Redefining Objectivity

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Science is constantly striving for objectivity. It is one of the foundational elements of scientific hypotheses and theories alike: for a hypothesis to be substantiated or a theory to become accepted, objectivity is key. And yet, our very notion of objectivity is fundamentally flawed: objectivity may not be truly possible while humans are the conduits of scientific understanding. Only by accepting this limitation can we seek to find effective opposition to null our innate biases. In this paper I will explore the ways feminist epistemologies can help achieve a more descriptive objectivity, articulate the objections and motivations of the existing scientific community, and show how the vested interests of the current hierarchical scientific structure impact scientific direction and findings.

Thomas Kuhn's theory of a normal science hinges on the idea of scientific paradigms. These paradigms are a packaged "way of doing science, in some particular field" (Godfrey-Smith, 76). Through this, we understand Kuhn's paradigms to be spatiotemporally located within a particular field at a particular time and to contain the agreed upon "claims about the world, methods for gathering and analyzing data, and habits of scientific thoughts and action" (Godfrey-Smith, 77). Paradigms then function as a rulebook for individual action within a historically located group that is performing science.

Feminist standpoint theory is a radical feminist epistemology that places the situatedness of a scientist as integral to the object of their study. This framework acknowledges that biases are inherent to science because of the individuals performing science. Feminist standpoint theory names spaces where bias infiltrates or outlook is imperative to the object of study — such as in initial theory construction, which directs and dictates which questions are asked, and is a mechanism that has remained historically unchecked. Sandra Harding remarks, "this part of the

scientific process is thought to be unexaminable within science by rational methods" (Harding, 245). Thus, initiation into a scientific community is in itself an introductory bias that insuperably skews the content of science as a whole. Through recognition of unavoidable biases, feminist philosophies of science produce a revolutionary everyday method of scientific practice.

As Kathleen Okruhlik points toward in *Gender and the Biological Sciences*, many factors produce bias from within the established scientific community. Differences in culture, status, or gender "may influence decisions about which questions get asked, which data must be accounted for and which can safely be ignored, as well as which interpretation among those that are empirically adequate is actually adopted" (26). Those in power control the power: the scientific community is inherently biased simply because it has an exclusive and hierarchal membership. Even those producing the normal science — which Kuhn paints to be inherently methodic and objective — are influencing its outcome, whether that result is revolutionary or not.

These types of systemic biases can only be addressed at the community level. But "so long as [these biases] are embedded within an outmoded and indefensible conception of the scientific process that limits the influence of social factors", this objection fails to see alternative environments for revolutions in science by overlooking those homogenous principles and principals who are producing and driving such a normal science (Okruhlik, 42). Feminist standpoint theory embraces the who and the where, shoring up once-invisible possibilities in scientific practice through this allowance and potentially creating a more realistic view of objectivity.

While subscribers to feminist standpoint theory see the inherent flaws with our current definition of objectivity, many members of the established scientific community would argue that everyday science is already being performed with a high degree of neutral objectivity.

Thomas Kuhn's work in *Scientific Revolutions* describes a normal science where a collective commitment to a clearly defined, traditional, and institutional practice builds our presumed objective body of scientific knowledge. Kuhn would insist that the majority of what constitutes our scientific body of knowledge is produced by such an unquestioning, normal science. However, this normal, foundational science does not question our idea of objectivity but arguably seeks to endorse an assumption of questionable objectivity in the scientific method only to build scientific content that then reconstitutes such assumptions, insulating any bias from criticism.

Unfortunately, this insulation from criticism is now a marked attribute of our current understanding of science. Describing the arrangement of a scientific paradigm in *Logic of Discovery or Psychology of Research?,* Kuhn states, "it is precisely the abandonment of critical discourse that marks the transition to a science. Once a field has made that transition; critical discourse recurs only at moments of crisis when the bases of the field are again in jeopardy. Only when they must choose between competing theories, do scientists behave like philosophers" (6-7). Therefore, normal science operates on specific and set standards of criteria based on a given theory.

Historically science is an accumulated process, building off of the antecedent theoretical knowledge presented and established. However, Paul Feyerabend acknowledges, "standards compete just as theories compete and we choose the standards most appropriate to the historical situation in which the choice occurs" (Feyerabend[1], 58). Scientific paradigms can be considered a protected class, guiding the day-to-day operations of Kuhn's normal science until a competing theory erupts causing a revolution in paradigms. Though it is important to note, "observational reports, experimental results, 'factual' statements, either *contain* theoretical assumptions or

assert them by the manner in which they are used" (Feyerabend[2], 31). These latent assumptions "shape our view of the world without being accessible to a direct criticism" (Feyerabend[2], 31).

As Karl Popper acknowledges in *Normal Science and its Dangers*, "we approach everything in the light of a preconceived theory" (52). So while these objectors would insist that normal, everyday science is and will continue to be performed without bias, there is a growing body of evidence that highlights the historical exclusion of minority racial, gendered, and sexually oriented individuals, a practice which reifies an inherently racist, sexist, and heteronormative body of science.

As feminist epistemologist Kathleen Okruhlik poses, "the rationality of the scientific community is just individual rationality writ large" (40). So while scientific history has been dominated by sexist and androcentric assumptions, "objectivity has not been operationalized in such a way that scientific method can detect [them]" (Harding, 238). Sandra Harding, through her work in *Rethinking Standpoint Epistemology*, notes that since scientists and scientific institutions are historically located they "can produce claims that will be regarded as objectively valid without having to examine critically their own historical commitments from which... they actively construct their scientific research" (246). The flaw with this objection is that the institution as it stands is historically situated to continue affirming its' biases, but they assert that science-as-usual will produce unbiased results. Thus the science of these institutions is problematic and deserving of more scrutiny than is currently tolerated.

The historical standing of individual scientific institutions is not the only major bias present in our current understanding of objectivity. The institution of science itself chooses to invite or omit individuals. This exclusive membership has its biases. As Sandra Harding recognizes, "this theory of knowledge refuses to fully address the limitations of the dominant

conceptions of method and explanation and the ways the conceptions constrain and distort results of research and thought about this research even when these dominant conceptions are most rigorously respected" as they would be within a currently accepted paradigm (239). Despite the existing scientific community's deep commitment to objectivity, when we accept these practices on faith we fail to imagine a new, more accurate sense of objectivity.

In addition to addressing the questions of standpoint and the research subject's imported worldview as integral to the object of scientific study, one must also consider credibility when scrutinizing objectivity. As Robert Merton advocates, the scientific community is motivated and rewarded by personal recognition and publication. David Hull agrees, noting that personal recognition is further granted through the use of ones' scientific contributions in future work. Because personal recognition is the main driving factor for scientists, one "must be concerned with causes of belief *rather than* with whatever evidencing reasons there may be for cherishing them" (Barnes & Bloor, 28). In *Relativism, Rationalism, and the Sociology of Knowledge,* Barry Barnes and David Bloor explore the idea of credibility by introducing their theory of an equivalence postulate, wherein "all beliefs are on par with one another with respect to the causes of their credibility" (23). Barnes and Bloor are concerned with seeking out local causes of credibility through the process of examining and evaluating research and results for any sources of conflicted interest. How does a scientist or scientific community stand to benefit from these results? Does the subject at hand "have a role in furthering shared goals, whether political or technical or both?" (Barnes & Bloor, 23).

Kathleen Okruhlik demonstrates many cases of vested interest within the biological sciences. Philosophy has historically positioned men as intelligent, dominating and manipulating nature (traditionally considered feminine) through more formalized studies. This concept of men

as more fully human is carried into conceptions of natural events, because it is seen as a natural kind. Okruhlik delivers the example of conception, where the existing narrative insists that the female gamete waits passively for the male sperm to take action to fertilize it. However, in 1895 it was discovered that "instead, the egg directs the growth of small, finger-like projections of the cell surface to *clasp* the sperm and slowly draw it in" (23). This observation remains a highly contested theory, which illustrates "how preexisting theoretical assumptions inform which questions we ask, which hypotheses we investigate, and which data we decide to ignore as evidentially insignificant" (23). This example explores how our decisions are clouded by conceptions of sex and gender, and transfers these ideas onto our supposedly empirical results. By accepting the androcentric tendentious explanation, we fail to acknowledge that "science knows no 'bare facts' at all but that the 'facts' that enter our knowledge are already viewed in a certain way and are, therefore, essentially ideational" (Feyerabend[2], 19).

Merton's descriptive philosophy of the driving motivation of science as personal reward, combined with the feminist epistemological idea that scientists are personally situated in specific, often-hierarchical cultures (and thus import their standpoints into the packaged paradigms of Kuhn's normal science), it may follow that objectivity is best criticized through Barnes and Bloor's idea of local credibility. By adopting this view, "the controverted question is not whether some data are evidentially significant at all, but which interpretation should be placed upon the same data" (Okruhlik, 24).

Because we have not yet removed the human element from empirical science, feminist epistemologies direct us to acknowledge it fully in our philosophy of science. This must inform our first defining alternate concepts of potential objectivity; in addition to imagining what a proxy objectivity might truly endeavor. Only when our normal science understands a more

accurate descriptive objectivity can it truly contribute progressively to our scientific body of knowledge.