogmatically pursued. Kourany's account makes sense to her because she has a pre-conceived notion of what an adequate social value is and what it means in application, but without an account of valuation, then what makes these values and ends-in-view adequate could be a matter of dogma and fanaticism.

[91] This is a simplistic point I am making. It is hypothetical and would also depend highly on what social responses we could reasonably expect. There are also factors to consider such as the fact that if the stereotype is false, then giving it the credit if a study can lend credence and legitimacy to it even while proving it wrong. My point, however, is merely about the logic of value judgment itself; general values can be understood in conflicting ways when applied in practice.

In fairness, Kourany does respond to the charge of dogmatism. For instance, she argues that debates and discussions can lead to provisional codes of ethics that can be open to continuous reassessment and revision to reflect diverse perspectives. Where there is disagreement, there are examples such as the development of codes of ethics where discussion has led to agreement and consensus to help justify choices (2013, 97). Although, as mentioned, consensus won't guarantee egalitarian ends. In response to Brown, Kourany suggests that certain findings would lead to the revision of values. She suggests that if efforts to deal with violence in black communities yielded no benefits to black women, or if black women always instigated violence in the black community and that they had the power to change this behavior without significant loss, it would lead to the revision of the value that black women deserve the same opportunities as white women. She thus concludes that there is no dogmatism in her ideal (2013, 101-2).

This response is problematic for two reasons. Despite claiming that one could give up values in the face of evidence, she also states that one could retain those values even if a research program begins to fail, so she hasn't answered Brown's concern that it would never be irrational to give a value up. On the other hand, if values can be given up as she claims, then her ideal no longer can do what she wants it to do. Recall that what sets her ideal apart from the others is that it *guarantees* social success according to her values if science is to be considered successful. She wanted this guarantee because she wanted science to be an ally in the fight for the equality of women. If any value could potentially be given up, then there is no guarantee that "social success" will continue to mean what she intended it to mean. This means it is no longer a guarantee that her ideal will meet her expectations. The more dogmatic the ideal, the stronger she can make that guarantee, but if it isn't dogmatic, if any value can be given up, then there is no guarantee. One cannot be a fallibilist and make guarantees. A value would have to prove its muster through

criticism and empirical success which would make the SRS ideal no better off than Longino's or the empirical ideal in those respects.

According to the account of values affirmed in previous chapters, something close to the empirical ideal may be an advantage to Kourany's situation. Values would be tested by their results in making for epistemically successful science, but not merely (as Kourany criticizes) their results. She argues that we should consider other factors like who the scientists involved were, training, resources at the disposal, and any other factors that can explain why otherwise good values can lead to bad science, and bad values can lead to good science.

Warranted assertability, I believe, requires this since warrant is tied to the situation. As we have learned from Lewis, consideration of values in the concrete situations in which they are employed allows us to understand how objectively good values can fail to yield positive results and vise-versa. According to my account, general values are only affirmed, and this affirmation may be highly dependent on how unique a case might be. Kourany worries that if Nazi values[92] can yield successful results, they would count as scientifically rational, but since warranted assertability requires that we consider the long-term effects, and the likelihood that such values in the long run would prove more detrimental to science than beneficial, the issue doesn't obviously present a major threat. Once again, the lesson to be learned is that any account must develop an understanding of valuation and understand how it relates to valuing and generalized ends to understand how values function in specific concrete contexts and this can improve her account.

[92] Notice that a term like "Nazi values" is broad. According to the account of values I have affirmed, we would have to be clear about the specific values as generalized ends being employed, and how they function in formulating an end-in-view. A specific "Nazi value," for example, might be that "one should prioritize efficiency in research over concern about rights, particularly if research subjects are of an inferior race." While a value like this can, and did produce, some epistemically successful results (see Proctor 2000), it is more likely to be detrimental to research in the long run, particularly in democratic societies, and difficult to formulate as a clear scientifically operationalized end-in-view since "inferior race" has no clear empirical standing.

4.4. Value Management in Heather Douglas

In Chapter 1 I discussed Heather Douglas' rejection of the value-free ideal and her desire to "articulate a new ideal for science" required in the face of recognition of the moral responsibilities of scientists and centered on the notion of a distinction between a direct and indirect role for values in science. In this analysis I will, like the others, try to articulate the conception of value she is working with starting with her explicit discussion of value. When we substitute her conception of value for my own, some of the perceived problems with values dissolve or are transformed into a problem concerning how best to engage in valuation. Thus, further justification is needed for using such a conception of value.

4.4.2 How Values are Characterized

Before getting into the technical arguments that Douglas provides, I will consider the explicit ways in which she characterizes values themselves. They reveal why, while she believes values should be used, she is cautious about their use without restrictions, and they motivate her prescriptions. Throughout her work Douglas associates values with "interests,", "biases," "blinders," "desires," "wishes," "likes," "preferences," and "wants" (Douglas 2009, 63, 87, 96, 100, 102). What seems especially troubling to her is that these values so characterized are also "not evidence" but can function as "reasons," "direct motivations," "decisions," and can "provide warrant" to do something (2009, 87, 96). So, values are crucial for some decisions, but in their usage they "must be restricted to certain decisions made in science and excluded from others" (2009, 96).

Douglas argues, like Longino, that we cannot make sharp distinctions between epistemic and non-epistemic values because "epistemic values end up reflecting the non-epistemic values of the day" (2009, 90). Unlike Longino, whose explicit discussion of value focused on different types of values (cognitive, constitutive, non-cognitive, contextual) and allowed for the potential

importance of such distinctions, Douglas insists that this issue is not important to determining how values should be used in science.

Douglas argues, "The crucial normative boundary is to be found not among the kinds of values scientists should or should not consider […] but among the particular roles for values in the reasoning process" (2009, 88). She distinguishes between two roles for values, a direct and indirect role. In a direct role values act as standalone reasons in and of themselves to accept a claim, and "provide direct motivation for the adoption of a theory" (2009, 96). Indirect use of values involves weighing the importance of uncertainty about a claim. Because findings can be uncertain, and because decisions based on those findings could lead to (for example) terrible consequences, scientists have a moral responsibility to use values when accepting or rejecting a conclusion. Indirectly using values means that where there is uncertainty, a choice needs to be made about what counts as sufficient evidence for a claim by considering the potential consequences of a wrong choice (2009, 97). The value is indirect because "values in this role do not determine the choice on their own" (2009, 97).

Douglas' ideal for value use in science mandates that values can serve a direct role only at certain stages of inquiry, such as what projects to undertake, how they should be funded, and certain aspects of the methodology to be used (2009, 98-103). Where there is uncertainty, values can indirectly play a role in determining standards of statistical significance and characterization and interpretation of data. The key to her ideal is that values serving a direct role should be restricted to certain stages of research such as where one is deciding what to do and how to do it, and not to be used when there is a decision about which empirical claims to make (2009, 101). Alternatively, values can be used indirectly throughout the research process (2009, 88).

So, considering the roles that values can play in science is key to protecting its integrity. Nevertheless, while there are no strict distinctions, her topology of values allows for different *kinds* of values. There are ethical values, which focus on the good or the right; social values which focus on what a society values; and there are cognitive values which assist scientists in their cognition of science. However, cognitive values aren't necessarily truth-preserving; a simple theory may be wishful thinking in a complex world (2009, 107). However, she argues that there are also epistemic values which are "distinct from cognitive values, [and] should not be thought of as values at all, but rather as basic criteria that any scientific work must meet" (2009, 92). These epistemic "criteria" include internal logical consistency, and predictive competence.

4.4.3 Logical Status of Values as Characterized

Douglas' analysis of the roles that values play tell us something specific about the logical functions that values can have. However, much of what is meant by value remains implicit. Further articulation of what she means by value is still needed and as well as how it compares with the account of the logic of values developed in the previous chapter. Thus, like Longino and Kourany I will attempt to reconstruct an explicit account of value that Douglas seems to be working with.

Sometimes, Douglas characterizes values as generalized ends. For example, in her discussion of cognitive and epistemic values, she mentions general values like simplicity, scope, external and internal consistency, or predictive precision (Douglas 2009 92-5; 2013, 798). Sometimes she argues that they can be suggestive aids in inquiry, something to be affirmed. A simpler theory may be easier to test, a broadly scoped theory may allow for more diverse opportunities of test (Douglas 2013, 800). We may strategically choose a broader theory over a narrow one, even if there is less evidence for it, because we may be more likely to find problems (Douglas 2009, 108). In this respect values function as proposals and take on the status of propositions in inquiry. On other occasions, Douglas suggests that what matters is manifesting the

general end in a theory and the generalized end itself is sufficient for the decision; they determine assertions. Her criticisms of cognitive values being used directly imply that a scientist would choose a simple theory as an end-in-itself, selected "for its own sake" (2009, 107) rather than aiding in the formulation of an end-in-view. This folds the notion of "value" as a generalized end into "value" as a judgment. However, this use of generalized ends says less about the dangers of their direct usage, and more about the dangers of dogma and the failure of intelligent valuation since, as I have previously discussed, valuation should not be about pursuit of fixed ends; valuation requires consideration of ends-in-view.

Douglas' characterization of the direct roles for values strongly imply the notion of "value" as valuing. When values are used directly they seem to be an expression of a preference, a wish, an interest, or a desire, and they are directly motivating. The reason they can motivate choices in this way is because they place "value on some intended option or outcome, whether it is to valorize or condemn it" (2009, 96). This characterization of values allows for the inclusion of valuing, particularly in that being motivating in themselves suggests they are asserted based on what the felt preference is. But does her account allow a distinct sense of value as "valuation"?

It may seem so when considering her treatment of value being directly used. While she claims that values are desires, wishes, and interests, she also claims that they can act as "reasons" to accept a claim, and can "provide warrant" for choice (2009, 96). However, I don't think we can accept that her characterization of direct values counts as valuation in the distinctive sense. For one thing, she characterizes values as providing *reason for* or *directing* decisions rather than being decisions themselves (2009, 100). Used in this sense, it can be equally consistent with merely invoking values as generalized ends. Recall that what is distinctive about valuation is that the value

is indeterminate until there is a judgment, whereas Douglas frequently discusses values as already being determinate, so much so that they will compete with and override all conflicting information.

According to Douglas, in their direct role, the issue is not whether the "choice will somehow come out wrong in the end [which is usually what judgment is concerned with], but whether the choice […] is what we want" (2009, 96). This disconnects values from the context which would determine their adequacy and reduces them to terminal responses; this is consistent with valuing but not valuation. Also, importantly, Douglas doesn't claim that the direct use of values can *sometimes* be problematic because they reflect our wishes, desires, or preferences (for example they take the form of valuings); they are problematic because science would be "*merely* reflecting our wishes, our blinders, and our desires" (2009, 102, emphasis added). This suggests that directly used values can only reflect desires, wishes, and blinders, and nothing more. She explains, "A direct role for values […] would allow scientists to reject data if they did not like it […] even if the evidence did not support such an interpretation" (2009, 102). While this would be true of valuing, if valuation is included then there is no justification offered to claim that this would always be true and thus science would *merely* reflect desires in all cases. Thus, I do not believe the direct roles for values as she characterizes them reflects values as valuation.

One unique way in which Douglas' treatment of values is, to an extent, consistent with valuation is in discussion of indirect roles for values. In these cases, we are required to consider competing options and the consequences they lead to; we must consider both ends and means together and weigh various possible ends-in-view rather than following a predetermined value. Consideration of competing ends-in-view cannot be fixed from the start but is dynamic and occurs throughout the research project (2009, 73-4). It isn't based on perfect knowledge, but rather on

what we can reasonably foresee (2009, 83). This is consistent with valuation. Thus, all three meanings of "value" are reflected in her conception of value in some ways.

One final contribution in terms of the logical consideration of values that Douglas provides is that there is good reason for thinking that values and objectivity are not mutually exclusive. She articulates seven different kinds of objectivity that are all distinct and not reducible to each other (2009, 129). For example, a claim might be objective because it allows for repeatable successful manipulations of the world, or because anyone who investigates a claim may come to the same conclusion, or because we may give up the claim in the face of contrary evidence, or because there is a complex interactive communal process to expose potential biases. Each kind of objectivity can bolster our confidence in a claim, yet objectivity is no longer absolute, but a matter of degree (2009, 117). This reconstruction of the idea of objectivity is a useful addition to the logic of value.

For example, it builds on and clarifies arguments advanced by others. Don R. Bowen argues that we cannot equate objectivity with being value free (Bowen 1977, 202). He describes three definitions of objectivity including the idea that science is objective if it is unprejudiced, if reality is capable of acting as a check on conclusions, or if it follows a methodology that allows for error correction (2009, 205). None of these rely on the notion of value freedom.

Ray Lepley articulates six distinct definitions each of subjectivity and objectivity. These include what is existential versus internal (mental), what is clearly expressed versus what is vague, ad-hoc or random trial and error formulation and testing versus processes of intelligently controlled formulation and testing, what is verified versus not verified, and what is idiosyncratic versus what is "cosmically secured" (Lepley 1944, 183). He argues that values cannot be categorically categorized as subjective nor facts as objective. Both are formulated and tested through interactions of subjective and objective factors (1944, 185). He demonstrates that values can count

as objective, but Douglas' analysis of the various kinds of objectivity can do the same. For example, Dewey's arguments about warranted assertability, or Lewis' terminating and non-terminating judgments can certainly meet some of Douglas' definitions of objectivity.

4.4.4 Value Management

In rejecting the value-free ideal, Douglas claims, "We need another ideal and a more robust understanding of objectivity to go with it" (Douglas 2009, 63). The ideal is supposed to address questions like "What is the proper role for values in science, if science is not value free? Can value, any values, play any role whatsoever in science" (2009, 85-6). She thus aims both to articulate what scientific objectivity entails, and which values should be employed in what ways. Her concern is values running "roughshod over evidence and reasoning" (2009, 86). In other words, she sees values as presenting a problem for science. Therefore, her account is a form of value management.

Douglas' particular conception of what a value is and what it is capable of doing motivates her approach. Recall that its central theme is the idea of limiting the direct role of values to prevent scientists from engaging in wishful thinking. Before arguing this, she claims, "simply because a scientist values (or would prefer) a particular outcome of a study does not mean that the scientist's preference should be taken as a reason in itself to accept the outcome. […] There must be some important limits to the roles values play in science" (2009, 87). Notice her claim that there must be limitations comes after she identifies values with a preference. It's clear here that values in that context are being discussed as *mere* preferences, for the issue is that it is *simply a matter of scientist having a preference* (and not appraisal of it), and the fact that it is simply a matter of having a preference is what she considers problematic for her claim to make sense. For if preferring also refers to appraisal, then it wouldn't be simply a matter of a scientist valuing, nor would the

preference be such a reason in-itself that merely because an outcome is valued does not mean that it is valuable.

Because Douglas emphasizes values as generalized ends or as preferences, it is clear why she does not believe they can serve an evidentiary role. Simplicity can be wishful thinking in a complex world, and merely liking a theory doesn't make it true. As Inmaculada de Melo-Martin and Kristen Intemann point out, Douglas' assumption that values are not relevant to whether there is evidence for a claim "lends force to the problem of wishful thinking" (de Melo-Martin and Intemann 2016, 514). In other words, once again the conception of value is what leads to the perception of the problem. But are these notions of value justified?

4.4.5 Values, Evidence, and Judgment

Let's reconsider how Douglas characterizes values in general. Take this passage where she articulates the danger of allowing a direct role for value at certain stages of inquiry:

> A direct role for values in the characterization of data would allow scientists to reject data if they did not *like* it, for example if it went against a favorite theory […] A direct role for values in interpretation of evidence would allow values to have an equal or more weight than the evidence itself, and scientists could select an interpretation of the evidence because they *preferred* it cognitively or socially, even if the evidence did not support such an interpretation. And if values were allowed to play a direct role in the acceptance or rejection of scientific theories, an *unpalatable* theory could be rejected regardless of evidence supporting it. (2009, 102, emphasis added)

Here we see her discussing various occasions of value use which are linked to likings, preferences, and tastes. Next consider this claim again: "If we allow values to play a direct role in these kinds of decisions in science [...] science would be merely reflecting our wishes, our blinders, and our desires." What are we to make of this? Is a value a form of liking, of preference, a matter of taste, a form of wish, a desire, or a blinder? Does value apply to each of these as distinct phenomena, or do all six concepts essentially mean the same thing? If not, how precisely do each of these concepts relate to each other? For example, does a value necessarily act as a blinder? If so, what is meant by blinder? If not, why prescribe a blanket ban on direct use at certain stages?

Consider Douglas' claim that values are problematic because we cannot wish the world a certain way. This not only requires a conception of value that incorporates wishing, but also one with a particular conception of wishing. Yet, for example, according to Dewey's account, wishing is not properly a part of valuing at all.

Alternatively, consider an account of values that does include wishing, just not as Douglas seems to conceive of it. As discussed, Lepley argues that wishes are part of any inquiry; they express themselves as criteria rather than being isolated anticipated satisfactions. He explains, "choices are in no case either unconditioned or unaffected by other elements in this and other adjustment situations. Purposes and 'choice-wishes' are in varying degrees formed, informed, and reformed by critical reflection, social criticism, and the effects experienced in overt action" (Lepley 1944, 58). Wishes in interaction with other scrutinized events give rise to "suggestions" and assist in directing and appraising the outcomes of further action; they afford subject matter and suggestions for inquiry. Thus, wishing can quite literally be a viable part of "making it so."

While it is always possible to engage in uncritical "wishful thinking" in a bad sense, Lepley notes, "In the degree that persons become maturely wise they wish to view wish effects as objectively and realistically as possible, to inform choice wishes in light of inquired-into-and-tested-wishes" (1944, 53). Thus, the mere fact that wishing is involved in valuing by no means warrants the conclusion that a scientist will ignore evidence or undermine the basis of science and our pursuit of reliable knowledge. Presuming they take science seriously, a mature wisher would do this. Wishful thinking in the bad sense owes more to individual habits (1944, 58). Therefore, even if it is appropriate to associate valuing with wishing, we still need justification for the particular sense of wishing that Douglas employs.

Now consider the other concepts I have linked to value. Liking, as I described, is a form of behavior and not to be taken in a purely personal, emotional, or mental sense. Thus, it has observable effects and produces observable consequences; we don't look at likings in isolation and we can be discerning about the worth of various likings. The same goes for desires, a term which is how valuation ought to be conceived according to Dewey. Desire takes place where there is a situation demanding effort to conserve or produce something. It is not isolated in-itself or merely personal. How precisely does Douglas' conception of liking differ from this (if at all) and why is it justified?

When it comes to blinders, I suspect Douglas employs the concept to describe someone who ignores evidence and insists on an outcome come what may. But according to Dewey, deliberation is irrational to the degree that it allows an aim to become fixed or so absorbing that our ability to foresee consequences becomes warped. For Dewey, ends should not be isolated and desired come what may, but rather are considered alongside means and the facts of the case. Maintaining a fixed end diverts us away from our examination of consequences and results in careless inspection of existing conditions. Thus, it would represent a failure in deliberation or valuation. In other words, we have no reason to think that values inherently act as blinders, but rather the opposite; valuation is poorly done to the degree we are blinded, and only in appraisal can we begin to criticize our immediate prizings and *prevent* them from being blinders. So conceived, mature valuation in a direct role is necessary to preventing mere wishful thinking. In other words, when we substitute some of these terms as my account describes them, some of the concerns that direct roles for values in certain states is always problematic dissolves.

Consider a scientist who prefers a certain theory and even desires to declare it confirmed despite evidence to the contrary. The scientist is conflicted because they also prize science as a

source of reliable knowledge. In deliberation the scientist makes a practical judgment that they ought not ignore evidence that conflicts with their theory since it would undermine their efforts as a scientist to find truth. I don't think we could deny that the scientist made a value judgment, yet it doesn't count as an indirect use of values. Is it really correct to claim that the scientist should not have made the value judgment? Could the scientist even not have made the judgment?

Remember that evaluation occurs where there is uncertainty over what to do, and it aims to resolve this conflict. Without judgment, no action can take place. Perhaps the scientists should not have had the desire or be conflicted in the first place, and this is the problem. But, the scientist didn't act on the immediate desire, they merely were inclined to act, their prizing emerging from an impulse. Do we want to claim objectivity lies with scientists not having such impulses (since these would count as direct valuing) rather than having the maturity to carefully evaluate and reject harmful desires? Recall from Chapter 3 that such judgments of practice must take place throughout inquiry as we must judge whether facts are facts of the case at hand; these too are value judgments like the case just mentioned and so denial that a scientist should make any such judgments is problematic.

Perhaps, the response might be that it is appropriate for the scientist to act according to the epistemic criterion of predictive competency. However, as a mere criterion, this wouldn't be sufficient in a case where the scientist's preferred theory and an alternative theory were at least competent but not as precise. In other words, if the scientist knew that both theories were competent, and wanted to declare their own preferred theory confirmed, but judged that it would be wrong to do so on that basis of mere preference, such a judgement would be a value judgment that Douglas' account would prohibit. As minimal standards, the epistemic criteria she does allow for would not be sufficient to determine the choice. It would only work in a case where one theory

is competent and the other is not. Nor is it clear whether such criteria would constitute a value judgment or not. In her 2009 book she questions whether they constitute values, whereas in later writings she refers to them as values. If they do count as values, it remains open whether they would be appropriately distinct from social and political thinking (see 5.1.2). While a proponent of the value-free ideal could point to so-called epistemic values to justify the choice not to go with preferred theory because it is preferred, since Douglas rejects that there is a hard distinction between epistemic and non-epistemic values, this option is not available to her.

Now consider Douglas' quote from the previous section, that simply because a scientist values or would prefer an outcome doesn't mean that it is reason to accept the outcome, and there must be limits on value usage. For this claim to make sense, we would have to agree that values and preferences are related, and that there is something in the nature of a preference that makes it a bad reason to accept an empirical conclusion, that it can't count as evidence, or tell us anything about the world. But Douglas doesn't explicitly say anything about the nature of preference to justify this. First, what is so problematic about a preference, particularly if it is a mere preference? Presumably it would be this: preferences, like desires or wishes, are subjective. They must be limited or else they threaten objectivity. After all, her central concern with values isn't their indirect usage (she favors greater use of such values), but that their direct usage must be limited or else the integrity of science is threatened. But if preferences are subjective, if they are not evidence, they mustn't tell us anything about the way the world is, only about "what we want."

But what reason do we have to accept that preferences are so subjective? As noted in Lepley, it could be that they are conceived as a terminal response and "when so conceived, attention is focused so exclusively upon the immediate act of choice that we lose sight not only of the processes which may have provided data which makes the choice itself more than subjective

but also of the processes of testing which may follow as effects of the actions which flow from the choice" (Lepley 1944, 182). When prizings are not taken as terminal responses, as we have learned from Dewey's and Kitcher's account, they can be more or less adequate and informed and reflective; when maturely and wisely considered, they reveal something about the world to us, and we have no reason to see them as isolated.

As Intemann and de Melo-Martin point out, values can indeed become the basis of evidence. Rejecting Douglas' view that values are extraevidentiary, they point out that studies measuring harms or impacts rely on values. In studying climate change, the question of whether loss of a cultural tradition counts as an impact depends on judgments about what goods are worth protecting (Intemann and de Melo-Martin 2010). Questions about how to represent race in racial disparity studies may involve whether the "one drop rule," the race of the mother, self-identification, or geological ancestry is more appropriate. Because of cases like this, "normative values about what ought to be are indeed sometimes relevant to what is the case" (de Melo-Martin and Intemann 2016, 514). If this is true, then values are not always subjective, but in addition they can tell us how the world is.

Is it possible that Douglas' account permits a notion of valuation and of carefully considered preferences in this way? If it does, it isn't reflected in her normative claim that values should never play a direct role at certain stages. If values are not always merely subjective, and can tell us about the world, it wouldn't warrant her claims about the dangers of direct value usage and a universal ban on their usage at certain stages, and it wouldn't warrant the claim that "our values […] have no bearing on the way the world actually is at any given time" (Douglas 2009, 103). In other words, when we consider different accounts of value, elements of Douglas' approach

to value management no longer seems warranted and thus to that degree it depends on whatever conception and justification of value she employs.

Of course, it is possible that Douglas has some conception of value that is consistent with valuation in direct roles, or a different conception of valuation, such that despite making judgments, values remain nevertheless problematic. Perhaps even if values are a product of mature judgment they may still lead to the consequences that she is worried about. But, there is no evidence of such a conception of value judgment in her account, and even if there were, it still seems far from certain that such a conclusion is justified. One doesn't have to accept all my account to see the problem either. If there is some meaningful difference between merely wanting something and judging that one should want something, then her characterization of direct values becomes problematic, and the blanket ban on all forms of direct valuation at certain stages seems unwarranted. If her claim is that values should never play a direct role during stages like theory acceptance because they are always subjective or problematically acting as evidence, then this conception of value needs further justification. If her claim is that values should never play a direct role during such stages despite the fact that values can sometimes be objectively judged and sometimes be subjective, or in other words, that valuation makes no discernable difference, then further precision of what is meant by judgment and further justification of the ban is needed. If her claim is that values in a direct role during such stages need not be always bad, such as in the case of objective judgment, then qualification of the claim that values should never play a direct role needs to be limited to cases of valuing but not necessarily valuation.

If the concern is that values in their direct role are always problematic because they can never act as evidence, then she hasn't said enough about the nature of valuation to warrant this. As noted, Sharyn Clough claims "not only are value-judgments informed by evidence, but where

relevant, value judgments can be used as evidence […] in helping to decide which evidentiary judgments should be given weight when choosing between hypotheses" (Clough 2008, 274). For example, a feminist value like inclusivity applied to studies of psychological theories of human development is likely to lead to giving full weight to experiences of males as males, females as females and so on. This is premised on the "well established inductive claim that, over time, theories that are […] exclusive tend not to be explanatory of, or consistent with, the evidence (2008, 276). In other examples discussed, feminist values utilized in the study of physiology and endocrinology lead to the identification of androcentric assumptions and empirical oversights that were eventually corrected, leading to better value claims and better science (Clough 2004, 111). In another paper, she argues that hypotheses consistent with equality have a better empirical track record than those consistent with racism (Clough and Loges, 2008). If this is true, and given what we have learned from Lepley that certain values may be more empirically sound than others, if a theory is consistent with a generalized value, it can be evidence that the theory may be true.

Perhaps Douglas could allow that direct roles for values will not always be problematic or challenge the integrity of science if used in the stages she says they shouldn't be used, but that given that her concern is with scientists potentially influencing policy, it would be prudent to still have a blanket ban given that values can have a track record of being harmful. However, even this would need further justification because we would need to know how likely it is that bad value judgments are made in science and whether this could ever be improved. Also, de Melo-Martin and Intemann have presented possible approaches to deal with values being directly used in science and their potential impact on policy (de Melo-Martin and Intemann, 2016).

Thus, when we carefully examine Douglas' conception of value, it reveals that much of her approach to value management depends on conceiving of values in a certain way. However,

problems arise because there is a lack of precision in terms of whether her account includes the possibility of mature value judgment, if it does in what respects the concerns she has about value usage pertain to mere valuing or valuation, or whether mature valuation would make any significant difference. Using her conception of value either requires qualification of her account to exclude cases of mature valuation or it requires revision of the account. Many of the problems she identifies with using values can be addressed by suggesting that scientists should not engage in valuing, but rather they should engage in mature valuation and that we should focus on improving valuation such that valuative inquiries do not proceed based on pursuing fixed-ends. Such an approach will not guarantee that the problems she is concerned about won't occur. Certainly, it is possible that even a well-supported value judgment can be used badly. But as Clough and Anderson point out any descriptive or normative predicate used inappropriately can drive inquiry to a poor conclusion. One can over-rely on an empirically grounded general value just as one can over rely on an empirically grounded protocol or a particular observation. However, my analysis suggests a shift in emphasis to the improvement of value judgment and their usage to meliorate that concern instead of a sweeping claim about how values should be used simply because they *are* values, a point I discuss further in the following chapter.

4.5. Value Management in Philip Kitcher

Since I have already discussed Kitcher's work in detail in previous chapters, I won't discuss what his conception of value is to the same degree as I have in the case of the accounts of Longino, Kourany, and Douglas. However, I will describe Kitcher's discussion of how values fit into science and will evaluate Kitcher's work as an example of value management.

In rejecting the value-free ideal, Kitcher points to historical examples of scientific transitions as resting on the adoption of different schemes of values, with competing sides weighing the importance of successes and failures of a theory according to these schemes in

competition with a rival theory. He proposes a three-fold division of schemes of values. A *broad scheme* of values represents ideals and goals people have for themselves and their societies; at this level it seems all values are included, similar to Lepley's inclusive conception of values. Within broad schemes concern values relating to obtaining knowledge, either instrumentally or immediately, or what Kitcher calls *cognitive schemes* of values. This is not to be confused with cognitive or epistemic values previously discussed; cognitive schemes regard the value we place on knowledge, or particular kinds of knowledge. Finally, there are *probative schemes* of values, where specific questions are considered more important than others. Probative schemes of values are most important to considering transitions in the history of science (Kitcher 2011, 37).

According to Kitcher, transitions in the history of science are primarily an exercise in demonstrating that one theory's successes in responding to certain questions are the most important because those questions are the most important. He explains:

> When schemes of values clash, the subsequent course of scientific dispute consists in each side's trying to extend its own range of successful solutions, while making trouble for the other. As this occurs, retention in one of the doctrines can easily require modifying the scheme of values—you cannot continue to insist that *these* are the really crucial problems, as your opponent starts to find defensible answers to some of them […] Resolution turns on showing how the losers are committed to an untenable scheme of values. (2011, 36)

For example, initially Copernicans had success in explaining the limited separation of Mercury and Venus from the sun but faced difficulty accounting for why things not firmly attached to the earth's surface did not fly off. Ptolemaic and Copernican astronomers thus adopted different probative schemes of values where each takes different problems to be more important (2011, 58).

Importantly, Kitcher stresses that these schemes of values interact, rather than one set being hierarchically derived from another. For example, given certain problems we may revise our cognitive schemes of values; initial epistemic goals determined by our epistemic scheme of values may be revised in the face of problems deemed important by our probative scheme. Further

problems may lead to revisions in our probative scheme to relax standards, or we may revise our goals informed by our broad scheme (2011, 38). In the case of scientific transitions, these kinds of revisions are expected. As a theory generates novel successes, an opposing side is forced to amend their idea of what the critical issues are, to amend their scheme of probative values. Eventually, a track record of problem solving by the victors leaves their opponents without a compelling probative scheme of values. Kitcher explains, "Debates reach a stage at which no serious scheme of cognitive values would yield a scheme of probative values capable of prolonging debate. If some people continue to resist, they do so because of allegiance to a *broad* scheme of values that shape judgments about cognitive and probative values" (2011, 58-9).

This allegiance to a broad scheme of values where one would insist on focusing on certain crucial problems while dismissing all other successes can lead to a situation where there is no clearly articulated scheme of cognitive values of their own. For example, an anti-Darwinist may insist on an account of the emergence of the first cell or maintaining a history of life consistent with a reading of scripture yet lack a viable alternative theory (2011, 59). He considers the idea that science falters when broad schemes of values play a role, while cognitive and probative schemes of values are permitted. Yet, he rejects this claiming, "the error lies not in invoking broad schemes of values, but in *the character of the particular broad scheme of values introduced*" (2011, 59).

According to Kitcher, broad schemes of values can play a legitimate role in scientific practice, but they are required to be sustainable in an ideal conversation. Recall from Chapter 2, that Kitcher believes that ideal deliberations satisfy the conditions of mutual engagement, which roughly speaking requires us to acquaint fellow deliberators with our needs, provide them equal status in the conversation, and aim at solutions that everyone can endorse (Kitcher 2011b, 340). A

conclusion counts as adequate only if under these conditions we can reach a consensus (2011b, 343). However, for there to be mutual engagement, participants must not rely on false beliefs about the natural world, they must recognize the consequences for one another of actions under discussion, and they must be able to identify the wishes of other participants and how they might evolve (Kitcher 2011, 50). These epistemic criteria are necessary, Kitcher argues, because "consensus reached on the basis of error would be problematic" (Kitcher 2011b, 344).

Another important element is the idea of mirroring, involving the expansion of one's sympathies where perceived desires of others are given equal weight to one's own. However, desires of ideal participants must be filtered to only include desires compatible with precepts of the participant's ethical code and are filtered through the epistemic conditions just mentioned (Kitcher 2011, 51). The idea is to achieve desires judged to be the best balance among varying assessments made by fellow participants. If discussion reveals that a potential solution to a conflict falls short of the conditions of an ideal conversation (such as relying on factual errors or shortcomings in accommodating the wishes of classes of other people), it can be discounted. This is why Kitcher believes that the anti-Darwinist's broad conception of values can be rejected since they violate the epistemic conditions required for mutual engagement.

4.5.2 Logical Status of Values as Characterized

It isn't difficult to see that Kitcher's account of the logical status of values includes valuing, and generalized ends. Recall that his pragmatic naturalism sees the ethical project as emerging as a response to the problem of altruism failure. Altruism failure emerges because we are unable to adjust our desires as we should and instead behave selfishly. Desires lie at the heart of his account and the actions and consequences they lead to are relevant. Thus, valuing is present in his account. In addition, the concept of normative guidance and the development of ethical codes suggests a conception of valuing as generalized ends, as maxims set up patterns of behavior, and disruption

of those habits occasionally lead to revisions of those codes (Kitcher 2011b, 331). Kitcher explains that such "vague generalizations" may include notions like "it is right to tell the truth," but "like many valuable generalizations in the natural sciences, they are surely not exceptionless" (Kitcher 2012, 318). Such codes guide behavior rather than constituting an end-in-themselves. The various schemes of values can thus take on the status of a proposition in inquiry.

Finally, Kitcher, unlike most other accounts discussed, devotes most of his efforts to articulating a conception of "value" as valuation. While desires are part of valuing, they are more or less adequate based on the consequences they are fitted to produce. Normative guidance requires us to perceive the regularities of actions and consequences and to avoid desires that lead to trouble; we must look into the future and consider alternate directions that ethical practice might take (2012, 315). Mutual engagement aims to allow for the refinement of ethical codes as a social technology designed to function as means of resolving ongoing social tensions. Thus, values in this sense take on the logical status of a judgment.

4.5.3 Value Management

Kitcher's articulation of an ideal discussion under conditions of mutual engagement in science is a response to what he sees as the failure of the value-free ideal. Scientists, Kitcher argues, must make value judgments and should use broad schemes of values in their work. Not only would judgment emerging from an ideal conversation function similarly to the value-free ideal in condemning broad schemes of values that threaten scientific integrity, but in certain conditions we would expect a broad scheme of values to allow for adjustments to a probative scheme in cases where there are opportunities to greatly benefit society or avoid harms; continuing with an original plan when an unanticipated discovery opens up opportunities for relieving human suffering can be condemned (Kitcher 2011, 60). So, Kitcher's account attempts to maintain the integrity of science while also attempting to determine what values should be adopted in science.

Is this a case of value management? Recall from Chapter 1, that what typifies a case of value management is a normative account that tries to determine what values should be used in science and how values can be used while maintaining a sense of scientific objectivity. However, both needs arise because using values in science seems to present an ongoing problem that needs managing. Value management is required because values are problematized. If one claims, "Values need to be used in science, therefore we need to protect the integrity of science," one must presume that values represent a threat. Yet, this doesn't seem to motivate Kitcher. For instance, he believes that value judgments are necessary for scientific inquiry not, like Longino, merely because they can influence background assumptions, but because, like the account discussed in Chapter 3, value judgments are "constantly made" to determine the practice of inquiry as we judge whether what we have done so far warrants taking the next step (2011, 34). Values are thus normalized as part of inquiry itself. Instead, the focus of his account is on what makes a good value judgment.

Kitcher, as previously mentioned, wants to challenge the often-implicit notion that value judgments are subject to no standards or that valuing is a matter of taste. His account addresses developing valuation, rather than thinking of values themselves as representing a threat to scientific integrity. In doing this, I want to suggest that Kitcher is doing something other than value management; the problem he addresses is primarily about what makes for good value judgment while concerns about the integrity of science are secondary and follow from his solution to his problem. This is evident from his claim that "Everything depends on the character of the value-judgments made, on the schemes of values and how they are applied, on the ways in which schemes of values are adjusted. If there are standards for endorsing, applying, and amending values, we can separate the religious opponents of evolution and the hired guns of industry from the genuine experts" (2011, 39-40). So, while Kitcher addresses how to maintain integrity, it doesn't stem from

a problem arising from the mere presence of values. He explains, "Instead of 'Science and Values'—as if the latter were grudgingly tacked on as an afterthought—we should think in terms of 'Values and Science.' (2011, 39). The meaning of this and the idea that Kitcher is doing something other than value management and what this specifically means will be addressed in the following chapter. But this doesn't mean that Kitcher's approach doesn't have its own challenges.

4.5.4 Ideal Conversations and Value Judgments

Kitcher's idea of a good value judgment requires that values be what would emerge from an ideal conversation under conditions of mutual engagement. Importantly, this conversation does not include just a few parties, but everyone: we must "introduce the considerations and lines of reasoning that would be brought forward to achieve consensus were the entire human population to participate *under conditions of mutual engagement*" (Kitcher 2011b, 340). However, he recognizes that such a conversation is impossible, so instead deliberations are supposed to replicate the outcome of a conversation that *would* occur *if* the entire human population were brought together in mutual engagement (Kitcher 2011, 51). While such conditions are supposed to mimic the conditions under which our ancestors began the ethical project, and while Kitcher believes we cannot hope to live up to these conditions and that their use is to suggest useful directions to take in actual conversations about values, it seems that such a standard will be of little use if we can't imagine what such conversations would be like under those conditions.

After all, we must imagine what desires would remain after being filtered, but the extended mirroring process requires us to attend to another's filtered desires, other people's assessment of that person's desires, other's assessments of our assessments of other's desires, and so on (2011, 52). Such an enterprise may be difficult to imagine on a small scale, let alone trying to imagine it on the scale of the entire human race. If we can't imagine what such an ideal conversation will look like, what use is it as a standard by which to measure our actual deliberations?

It is also ambiguous as to whether the concept of the ideal conversation is supposed to be the benchmark of an adequate value or whether it is merely supposed to be an aid in deliberation. After all, he claims that ideal discussion is "The only vehicle available to us […] for arriving at judgments about values" and that "our ethical discussions are adequate to the extent they reach the conclusions that would have resulted from an ideal deliberation" (2011, 49-50). However, he suggests that it is supposed to be an aid in actual conversation, and in the later *Preludes to Pragmatism*, his Chapter "Hall of Mirrors" discusses the notion as a mechanism as a means of avoiding the "problem of partiality," or a way to correct for bias towards individuals or qualities (Kitcher 2012, 328). Here he builds in the work of Dewey into a "Deweyan conversation" that requires us to reflect other emotions into our own, filter judgments based on ignorance, and trace whether biases occur by examining consequences of certain traits or social connections (2012, 340). However, he also points out that for Dewey, such an approach is "part of a body of techniques available for intelligent resolution," and is a tool of inquiry rather than a standard to determine what counts as justified morality; for Dewey resolution is not just a matter of correcting for bias, but for resolving a problematic situation. Avoiding partiality is one concern for valuation, but it is not the only concern. Thus, Kitcher's method may be an aid in deliberation as a mechanism for checking biases, but it seems less helpful as the sole basis for justified value judgment.

It is also worth considering the fact that while Kitcher clearly describes his concept of an ideal conversation as a proposal for ethical solutions, it as an ideal conversation. Recall that for Dewey (and others) value judgments need to be responsive to concrete conditions. While we may imagine how those who hold conflicting views may deliberate with us under ideal conditions and consider what value judgments would emerge, conditions different from the ideal might warrant different solutions. In other words, judgments I might consider warranted under ideal conditions I

might not consider warranted under actual conditions, particularly if others won't partake in mutual engagement. For instance, we may hold certain theories to different standards given concrete conditions than we would under ideal circumstances. In *Science, Truth, and Democracy* (2001), Kitcher discusses instances where political and epistemic asymmetry may lead to our beliefs being taken to be more supported than they actually are and that while the Millian ideal of free inquiry is good under ideal conditions, they don't exist. Under ideal conditions blocking certain forms of research would not be necessary, but under actual conditions it might be. Thus, in concrete conditions, wide sympathy may not be desirable as a means to resolution.

Finally, it is worth considering that Kitcher's answer to good value judgment heavily focusses on values responding to social conflicts. This is telling since his discussion of how to make value judgments in science is identical to the account he gives in *The Ethical Project*. In other words, it conceives of values too narrowly in terms of ethical matters, but like Lacey, Kitcher applies his solution too broadly. Whereas according my account, values as judgments of practice are far broader than ethics, including scientific, artistic, logical, and general practical concerns. Thus, it is less clear how well suited Kitcher's ideal conversation is regarding those matters if it is to be the basis for what counts as justified value-judgments or not.

4.6. Conclusions to Draw in Comparing Accounts of Value

When compared to the account of value affirmed in Chapters 2 and 3 the approaches of Longino, Kourany, Douglas, and Kitcher expose potential problems in approach. For one thing, it is clear that each account relies on a conception of value and that limitations in that conception of value can mean challenges for the account. Each approach has problems, yet the analysis reveals important things to take away when considering the roles for values in science.

Longino's emphasis on social criticism and a diversity of perspectives, like Kitcher's ideal conversation, provides a tool to check implicit biases in values and offers a plausible account for

the experimental testing of value judgments. Kourany's distinction between values that are biases and values that are more objective tells us that values do not have to be a threat to science so long as we figure out how to distinguish them. Douglas' account tells us explicitly that values do not always function in the same way and that we should be mindful of the logical role they can have, while her accounts of objectivity tells us that the presence of values does not mean a lack of objectivity. Finally, Kitcher's account suggests that we should be careful that values should not be externally tacked on to science and that there may be an approach beyond value management.

Another important take-away is that these normative ideals, criteria, and standards all function as generalized value claims. They prescribe general norms of behavior that should aid us in formulating ends-in-view rather than being pursued as ends-in-themselves. As such, each may be subject to revision and amendment given concrete conditions.

For example, Longino notes that her ideas form the basis of an idealized community (Longino 2002, 134). But short of ideal conditions, these norms may need to be judged and revised to determine their relevance to inquiry as we take note of means and ends. For example, the criticism that she favors may be unwelcome during early stages of the development of research programs that need to be built up within a community before it can withstand the kind of criticism expected. If accepted research legitimizes racist or sexist views, it may affect the growth of research countering such conclusions in certain ways including the potential lack of funding, or other means of support that would allow it to even get to the table to engage in criticism of accepted work. This undermines potential diversity and criticism in the future. This point is essentially made by Kourany who argues that for alternative accounts to develop and alter community standards in Longino's ideal community, it will be highly dependent on political societal conditions which are by no means guaranteed (Kourany 2010, 62).

While there is reason to accept Longino's point that alternative views should not be arbitrarily excluded, and that there needs to be as much criticism as possible, is this a good reason to also put all potential theories on an even level? Perhaps just like new theories need time to develop before they are criticized, certain theories that can legitimize racism or sexism need to be excluded until non-racist and non-sexist attitudes can properly develop both within the scientific community and the community at large such that they cannot be easily overwhelmed by lingering and stealthy racist/sexist attitudes. Can we put off one form of objectivity today in order to embrace it in more stable ways in the future?

This may be true for Kitcher as well. Under ideal conditions, we would probably not expect sexist values to be part of a valid broad scheme or to influence our probative schemes. But short of ideal conditions, such values will influence science, and so it might be better to adopt different value schemes and different standards of evidence and criticism for certain theories to counter research than we might otherwise under ideal conditions. Douglas' rule that values should be banned from playing a direct role at crucial stages of inquiry may not always be necessary. Kourany and Clough believe that in many cases such value use can lead to better science, not worse. If this is true, then we need to consider how such a rule should function in concrete conditions rather than accepting it as an end-in-itself and thus when it may not be wise to apply it.

One of this chapter's central aims was to show that justification of approaches to value management will depend on the justification for the accounts of values they presume. Another aim is to make the case that by not paying sufficient attention to these different accounts of value, we don't notice that competing accounts can be incommensurate. An example of this is found in Kourany's criticisms of Longino's account. Kourany's criticism of Longino's account involves the kind of neutrality that it adopts with respect to what kinds of values are welcomed into critical

conversations. Recall that Kourany is critical of this idea since it puts feminist values and sexist values on the same level; since any value or perspective is to be welcomed, epistemic communities even conforming to Longino's prescribed criteria are not guaranteed to eventually reflect the values that Kourany believes are necessary and thus science is not guaranteed to be an aid in the fight for women's equality. Because of this, she rejects Longino's account (Kourany 2010, 62).

Notice, that Kourany's criticism presumes an account of value where values are not on an equal level. Certain values objectively should be adopted, and other values are just biases. However, Longino's conception of values doesn't permit anything other than neutrality initially. All values are potential sources of idiosyncratic bias, and thus we cannot make distinctions between acceptable and unacceptable values to use in science without that social criticism. For Kourany such an approach is unnecessary since she believes she has identified the values that are the source of objectivity and the ones that are bias and thus welcoming all values only leaves the door open to biased values having an influence. In other words, Kourany's criticism of Longino is less about her approach to social criticism and more about the conception of values she adopts.

Alternatively, consider an objection from Douglas towards Kourany that her approach leaves her open to wishful thinking since we may reject a theory that has strong evidence despite not being socially successful. However, Kourany distinguishes between values that are justified and those that are biased. So, she would reject that the values she favors act as biases or blinders just like the value-free ideal. If anything, Kourany points out that the values that she favors lead to more objective science (Kourany 2010, 56). If we accept this, then she might have plausible reason to deny that science that fails to be socially acceptable can count as objective or could at least argue that social failure indicates possible bias. For Douglas, however, *any* value used directly will compete with evidence and can lead us to act according to our biases and blinders, yet Kourany

cannot accept this; for her values can act as a gate keeper to prevent the adoption of biased science. Thus, disagreement hinges on competing conceptions of value.

While the values that Kourany favors may be sustainable in an ideal conversation and may validly inform a broad scheme of values, the more dogmatic elements of Kourany's program may not conform to Kitcher's pragmatic naturalism. Alternatively, he and Douglas may disagree over using broad schemes of values in a direct role at certain stages. For Kitcher the emphasis on what could count as good value judgment serves to block distorting influences in science such as hired industrial guns, climate change deniers, and anti-Darwinists. For Douglas, however, even if she accepts that some desires are more adequate or justified, it makes no practical difference when it comes to their direct usage in certain stages of inquiry; for Kitcher, it makes a huge difference. Hence, again competing conceptions of values can leave critics talking past one another.

Figure 7

	Longino	**Kourany**	**Douglas**	**Kitcher**
Broad description of values	Preference, idiosyncratic	Prejudices, biases, subjective OR Adequate, objective, justified	Interests, biases, blinders, desires, wishes, likes, preferences, wants	Desires, value-judgments, progressive truths
"Value" meanings	Valuings, generalized ends: determine choices either subjectively or inter-subjectively in the adoption of background assumptions.	Valuings: determine choices, promote sexist/racist research OR Generalized ends: inquiry resources, determine choices; provide standards for successful science and objectivity.	Valuings, generalized ends: act as evidence or motivation. Indirect uses; inform ends-in-view indirectly; ensure science is morally responsible.	Valuings, generalized ends, valuation: Inform ideal conversations, provide schemes of values to determine choices, broadly capture functional fitness for conflict resolution.
Primary logical status(s) in inquiry	Non-propositional impulse/habit, propositions	Non-propositional impulse/habit OR propositions	Non-propositional impulse/habit, propositions	Non-propositional impulse/habit, propositions, judgments

This analysis reveals how important the conception of value being used is when it comes to defending or criticizing competing approaches to value management, including the value-free ideal. As noted in Figure 7, none of the four figures agree on what "value" means. If we can't agree on what we mean by "value," at a given point, what the functions of different kinds of values are

at different stages of inquiry, and what the consequences of using values will be, then there is a risk that we will be talking past one another. What are taken to be problems given an account of value used by one philosopher are not necessarily problems given the account used by another. Thus, each philosopher is entitled to ask for further justification of the other philosophers' conception of value. If a conception of value used to articulate a normative account can't be, or otherwise isn't, defended and justified, then that normative account suffers.

What is especially important to keep in mind when we discuss the various logical statuses of values among competing conceptions of value is that for some philosophers, values will not feature in scientific judgment at all, neither as a proposition in a judgment, nor as a judgment. They are physical, not logical. For some philosophers, values will factor within judgment itself such as when generalized ends are utilized to determine what theory to adopt or to propose a course of action, thus appearing as propositions. If values are only valuings, inquiry is only about finding the means to carry out what is valued, such as in the case of a scientist who ignores evidence to bring inquiry to a pre-determined end. Valuing behaviorally affects inquiry without figuring within in it as a logical component. This is why it may be difficult to determine if valuings are having in inappropriate influence. However, if values do function within inquiry they may be true or false, or they may be affirmed as useful or not; they can provide reasons and justifications. These are radically different ways in which values can influence science, and lack of general agreement on what values are suggests different conceptions of what scientific judgment is and how it works.

4.7. Conclusion

In this chapter I have analyzed various accounts of how values fit into and should be used in science. In doing so, there were over eight distinct concepts associated with values, with over six distinct functions they might perform in science. There may be even more distinct concepts depending whether we consider concepts like liking, bias, and taste to be distinct. For example, it

may be tempting to say that liking something and having a taste for it are the same thing, but as Dewey explains taste is something to be cultivated, developed, and formed rather than describing arbitrary liking (Dewey 1929, 262). This wide diversity in conceptions of value should give philosophers pause when we talk about values in science because it is all but clear whether we are talking about the same thing.

It should also give us pause if accounts of how values should be used in science rely on these conceptions of value for their validity. When the conception of value presumed in many of these accounts is traded for my own account, many of the problems and prescriptions for these problems no longer follow just as in the case of asking what is the relationship between university-trained doctors and wishing. Because of this, we must ask why we would use one conception of value over another? What justification does each conception provide? Thus, further justification will be needed to continue to assert a conception of value, or the prescription will need to be qualified or revised.

When compared to the account developed in the last two chapters, a common theme emerges. Many tend to underemphasize the notion of value as valuation; values are often discussed as mere valuings or they are discussed as general conceptions; both act as their own form of value judgment in determining what we should do. Because of this, accounts tend to focus on the worry about the use of values either because general values will be applied inappropriately or dogmatically, thus undermining scientific integrity, or because employing values means that science will be a biased, prejudiced, or idiosyncratic pursuit of conclusions simply because they are liked, thus undermining scientific integrity. However, these apparent problems arise because valuation is underemphasized and underdeveloped in these accounts, but it is valuation which specifically requires paying attention to the concrete conditions of value usage and the adequacy

of a course of action in a particular inquiry (and thus the potential for undermining the reliability of scientific results) that can help maintain scientific integrity. As a result, values are treated as having their own meaning and justification, as independent or antecedent to inquiry rather than being developed within it. This intrusion of values into an inquiry creates competition when considering evidence and thus creates a problem. Hence, their incursion requires management. It should not be a surprise that Kitcher's emphasis on value judgment does not lead him to the same conclusion, and I will address this in the following chapter.

Chapter 5: Experimental Value Formation

In the previous chapter, I considered numerous approaches to value management and determined that none of these accounts share the same conception of value despite the fact that the conception of value adopted has a significant influence on arguments about how values should be used in science. In examining Kitcher's account I suggested that value management involves the idea that values have a meaning and justification independent of the inquiry that they are being used for, and that a different approach may yield an alternative to value management. This chapter will fulfil the purpose of this dissertation and develop such an alternative that I will call *experimental value formation*. Before I do this, however, more needs to be said about how values are treated in philosophy of science to demonstrate the difference. First, I will consider the issue of epistemic and non-epistemic values and the relationship between values and evidence to demonstrate that values are typically conceived of independently of inquiry. I will then present my account of experimental value formation as a different approach to thinking about values in science. Next, I will evaluate the approach in light of the plausibility of the account of values I have affirmed. I will close the chapter and the dissertation by arguing that this approach should be a first step in a new direction for research into values in science rather than being a complete program into itself.

5.1. Values in Philosophy of Science

Considering the concrete conditions in which values play a role in science reveals some troublesome ways in which values are discussed. The first example of this will be the debate between epistemic and non-epistemic values, while the second will be the matter of values compared to evidence. In the first example the distinction is more complicated than it sometimes, but not always, appears, and in the second example when we consider how values and evidence interact, it is no longer obvious that they are in strict competition with each other.

5.1.2 Epistemic Vs. Non-Epistemic Values

In Chapter 4, I already considered epistemic and non-epistemic values briefly, however I want to return to the issue in more detail. As mentioned, Hugh Lacey's (and others') defense of the value-free ideal depended on a strict demarcation between epistemic and non-epistemic values, while critics of the value-free ideal like Helen Longino and Heather Douglas have argued that we cannot rely on such a distinction to deny a place for non-epistemic social and moral values in science. I will argue that once we pay attention to the various meanings of value I have elaborated, we cannot claim that there are inherent differences between epistemic and non-epistemic values, but that distinctions could be made for legitimate reasons according to different possible functions such a distinction may play in a given inquiry.

According to Lacey, only what is observed and certified by experiment, independent of our desires, value perspectives, cultural and institutional norms, can serve as evidence for scientific theories and serve as a basis of theory acceptance (Lacey 1999, 4). He advocates the thesis of impartiality which holds that personal, moral, and aesthetic values should play no role in choosing a theory (Lacey 1999; 2005). However, cognitive values, which are values about what qualities we want our beliefs to have, are necessary for theory acceptance since accepting or rejecting a theory is itself a judgment of cognitive value (Lacey 1999, 15).

As mentioned in the previous chapter, Lacey's distinction rests on what the subject matter that values pertain to. Cognitive values pertain to desires about beliefs, while other values pertain to oneself, people in general, institutions, or art (1999, 27). However, there are other bases upon which he makes the distinction. Another way he distinguishes cognitive values is by claiming that they are a criterion of cognitive value, that they indicate sound scientific reasoning (1999, 91). One of the ways a criterion can manifest cognitive value that Lacy dwells on is if it serves the

objectives or aims of science.[93] However, for a philosopher like Kourany, who is explicitly urging for changing the aims of science, this argument will not be convincing.

According to Lacey seeking a higher manifestation of a cognitive value cannot be incompatible with other cognitive values gaining higher manifestation in that theory. A value that seeks consistency with biblical interpretation cannot be a cognitive value because it clashes with manifesting other values like empirical adequacy (Lacey 2005, 66). He also adds that if the historical record demonstrated that a method of trying to manifest social values in theories furthered the aims of science, the need for a distinction between cognitive and social values would not be necessary (2005, 68). However, he clearly does not believe this to be the case. I, however, reject the notion that valuation is about the manifestation of a general end, so the principle of the distinction is not one I would subscribe to.

There are additional arguments Lacey presents, but I won't address them all. Instead, I want to focus on one specific argument. Because cognitive values do not require a conception of a good life or what is a good society like we find in other kinds of values, they can function impartially. Different social and personal values are only differences rather than disagreements, owing to different relative conceptions of good lives and good societies, presumably making them more idiosyncratic (2005, 52). However, differences in epistemic values like whether to favor accuracy, simplicity, or fruitfulness "*are* disagreements, not simply matters of taste" (2005, 53). However, as we have learned from previous chapters, one could value and operationalize general

[93] I don't wish to address this at length because it would become a distraction from my original point, but one such criterion that he considers a cognitive value is pursuing science according to materialist strategies which is defined in terms of seeking out explanations of natural phenomena in terms of underlying laws, structures, or processes in a way disassociated from any link with values, human lives, or social arrangements (Lacey 2005, 69). As he notes, a materialist strategy borrows from a materialist metaphysics. However, such a view presumes a fact-value distinction, and as I discuss from Putnam's work, fact-value distinctions presume some kind of metaphysical world view.

epistemic ends in a "subjective" or idiosyncratic way, while the notion that personal values are merely personal and thus not capable of empirical disagreement is faulty.

Unlike Lacey who seeks a hard distinction, other philosophers undermine distinctions between cognitive and non-cognitive values, and their accounts reveals other ways in which distinctions could be made. While philosophers like Longino and Douglas are correct in pointing out we cannot make sharp distinctions between epistemic and non-epistemic values, their arguments require further analysis. Recall that Longino argues that epistemic values are values that are supposed to be conductive to truth, while non-epistemic values are political and social in nature. In presenting her argument, she states "My aim is […] to cast doubt on the very idea of a cognitive value or virtue, where we mean by that a quality of theories, models, or hypotheses that can serve independently of context as a universally applicable criterion of epistemic worth" (Longino 1996, 42). This is already contentious because it isn't clear why a quality must be independent of context to be conducive to truth. If we detangle "value" as a generalized end from "value" as a judgment, then general values are to be intelligently adopted based on the contextual end-in-view, so the conclusion that a value is contextual instead of universal isn't a ground for concluding that we cannot distinguish between cognitive and non-cognitive values. In fact, other philosophers don't rely on the universality versus contextuality demarcation at all for their distinction; Steel has argued that different cognitive values can depend on context, so long as they promote the attainment of truth in the context of their use (Steel 2010, 20). Lacey also does not make the distinction on the basis of contextuality (Lacey 1999, 213).

Longino's argument demonstrates that it is not the case that there are certain sets of values that only promote truth and do not have social and political valence, while others have such valence and do not promote truth. However, it isn't clear why she (although others too are guilty of this)

treats "non-cognitive" and "politically and socially" as synonymous. Longino's argument suggests that we can't always contrast the cognitive with the social and political, not that we can't contrast general ends that (generally) promote truth with those that do not.

Similarly, Douglas argues that "The main argument for the porousness (and thus failure) of the epistemic/nonepistemic distinction is that epistemic values end up reflecting the nonepistemic values of the day" (Douglas 2009, 90). Social and cultural values can inform epistemic decisions, thus acting as epistemic values allowing for "smuggling the non-epistemic values through the boundary." She explains, "how one interprets a cognitive value such as simplicity may well be influenced by socially structured aesthetic values, values that help one interpret and recognize simplicity" (2009, 91). Further, she questions whether epistemic values are reasons on their own to accept a theory since simplicity in a complex world won't provide truth.

Both sets of objections have limitations. Just because a value is socially informed does not mean that it can't be conducive to truth, and once we detangle general values from valuations, then a value like simplicity, while not being a reason-in-itself to believe a theory is true, can be conducive to truth at least some of the time. If epistemic value is defined as being conducive to truth, then in various circumstances, certain values will definitely be conducive to truth while others will definitely not. It may be that when accepted theories rely on sexist biases and thus have gaps in data, novelty may be clearly a cognitive value since it suggests we look to new theories that may not have gaps in that case while consistency will not. And, as we noted from Lepley's discussion in Chapter 2, epistemic values may have a better track record of being empirically verifiable than values used in ethics.[94]

[94] I'm not suggesting a loyalty to traditional epistemic values here. Certain traditionally discussed values may be very unreliable. Although, recall Lepley's point that this is not evidence of fixed difference, but a matter of testing possibilities and sophistication of said testing.

This last point highlights the potential functions that different values can have when it comes to categorizing them as being epistemic or non-epistemic. If a scientist invokes a value (whether it is traditionally categorized as epistemic or not) with the explicit purpose of preserving or promoting social ends while taking no interest in the actual truth, then the value is functioning clearly as a non-epistemic value. Alternatively, even if social, ethical, or aesthetic habits inform our understanding of a value, it may still function as epistemic if it is being affirmed because it is believed it will be conducive to truth. Or, when we consider Longino's objection, any value can have politically and socially relevant consequences, so we may wish to ask if those consequences are relevant to our categorization. For example, invocation of a value may yield social or political consequences, but that doesn't mean that it was functioning that way as part of the end-in-view of the judgement being made at the time.

The epistemic function of consistency is that it can help conserve data and hypotheses that may save time and render problems more determinate. By contrast, it can serve a social function when it endorses the status quo and can legitimate gender oppression while novelty will seek to end gender oppression (Longino 1996, 51-2). However, by claiming that a consequence of adopting consistency is that it may legitimize gender oppression, it does not follow that that the value was functioning as a social value in the inquiry in which it was adopted, but rather it could be an unfortunate side effect. Whether we want to consider such consequences or not in how we categorize values may vary depending on what our purposes are at the time.

Notice that Longino undermines the distinction to argue that socially and politically informed values can play a legitimate role in theory and background assumption choice, while Douglas undermines the distinction to sully the idea that *any* value should play a direct role in

theory choice. However, Douglas also distinguishes between cognitive values and "epistemic criteria" and thus introduces another potential distinction.

Steel defines an epistemic value as one which promotes the attainment of truth, however he distinguishes between intrinsically epistemic values whose quality if attained constitutes the attainment of truth, and extrinsically epistemic values which promote the attainment of truth without being an indicator or a requirement of truth (Steel 2010, 18). He includes internal (logical) consistency and empirical accuracy as intrinsic. This is similar to Douglas who argues that there are certain criteria that science must meet to be acceptable, or minimal criteria that would indicate a problem if they were lacking (Douglas 2013, 799). She identifies internal consistency and predictive competence (but not precision) as such criteria. Since these values operate as minimal requirements which exclude theories that do not possess them, she claims these "are less like values and more like criteria that all theories must succeed in meeting" (Douglas 2009, 94). However, Steel doesn't believe that her characterization of criteria warrants denying the label "epistemic value" (Steel 2010, 25).

I am inclined to agree since what these criteria mean in practice is prescribing certain operations for promoting certain consequences in inquiry, namely a reliable theory. An inconsistent theory which only serves to frustrate inquiry is deemed bad on that basis. Thus, consistency would inform the end-in-view for inquiry just as any other valued quality. Nevertheless, we may follow Douglas and Steel and affirm that one way to distinguish epistemic values is that they are required for truth.

However, I don't believe that this means that they are free from social tinge either. Even a minimal standard of epistemic competence could admit social and moral influences given theory-ladeness of observation. If one accepts Longino's account, then even just determining capacity for

predictive competency would require background assumptions. In addition, Kevin Elliot (2013) and Miriam Solomon (2001) have pointed out that what is meant by calling a theory accurate or competent can vary. While Douglas characterizes predictive competency as a minimal benchmark to determine "close enough" plausibility, what might count as plausible may depend on the purposes of the scientist whose models represent aspects of the world. A theory may be known to be literally wrong, yet still competent for its intended purpose as previously discussed. As Lacey points out, "close enough" or "good enough" judgments are value judgments (Lacey 2005, 61). Thus, while we may distinguish the value as being epistemic in the sense it may be required for truth, it still may not be clearly distinguishable in that it is independent of social or ethical considerations.

Steel's idea of extrinsic epistemic values echoes my point that whether a value will count as epistemic can vary by context as they can be "contextual in the sense that their capacity to promote the attainment of truth depends on occurring within a specific set of circumstances […] what is truth promoting and what is not can depend on the actual state of the world" (Steel 2010, 20). Because a value only needs to be truth promoting, it doesn't have to be non-social either. As he notes, "Both epistemic and non-epistemic values can be and typically are social" (2010, 23).

So, to summarize, values are not distinguished from each other by being logically distinct. As I argued in Chapter 3, they are all judgments of practice. We cannot sharply distinguish values from each other, but that doesn't mean that we should abandon distinctions altogether. As Putnam pointed out in the work discussed in Chapter 3, we can abandon dualisms but that does not mean denying that there is any sense in distinctions (Putnam 2004, 10). Whether we want to call a value epistemic or non-epistemic is ultimately a logical question about what ways of distinguishing

values aids us in a given inquiry. It is not a matter of the inherent nature of values themselves to be epistemic or not.

For example, we may distinguish epistemic values, as Lepley might suggest, on the basis that certain values are more verified in science than others. We may distinguish epistemic and non-epistemic values based on consequences they may produce when acted upon. We may distinguish an epistemic value if it can ever be useful in promoting truth, or if we invoke it solely for its epistemic functions without regard to social consequences. We may distinguish a value as epistemic, as Douglas or Steel might, if it is necessary for truth. A value may count as epistemic or as non-epistemic depending on the criteria used and the function it performs, and this is fine so long as we note the reasons for its distinction, and we don't fall into essential or absolute taxonomies. The epistemic versus non-epistemic value debate can in some cases hinge on thinking these values have an essential meaning independent of inquiry and this analysis reveals the importance of thinking about how values are formed and used within inquiry to make distinctions.

5.1.3 Values Vs. Evidence

One of the ways in which values present a danger to science is when they are portrayed as conflicting with evidence. It is common enough to hear that "values should not trump evidence," or, when values are implicitly linked to prejudice, that "prejudice should not trump evidence." But what is actually meant in these cases? One meaning suggested is that values act as, or instead of, evidence. Haack mentions the concern that when values are used they, not the weight of evidence, determine what theories to accept, and that values "constitute evidence" (Haack 1993, 34-5). Likewise, Douglas characterizes direct usages of values as cases where values act like evidence or "compete" with evidence, becoming a reason in themselves to adopt a claim. In cases like this a theory or conclusion is adopted solely because the scientist wants the claim to be true or values the claim being true. The issue is not about a choice being wrong but is whether it is what we want

(Douglas, 2009, 96). This might take the form of "I like X, therefore X is true." If values cannot act as evidence then relying on them risks supplanting evidence with the desire for theories that better support one's social values (de Melo-Martin and Intemann 2016, 514).

That is one characterization. In another, values work against evidence, not because they act as evidence, but because they constrain it by biasing it or ruling it out. Hudson refers to values justifying one's choice of evidence and the illegitimacy of this (Hudson 2016, 171). Wilholt discusses values operating as preference biases to increase the likelihood of a preferred outcome rather than outright fabrication. Outcomes can be declared irrelevant, attributed to alternate cases, or declared insufficient (Wilholt 2008, 93). One example includes industry funded studies into Bisphenol A whose toxicity is associated with its similarities to estrogen. Some studies used rats who were insensitive to estrogen yet omitted that this could have affected their conclusions (2008, 93). It's likely that in these cases values operate implicitly, unlike in the first set where if the value alone is used to make the choice, it is likely to be a conscious decision. This might take the form, "When we consider the evidence *that really matters*, X is true."

Finally, values interact with, although not necessarily constrain, evidence by coming into use when there is no decisive evidence to choose between competing theories. In comparing empirical support for two competing explanations of physical and cognitive human behavior, a linear-hormonal model and the selectionist model, the decision could be made on the basis of political and social interests served by reinforcing gender dimorphism. Or, in the time of Copernicus, choice between a geocentric or heliocentric model could be made based on whether one favored simplicity or consistency with other established theories (Hudson 2016, 169). This position is that of Neurath with his auxiliary motives being used to determine choice, and more recently by Steel whose values-in-science approach allows non-epistemic values to influence

choices only when epistemic values fail to indicate a best option (Steel and Whyte 2012, 170). Even this approach sets up a conflicting tendency between values and evidence since it suggests that the more evidence we have the less values should be used (Biddle 2013, 130). Underdetermination arguments thus presume a sharp separation of evidence and values.

These are three significant ways in which values are considered to be in conflict with evidence. However, there are two problems with thinking that values conflict with evidence. The first is that it tends to view evidence and values as completely distinct logical or ontological entities whose nature is fixed independent of context, after all we must return to the lesson from the previous chapter and ask what is meant by "value" in each context. As Lynn Hankinson Nelson points out a naturalistic account of evidence should assume no pre-theoretic standard of what evidence is prior to investigations to explain and predict what we experience (Nelson 1993, 173). Assuming such a position, we could not presume that values and evidence are essentially distinct. As previously mentioned, according to the holistic account she develops, sociological or political claims or theories can constitute evidence for a theory and feminist scientists have demonstrated this (Nelson 1995, 405).[95]

Kristen Intemann and Inmaculada de Melo-Martin deny the assumption that values are always extraevidentiary. As discussed in the previous chapter, determining what constitutes an impact or a side effect requires a value judgment, and these determine what counts as evidence. Concepts like "ecological restoration," "sustainability," or "healthy forests" require values regarding what we consider important to protect and what is central to environmental flourishing. Evidence that gray wolves are in decline rests on the concern about the continued existence of gray wolves, the existence of "pure" gray wolves that are not interbred with coyotes, or the presence of

[95] Nelson discusses this at length in case studies such as studies in neuroendocrinology (See Nelson 1995, 410-415).

gray wolves in a particular ecosystem (de Melo-Martin and Intemann 2016, 514-5). Given this they note, "In such cases, it is incorrect to see contextual values 'trumping' or 'supplanting' epistemic considerations" (2016, 216).

A second problem with the idea of a conflict is that this may not best reflect how values and evidence logically interact and thus it can be misleading. We do not "judge" that a theory is good because it embodies simplicity. We may impulsively favor simplicity, but we judge simple theories as ends-in-view in concrete situations, and thus values and evidence work into an integrated judgment of practice.

Given the account of judgments of practice affirmed in Chapter 3, we can acknowledge that what counts as evidence is partially based on what value judgments we make. This should not be particularly controversial as such value judgments (judgments about what we should do) determine what methodologies to use (Douglas 2009), what ontologies to adopt (Longino 2013), what ideational conceptions to use (Dewey 1938), what questions to pursue (Kitcher 2001), and what background assumptions to make (Longino 1990). These judgments can determine how we group together what we experience and filter those experiences into a form that is useful for inquiry. Nelson argues that on a naturalistic account, scientific theories make use of large systems of theories, practices, and standards and that these serve as evidence for a theory (Nelson 1993, 180). In practice this means that values, common sense ideas, and political beliefs can all serve as evidence, so we should "not erect artificial boundaries between politics and science" (1993, 183). Alternatively, my account of values suggests that our value judgments should be determined by what evidence we can bring to bear in making a choice. Evidence should influence what we value, but what more can be said about how values and evidence interact?

One useful model for thinking about the relationship between evidence and values can be found by considering Dewey's account of the relationship between facts and ideas and their resulting logical entanglements (Dewey 1938, 112). He argues that the relationship between facts and ideas should be understood as operational in nature, with each playing a functional role in inquiry. Perceptual and conceptual materials (facts and ideas) are "instituted in functional correlativity with each other," where facts locate and describe a problem, while ideas represent possible solutions (1938, 111). Our account of the facts of the case will inspire ideas, and as those ideas are tested, they direct us towards new perceptions and the revision of our understanding and the collection of new facts. The facts and our ideas begin as tentative and are tested and checked against each other until, as inquiry progresses towards an answer, they begin to become firmer (or if inquiry doesn't progress, we may realize that we may have to start over with a new understanding of the facts and consider new ideas to test them) (1938, 113-4).

I believe that we can use this account to model the relationship between evidence and values in science by considering their operational functions. The function of value judgments is to determine what operations and which ideas we should adopt and thus the criteria by which experience is organized in to facts and facts are organized into evidence. In other words, facts become, through value judgments (as discussed in Chapter 3), facts *of the case*. These facts of the case become the evidence of final judgment; the fact would not be evidence without the valuation. Much of this depends on how the problem is defined. As Dewey notes, "The way in which the problem is conceived decides what specific suggestions are entertained and which are dismissed; what data are selected and which rejected; it is the criterion for relevancy and irrelevancy of hypotheses and conceptual structures" (1938, 108). Thus, affirming that a problem is adequately defined will determine what counts as evidence. The function of evidence is to test and allow for

revisions to our ideas and previous judgments; these direct us towards new operations requiring new value judgments. These judgments must be based on and tested by evidence. Like ideas and facts, values and evidence are "checked by their capacity to work together to introduce a resolved unified situation" (i.e. attain warranted assertability) (1938, 111). Values and evidence thus work as an evidentiary-evaluative circuit. This model is useful because it also reminds us that neither evidence nor values are determinate independent of inquiry but become determinate within it.

Just like facts and ideas, what we count as evidence and what we value or deem valuable will likely begin as tentative, until mutual correlative logical operations make the determination of what facts are facts of the case, and what we ought to value become more determinate. As Nelson points out, standards of evidence emerge within processes through which we generate knowledge (Nelson 1993, 181). In philosophical discussion of values and evidence, this functional division complicates the narrative. Values as valuations (not mere valuings[96]) can no longer be placed at the margins where evidence is insufficient, but we should also not consider either to take priority or even that they need to be at odds with each other. As we attain new evidence, this should reflect new value judgments, and as we make new value judgments, we alter what counts as evidence in inquiry (what propositions to affirm) so that it directs us in our operations taken towards attaining warranted assertability. Neither evidence nor values should be thought as determinate independent of inquiry, and we should resist the temptation to think of evidence has having self-sufficient character which we merely record, but rather think of it as the outcome of a refining process. Recall from Chapter 2, experience is not given; it is taken. Dewey characterizes it with an analogy: "The man who is making a boat will give wood a form which it did not have, in order that it may serve the purposes to which it is to be put. Thinking may then be supposed to give its material the form

[96] Mere valuing as impulsive or habitual decisions can of course lead to behavior like ignoring or dismissing evidence.

which will make it amenable to its purpose—attaining knowledge, or, as it is ordinarily put, going from the unknown to the known" (MW 8: 66). This model also helps us remember that values are not terminal responses but develop within contextual situations.

One objection to this approach is that it seems like there are obvious cases were values do trump evidence, even if we don't consider it problematic. For example, ethical codes of conduct and rules governing ethical experimentation seem to rule out all kinds of potential evidence that could be collected. However, it is important that we remember that in problem solving adjustments that the problem itself is not determinate from the beginning. If ethical considerations do alter what we consider acceptable practice, it is judged that in the long run practicing science in an ethically unacceptable way will only frustrate the ends of inquiry given the backlash and this leads to a reformulation of the problem as we understand it, namely to seek answers in an ethical manner. Because the problem itself is reformulated in this way, certain kinds of facts are not relevant to the problem being addressed (as facts *of the case*). In other words, unethically collected facts are not relevant to the problem as formulated and so again this is an example of evidence and values being formulated in correlation with each other rather than two pre-determinate and opposing factors.

This model echoes the point made in Chapter 3 which is that science requires values, not merely because sometimes evidence doesn't add up, but because propositions are never purely descriptive. They are affirmed in functional correlation with other propositions suggesting a course of action as a means of forming an end-in-view and a final judgment. Valuation is, thus, far more common than we may realize. For example, in writing this chapter I had to constantly evaluate how simplistic or complex to make my explanations, a judgment that will be verified or not based on whether how well it is understood.[97] In philosophy of science it is easy to focus on big decisions

[97] I hope my judgments are correct.

that come along once we get stuck regarding what to do with competing or insufficient evidence, but I propose that we consider a more "micro model" for thinking about values. I am not claiming that there is an essential difference between "big" decisions and little ones, but that value judgments are commonly made but not "seen" throughout the process of inquiry. This micro model is in keeping with the account of practical judgment discussed in Chapter 3 where I argued that all inquiry just is a series of practical judgments, and thus valuations, from the affirmation of various propositions to delimit the problem and determine what is relevant to a potential solution, to determinations of the best operations to undertake, and finally the judgment itself as it is asserted.

Consider the example of the development of electron microscopy and early attempts to photograph mitochondria. Beginning in the 1940's rival interpretations of the internal structure found in such micrographs were established, with American scientists holding that the inner membrane form ridges called cristae that do not divide the body, while the Swiss held that lamellae do close off the body and are not attached to the bounding membrane (Rasmussen 1995, 401). The American interpretation held that their findings were compatible with biochemistry yet removed all potential conflict between the evidence from electron microscopy and biochemistry by limiting their conclusions to topography and not by attempting to determine membrane composition using microscopy. In contrast, the Swedish approach favored the use of higher resolutions and interpreting the micrographs purely visually with more emphasis placed on accurate measurement. By measuring the best micrographs, they believed they could deduce molecular architecture. When disagreement began to focus on sample preparation techniques, the Swiss team argued the American interpretation produced flawed images since it relied on sample preparation techniques that could damage structure, despite the same protocol also being used by biochemists. The Swedish interpretation was able to challenge established biochemistry. However, despite no

biochemical argument to refute the second interpretation, biochemists favored the American interpretation and it is now the dominant view (1995, 420).

It is tempting to see a case like this as an example of two competing positions with neither having definitive evidence and being decided in the end by some value like external consistency. Nicholas Rasmussen points to the social factors of the "political dimensions" of the relationship between biochemists and the proponents of the American interpretation which "stabilized the decision" on structure and their means for arriving at it as orthodox (1995, 419). However, it is important to remember that these competing results followed only as a result of a multitude of value judgments giving rise to the protocols for imaging. For example, the development of a fixative process for samples using osmium was "judged best partly because it gave appearances […] where mitochondria are narrow […] [the] recipe was established as reliable on the assumption that nucleus and cytoplasm should appear homogeneous, which can be assessed in living cells using visible light only to a limited degree, and that anything larger than the narrowest mitochondria represents swelling" (1995, 388). This value judgment about the relevance of the narrowness of the mitochondria determined what would be called evidence.

Additional examples of how judgments of relevance determined what counted as evidence can be found in competing approaches to fixation. The Swedish team's process focused on producing samples as quickly as possible from recently living tissue and carefully adjusting the physiological levels of salt and pH. This judgment was based on the idea that the best fixative is the one that would leave the specimen with a maximum organization according to the epistemic principle that there is more order in a living than a fixed specimen (1995, 409). The American team did not consider this relevant as they believed that fixed and unfixed specimens differ, and this cast doubt on the value of precise measurements from electron micrographs for reaching

biochemical conclusions (1995, 408). Thus, differing judgments about the relevance of facts altered what would be counted as evidence of what. In the dispute, "there was a basic question about what the rules should be—that is, a fundamental disagreement on how well micrographs needed to be made, and how to use them properly as evidence" (1995, 407).

What we should draw from this limited account of the various decisions and judgments that were made to even produce the first two sets of micrographs and their interpretations is that final judgments came about as a result of minor judgments made to establish protocols for the emerging practice of electron microscopy. What came to be called evidence was a product of several value judgments, and any final or overall judgment cannot be completely distinguished from them even if they may not be in the foreground. What it does show is that various facts (such as the thinness of mitochondria in an image) informed various value judgments which then reinforced the importance of other facts and eventually what would be called evidence. This suggests that value judgments and evidence are not conceptually distinct, and that valuation occurs throughout inquiry. Thus, again we should hesitate to think of values as being determinate external to inquiry, but rather formed and made determinate within it.

5.2. Experimental Value Formation

As I have discussed in the previous section, when it comes to the matters of categorizing values or considering the potential for conflict between values and evidence, we must pay careful attention to the ways in which values are formed and used within inquiry rather than making sweeping abstract generalizations and a priori claims. Whether a value (as what is valued, generally prescribed, or as evaluated) will count as epistemic or will pull against evidence will depend on context, not upon the inherent nature of values themselves. Thus, we should resist the temptation to think of values as having a determinate meaning antecedent to inquiry. This already addresses,

or rather points to ways to reconsider, problems that values can pose for science. What about other problems that tend to arise when considering values in science?

In the previous chapter, I considered an entire array of ways that values can play a role in science. As discussed in this and previous chapters, there are some obvious ways that values can be problematic when used in science. There is the direct approach where valuings drive what conclusions are reached. This might take the form of "I like result X, therefore X." There also cases where a general value may be employed that would override other considerations and would be employed where there is no guarantee that theories that embody them are more likely to be true, and in fact it may be more likely to lead to falsehood. This would take the form of "Simplicity, therefore X" or "Egalitarianism, therefore X." There are also more subtle ways in which values can have an impact, where the value itself never appears as a proposition in inquiry but does affect the behavior of the inquirer in a way that leads to ignoring or cherry-picking evidence to reach a desired conclusion. These are cases of implicit biases and could be informed by likings or habitual responses to affect background assumptions, function to weigh the sufficiency of evidence, provide standards of social success, distort truth, compete with evidence, be dogmas, be well regarded decision vectors, be epistemic aids, and so on.

What is an effective way to limit the possibilities of values having this kind of influence? I believe that the common element in most of these problems lies with treating values as having predeterminate meaning and quality antecedent to inquiry. For example, the idea that a scientist would decide to warp, distort, or ignore evidence because they want to obtain a conclusion that they like, suggests the use of value as valuing, where what is valued is determined regardless of what comes up in inquiry. This means that the value has a predeterminate meaning and quality and the process of inquiry itself wouldn't affect what is valued such that it wouldn't be altered by the

evidence collected. If a scientist decides to adopt a theory based on some generalized epistemic or social end, there is a similar logical quality to the decision; inquiry is brought to a predeterminate end according to a value that has a predeterminate meaning and quality antecedent to inquiry itself. In either case, because of impulse, habit, or because the end is set up as an end-in-itself, inquiry becomes a matter of pursuing a fixed end which renders inquiry less intelligent and less reasonable.

Dewey makes the point that fixed habits, rules, principles, and ends are opposed to experimentation since their purpose is to provide a sense of security in the form of certainty whereas an experimental approach requires indeterminacy (Dewey 1922, 237). Recall that valuation takes place where the value of something is indeterminate; that is, we cannot say from the beginning that there is a fixed value of something and thus we need to experiment by testing the consequences that various kinds of actions are likely to produce to determine what the value of various options are relative to each other. When an impulse or habit becomes fixed it "overrides all competitors and secures itself as the sole right of way […] Then choice is arbitrary, unreasonable" (1922, 193). Alternatively, "principles treated as fixed rules instead of as helpful methods take men away from experience" (1922, 238).

Fixed habits and impulses won't allow for adaptation, and fixed principles leads us away from facts and reality. Thus, the solution to prevent (or limit the likelihood) of this, is to ensure that ends do not have a predetermined value and quality fixed prior to inquiry; values must be indeterminate and thus be formed and revised within inquiry by consideration of evidence and concrete conditions. We must therefore encourage mature valuation. When ends are not pursued as ends-in-themselves but are evaluated as ends-in-view we must evaluate various ends by considering concrete conditions. So, if a general value frustrates our aims within inquiry, we don't adopt a theory merely because it happens to embody it. When the value of some prizing is

indeterminate, we must consider the evidence at hand that speaks against it. When we deliberate reasonably, the end-in-view adopted is one that "stimulates by unifying, harmonizing, different competing tendencies […] not in their original form, but in a 'sublimated' fashion […] making eliminations and recombinations in projecting a course of possible activity" (1922, 195). This kind of valuation and re-evaluation requires intelligent consideration, and it is what makes it less likely that a valued end will run roughshod over evidence and will lead to the adoption of a theory merely because something is valued.

Because values in such a process are indeterminate at the beginning of inquiry, the value ultimately settled on is one that forms within inquiry through experimental means and considerations, rather than being formed antecedent to inquiry. I believe that this model will limit or avoid the problematic influences of values in science and should change how we think about the influence of values in science. This brings us back to our discussion of Kitcher in the previous chapter. Recall that for Kitcher, schemes of values form, reform, and are shaped by inquiry as a process. Values are part of the process of inquiry and so "everything depends on the character of the value-judgments made" and so the problem shifts to what makes for good value judgment. Values should not be "tacked on as an afterthought" to science.

I think what Kitcher is suggesting is that we should shift our focus away from thinking of science and values as distinct concepts and instead focus on how values are formed within and play a logical role in scientific inquiry. If I am right about this interpretation, then this is something other than value management since the focus is not on "managing" something distinct from science which represents a problem, and instead is a fundamental shift in focus in how we think about the logic of science and how valuation plays a role. Philosophers of science are too focussed on values as ends, that is as desired ends or general ends, and should shift their focus to an approach that

addresses on how value judgments are formed in concrete conditions. I call this approach *experimental value formation.* The idea behind this approach is that (1) that most of the obvious ways in which values can be problematic in scientific cases are when a scientist out of impulse or habit either uses a value as a valuing or follows a general end as an end-in-itself instead of engaging in valuation within inquiry, (2) that the key to objectivity is more valuation not less, (3) that valuation is already inherent to scientific practice, and (4) considering how values can be successfully formed within successful science allows us to model the best kinds of values and value judgments to use in science and in the most appropriate ways. It is also a project focussing on melioration of value judgments rather than prescribing fixed rules, ideals, or criteria.

My hypothesis is that so long as scientists are engaging in mature valuation within inquiry rather than merely following impulse, habit, or general end, if they are intelligently considering a course of action as an end-in-view, then most of the problems associated with values in science are not as likely to arise. A scientist who values a certain conclusion, for example, will not blindly insist on that conclusion despite any evidence that arises just because they happen to value it. Nor will they begin to dismiss or distort evidence in ways that couldn't be defended and deemed an adequate response. This is because it is to be expected that what a scientist values should be modified as inquiry progresses, and the scientist must weigh the value of pursuing certain ends against the potential means involved like fundamentally distorting the facts of the case.

In addition to Kitcher, there are some philosophers of science who have moved in this direction. As discussed, Elizabeth Anderson urges this kind of shift. She points out, for instance, that "the time has come to rethink […] models of the relations between values and hypotheses," certain models like underdetermination arguments do not "help us evaluate the different ways that values might be deployed in inquiry" (Anderson 2004, 2). As cited in the previous chapter she

notes that the undertheorization of value judgments has impeded the development of criteria to distinguish legitimate from illegitimate uses of values in science. The problem, as she describes it, is that traditional arguments for the inclusion of values in science sees values as an exogenous influence on theory choice and take value judgments for granted and has "impeded the development of criteria to distinguish legitimate from illegitimate uses of values in science" (2004, 3). As recounted, she argues that value judgments are taken to have a dogmatic character because they are not empirical. If, however, value judgments are formed in respect to available evidence, they "can be integrated into scientific theorizing without making it dogmatic" (2004, 2).

Lynn Hankinson Nelson has argued for the importance of scrutinizing value claims as a means to objectivity. She establishes the fact that value claims are already a part of scientific inquiry as scientists bring their values to the laboratory (Nelson 1990, 306). She also argues that when values are subjected to empirical control, it is clear that not all values are equally defensible (1990, 308). The notion that inclusion of values leads to relativism, she claims, rests on the assumption that there are no grounds for evaluating values and no alternative understanding of objectivity than value-freedom. Failure to be upfront about our values and to thus to scrutinize them is dangerous. She notes, "If values remain separated from what we can ascertain about how things *are*, if we advocate or praise them or adopt them without reference to what we come to know about how thing are, there's nothing 'objective' about them. If left unevaluated, they become incorporated into the content of science, and then ideology has a field day" (1990, 134). She urges that we accept science as value laden to make sense of scientific practice: "Scrutinizing and evaluating the values, political and otherwise, incorporated in our approaches to human and nonhuman nature, and taking responsibility for their consequences, must, without the assumption

of false boundaries, become part and parcel of good scientific practice" (1990, 316). Thus, greater valuation is the key to objectivity.

Matthew Brown has argued that the idea that evidence leads to objectivity and values detract from it is a source of tension in the arguments of opponents of the value-free ideal since they favor a lexical priority of evidence over values. Part of the problem with the lexical priority of evidence over values, is that it requires a "relatively uncritical stance towards the status of evidence within the context of certification, relative to values" (Brown 2013, 836). It is problematic to assume that values should only play a role at the margins since we have no a priori way to claim that evidence is going to be any more objective than value judgments. Evidence can prove to be bad in many ways in that it can be unreliable, noisy, or unrepresentative. Alternatively, values can be adopted for good reasons and not be merely a preference. He advocates for "rational revisability of evidence and values" where "on this principle, both the production of evidence and value formation are recognized as rational but fallible, revisable processes" (2013, 837).

There are at least two significant reasons why a scientist, engaging in mature valuation, would not engage in the problematic behavior identified by so many philosophers of science. The first, as I will discuss further in the following section, is that scientists don't only consider their own idiosyncratic preferences. Kitcher points out that when we deliberate as individuals we are already socialized, our patterns of actions are modified, and our dispositions are attuned to the broader community (Kitcher 2012, 338). Evidence for this is found in scientific practice as scientists make decisions with a view towards the expected response from other scientists in a community of "validators," and they seek their work to be incorporated into ongoing research in the community. If a scientist seeks to engage in particularly idiosyncratic valuing and to have this be reflected in their final work, it is likely to frustrate them. The second reason is that insisting on

certain values come what may is likely going to frustrate research in the long run and make a final judgment difficult. For example, if a scientist makes decisions about what theories to accept based on its ability to embody a general end rather than using a general end as a suggestive aid in forming an end-in-view, then this will also likely prove to be problematic in the long run. If one insists on simple theories despite mounting evidence of complexity, this will be harder to defend in the long run. If the scientist continues to insist on simple theories then philosophers like Douglas are correct in pointing out that wishing, or rather desiring, does not make it so. In other words, valuations as judgments of practice of this nature are not going to be warrantedly assertable.

It may seem simple, but by incorporating the account of value I have affirmed, we can say this when using values in science goes astray: the inquirer made the wrong judgment. This means both that the end itself could be bad, but also how it is attained (the means used in inquiry) have caused problems. If a given finding is found problematic when subject to criticism, for example, if the inquirer finds that their solution did not work out as planned, or when pursuing inquiry in a certain way makes finding a true answer more difficult we can say that warranted assertability is undermined and we must return to inquiry (Burke 1994, 202). This can suggest that bad value judgments were made. Such determinations of what we ought to value can only be determined experimentally. Sometimes this will consist of considering or testing various ends-in-view as a resolution to a problem in individual situations, and sometimes it will consist of experimenting with general approaches across various cases to develop new tools in the form of general ends. But in all cases, how we ought to proceed is determined within inquiry on an experimental basis. It creates a value that wasn't there before, and therefore it is experimental value *formation*.

If a scientist maturely considers various courses of proposed action (each of which may be valued in some way) to determine what should be valued, it is less likely that they will blindly

follow certain ends since it will make it difficult for them to find the truth in the long run. But what about the scientist who doesn't seek to find the truth, but rather only seeks to get others to believe as they do? Likely examples include creationist scientists or hired guns of industry who are merely seeking to give a conclusion the appearance of legitimacy. It should be noted that in an obvious case where no evidence or counter-evidence would affect the conclusion reached and where the inquirer isn't concerned with demonstrating the truth of their claim, then the problem that the inquirer is addressing involves science as a means but is not scientific in nature. Thus, while they may make *some kind* of judgment, it isn't scientific judgment.

In value judgments in science, there is just the one final judgment. It will not be distinctly social or ethical, nor epistemic. The judgment is a judgment of practice, and it could involve social, moral, or epistemic matters that are deemed relevant to the judgment. There will be obvious problematic cases like dogma, implicit biases, or habitual responses favoring general ends that are less likely to seriously affect inquiry the more we engage in valuation. In these cases, social and ethical factors will be problematic if they distort inquiry in the ways just discussed; that is, in cases where they replace judgment or where we judge poorly. However, there are still complex cases that are less obvious when social and ethical factors could be relevant. There is no obvious a priori reason to claim that their inclusion must threaten scientific objectivity. For example, Kristen Intemann argues that definitions of clinical depression depend on value judgments because there is no consistent correlation between symptoms and biochemical events. To avoid the arbitrary lumping of various symptoms into a definition, she points out that the symptoms all impair the functions most essential to human flourishing and this is what distinguishes them from the common blues. She notes, "determining which functions are central to human flourishing involves making value judgments" (Intemann 2001, S509).

Now compare this to Kourany's example of PMS. In that example, there were no consistent definitions of PMS and it included a very large array of symptoms from headaches, depression, dizziness, low blood sugar, and so on. Nor was there a consistent account of how severe the symptoms had to be. Despite this, it was linked to impaired concentration, physical condition, judgment, and efficiency, as well as deviant behavior and diminished moral and legal responsibility (Kourany 2010, 50). Kourany argues that in this case, biases in the form of sexism and androcentrism led to these definitions. What is relevant is that in a case like this, unlike the depression case, is that either there was no careful mature value judgment and instead the definition arose from implicit bias, or there was a poor judgment in which case we could point to the problems it gave rise to. In the depression case, it is less obvious and seemingly less problematic to weigh social and ethical factors in judgment. Of course, the value judgments informing the definition of depression could prove problematic as well, but like any judgment, as new evidence comes to light, it can be revised.

If the more problematic ways in which values affect inquiry will take the form of unquestioned and thus absolute likings, implicit biases, or habitual use of general ends despite the fact that they may not be likely to lead to successful inquiry, then the best way to avoid these will be to make sure that mature valuation takes place. To reiterate a point by Dewey, when a general conception is taken for granted it can remain implicit, unstated, or propositionally formulated in such a way that it becomes static instead of functional and this is a "death warrant" for inquiry in that they can be obstructive to new lines of investigation (Dewey 1938, 507). If valued ends lead to the consequences philosophers of science worry about, deliberation is the key to avoiding them. This is because deliberation, as a process of valuation, involves blocking "efficient overt action"

that would flow from habits or impulses and then experimenting by considering what various lines of action would be like if acted upon (Dewey 1922, 190).

Through the formation of various ends-in-view we are then in a position to give meaning to potential courses of action, including those that would likely aid or frustrate our scientific aims. Like Intemann's example, sometimes social and ethical factors will aid, and like Kourany's example, sometimes it will frustrate these aims. Above all, however, "All deliberation is a search for a way to act, not for a final terminus" (1922, 193). Thus, its aim is to avoid fixed ends and this makes it crucial to scientific objectivity. Since, as I have already argued, valuation is already inherent to inquiry anyways, and since valuation is a resource for critically examining previously unquestioned valuings, it stands to reason that there should be a heavy focus on the processes by which valuation is made, and on methods of improving valuation.

Since the approach is experimental, it resists the idea of simple or absolute criteria or prescriptions for what constitutes good science. My argument isn't to claim that we already have a good understanding of valuation, but that the focus of philosophy of science should be on the development of such models. Nor does my account hold that any use of value judgment is good. The mere use of judgment instead of direct valuing does not mean values can't become problematic. As Kitcher notes, everything depends on the character of the judgment. However, with explicit focus on how successful valuation is made, including those cases where valuations, including both epistemic and social and ethical factors lead to successful science (including what "successful science" means in various contexts), we will be in a better position to recommend various kinds of values, to know their limitations, and to determine how they should function in scientific inquiries. That is, experimental value formation recognizes that scientists already

frequently make value judgments anyways, and so the role of the philosopher will be to better understand those valuations and to eventually be in a position to improve on them.

That is not to claim that such a focus will be free of problems. The fact that a general end has a demonstrated empirical track record does not mean that it's usage will avoid the problem of improperly leading inquiry to an inadequate conclusion. Part of having a verifiable value judgment means that the determination of what values to use is also a matter of *how* they should be used in inquiry and in an inference. In other words, if an otherwise carefully considered and perhaps generally empirically grounded value is used such that it biases or skews inquiry in the wrong direction, then that judgment as an end-in-view is to that extent incorrect. Recall from Chapter 2 Dewey's claim that if the adoption of an end serves to cause further frustration, it is to that extent a bad end. A generally well established and maturely considered end like gender equality can also frustrate inquiry depending on how it is used. Thus, a key element of experimental value formation is that it is at heart an empirical project to finding out *how* to use different values in different contexts and inquiries rather than just *what* values are generally well supported. To that extent, there is a degree of finding out how to manage our usage of values. However, an important difference between this project and value management is that it does not rely on sweeping claims about how values should be used *because they are values.*

The experimental value formation approach makes no promise to eliminate problematic uses of values in science. For example, it is worth considering whether a scientist could make a careful and mature value judgment and yet still have values negatively affect science. For example, in the time of Galileo or Lysenko the social environment may have been such that valuation consistent with restrictive social values might be warranted if breaking with those values could be worse despite the threat to scientific integrity. The context of valuation may make any sort of

judgment problematic compared to other contexts. However, there are a few important things to keep in mind. First, like Lewis argues, something can have value in certain particular contexts despite not ultimately being objectively valuable. Second, with value being relative to context, my approach can recognize that if we can only make the best of a bad situation, our focus should be on ensuring the conditions needed to avoid similar situations in the future. In other words, it doesn't guarantee that only ultimately good values will be made, but rather focusses on melioration of the conditions and situations in which valuation takes place to secure and stabilize goods recognized as necessary to secure scientific integrity. It thus insists on a broader focus than any one case.

My approach is also sober enough to recognize that there will not always be obvious answers. For example, in their work on environmental justice, Steel and Whyte discuss studies of commercial hazardous treatment, storage, and disposal facilities (TSDFs), their placement, and their relationship to areas with large minority populations. The United Church of Christ's Toxic Wastes and Race in the United States (UCC) study determined there was a significant disparity between communities that had TSDFs and contained higher minority residents and communities that did not have TSDFs and lower numbers of minority residents, thus concluding that race is a better predictor of location of a TSDF than other factors (Steel and Whyte 2012, 164).

On the other hand, a study funded by Waste Management Inc. by Douglas Anderton of the University of Massachusetts claimed that the average percentage of minority residents did not vary based on whether TSDFs were located in the community or not. The significant difference between the two studies was choice of control group. The UCC study included all zip code areas in the United States that did not host a facility, while the UMass study included only census tracks that did not host a facility and that were in a metropolitan statistical area that already contained a facility. When we consider the rationales for these decisions, there are obvious value concerns.

The UMass study "argued that census tracts are a better unit of analysis than zip codes because they are too large and thus could be subject to 'aggregation errors' and 'ecological fallacies'" (2012, 165). It also argued that its control group was a better choice because the areas excluded were not likely candidates for TSDFs because they did not contain industries that would require them and thus it would be misleading to use such areas.

In this case, while the rhetoric focussed on what was more "justified," the choice is clearly the result of a judgment of practice used to determine what facts were relevant as the facts of the case. The judgment regarding choice of control group was formed based on connecting certain means, in this case using census tracts and excluding rural areas, with anticipated ends, which were expected results that wouldn't be misleading. The difference in findings was attributed to choice of control population and so "a key question is why one control group should be chosen rather than another" (2012, 166). Were either set of valuations warranted? Critics of the UMass study argued the choice of control group was wrongheaded since it bypasses the question of why certain metropolitan areas do not have TSDFs, the fact that some rural areas do have them, and that studies on environmental impacts demonstrated that larger areas can be affected by land use decisions and thus the zip code as a unit of analysis is a better option (2012, 166).

Critics argued that the studies were each addressing separate questions, again highlighting how evidence is determined by choices about formulation of the problem, and that such formulations are themselves products of valuation. However, it is not readily apparent that either study is fundamentally wrong headed or subject to unacceptable value usage.[98] Despite being funded by industry, the UMass study's use of values is not obviously driven by the desire to vindicate TSDF choices. It is possible that values operated in a more implicit/indirect way in

[98] Steel and Whyte believe it is, although their reasoning for this doesn't rely on much beyond conjecture that the UMass choices were determined by their funding.

choosing control groups, but the choice itself could be rationally defended. When it comes to choosing between the two options for control group, the warrant for either assertion may not be apparent without further studies and further considerations. They may both be adequate for the problem they address, and questions about whether to use their studies in further inquiries, such as in policy considerations, are themselves value judgments as we judge what facts are facts *of that case*. Determining if either approach is wrongheaded will only come with further experimentation with these approaches and improvements to valuation in cases of this nature.

When it comes to determining if values were playing an inappropriate role, Steel and Whyte are critical of Douglas as she suggest that how scientists respond to new evidence will determine inappropriateness. If, despite evidence pointing to one particular hypothesis, a scientist refuses to change their mind it may suggest direct value usage, or as I would describe it, dogmatic, habitual, or impulsive thinking rather than careful valuation. They argue that this is problematic since it can be ambiguous if a scientist has changed their mind. Anderton later insisted that he did not deny the existence of environmental injustice, but rather insisted that the mechanism to explain it emphasized economic and sociological factors other than overt racism. They believe it remains ambiguous whether this is a change in mind.

Instead they insist that to determine inappropriate value usage, we should focus on the quality of the research and make the motives of scientists a secondary consideration (2012, 177). However, I think Douglas is right in her suggestion that understanding value usage is going to be a matter of how scientists behave. Recall from Chapter 2 that valuing is affective-motor, and so if a valuing is driving behavior regardless of evidence, no evidence will change their mind. While it may not be obvious how values are influencing research, this may be because "no researchers […] would admit that nonepistemic values played a direct role in determining the outcomes of their

study" (2012, 173). We should remove the stigma about using values and be more upfront in our reasoning about judgments of practice and why we consider value judgments to be warranted. As noted, scrutinization of our values allows us to take responsibility for our consequences of our judgments, and one of the benefits of feminist science has been its self-conscious inclusion of values to subject them to empirical controls (Nelson 1990, 315). Valuations are inherent to research, and so we cannot separate the quality of the research with the motives of the scientists as they affect their judgments of practice. Being upfront means more opportunity for critical examination and experimentation with such judgments to determine how to improve them in the future. It also allows us to pay more attention to what distinguishes good mature valuation from bad valuation. Thus, while my approach doesn't provide a definitive answer in this case study, it does suggest a method of improvement.

5.3. Evaluation of account of Values in Laboratory Studies

As I argued in the previous chapter, if our thinking about how values should play a role in science is going to be justified, then our conception of values will have to be justified as well. This will be true for my experimental value formation approach. So how plausible is the account I have affirmed? To examine this question, I will consider laboratory study research. While it doesn't definitively determine my approach is correct, it does point to a more complex approach to values used in concrete conditions in the laboratory than other accounts considered. Karin Knorr Cetina undertook a yearlong laboratory study in 1976 at a federal research facility in California devoted to basic and applied research in chemical, physical, microbiological areas in which she observed scientists' interactions with instruments and each other, using a "sensitive methodology" that interacted with and engaged scientists, conducted interviews, and collected lab protocols and paper drafts (Knorr Cetina 1981, 17). As I will argue, many of her findings suggest that scientists do engage in valuation in the ways I have described.

First and foremost, Knorr Cetina confirms that scientific inquiry proceeds by, and largely consists of, a series of practical judgments. She reports that inquiry involves "chains of decisions and negotiations" through which outcomes are derived which she calls "selection." Selections are required and are based on translations of further selections (1981, 5). For example, a scientist running a regression program may select a function using a criterion. Such criteria are translated second order selections. Similarly, a problem like reducing urban smog may be translated to a problem of reducing led in gas (1981, 5). Scientific products can be structured in terms of selectivity with each selection being challengeable because they involve the possibility of alternative selections. Important is Knorr Cetina's conclusion that scientific facts are the result of decisions and thus "to study scientific investigation, then, is to study the process by which the respective selections are made" (1981, 7).

According to Dewey valuing is a matter of selection and rejection, it indicates a preference for "this-rather-than-that" (Dewey 1922, 334). Valuation occurs in any experience where alternative possibilities enter. As Knorr Cetina characterizes selections, they are decisions amounting to a choice among other possible choices, or, this rather than that. As noted, all judgments have a reference to a course of action to be tried, and since as Knorr Cetina suggests that they are part of the practice by which science is fabricated, we have reason to believe that selections are valuative in nature. Once we acknowledge that selections are valuative, then her point is evidence for my account that scientists must constantly make judgments of practice.

As she notes, "The formal features of reasoning show the scientist to be a practical reasoner" (1981, 22). However, her point is that such selections cannot be only found in partitioned sections; she argues, "since choices exist throughout the process of experimentation, there is no research core which, even in principle, is left unaffected by the circumstances of production"

(1981, 40). Decision criteria negotiated and affirmed at the proposal stage are often revised, ignored, or overthrown in the process of research (1981, 89). For example, a choice faced by a scientist between a filter and a centrifuge to eliminate chemical precipitation agents from a protein sample was translated into a problem of energy consumption and thus they chose based on energy consumption. However, when the filter did not work, the problem was again translated into a matter of practical availability, and they reverted to the centrifuge. However, such translations are contextual and often utilize an end-in-view.

Even though selections as value choices or practical judgments are constantly made throughout inquiry and (as I will discuss) affect results, they are not apparent in the final work. The contextual selective nature of research is brushed over in a decontextualized finished paper (1981, 110). She notes that rarely are choices made explicit. Many "(perhaps even most) laboratory selections are made without their ever becoming a topic of discussion or reflection. Scientists speak of such selections as the 'normal', 'natural' or 'logical' thing to do" (1981, 89). This explains why we often don't "see" the valuations that take place according to my micro model.

While practical decisions are thus required, sometimes these claims will be a product of careful judgment and sometimes they won't be. As she reports, selections are often not noticed until something interferes with the "natural" sequence of events or there is an anomaly. In such cases judgments will be made, but often selections can be made without conscious attention using habit. Thus, not all selections are a product of careful judgment. However, for this section I will focus on cases where judgment is conscious to consider how her account of what she calls control of decisions compares to my account of judgment.

As mentioned, translations are often done to recharacterize a problem. Not only does this demonstrate that affirmations characterizing the problem are ultimately practical since they

determine further selections, but according to Knorr Cetina, selections are often made as a matter of a problem-solving adjustment (1981, 9). Determination of how research ought to be conducted is in view of a defined problem, where the problem itself is a matter of judgment. She notes, "the process of defining a problem penetrates into the very core of research through its implications and operationalizations […] we can say that a specific definition of a problem activates a set of presuppositions which determine a set of subsequent questions asked in the laboratory" (1981, 88).[99] Thus, how a problem is defined will determine what is relevant to a given inquiry in a given context, and thus can determine what operations are performed and what will count as relevant evidence for that inquiry, just as I described earlier.

Knorr Cetina's work does more than demonstrate that scientists *do* constantly make value judgments, it demonstrates that *how* they make such judgments is in line with what I have argued. One point that she repeatedly stresses is the fact that the selective (or valuative) nature of inquiry means that it is highly contextual. She explains, "the concrete research situation [is] the key to understanding how decisions in the laboratory are made […] laboratory selections are local, depending on the context of research" (1981, 33). She adds that decisions are made in a particular time and place and carried on by particular interests of agents rather than universally valid interpretations. Her account of a contextually specific reasoning process points to what she calls an "indexical logic" and thus like my own account of valuation is situation oriented. She explains, "The decision-translations through which the selections of the laboratory are produced refer us to the context in which they are embedded. The selective interpretations of the laboratory are situationally and contextually contingent" (1981, 16).

[99] Notice the similarity to the Dewey quote in section 5.1.3.

The contextual nature of this valuation suggests, as might already be clear, that decisions are made as ends-in-view rather than based in universally applicable general ends. Ideas are contextualized and practically suggestive as they "take on the character of *solutions*" (1981, 57). These ideas display themselves as unrealized solutions holding the promise of success rather than being merely "conjectures about a phenomenon subjected to test" (1981, 57). Ideas are thus ultimately practical judgments since:

> The occurrence of an unrealized solution is important to scientists in that they take it as an organizing principle for subsequent actions and selections. It provides a principle for reevaluating previous priorities, and introduces new equivalences. It makes some decision translations more salient and downgrades others. (1981, 58)

In other words, since the scientist is a practical reasoner, their work involves examining various ends-in-view as Knorr Cetina explains, "the major task of the laboratory is to rule out possibilities, manipulate the balance of choices so that one becomes more attractive than the others, and to up- or downgrade variables with respect to alternatives" (1981, 21). Decision criteria are invoked in circumstances with reference to a specific aspect of research with costs considered with respect to considerations like time, effort, money, etc. (1981, 40). Evaluation involves calculation of outcomes, weighing alternatives, and making selections according to expected consequences (1981, 75). This largely mirrors Dewey's account of weighing competing ends-in-view.

The fact that scientists make selections and translate selections by considering ends-in-view also suggests that scientists in many cases do not make a selection solely on the basis of it being valued. Choices are modified according to what is available. Often what is available in the lab will determine what tests are performed. One scientist explained that all things being equal he would have selected an entirely different series of tests from those available at the service lab (1981, 35). This suggests that scientists modify and evaluate their prizings according to the end-in-view rather than pursuing something purely because it is wanted.

So far, Knorr Cetina's work suggests that scientists evaluate ideas and selections relative to each other, with careful consideration of context and means. This confirms part of my account, but her work also echoes the idea of an ends-means continuum. As she explains:

> selections of previous work constitute a *resource* which enables scientific inquiry to proceed […] selections of previous investigations also affect subsequent selections by modalising the conditions of further decision-making. Thus, the products of science are not only decision-impregnated, they are also decision-impregnating, in the sense that they point to new problems *and* predispose their solutions. (1981, 6)

As explained in Chapter 2, the idea is that ends and means cannot be sharply distinguished as ends become means to further ends. This suggests not only that valuation is contextual involving consideration of antecedent conditions and consequences and thus is not a terminal response, but also that long term effects constitute a basis by which to continually test a judgment.

As mentioned, previous work can provide a resource for future work in the form of tools, methods, and interpretations, and part of this can be the establishment of generalized ends. However, this goes beyond just general values like simplicity or fruitfulness, but also experimental protocols as well. Selection of generalized ends can be fixed by education, social cooperation, training, and instruments (1981, 6). They can serve to overrule some local contingencies by "suggesting which decisions *should* be made in regard to the indeterminate choices that scientists confront" (1981, 40). Thus, in this respect they function as general values.

Despite this, Knorr Cetina's point about using these criteria for judgments in the form of generalized ends echoes my own. She explains, "decision criteria are invoked in specific circumstances, with reference to a specific *aspect* of the research" (1981, 40). In addition, generalized prescriptions are often rejected for anything other than routine analyses since they can be outdated and thus scientists often engage in methodological adaptations for new situations. Research laboratories will develop general ends according to a local interpretation of methodical rules; they develop a local know-how to determine how to make things work best in practice (1981,

37). She explains, “contrary to what we may think, criteria for ‘what matters’ and ‘what does not matter’ are neither fully defined nor standardized throughout the scientific community. Nor are the rules of official science exempted from local interpretation” (1981, 39).

In other words, generalized ends are invoked in deliberation, practical judgment, and in selection, but as generalized ends they are suggestive, not determinate. Scientists do not make decisions based on broad value notions since there are local indeterminacies that require contextual valuation. Knorr Cetina notes, “while we must not diminish the importance of rules as instruments of social action, we cannot assume that they *rule out* the underlying indeterminacy and contingency of such action, nor the processes of negotiation which should have been determined by those rules” (1981, 46). Values as general ends are not a substitute for values as valuation, but rather inform ends-in-view which are then evaluated accordingly.

Determination of successful valuation in the form of selections and their translations is not based on bringing about a pre-determined end, but rather is based on its ability to resolve the problem the scientist is facing. Knorr Cetina explains, “If there is a principle which seems to govern laboratory action, it is the scientists’ concern with making things ‘work’, which points to a principle of success rather than one of truth” (1981, 4). Here success is determined as a concrete and feasible goal rather than an abstract ideal. She further elaborates that “the selection of a substance, technique or composition formula ‘because it works’ refers us to the greater relevance of *success* than truth in actual laboratory works […] success, as one scientist said [is], ‘a different trip for every one of us’, [and] what works—and consequently what counts towards success—depends […] upon routine translations arising from practical concerns at a research site” (1981, 41). This is relevant to valuation because it echoes the points made in Chapter 3, namely that

verification of valuations (selection) is consistent with warranted assertability, a success term which is situational and contextual, referencing the resolution of a concrete problem.

Further, according to Knorr Cetina, successful selections factor in certain criteria into the end-in-view. She explains, "Scientists constantly relate their decisions and selections to the expected response of specific members of the community of 'validators', or to the dictates of the journal in which they wish to publish" (1981, 7). They very much have in mind a view towards potential criticism of their work from enemies and allies within the field and this informs their concept of success. Scientist's value the imposition of one's own work as a resource to be used in the subsequent work of others, and thus it must be perceived as a resource in the ongoing research of others. Thus, a scientist in careful evaluation will not impose wants and values into their work without regard to the consequences for inquiry, since idiosyncratic selections mean that research is less likely to be used by others or is likely to encounter criticism. Therefore, prizings are more likely to be appraised to obtain success.

Scientists constantly must make practical judgments in order to conduct inquiry effectively, but do these judgments affect the conclusions reached? After all, no one would deny that scientists must make practical judgements at certain stages, but it doesn't follow that they can or should determine outcome. According to Knorr Cetina, they do. Not only do we know that scientists make selections as ends-in-view, in that they anticipate what the results should be, but inquiry cannot be cleanly divided into stages. She explains, "research in the natural and technological sciences cannot be partitioned into one section which is open to the situationally contingent selections and contextual influences […] and another which consists of the internal, objective and standardised execution of the necessary enquiry" (1981, 40).

To recap what Knorr Cetina's work tells us, scientists are practical reasoners who constantly make evaluative practical judgments in the form of selections and translations of selections. This echoes my account that science is a process of making complicated value judgments. Scientists' selections are determined since a problem-solving adjustment and often definition of the problem itself will be practical and determine what counts as relevant evidence for a resolution. Selection or valuation takes place by considering competing ends-in-view and the means that will affect the ends valued. They think along an ends-means continuum. Scientists do not take general ends as being deterministic or as a value judgment in themselves but are considered to be relevant or useful to the situation and are often modified in a given context. We have also learned that validation of such judgments is not determined according to abstract concepts, but in concrete terms of success, echoing the notion of warranted assertability. Finally, these selections are buried or not noticed despite being extremely common.

All of this echoes my account of values and suggests that it may apply to actual scientific practice. Obviously, Knorr Cetina's observations may not be generalizable across all of scientific practice nor do all selections involve careful valuation, but they do suggest that my account is at least plausible in that when we consider the concrete conditions of deciding what to do, scientists will consider things in complex and concrete ways rather than focusing solely on what they happen to want or value, or making decisions according to a pre-determined end contained in a generalized value concept, whether it be a "cognitive value" or in prescribed protocols and procedures. If values are not pre-determined as desires or as ends-in-themselves but are rather developed and shaped within inquiry itself as a matter of practice, then this suggests that the best approach to considering how values should be used in science would be to focus on how values are formed within inquiry, and how to improve that process to mitigate potential problems. Thus, the account

of valuation I have affirmed can be considered a reasonable approximation of how values are employed in science and thus values are more complex and nuanced than other accounts considered tend to characterize them.

5.4. Conclusion

This dissertation's central goal was to focus on how conceptions of value can affect the values in science debate and to develop a plausible account of value by which to evaluate the state of the debate regarding values in science. The experimental value formation approach is the culmination of this effort. It is not supposed to be an alternative normative account in addition to the value management accounts from the previous chapter, but rather recommends a fundamental shift in approach to thinking about this debate. This is because once we consider the ways in which values can be manifested and formed, many of the presuppositions about the nature of values, evidence, scientific inquiry, and the social and ethical factors involved in each are reconstructed. Thus, the problems these accounts respond to dissolve in favor of new problems. There is a shift away from thinking that values can be problematic for science and thus how can we mitigate them and towards the idea that scientific judgments can be complex and problematic and how can we improve them?

The shift in focus that I recommend does not aim at an all in one set of prescriptions to determine what counts as good or rational science, nor does it pretend to have perfect knowledge of what counts as good reasoning when it comes to valuation and its place in science. But this is just my point; valuation is an underappreciated aspect of scientific inquiry, and if we want to improve the way values integrate into science, we need to make the process of valuation more explicit and to develop logical accounts in the service if its melioration. Nelson suggests that part of our reluctance to incorporate values is because of a lack of trust in ourselves (Nelson 1990, 308). If this is so, building trust will be partially a matter of building trust in a method of critical evaluation. Thus, the dissertation represents the beginning of a new philosophical program for

thinking about values in science rather than being the final word on the subject. Further development of such an approach isn't discussed, not only because it is outside of the scope of this dissertation, but also because the real experimental work on valuation, how to improve it, and how it can and should function in science still needs to be done. Thus, my work is not so much a final judgment, but rather a proposition suggesting the formulation of a problem for further inquiry.

For example, consider a case of a scientist who, facing dwindling resources, is tempted to fabricate data because they may be practically certain of what the data may look like anyways, and with the laboratory running out of funds and the need for the data to support graduate students, and the fact that it is very unlikely they would get caught, it might seem like a viable value judgment to proceed with fabrication. It may be possible that within this context that such a judgment has warrant. However, if we recall Lewis' discussion of values-in-fact, value predication can vary based on context and circumstances. A certain outcome can be genuinely valuable but objectively bad. My proposal does not offer a solution, but it does offer new avenues for thinking about the relative value of potential judgments, and it offers a new way to examine problems like this since we may now try to determine what standard of value-in-fact predication should be acceptable in science and under what contexts we may seek different relative standards of value.

Or another avenue for further study might be proposed given that value judgments are an inherent part of inquiry and given that social and moral elements may be part of such judgments, everything will depend on the quality of the judgment and the person making it. One possible key to maintaining objectivity may be by fostering a scientific attitude (as briefly discussed in Chapter 1) in our patterns of judgment (Dea and Silk, forthcoming). Thus, perhaps another avenue of inquiry for philosophers of science will be how to instill and improve such attitudes.

As I have discussed, the nature of what values are does affect the debate in philosophy of science about what place they have in science; this is true of historical debates over the value-free ideal and it is true of the modern-day debate. What characterizes the modern-day debate is a series of normative accounts that aim at value management. That is, by relying on a conception of what values mean by their inherent nature it is suggested that they represent a problem for science which requires managing. I have argued this is a problematic approach by focusing on the nature of valuation. When we consider these approaches and how values are characterized we find no general agreement on what values even are, let alone the potential logical functions they are capable of performing. What some philosophers will identify as values will not be recognized as values by other philosophers. By no means is it clear that discussions are on the same page when discussing how values should be used. Thus, greater precision is needed in value discussion.

As I have argued, values are incredibly complex and multi-faceted, taking the form of valuing, valuation, and generalized ends. Whereas much of discussion of values tends to view them as terminal responses, which are often manifested as mere desiring or liking on the one hand, or as the application of fixed ends having their own inherent value on the other, I have considered several accounts that urge that we look to the concrete conditions in which values are formed and utilized. When we do this, we find that values are formed based on their suitability to the case at hand and in response to needs felt. Because of this they are capable of being judged according to their adequacy for resolving the problems they are considered for. Inquiry itself is a sequence of valuations taking the form of judgments of practice, and these value judgments are verified every time we deem some method, some approach, or some conception well suited to its intended purpose for resolving a problem. Because values are capable of being verified, we have a clear basis to address how values are used in science.

Values that are not verified or are judged to be wrong are values that should not be used in science. It isn't difficult, given that scientific inquiry inherently involves intelligent adaptation of concepts to evidence, to see that relying on dogma, impulse, or habit without intelligent criticism are bad judgments and this goes a long way to resolving many of the problems found to present themselves when values are used in science. This does not resolve all potential problems regarding how values are used. However, by shifting our focus to valuation, we may be in a better position to investigate why value judgments go wrong rather than looking at the problem as why values can lead to bad science. The former I believe is an ultimately more fruitful question.

For philosophers, the shift towards an experimental value formation approach will involve the further development of the logic of valuation itself. The model of judgments of practice discussed in Chapter 3 may be the beginning of such an effort. For example, understanding that there is a difference between a value judgment and a generalized value puts us in a better position to be able to recognize the difference between utilizing and affirming a general value to aid as a part of a much larger judgment and it inappropriately being a judgment by-itself. It also allows us to pay more attention to the role that an invoked value is playing in a logical judgment about what to do, and thus it not only allow us to make more careful and refined distinctions between values based on the roles that they are playing, but also to experiment with what values are most effective in certain roles at resolving problematic issues that are part of inquiry. So, philosophically the approach suggested in this dissertation offers avenues for new discussion and research.

In the long run, however, the discussion of values and their interrelation with facts in inquiry may mean the abandonment of language concerning factual and value judgments altogether. As discussed in Chapter 3, Lepley suggests that factual and valuative judgments are different modes of expressing the same thing, even suggesting that any factual or valuative

formulation can be translated into each other. Perhaps this might mean abandoning any meaningful distinction between the two in favor of examining scientific inquiry as a series of warranted assertions. More research would need to be done, but if it is true, then this would require a major rethink of the values in science debate.

Such a shift would also mean that philosophers and scientists have a role to play in terms of our public discussions of values and science. On the one hand there is a danger that being more open and upfront about value usage may lead to dismissal and a breakdown of trust that the public may have in scientific publications and policy advice. This issue can be more compounded if scientists are perceived to be advocating for particular issues or changes to public policy. As previously mentioned, if trust in science breaks down because it is more apparent that value judgments are being made, this can largely be attributed to a lack of trust in values and value judgments. Philosophers bare some of the burden for creating this lack of trust in values, and perhaps they now have a responsibility in helping to build that trust. In the short term this can be done by articulating more specific and clear ways that values can be appropriately used, by offering clear accounts of logical fallacies associated with value usage, by providing a taxonomy that can allow for the public at large to identify different kinds of values and their different functions, and by explaining how verifiable practical decision making are a common part of our daily lives and are thus less of a menace than previously thought.

Philosophers of science can also play a role by discussing and communicating clearly with scientists themselves so that the scientific community feels more comfortable about being upfront about valuative reasoning and providing a framework by which they can understand when it may be appropriate to advocate for causes such as in cases of climate change, and how they can articulate why their advocacy does not tarnish the integrity of their studies. Sometimes this may

mean that in order to secure public trust, the openness of value discussion may have to be less prominent, and sometimes it may involve being more upfront, noting and experimenting with what contexts public reaction may be positive or negative, and when it may undermine ultimate aims. It may also involve figuring out how democratic and public values can be integrated into science and how this can be translated into ends-in-view for particular scientists to consider.

Philosophers will also especially need to articulate clearly why certain value judgments are warranted and others are not. Doing so may aid in reducing the cynicism that might arise if it is revealed that factual claims in science are also value judgments and so one may feel they are therefore entitled to instead assert whatever claims are consistent with their ideologies and to dismiss alternatives as "fake news." Being able to trace the valuative reasoning, to defend and justify it according to evidence tells us that while values are a part of what makes up facts, facts are also what make up values and so we can trust in the process and not fall back into epistemic anarchy. And, in fact certain values may simply be inappropriate in discussion of scientific knowledge and this can be justified. In the long run, the hope we may have is that progress in articulating the basis of mature value judgments and their melioration may spill over into the habitual thinking and mindset of the public such that they can trust in value judgments and are less inclined to jump to the conclusion that if values are being used, science must not be as reliable.

For now, however, so long as we devote more attention to how value judgments are formed, and so long as we are more explicit about our considerations and valuations and weighing of potential ends-in-view, we open the door to more opportunities for criticism and analysis of value judgments that are already inherent to science anyway. Our aim should be the development of models of value judgment built on what has proved successful. With this in place, we will find that the key to maintaining the integrity of science will involve more valuations taking place, with

greater care, consideration, and testing. Further development and refinement of how values are formed within science is the first step towards articulating how to maintain the integrity of science, but it first requires that greater priority be given to theorizing about valuation.

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