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Rejecting the Strong Program's Equivalency Postulate with Regard to Empirical Objectivity

Present the arguments which, in your view, best support the claim that the influence of ‘the social’ is ineliminable in science. Can these arguments be answered, and if so, how? If not, can science still be deemed objective and rational?

Barnes and Bloor present a sophisticatedly nuanced understanding of the role of “the social” in science. The usual issues a scientist takes with a sociological approach like their own—the elimination of validity, the denial of an objective world—Barnes and Bloor do not embrace. Rather, essential to their view is the idea that we all share an objective reality and there *are* standards for validity—some claims are true, while others are false. Their version of relativism is much more modest, yet absolutely problematic. They claim that “all beliefs are on par with one another with respect to their credibility” (23). It follows that a belief cannot be evaluated objectively, but must be analyzed with respect to its social locus. This essential element of their “Strong Program” is called the “equivalency postulate,” (25) and it will be the object of interest in this paper.

I will discuss Barnes and Bloor’s two most important arguments for their equivalence postulate: (1) the Linguistic Argument and (2) the Logical Argument. Argument 1 attempts to show that because translation is impossible, scientific claims are incommensurable. Argument 2 attempts to show that, because methods of logical inference cannot be *a priori* justified, methods of inference are also relative. From this it follows that scientific claims must only be evaluated in their social context. I will defuse both of these arguments and conclude that the sociological

context of scientific claims is useful for describing a map of those claims to objective entities in the empirical world, and from this objective foundation we can establish universal rules of inference grounded in empirical observation. Thus each scientific claims refers to an empirically objective entity, and each claim must be evaluated by the same methods of inference.

Throughout this paper I will describe an *empirical* or *objective reality*. I use the terms “objective” and “reality” without metaphysical significance; I do not mean to make a claim about the fundamental reality of these scientific terms—that is for a different paper. I use these terms rather to describe a universally shared epistemic foundation for empirical observation in science. This is an important point in my paper, for I hold that the only *a priori* concepts in science are empirical observation, whereas Barnes and Bloor hold that social presuppositions must be taken *a priori* in scientific research.

Part 1: The Linguistic Argument

I will argue a more nuanced version of Barnes and Bloor’s sociological causality thesis. I agree that all scientific claims are socially located. Further, I agree that this social locus is responsible for the types of questions asked, and the types of questions asked are responsible for the terms that arise under a certain research program (or paradigm, if you are a Kuhnian). I argue, however, that this does not imply the relativism that is fundamental to Barnes and Bloor’s Strong Program. Rather, social causality can be reconciled with an objectivist, empiricist epistemology. Consequently, there is a universal epistemic foundation shared across scientific research programs, and scientific claims do not have to be evaluated from different bases according to their social context.

All scientific practices must hold as their foundation *observable entities*. We all share this same reality from which we draw our empirical observations. But Barnes and Bloor do not deny this claim. They accept that we all “share the same unverbalized environment” (40). However, they respond that there “are any number of equally reasonable ways of speaking it” (40). I deny this claim. Any different ways of speaking about reality that are equally reasonable are in fact not different at all.

Barnes and Bloor’s Linguistic Argument goes as follows: Concepts are arrays of judgments of sameness. Arrays are a unique sequence of judgments. Each array (concept) is unique, so it cannot be directly communicated in another language. Therefore translation is impossible. Therefore there are many equally reasonable ways of describing the natural world (Barnes and Bloor 39-40).

Another way to think about this is as concepts being *sets* of judgments or observational terms. The *elements* of the set (the judgments that compose a concept) in one language cannot be mapped one-to-one to the judgments in the same concept in another language. I hold that if the judgments (or terms) cannot be mapped one-to-one, then, rather than presenting a conflict, the terms are not equivalent.

This argument is directly related to Ian Hacking’s “contingency” sticking point. Hacking’s social constructionist believes that science could have developed in a number of equally successful ways (Hacking 32-33), whereas the typical objectivist believes that science had to converge in the way it did. This is the crux of the contingency sticking point, and almost identical to Barnes and Bloor’s claim that “there are any number of ways of speaking of” our shared reality (40). On this point I disagree with the typical realist, and somewhat agree with Barnes and Bloor. I argue that the convergence of science is contingent upon the prevailing

research program, because this program is responsible for defining the questions/patterns of interest in research, which in turn define the terms. However, this does not deny the objectivism of science. Terms all pick out entities from the observable world shared by all languages and research programs. Because of this top-down approach (from research program to defining terms), it is highly unlikely that different research programs will arrive at exactly equal terms. But this does not mean that different programs arrive at different realities, for their terms pick out different sets of entities. These different research programs are equally valid, but the difference in terms creates an apparent conflict that can easily be resolved.

There are two problems with the Barnes and Bloor argument: The first is that it presupposes that our ways of speaking science are fundamental to its practice. This is, in my view, naïve, for there are terms in science which can be expressed in objective (specifically, mathematical) language by which speech or any picking out of empirical terms is unnecessary. If one takes seriously a reductionist view, then as science progresses it will become steadily more mathematical, and thus less dependent on language. The limits of science approach the point at which no language is necessary for it to be communicated.

However, this reductionist view is controversial in its own way and merits its own discussion. So, let us presuppose that language is fundamental to scientific practice. Then Barnes and Bloor's argument has a second problem: They suppose that similar scientific terms in different languages must be “judgments of sameness” (39). From here they draw a false dichotomy: that the sets described in different languages must either be the same, or they present a conflict. If the terms are in conflict but both accurately describe the world, the logical consequence is relativism.

Terms that describe sets that do not directly correspond are not in conflict, nor are they failed attempts to describe the same thing in different languages; rather, they are intentional attempts to describe and look for patterns in objectively different sets, each with their own merit. Their “rational bridgehead” (Barnes and Bloor 39) is that terms in both languages pick out real items. Thus the effort in ideal translation should not be drawing an equivalence of terms, but of mapping the terms (and corresponding sets) of each language to their corresponding empirical reality.

Unlike Barnes and Bloor, I do not hold that there are equally reasonable ways of speaking about the natural world. Rather, there is one reasonable way of speaking about the world, but different research programs choose to only focus on specific parts of the world. If a pattern is observed in a term in one language that has not yet been observed in another language, then it is likely because that precise term has not been identified in the latter language yet. In fact, it is *highly unlikely* that any two terms will pick out identical sets in different languages. The pattern is just as real in both linguistic environments, and any apparent conflict is simply a failure to yet map the pattern according to its proper set in the empirical reality.

It should be noted that, in practice, it is not in our best interest to create terms for infinitely many sets. In reality, only some sets create patterns. If we are studying mass, for example, a group of protons demonstrate a consistent pattern (equal mass) while a mixture of electrons and protons do not. The scientific research program most often dictates the patterns that are of interest, and terms are defined according to those patterns of interest. Thus, the terms that are created are contingent upon the prevailing program of the time, but this does not mean that they are incommensurable with the terms of another program or another language.

We thus demonstrate that a linguistic argument is not sufficient to do away with a universal empirical reality that all of science shares. However, Barnes and Bloor do offer another problematic argument: that the methods of rationality and inference are also relative. Whereas their former argument I called the “Linguistic Argument,” I remind the reader that I will call this the “Logical Argument.”

Part 2: The Logical Argument

It is not necessary to recreate their argument in full, because the authors spend much time rebutting counterarguments to their original argument, and I do not find it necessary to even consider these counterarguments. Barnes and Bloor show that deduction, like induction, must rely on its own methods of inference to prove itself; we cannot prove deduction without deduction. They show this well and I do not deny this claim.

However, Barnes and Bloor are searching for *a priori* justifications for inference systems in the wrong place. Perhaps the question of whether there exists some fundamental justification for logical inference is of more interest to the mathematician. I maintain that the scientist’s greatest foundation is the empirical world. We have shown that the empirical world is sufficient to explain a universal reality, but I claim now that it is also sufficient to explain a universal system of inference.

I will here adopt a Popperian view of logical inference, because it best mirrors the logical structure of the natural world and is removed from sociological functions. Deduction is evident in the natural world as we have empirically observed it. Our empirical world has, without fail, demonstrated a causal nature that gives deduction the power of confirmation. It has further demonstrated that induction is a probabilistic estimate that does not have confirmation power; it

is instead corroboration. Deduction and induction should thus be treated in science as they are evidenced in the natural world, for this empirical observation is the foundation of science.

Note that these are certainly methodological biases—assuming a causal structure of nature. However, these biases are rooted in the empirical world, which is universal. These assumptions are shared and must be shared for science to be successful. Without appeal to the natural world for both a notion of reality and methods of inference, science loses foundation and purpose.

From this proof that both reality (source of empirical evidence) and inference methods are universal to all scientific claims, it follows that all scientific claims should be evaluated in the same way, irrespective of their sociological locus. This locus should rather be used as a map to translate the scientific claims from their sociological context to empirical reality. Having established a universal language for these claims, they should be evaluated according to the universal inference methods established by the natural world.

Conclusion: Why This Matters

Though it is not central to my thesis, I feel it necessary to detail the particular reasons why Barnes and Bloor's Strong Program, and the social constructionism and relativism it posits, are dangerous.

Social constructionism (and the resulting relativism) allows for others to illogically insert their own narrative into scientific practice, effectively diagnosing their opponent in a way that is un-Popperian. This is because the social constructionism thesis presupposes that a theory has an *extra-theoretical* function (Hacking 20), which necessarily assumes an architect behind that function. This architect is the creator of the scientific theory or program. Because the social

constructionism thesis also presupposes that the social construction is perceived as inevitable, but is not truly inevitable (Hacking 12), it implies that the architects behind the program will be, by definition, unaware of its construction, further diagnosing their opponent in a way that is un-Popperian. The social constructionism thesis, largely represented by Barnes and Bloor, gives justification to any individual claiming that a school of thought, a research program, or a scientific term is founded in nothing but a sociological power struggle, and they need not evidence to prove this point.

Works Cited

- Barnes, Barry, and David Bloor. "Relativism, Rationalism and the Sociology of Knowledge." *Rationality and Relativism*, by Martin Hollis, MIT Press, 1997, pp. 21–47.
- Hacking, Ian. *The Social Construction of What*. Harvard University Press, 1999.