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Social constructivism and the aims of science

Abstract: In this essay, I provide normative guidelines for developing a philosophically interesting and plausible version of social constructivism as a philosophy of science, wherein science aims for social-epistemic values rather than for truth or empirical adequacy. This view is more plausible than the more radical constructivist claim that scientific facts are constructed. It is also more interesting than the modest constructivist claim that representations of such facts emerge in social contexts, as it provides a genuine rival to the scientific axiologies of scientific realists and constructive empiricists. I further contrast my view with positions holding that the aims of science are context-dependent, that the unit of normative analysis is the scientific community, and that the aims of science are non-epistemic social values.

Introduction

Among philosophers, it has become somewhat fashionable to dismiss various

statements of social constructivism as incoherent, vague, or uninteresting[1]. In this paper,

I seek to lay down the ground rules for providing a plausible, precise, and substantive

account of social constructivism. More specifically I shall argue that a proper account of

social constructivism should specify a set of social conditions constituting a universal

and fundamental aim for science, such that a scientific practice is successful just in case

it advances science towards those social conditions.

To establish this claim, §1 argues that a philosophically significant social

constructivist position must provide social explanations of science that plausibly conflict

with the range of positions in the scientific realism debate. §2 then indicates how

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[1] Cf. (Boghossian 2006; Goldman 1999; Kukla 2000; Mallon 2007) for some representative statements to this effect.

providing social explanations about the success of various scientific practices best meets this desideratum. §3 then fills out some of the details of these constructivist explanations, arguing that the specification of social conditions to which science aims provides the most plausible and philosophically interesting social explanations about what counts as a scientific success, while §4 claims that other plausible social explanations of scientific success cannot, by themselves, provide philosophically significant renderings of social constructivism. Taken in sum, these arguments indicate that social constructivism should be understood as a position explaining scientific success in terms of universal social conditions to which science aims.

Before I proceed, I must stress that it is not my goal to interpret what other social constructivists have intended with their positions, but rather to state what social constructivism *should* be. For the most part, I agree with my philosophical colleagues that these positions are flawed. Furthermore, although §5 discusses possible variants of a fully developed social constructivist account, this is not my chief objective. Instead, my investigation is at a higher level of abstraction, in that it seeks to uncover some of the parameters that such a developed view ought to respect. If one likes: mine is a metaphilosophical reflection on social constructivism.

1. Background

Social constructivism is a position endorsed largely by historians, anthropologists, and sociologists of science. While its meaning varies according the theorist touting it, it is

generally agreed that social constructivists hold that things we typically take for granted,

e.g. the objectivity of scientific facts, are actually products of contingent social processes.

Some representative statements of constructivism (Latour and Woolgar 1986;

Pickering 1984) have faced scathing philosophical criticisms (Boghossian 2006; Kukla

2000; Roth and Barrett 1990)[2]. Insofar as there is a general recipe for philosophical

critiques of constructivism, it seems that constructivism can assume either a strong

doctrine or a weak doctrine, and neither appears philosophically compelling.

On the first reading of constructivism, the philosopher takes the really

interesting constructivist thesis to be that *facts* are constructed. Call this *strong*

constructivism. The strong constructivist holds that a scientific fact's being true or false

hinges on the social conditions under which it was established as a fact, e.g. the social

practices in the laboratories that isolated a relevant phenomenon, the social practices

involved in the classification and explanation of that phenomenon, the organization of

the scientific community in and throughout which information about various claims is

conveyed and circulated, etc. Perhaps its most (in)famous statement is Latour and

Woolgar's (1986: 182) remark that the 'out-there-ness' or objectivity of a scientific fact

'is the *consequence* of scientific work rather than its *cause'.* Thus, strong constructivism

is committed to rather startling claims, e.g. were the scientific community and its social

practices different, then quarks would not have existed.

Strong constructivism should not be confused with the *weak constructivist* thesis

that, were our scientific practices different, we would not *think* that quarks exist. A

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[2] I treat sociologists of scientific knowledge, such as Bloor, Barnes, and Shapin, as outside of the constructivist camp.

majority of human history supports that claim full well. Philosophical critics acknowledge the truth of weak constructivism, but rightly think it philosophically uninteresting. In calling this *philosophically* uninteresting, I hope to intimate that such works are interesting for other reasons, e.g. because they give us a richer historical understanding how we came to accept the quark model.

Undoubtedly, there are many more details one could add to the sophisticated philosophical critiques of constructivism. But I think the typical philosophical reader can already anticipate their upshot: strong constructivism is an indefensible doctrine, and weak constructivism is trivial. So what's left of social constructivism?

For those sympathetic to social constructivism, some middle path between strong and weak constructivism is possible[3]. Fine and good, but I want to dwell for a moment on *how* we would decide on such a position. In particular, I am interested in two questions. How would we know when our modifications disqualify such moderate positions from being social constructivist positions? And what counts as an 'interesting' modification to weak constructivism?

Turning to our first question, I assume that a social constructivist position must invoke social explanations. While some social constructivists have rather exotic views about explanation, e.g. (Latour 1988), many appear committed to counterfactual dependence being a necessary feature of such explanations. Indeed, the cursory discussions of weak and strong constructivism both intimate commitment to a certain kind of *social counterfactual* claim, namely:

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[3] (Hacking 1999; Longino 2002; Rouse 2002) all can be read in this light. Extensive comparison of these views exceeds the scope of this paper.

(SC) Were the social conditions *X* different, *Y* would be different.

For the strong constructivist it is the *fact* that, e.g. quarks exist, that counterfactually depends on the social conditions; for the weak constructivist, the (widespread) *belief* that quarks exist. Thus, commitment to some instantiation of (SC) is necessary for social constructivism[4].

Turning to our second question about what constitutes an *interesting* version of social constructivism, things are more up for grabs, since no great measure of philosophical intrigue exists. Nevertheless, a plausible rationale for weak constructivism's being uninteresting might be that if constructivism advances a new philosophical thesis anywhere, it should be in the scientific realism debate; yet weak constructivism is compatible with both scientific realism and other forms of scientific antirealism[5]. With this in mind, I assume that some 'rivalry condition' is sufficient for philosophical intrigue: i.e. an interesting constructivist position must conflict with most philosophical positions in the scientific realism debate, particularly the canonical ones. Of course, it must also satisfy some 'plausibility' condition, which strong constructivism has, in most philosophical estimates, been shown to fail.

2. Social constructivism as an axiological doctrine

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[4] Hacking's (1999) requirement that constructivists about *X* hold that *X* could have been otherwise intimates the same ethos. By itself, however, this would not make *X socially* constructed. Cf. (Kukla 2000; Nelson 1994) for appeals to similar counterfactuals.

[5] To that end, Kukla (2000: Ch.9) argues that social constructivism is a vaguer or 'blurrier' variant of van Fraassen's constructive empiricism, and then intimates that when the former's details are articulated, it will seem unoriginal in light of the latter.

Taken in sum, a variant of social constructivism is an interesting position just in case the social counterfactuals to which it is committed conflict in some plausible way with most versions of realism and antirealism. Of course, there are many positions in this debate[6], but more to the point, these different positions do not all address a common question. At least four questions concern the scientific realism debate:

- *Semantics*: Should scientific theories be interpreted literally, or is their real meaning reducible to something else, e.g. empirical claims?

- *Metaphysics*: Is there a mind-independent world that is roughly as science describes it?

- *Epistemology*: Are we justified in believing that the world is roughly as science describes it?

- *Axiology*: Is the aim of science to discover true theories?

Both contemporary realists and antirealists widely agree that the semantics question is settled; theories mean what they say. Of the remaining questions, I know of no metaphysical realists who are not epistemological realists. It would be strange to claim that the world is as science describes it, but to claim that we have no reason to believe so. Presumably the realist thinks that science gives us such reasons!

Similarly, all epistemological realists appear to be axiological realists. While it is conceivable that science aims for something other than truth but that we nevertheless

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[6] Brief disclaimer: there are forms of realism that would replace the aim of providing true theories with another aim, e.g., using entities posited by science to intervene on new parts of nature (Hacking 1983); discovering concepts that refer to real entities (Kitcher 2001) or theoretical structures (Worrall 1989); or providing ideal explanations (Ellis 1985). Rather than surveying every conceivable axiology, I will simply acknowledge that constructivists must be mindful of these other positions as well, but will treat the standard realist and constructive empiricist positions as stand-ins for these other positions.

have good reasons to believe that science discovers truths, this appears to make

epistemological realism a happy accident (dare I say a miracle?). Presumably, realists

think science's discovery of truths is not so haphazard. Thus, realists hold either that

truth is instrumental to some deeper, more fundamental good, or that truth is

intrinsically good. In either case, science must aim for truth, and this is exactly what

axiological realism demands.

Significantly, however, the relationships between metaphysical, epistemological,

and axiological realisms are asymmetrical. There are philosophers who claim that we

can aim for true theories even if we lack sufficient justification to believe that we've

reached that aim (Lyons 2005; Popper 1983; Rescher 1987) and still others who claim

that we can be *justified in believing* we've reached that aim even if we never *actually*

reach that aim (Ellis 1985; Wright 1992).

This cursory classification suggests that any species of realism requires

axiological realism. This makes it an attractive target for constructivists seeking to meet

the rivalry condition. I will follow van Fraassen in taking the following as a minimal

statement of (axiological) realism:

Science aims to give us, in its theories, a literally true story of what the world is

like; and acceptance of a scientific theory involves the belief that it is true. (van

Fraassen 1980: 8)

Van Fraassen provides two further important ideas about scientific axiology. First, he

asserts that 'the aim … determines what counts as success in the enterprise as such'

(van Fraassen 1980: 8). Second, he distinguishes the aim of science from individual

scientists' motives. Advancing a theory may be done for any number of personal

motives (recognition, money, etc.), but its fulfilment of these motives does not qualify it

as a scientific success. The main point is that all of these motives could be absent and

the theory would still count as a success if it satisfied the aim. For instance, the aim of

basketball is to score more points than the other team. So sinking a jump shot is a

successful activity in basketball because it promotes this aim, even if many players are

motivated to sink jump shots to receive lucrative contract offers, woo fans, etc.

Analogously, scientists may be motivated by all sorts of things, but if the realist is

correct, so long as their experiments, models, inferences, etc. further the aim of

discovering true theories, then those activities are successful.

    With these considerations in mind, I propose the following definition of scientific

axiology:

    (DSA) p is a success in science if and only if p furthers science's aim.

I will assume that p furthers science's aim if p is either a good reason to believe that

science is getting closer to its aim or an effective means by which science can reach its

aim. Typically, p describes a theory's empirical success. For example, a theory's

providing a novel prediction is a reason to believe it to be true, and, as our definition

suggests, we consider novel predictions to be scientific successes. For ease of locution, I

will call the values that p can assume successful scientific *practices*.

    As stated, it is natural to interpret (DSA) as a logical claim about practices, aims,

and scientific success. However, I share the growing sentiment that such axiological

claims should be construed naturalistically and thus as empirical claims[7]. As a result,

realism should be understood as entailing the following *realist counterfactual*:

> (RC) Were *p* not to further the aim of providing true theories, then *p* would not
>
> count as a scientific success.

Analogously, van Fraassen's antirealist alternative, constructive empiricism, offers the

following *empiricist counterfactual* as an alternative:

> (EC) Were *p* not to further the aim of providing empirically adequate theories,
>
> then *p* would not count as a scientific success.

Here, 'a theory is empirically adequate exactly if what it says about the observable

things and events in the world is true' (van Fraassen 1980, 12). The two counterfactuals

will conflict whenever one lacks reason to believe that a theory is true but has reason to

believe it empirically adequate, i.e. whenever one lacks good reason to believe the

theory's statements about unobservable things are true, but has good reason to believe

that all of its statements about observable things are true.

By analogy, we might think that (SC) should be modified to read: were social

conditions *X* different, then *p* would not count as a scientific success. However, this

won't work, since such a statement works most comfortably as a descriptive claim,

whereas both realism and empiricism are best understood as normative positions. As a

result, it will fail either the rivalry or the plausibility condition. For instance, imagine a

powerful religious leader who believes that only superstitious practices should count as

scientific successes, and who executes all dissenters. It might well be the case that, in

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[7] Cf. (Fuller 1988; Laudan 1984, 1987; Lyons 2005; Sankey 2004). While not addressing the scientific realism debate per se, (Kornblith 2002) offers another pro-naturalistic view towards epistemic axiology.

this community, the superstitious practices count as scientific successes, and

furthermore, that the despot's oppressive policies trump any good reasons to believe in

the truth or empirical adequacy of a theory.

Both the realist and the empiricist would presumably claim that because the

despot's practices do not satisfy their preferred aims, those practices should not count

as scientific successes (full stop), even if they countenance that such practices should

count as scientific successes *for the despot and his subjects*. Constructivists agreeing

with this conclusion must devise some alternative reason for why the despot's practices

are unsuccessful or else they must accept the realist or the empiricist's arguments for

this conclusion. In the latter case, they fail to satisfy the rivalry condition. On the other

hand, constructivists holding that the despot's tactics are consistent with the

superstitions' counting as scientific successes (full stop) satisfy the rivalry condition, but

would seem hard-pressed to satisfy the plausibility condition. If anything should not

count as a scientific success, it would appear to be superstitions that people are coerced

into accepting.

Thus, if social constructivism is to satisfy the rivalry and plausibility conditions, it

must be a normative doctrine, and we must have some test of a practice's counting as a

scientific success that is largely independent of one's preferred axiology. I suggest that

the best test we have is whether that practice would count as successful *according to*

the norms of the best available science[8]. Indeed, since we have no sense of the norms of

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[8] Cf. Laudan (1984) for a similar argument, which he has used most prominently in 'the pessimistic induction' (Laudan 1981) in which our best current science is the standard by which we judge the approximate truth of past theories.

the best *un*available science, this constraint seems indispensable to our notion of a

scientific success. Thus, we should modify our *constructivist counterfactual* accordingly:

> (CC) Were social conditions *X* different, then, holding the norms of the best
>
> available science fixed, *p* would not count as a scientific success.

This would block the despot counterexample since by our best available science,

superstitious practices do not count as scientific successes. (Note: the realist and

empiricist counterfactuals should be similarly modified.)

By analogy with the constructive empiricist's treatment of the realist's

counterfactual, we have a relatively clear understanding about when this claim will

conflict with realism and constructive empiricism, namely:

> (CC.1) Even if *p* furthered either the aim of providing true theories or that of
>
> providing empirically adequate theories, so long as the social conditions *X* were
>
> different, then, holding the norms of the best available science fixed, *p* would
>
> not count as a scientific success.
>
> (CC.2) If social conditions *X* were the same and *p* furthered neither the aim of
>
> providing true theories nor the aim of providing empirically adequate theories,
>
> then, holding the norms of the best available science fixed, *p* would still count as
>
> a scientific success.

Let me illustrate the significance of these claims with a brief example. By our best

available science, Einstein's novel prediction of the Eddington results is a success. The

realist explains this success on the grounds that it provides good reason to believe that

relativity theory is true; the empiricist, to believe that it is empirically adequate. Let us

suppose, for the sake of this argument, that the social conditions *X* in question involve

consensus-formation. (CC.1) says that if the consensus on relativity theory were formed

in a different manner, then the prediction's furthering the aims of truth and/or

empirical adequacy would be insufficient to make it a success. (CC.2) says that even if

this prediction were not a good reason to believe that relativity theory is true or that it

is empirically adequate, the means by which consensus on relativity theory formed

would be sufficient to make the prediction a success.

Importantly, these claims only concern whether or not a practice would *count* as

a success; not whether or not it would *succeed.* The constructivist can grant that many

(indeed, perhaps any) social conditions are compatible with relativity theory predicting

exactly what it does. However, not all social conditions (namely those that fail to satisfy

our currently-mysterious social conditions *X*) will permit these predictions to *count* as

successes. In other words, there are social conditions wherein relativity theory's

predicting the Eddington results would be normatively insignificant.

Of course, there is still much more to be said about how we define the social

conditions that determine a scientific success, but a brief progress report is in order.

Specifically, the combination of (CC.1) and (CC.2) clearly satisfies the rivalry condition,

but furthermore it entails neither strong nor weak constructivism. In a nutshell, it states

that there are social conditions that are more invariant determinants of scientific

success than justifications for either realist or empiricist beliefs towards a theory. This

statement is consistent with the claim that facts stand independently of those social

conditions, and thus with a denial of strong constructivism. Furthermore, while I do not

deny weak constructivism, the position sketched here does not entail it. For instance, it

is consistent with a scenario in which the success of our practices has social

determinants, while our beliefs about those practices do not. More plausibly, this view

suggests that our beliefs' social origins are only philosophically interesting insofar as

they explain why certain practices count as scientific successes.

3. Social axiology

Thus far, I've claimed that a proper account of social constructivism should appeal to

social conditions in explaining why a scientific practice counts as a success. Furthermore,

to be interesting, it must conflict with realism and empiricism. Specifically, the

constructivism I have begun to articulate insists that there are some scientific practices

that are successful when realist and empiricist criteria of scientific success do not hold,

but some social conditions remain fixed, and other scientific practices that are

unsuccessful when the same social conditions change but the realist or empiricist's

criteria for success obtain. However, it is important to specify the social conditions in

greater detail to discern the nature of social constructivism. In particular, I want to

sharpen the sense in which social conditions might determine the aims of science.

To that end, we should identify the relevant ways in which constructivist

counterfactuals (CC) could compete with the realist (RC) and empiricist (EC)

counterfactuals discussed above. Clearly, all share the same consequent: if the norms of

the best available science were held fixed, *p* would not count as a scientific success. If

these consequents differed, we would have good reason to think there is no rivalry at all,

since they are not attempting to account for the same things. Thus, all differences must

occur in the antecedent. Importantly, *(RC) and (EC)'s antecedents* have a common

structure:

(REA) *p* furthers the aim of providing *valuable* theories.

In this case, the realist and empiricist disagree only about what it means for a theory to

be valuable. The realist claims truth as the 'core value' of science; the empiricist,

empirical adequacy.

Turning to social constructivism, there is significantly less similarity between

(REA) and *(CC)'s antecedent*:

(CA) Social conditions *X* are different.

One way to make (CA) more precise is to plug in a set of social conditions as

constructivism's core value. In this case, we can modify our constructivist antecedent

accordingly:

(CA*) *p* furthers the aim of achieving social conditions X^9

On this view, the constructivist insists that certain social conditions should be sought in

all scientific epochs. Call this view *social axiology*.

Social axiology appears a solid route for satisfying the rivalry condition. For

instance, one may claim that science aims for consensus, to end controversy, or to

coordinate certain kinds of interests rather than for true or empirically adequate

theories. Practices would then be assessed according to their ability to further these

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[9] The most faithful constructivist reinterpretation of (REA) would be: *p* furthers the aim of providing theories in social conditions *X*. For reasons that will become clearer, I have opted for the more general schema in (CA*).

aims, e.g. to effect consensus. Given our earlier requirement that we assess scientific

practices in accordance with our best available science, and the further observation that

this science is often the product of these kinds of social processes, we would appear to

have something that tracks closely with the normative standards being used to test the

various axiologies. To be sure, there are many alternative social aims we should consider

attributing to science and far more details we would want to add if we were to pursue

these schematic proposals, but the *idea* of social axiology at least looks like a plausible

rival to the positions in the realist debate.

So far as I can tell, social axiology is a relatively untouched doctrine in the social

studies of science, broadly construed to include the social epistemology of science.

While the kinds of social processes I've discussed here (consensus, etc.) are certainly

part of the constructivists' stock-in-trade, constructivists have not really discussed these

processes in the context of an axiology. Among philosophers, Longino provides the only

genuine social axiology of which I know. As she writes:

> Processes and practices of content construction and acceptance… are
>
> *knowledge-productive practices* in [community] C, if when engaged in by
>
> members of C, they tend to result in the production or adoption of epistemically
>
> acceptable content that conforms to its (intended) objects sufficiently to enable
>
> members of C to carry out their projects with respect to those objects. (Longino
>
> 2002: 137)

As should be clear, Longino is claiming that practices are successful ('knowledge-

productive') if they further the aim of producing/adopting epistemically acceptable,

conforming content. On Longino's view, both epistemic acceptability and conformation are social aims. Epistemically acceptable claims are social in that they must survive the critical scrutiny from as many perspectives as are available in a well-functioning scientific community. Such communities, in turn, must satisfy various norms concerning critical practices and institutions, as well as its distribution of intellectual authority. Analogously, conformation is, roughly stated, the 'fit' between some representation and its intended object, and is social insofar as closeness and character of fit are dependent on researchers' goals and interests.

As should be clear, Longino is committed to a set of counterfactuals instantiating (CC), (CC.1), and (CC.2). For example, theories might conform to their objects in a manner well short of truth or empirical adequacy, but because they suit inquirers' interests, the practices producing (furthering) them are successful. Similarly, Longino's position suggests that, were the set of objections circulating throughout a community different (but still in accordance with her social epistemology), different scientific practices and claims might have gained prominence.

4. Social axiology and its near neighbours

Thus, social constructivism is well-served by offering a rival, social axiology to the realist and empiricist's alternatives. There are neighbouring doctrines, however, from which it should be disambiguated. I shall discuss two: what I will call social instrumentalism and aim contextualism. These views dominate contemporary social epistemologies of science, and, on the assumption that reasonable people can disagree, are perfectly

respectable doctrines. However, I shall argue that they cannot satisfy the rivalry and plausibility conditions, and thus cannot undergird social constructivism. As a result, we have strong reasons to believe that social axiology is necessary for any plausible and interesting form of social constructivism.

4.1. Social instrumentalism

In addition to differing about core values, constructivists might also differ with realists and empiricists about other features in their axiological picture. To get a sense of these other constructivist departures from realism and empiricism, let's revisit the two relevant claims. The first is the constructivist's precondition for judging the success of scientific practices:

(CA) Social conditions *X* are different.

And the second is a precondition common to both realism and empiricism:

(REA) *p* furthers the aim of providing *valuable* theories.

While the previous section focused on the constructivist differing about what constitutes a core value of a theory, further differences between constructivists and their interlocutors can be generated by examining how social conditions supplant other aspects of (REA). For instance, constructivists may argue that instead of *p* furthering the aim of providing valuable *theories*, *p* furthers the aim of providing valuable *social conditions*. In such cases, I'll say that they differ from realists and empiricists about the relevant *value-bearers* or units of normative analysis. Alternatively, constructivists may

differ over the *means* for promoting core values, i.e. they may insist that a practice

socially furthers the aim of providing valuable theories.

I will use the term *social instrumentalism* to refer to positions arguing for the

sociality of value-bearers or means. Social instrumentalism has been the paradigm for

social epistemologies of science. For instance, Nelson (1990) claims that the community

is the primary knower, and thus the primary bearer of epistemic value. More frequently,

social epistemologists claim that certain social practices are instrumental to traditional

scientific aims, paradigmatically truth (Giere 1988; Goldman 1999; Kitcher 1993;

Solomon 2001; Thagard 1999).

Intuitively, if certain social conditions are core values, as social axiology asserts,

it would only be natural that the bearers and means of achieving its associated values

would change. In particular, scientific communities might become more significant

value-bearers than theories, and social processes might gain greater prominence as a

means to realizing science's aim. However, this rests on the rider that *social axiology is*

assumed. As I shall now argue, this assumption is necessary, for without it, positions

socializing the bearer or means to some non-social core value fail to meet the rivalry

condition.

Consider one such case, e.g. where a certain cognitive division of labour furthers

the aim of producing true theories. Clearly, this poses no threat to realism. Turning to

social conditions bearing some non-social value, consider the following:

Were *p* not to further the aim of producing communities whose collective beliefs

were largely true, then, holding the norms of the best available science fixed, *p*

would not count as a scientific success.

This also poses no threat to realism; it simply urges the realist to realize his/her aims

through communities rather than theories.

More generally, there is a danger that any asocial aim, even if ascribed to a social

group and distinct from realist and empiricist aims, will not produce an interesting

constructivist position because the non-social elements in the aim will be the basis for a

practice's success, and the remaining social elements will be largely incidental. I call this

the *screening objection*, and revisit it below. For now, the key point is that it burdens

social instrumentalist positions lacking social axiologies. Of course, this is not an

indictment, since none of the social instrumentalists cited above would claim to be

social constructivists, and all claim to be realists of one stripe or another. Rather the

point is that if there is a viable constructivism, it will look markedly different than many

of the leading social epistemologies of science.

There are three important consequences of the screening objection. First, it does

not preclude the constructivist from disagreeing with the realist and the empiricist on

things beyond core values. Rather, the preceding considerations are primarily intended

to show that, whatever constructivists verdicts on those other fronts may be, they must

make substantive claims about these core values, and given our previous discussions,

social axiology appears to be the way to do so.

Second, while each of the social epistemologists discussed in this section has distanced themselves from older forms of social constructivism, the constructivism being advanced here calls for a shift in the terms of the debate. Specifically, instead of wrangling over epistemological and metaphysical arguments, the focus is now axiological. For instance, Goldman's veritistic social epistemology is largely realist in its axiology; Solomon's Whig Realism somewhat less so; and the constructivist's axiology decidedly not. The question should now focus on which of these axiologies track best with our current judgments about successful scientific practice.

Third, and most importantly, since social instrumentalism and social axiology appear to exhaust the constructivist's avenues of challenging (REA), we have secured an argument for the necessity of social axiology for social constructivism in its mature form. To reiterate, very few social constructivists have made overt reference to the axiology of science, so this ends up being a fairly radical call to arms.

4.2 Aim contextualism

Arthur Fine (1986; 1996) and Joe Rouse (1996) have provided another alternative to social axiology, herein dubbed *aim contextualism*, arguing that since different scientific theories arise in different social conditions, they often have different aims, and more strikingly, a practice will count as scientifically successful in one set of social conditions, but not in another. Aim contextualism thus treats core values as shifting in accordance with social conditions, while social axiology claims that there is a single core value that is fixed by a set of (ideal) social conditions.

There are several problems with aim contextualism. For one, the strongest arguments for aim contextualism, citing historical evidence that different scientists have aimed for different things at different times, are flawed in two ways. First, the aim contextualist might be conflating a descriptive question—what *did the community think* science should aim for?—with a normative question—what *should* science aim for? As a result, it fails our requirement that the practices would count as successes if the norms of our best available science are held fixed, for presumably, if a practice is only successful because it satisfies a contextually idiosyncratic aim (e.g. it provides evidence of divine ingenuity), then it will not count as a success by the norms of our current science.

Second, recalling an earlier distinction, much of this historical 'evidence' may turn on conflating motives and aims. There are good reasons to respect this distinction, for many *non*-scientific practices that are widely regarded as highly dependent on social conditions nevertheless appear to retain their identity only by fixing their aims. For instance, the aim of a wedding is to establish a marriage. Undoubtedly, a lot of interesting work could be done to trace how people's motives for being wed have changed under different economic and cultural conditions, but it would be hard to see how a wedding could count as a success (qua wedding) if it did not establish a marriage. If institutions as culturally variable as weddings are the kinds of things that have stable aims despite shifting motives, the aim contextualist at least owes us an argument as to why science is somehow different.

Additionally, much of the flexibility in core values for which aim contextualists are looking can be accommodated within a social axiology. The four candidates we've mentioned for social axiology—consensus, social order, and coordination of interests, and Longino's view—all are compatible with different scientists having different motives, values, criteria of adequacy, etc. However, in each scenario, these differences don't simply coexist, as aim contextualism might imply. Rather, consensus often involves agreement between people with different motives; social order, between setting up rules and norms for settling conflicts between people with different motives; Longino's view implies that social structures should be permissive enough to let different interests be pursued, but restrictive (i.e. critical) enough to exclude 'wrongheaded' interests, such as those motivating 'creationists and fortune tellers'.

The social axiologist's ability to accommodate a pluralism of interests within a singular, social aim has at least two advantages over aim contextualism. First, many previous constructivist works have provided compelling empirical studies and rich frameworks for understanding how different motives (interests, goals) are coordinated, providing further empirical evidence against aim contextualism. Second, requiring different scientific motives to be structured within a specific social context provides more demanding normative standards, thereby blocking certain kinds of relativism and incommensurability.

Finally, aim contextualism is far more ambiguous in its satisfaction of the rivalry condition. In particular, it does not rule out the possibility that in certain contexts, science aims for truth or empirical adequacy. The more that these cases exhaust the

successful scientific practices, the less interesting aim contextualism becomes. By contrast, social axiology remains an interesting doctrine so long as the practices in question further its prescribed social conditions.

5. Social constructivism: future prospects

Taking stock, in §1 and §2, I argued that constructivists should ascribe an aim to science different than that of realism and empiricism, and that such an aim should have something to do with social conditions. This was sufficient to distinguish it from both strong and weak constructivism. In §3 and §4, I have made the further argument that this 'moderate' constructivism must assume a more definite form—social axiology—in which science aims for certain social conditions. This is to be contrasted with social instrumentalism—in which science consists of social conditions bearing or furthering some asocial aim—and aim contextualism—in which aims vary from one social context to the next.

To reiterate, social axiology holds that all successful scientific practices must further the aim of achieving social conditions X. Furthermore, the screening objection indicates that X also cannot be a mere instrument to some asocial aim, particularly those aims favoured by other parties in the scientific realism debate. While space prohibits little more than conjecturing about further specifications of X, there are certain avenues that appear more fruitful than others. I will first discuss some pitfalls, and then suggest a program for developing a full-blown social axiology.

First, when we think of prescribed social conditions, we might be inclined to think of non-epistemic sorts of social values, e.g. justice or improving the quality of life for as many people as possible. These sorts of aims suffer from the fact that, if they are the only aim of science, they strain to pass the plausibility test. It is hard to see how our best available science would not count a novel prediction as a success simply because it failed to improve human welfare. Conversely, Mother Theresa's actions, noble as they were, should not count as *scientific* successes simply because they furthered the aim of minimizing human suffering. Nevertheless, much as the plausible bits of aim contextualism could be preserved by treating different motives as fodder for coordination under the prescribed social conditions, we can perform an analogous service with these non-epistemic social values.

This would seem to narrow the space of permissible social axiologies considerably. On the one hand, the screening objection counsels constructivists against adverting to social conditions that are merely instrumentally valuable to some deeper asocial epistemic value, since then it will be the epistemic values carrying more of the explanatory weight than the social conditions, and the resulting position is not robustly social. On the other hand, as the Mother Theresa example illustrates, the most obvious social, non-epistemic values suggest implausible axiologies.

Thus, Longino's social axiology seems to be in rarefied air. However, we can populate the field of contenders considerably, by way of a two-step process. First, constructivists need to get clear about all of the epistemic values available, social or otherwise, and to focus on those satisfying the rivalry condition. On this front, they

would do well to follow the epistemological discussions about the value of knowledge,

where understanding (Kvanvig 2003; Zagzebski 2001), intellectual virtue (Zagzebski

2003), 'credit' for achieving knowledge through our cognitive abilities (Greco 2007),

value to practical reasoning (Hawthorne 2004), and the identification of reliable

informants (Craig 1990) have all been considered as intrinsic epistemic values to be

considered alongside true beliefs[10]. Furthermore, we can add more science-specific aims

such as explanation (Thagard 1992), prediction (Barnes 2008), and control/manipulation

(Hacking 1983; Woodward 2003). Second, to avoid the screening objection,

constructivists must then argue that some of these values are necessarily social. The

values that survive these two stages will constitute the constructivist's social axiology in

its proper form.

For purposes of illustration, I will focus on explanation or understanding as a

rival epistemic value[11], though I believe that virtually all of the other values in the

preceding paragraph are amenable to the two-stage strategy just sketched. Turning to

the first stage, explanatory (simple, powerful, fruitful, conservative, etc.) theories

appear capable of being good regardless of their truth or empirical adequacy. Thus, as

an *asocial* axiology, this could provide a genuine contender to realism and empiricism[12].

Turning then to our second stage, some have argued that explanations are, at root,

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[10] Cf. (Pritchard 2007) for a review of this literature.

[11] The sketch provided here is being developed in detail in another work.

[12] (Ellis 1985) suggests a view along these lines, though he also adds an epistemic theory of truth.

social relations, e.g. 'Jones explained to Smith[13]'. Faye (2007) provides a more general

schema for such models of explanation:

S explained to H why q by uttering u in a problem context P.

However, insofar as this undergirds a social axiology that can weather the screening

objection, it appears that science aims for something that is both more social yet no

more epistemically loaded than this. I will call this more-thoroughgoing social axiological

thesis the *constructivist explanatory aim*:

(CEA) For all problem contexts P, if there is a question as to why q in P, a scientist

S could explain to an interested party H why q is/is not the case.

This schema could be further 'socialized' along several other dimensions. For instance,

Faye explicitly acknowledges the role of interests in determining problem contexts, and

this has long been part of the constructivist's toolkit. Yet another way to socialize these

explanatory values is to explore relevant social-scientific research on how subjects

explain, e.g. (Lerner and Tetlock 1999; Shaw, Wild, and Colquitt 2003).

Importantly, for the purposes of securing a social axiology, the constructivist

must argue that *S's* explaining to *H* bears epistemic value only if it is a social relation. For

example, the constructivist would have to argue that simplicity is an explanatory virtue

only if (CEA) is true. While this is no small feat, if successful, the constructivist would

accrue some social-epistemic capital by which to engage other parties in the realist

debate. To reiterate: this is not limited to explanatory value, but to any epistemic values

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[13] These are advocates of 'pragmatic' or 'erotetic' models of explanation (Achinstein 1983, 1984; Richardson 1995; Risjord 2000; Sintonen 1984, 1989; van Fraassen 1980).

that (a) rival the axiologies currently entertained in the realism debate, and (b) are necessarily social.

With this in mind, let us assume (for the sake of argument) that explanatory value satisfies these two conditions, and, for ease of locution, let us say that (CEA) claims that *science aims to explain everything of interest to members in a scientific community*. We can then revamp our earlier theses:

(CC*) Were *p* not to further the aim of explaining everything of interest to members in a scientific community, then, holding the norms of the best available science fixed, *p* would not count as a scientific success.

(CC.1*) If *p* furthered either the aim of providing true theories or that of providing empirically adequate theories, but did not further the aim of explaining everything of interest to members in a scientific community, then, holding the norms of the best available science fixed, *p* would not count as a scientific success.

(CC.2*) If *p* furthered the aim of explaining everything of interest to members of a scientific community, but *p* furthered neither the aim of providing true theories nor the aim of providing empirically adequate theories, then, holding the norms of the best available science fixed, *p* would still count as a scientific success.

The constructivist would then have to establish these claims by examining the history of science, looking for successful practices in which explanatory concerns trumped concerns about truth or empirical adequacy.

It is worth stressing that the remarks in this section are more intellectual reverie

than rigorous argument. So the work for social constructivists has just begun!

Nevertheless, some substantive lessons have been learned from the preceding. First,

little in the constructivist canon has explicitly developed the axiology of constructivism,

much less compared it to the realist or empiricist's axiology. This has been a major

source of the philosophical shrieks and cackles. Second, there is a rather definite shape

the constructivist's alternative axiology must assume if it is to be a plausible rival to the

philosophical positions currently on tap—it must be a social axiology; it must claim that

science aims for a set of prescribed social conditions. And what could be so incoherent

or uninteresting about *that*?

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