

## **Science and Values**

**Matthew J. Barker, Concordia University**

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Many people think that science should aim for objective knowledge, and that we veer dangerously from this when our subjective values seep into science. And often, when science goes awry, it is *because* values tainted its objectivity. It is tempting to say that such mixing of science and values helped cause much *eugenic science* to go terribly wrong. But seeing how this view is too simplistic informs us about both eugenics, and science and values more generally.

### **Some Values Should Be Involved in Science, at Some Times**

It is certainly true that values mixed with eugenics. Indeed, values were built into the very idea of eugenics, when Sir Francis Galton (1883) first defined eugenics as “the science of improving stock”. This means the science of increasing the *value or goodness* of human populations, by favoring the reproduction of certain sorts of people over others. Does the history of value-laden eugenics show that values ought to be purged from science entirely?

No. To see why, consider physics. It’s an impressively objective and successful science. Yet it would be preposterous to tell physicists that they should not value finding answers to their questions, or that they should not consult human values when recommending how their results be applied (Anderson 2004). An

energy crisis may drastically increase the value we place in newer, more sustainable energy sources, and it can be wise for this to inspire and guide some research in physics. Instead of keeping values out of physics, physicists should appeal to *appropriate values* at *appropriate times*.

### **A Newer View of Science and Values, and Explaining Eugenic History**

For reasons like this, the simplistic view that science and values should not mix has been largely replaced with a newer view of science and values (e.g., Royall 1997; Sober 2007, 2008), one informed by feminist philosophy of science (e.g., Fehr 2008; Harding 2009; Longino 1990), history of science (e.g., Bowler and Morus 2005), and sociology of science (e.g., Moss-Racusin et al. 2012; Hird 2011).

Central to the newer view is a distinction between *belief* and *action*. With regard to belief, the newer view says we should *minimize* appeal to values and maximize objective appeal to evidence and logic, when settling and justifying scientific beliefs. But once such a belief is settled and it is time to *act* on and apply it, we should *always* appeal to *appropriate* values to guide our action.

Perhaps this newer view can help better explain why so much eugenics went terribly awry. Instead of saying eugenics went wrong simply because it appealed to values, the newer view would look for one or a combination of three mistakes in past eugenics. (i) eugenicists let values judgments have too large a role in settling and justifying their scientific beliefs. (ii) those scientific beliefs were based at least partially upon evidence or logic that turned out objectively weak, regardless of whether the beliefs were also based on value judgments. (iii) eugenicists appealed to inappropriate rather than appropriate values when they turned to act on their scientific beliefs.

To make this more concrete, consider the case of Canadian eugenic psychiatrist Dr. Charles Clarke. After years of frustration working in the asylum system, he left that system and founded the so-called “feeble-minded clinic” in Toronto in 1909. There, he used patient scores on intelligence tests to diagnose “feeble-mindedness.” He often clinically recommended that people, including many young girls, who scored under 70 on intelligence tests should be “prevented from having offspring” (Wheatley 2013). Did this abhorrent eugenic recommendation of Clarke’s stem from one or a combination of the three sorts of mistakes articulated by the newer view of science and values?

### **Mistake One? Did Values Illegitimately Influence How Eugenic Scientists Formed Their Scientific Beliefs?**

As with many of his eugenic counterparts, it is unclear whether Clarke’s eugenic recommendation was caused by his appealing to value judgments when settling and forming his scientific beliefs. The kinds of beliefs in question include relatively straightforward beliefs about data, and more complex ones about detailed psychological hypotheses. It is doubtful that Clarke appealed to value judgments to justify the simple sorts of belief about data. Suppose a patient of his, Emma, scored 65 on an intelligence test in Clarke’s clinic. To justify his belief that *Emma scored 65*, he probably just checked her answers on her test, rather than appealing to what score of hers he might value.

Things become less clear when turning to the more complex scientific beliefs, like the ones about nuanced hypotheses. For instance, Clarke probably believed the following hypothesis: *The type of intelligence test that Emma took is a valid indicator of hereditary intelligence.* Did he appeal, implicitly or explicitly, to his values when he settled upon and justified his belief in that hypothesis? It is exceedingly difficult to carry out the historical studies that would help answer this sort of question.

## **Mistake Two? Did Eugenic Scientists Often Fail in Their Aims to Objectively Support Their Scientific Beliefs?**

The newer view says some science goes awry when scientific beliefs lack objective support, regardless of whether values influenced the formation of such beliefs. Did this sort of problem arise for Clarke?

Probably yes. The idea is that Clarke's scientific beliefs should be based on both objectively strong *empirical evidence*, and that Clarke should reason about such evidence using objectively strong *logic*. But the evidence and logic used by Clarke and many eugenicists to support their more nuanced hypotheses were weak by today's standards, even if strong by theirs. For instance, many eugenicist psychiatrists of the early 20<sup>th</sup> century sincerely believed that intelligence tests were valid indicators of hereditary intelligence. But those tests were variations of Alfred Binet's "Measuring Scale for Intelligence," which was designed to reliably predict student success in schools in France, with little (if any) evidence on the relation between this and any so-called hereditary intelligence. Perhaps some psychiatrists like Clarke would have called for less interference with human reproduction if they had appreciated the weaknesses in their evidence and logic.

## **Mistake Three? Did the Actions of Eugenic Scientists Often Stem from Inappropriate Rather than Appropriate Values?**

It is when switching from the beliefs of eugenic scientists to their actions that their mistakes are most clear and egregious according to the new view of science and values. That view says such actions should be based not only on well-supported scientific beliefs, but also on appropriate value judgments. But eugenic scientists often appealed instead to *inappropriate* value judgments, and this had bad consequences. Often the inappropriate value judgments were well intentioned, but inappropriate nonetheless, and sometimes wildly so. There is evidence that compassion-based values motivated Dr. Clarke's act to clinically recommend that patients with intelligence test scores under 70 be prevented from reproducing. While in the asylum system

he is said to have “worked constantly to improve the conditions of patients,” as he developed “an authentic fondness for the mentally ill,” and morally “abhorred the stigma they traditionally bore” (Dowbiggin 2005). But in retrospect many of us are appalled at *how* his compassion manifested when motivating his clinical recommendation, which would have had thousands of people sterilized against their will, simply for scoring low on an intelligence test.

## Beyond The Newer View of Science and Values, in The Eugenic Future

So perhaps it seems the newer view of science and values can explain how eugenics went wrong. But there are important limitations to this view.

A first limitation is that its advice to maximize objectivity when forming scientific beliefs overlooks the fact that many of the *concepts* those beliefs are about are unavoidably infused with value from the start. The concept of *intelligence* is like this. When hypothesizing about whether a test validly tracks hereditary intelligence, we imply some meaning of the concept “intelligence”. And our values often help determine that meaning – values help determine the content of many scientific concepts, even when their definitions are stated very exactly and numerically. If we bring this out into the open more explicitly than the newer view of science and values does, we can increase the chance of appealing to appropriate rather than inappropriate values when determining what concepts our hypotheses are about.

Such concerns will be increasingly important in the future, as the concept of intelligence continues to loom large. Eugenics has not so much ended as changed, e.g., into bottom-up *laissez-faire* eugenics that results from well-intentioned prospective parents using private companies to genetically screen embryos produced by *in vitro* fertilization (Kitcher 1997). Some ethicists are already recommending that when a prospective parent is choosing which embryo to implant, she typically has a significant moral reason to select *against* any

embryos that genetic screening tells us will probably have *lower* intelligence than the others (e.g., Savulescu 2001). Following such advice shapes human populations in ways similar to Dr. Clarke's advice to prevent people with low scores on intelligence tests from reproducing. We need to scrutinize the values that are shaping the concepts of intelligence (and related things) that these sorts of advice so dearly favor.

A second limitation is that our methods for settling and justifying scientific beliefs are often necessarily more infused with value than the urge for their objectivity allows. The content of evidence claims often depends on various background assumptions that rest on value judgments (Longino 1990). And it is difficult for logic alone to specify which of the many types and *degrees* of evidence is sufficient to objectively support belief in a particular hypothesis. Consequently, authors have argued we should appeal to appropriate values to help decide which degrees of evidence suffice in which cases (Douglas 2009). So even if evidence starts to favor the hypothesis that a test validly tracks intelligence, the moral and political gravity surrounding intelligence tests in the context of reproductive technologies gives value-based reasons to demand a higher degree of evidence than would suffice in scenarios of less gravity.

A final limitation of the newer view of science and values moves us from belief to action. Here the problem is a historical one of emphasis in the philosophy of science and values. There has been much good emphasis on detailing the nature of evidence and logic in science, but comparatively much less emphasis on how these fundamental views should be integrated with more applied contexts of action—with decision-making, policy development, and the unavoidable roles for values.

One result has been that more applied views about how to best organize and fund science, so that it more routinely involves appropriate values and meets human needs, have not yet achieved the rigour that the fundamental views about evidence and logic enjoy when isolated from their important applied implications. But researchers are slowly remedying this (e.g., Kitcher 1997, 2001), seeing that a rigorous integration of

both fundamental and applied views on science and values can help guard against new forms of eugenics that threaten.

**Matthew J. Barker**

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