

FROM SCIENCE WARS TO SOCIAL EPISTEMOLOGY: A HALF-CENTURY OF VIEWS ON THE SOCIAL NATURE OF KNOWLEDGE

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Abstract:

In this paper, I survey and compare a half-century of diverse views on the social nature of knowledge-generation, from the External Factors debate, which occurred during the Science Wars of the 1970s, 80s, and early-90s, through the External and Social Turns in mainstream analytic epistemology, to a very recent family of views I call Extended Externalism. Views over this period differ in three important ways. On some accounts, social factors can be only occasioning factors: they can kick-start knowledge-generating processes that otherwise would not have commenced. On other accounts, social factors can be constitutive of the epistemic contexts in which knowledge is generated and appraised. On still other, more recent accounts, social factors can be constitutive of knowledge-generating processes themselves. At the conclusion of this paper, I tabulate these issues, generating a taxonomy of the key differences between a half-century of diverse views on the social nature of knowledge.

“...cultural influences [that] went into the discovery of Maxwell’s Equations and other laws of nature have been refined away, like slag from ore.”

— Steven Weinberg (1996, p. 56)

Introduction

In this paper, I survey and compare a half-century of diverse views on the role of social factors (SFs) in generating knowledge. Views over this period differ in three important ways. On some accounts, SFs can be only occasioning factors (OFs): they can kick-start knowledge-generating processes that otherwise would not have commenced. On other accounts, SFs can be factors constitutive of the epistemic contexts in which knowledge is generated and appraised (EFs). On still other, more recent accounts, SFs can be constitutive of knowledge-generating processes themselves (CFs).¹

I first revisit the External Factors Debate, which was part of the Science Wars of the 1970s, 80s, and early-90s. This debate was concerned with the role of so-called ‘external factors’ in generating knowledge. A major contribution to the External Factors Debate was the Forman Thesis (Forman 1971), which was specifically concerned with the minimal role played by SFs in mainstream, Intellectualist accounts of how knowledge is generated.² In section 1, I present the Forman Thesis as well as Steve Fuller’s (2002, ch. 10) ‘extension’ of the Forman Thesis, which is a social constructivist programme I call *Sociologism*. In section 2, I show that, contrary to Fuller’s caricature, *Intellectualism* (and internalism more generally) affords SFs a positive, though modest, role in generating knowledge: SFs can occasion knowledge-generation. That is, some OFs are SFs.

In section 3, I revisit the Externalist Turn in mainstream analytic epistemology. I show that much of the longstanding debate between internalists and externalists affords SFs no more salient a role: SFs can be OFs but they are not constitutive of knowledge-generating processes themselves. That is, no CFs are SFs. This is the case on internalism and on the majority of externalist views.

However, an epistemically salient role is afforded to SFs on views allowing them to feature in epistemic contexts in which belief-generating processes are appraised. In section 4, I explore this family of views, which became more prominent during the Social Turn in epistemology. I call this *Social Contextualism*, which says some EFs are SFs. In section 5, I explore a recent family of views I call *Extended Externalism*, according to which SFs can be constitutive of knowledge-generating processes themselves. That is, some CFs are SFs.

After briefly distinguishing between two versions of Sociologism in section 6, I conclude in section 7 by tabulating the issues discussed in this paper (fig. 2). This is a taxonomy of the key differences between a half-century of diverse views on the role of social factors in generating knowledge.

1. A Précis of Fuller's 'Extended' Forman Thesis

Forman targets historians and philosophers of science who depict the birth of quantum indeterminism as the result solely of disinterested deliberation upon available ideas, reasons, and evidence. Such an approach, says Forman, cannot make sense of why physicists chose quantum indeterminism precisely when they did and not earlier.³ A satisfactory approach will not be so ahistorical: it will account for why it was not until the mid-1920s that quantum indeterminism was decided upon, even though the relevant indeterministic ideas were available in late-nineteenth and early-twentieth century Europe. Forman argues that it was not until the presence of certain social pressures — when the “currents of thought” (Forman 1971, p. 3), or popular ideology, of the Weimar milieu aligned with available indeterministic ideas — that physicists deliberately allowed indeterministic ideas to inform their science. As such, any appraisal of the birth of quantum indeterminism must characterize it as the result not of disinterested deliberation but of deliberation informed by local, *social factors* (SFs).⁴

Steve Fuller (2002, ch.10) agrees that SFs played a central role in the birth of quantum indeterminism. What he contests is Forman's depiction of the Weimar physicists as *deliberately* adapting to popular ideology so as to ensure the survival of their research programmes. In Fuller's view, the debate between Forman and Intellectualists is predicated on a false dilemma: in full light of social pressures exerted upon them, Weimar physicists deliberated either disinterestedly, as Intellectualists say, or self-interestedly, as Forman says. This debate takes for granted the idea that elucidating and appraising knowledge-generating processes is just a matter of elucidating and appraising scientists' deliberations. Fuller regrets that this remains a debate “penetrating not the sociology of science, but the psychology of scientists” (p. 235).

He worries this leaves Forman vulnerable to the Intellectualist response he calls the *Strong Objection to the Sociology of Science* (SOSS) (*ibid*, p. 239). According to this objection, even if SFs played a role in the original acceptance of quantum indeterminism, the Forman Thesis is concerned only with the deliberations and social context of one scientific community, at one time, and in one place. To show that SFs compelled the *retention* of quantum indeterminism in different places, over time, and across scientific communities, Forman must identify new SFs compelling each occasion of retention. Fuller thinks this allows Intellectualists to retain a “transsocial” view of scientific knowledge (*ibid*).

As Fuller understands it, Intellectualists must concede to Forman that quantum indeterminism was generated *via* the ‘wrong’ sort of deliberation on the part of Weimar physicists — i.e. socially-compelled deliberation — which is the kind of deliberation that cannot contribute to knowledge. However, Intellectualists can insist that when these SFs were no longer in play, physicists engaged in the ‘right’ sort of deliberation — i.e. disinterested deliberation. This later, epistemologically bonafide legwork showed that the Weimar physicists stumbled on the right idea for the wrong reasons. Thus, later scientists properly established quantum indeterminism in the scientific cannon.

In response to the SOSS, Fuller contends that scientific claims and theories only *appear* continuous across time, but that they actually change with their subvenient social contexts. The very idea of something merely seeming continuous involves it seeming to the relevant observers to be what it is not. So, focusing on the deliberations of misperceiving observers will not help generate an account of the wider, external phenomena causing those misperceptions. Put another way, Fuller’s problem with the Forman Thesis is that it cannot be generalized into a social historiography of knowledge, or *Sociologism*, which consists of two parts. First, the history of science is the project of elucidating the sociological forces that tightly constrain historical agents (*ibid*, p. 235). Second, since agents are tightly constrained

by their social contexts, their epistemic performance is to be appraised only relative to their social contexts. Fuller takes Intellectualists' armchair approach to retain a naïve picture of the scientist as a fully aware agent, free to choose disinterestedly or self-interestedly, being unconstrained by her social context (*ibid*, p. 240f). Fuller contends that focus must shift away from scientists' internal lives towards more readily available units of study, which are external, material, and contextual.⁵

2. Intellectualism: A Caricature

In his response to Forman, Andrew Lugg (1984) differentiates between two senses in which factors can play a role in generating scientific knowledge. *Occasioning* factors (OFs) bring about moments of theory choice and *constitutive* factors (CFs) are those literally constituting belief-generating processes terminating in theory choice.⁶ Only CFs are subject to epistemological appraisal. Lugg maintains that social processes occasioned the Weimar physicists' choice, while the belief-generating process terminating in their choice of quantum indeterminism in particular was constituted only by deliberation. So, according to Lugg, some OFs were SFs but all CFs were deliberative. That is, no CFs were SFs.

As we saw from Fuller's criticism, Forman could technically agree with Lugg thus far. He could contend that certain SFs — i.e. popular ideological pressure — were the OFs bringing about a moment of theory choice, and deliberative processes — i.e. the Weimar physicists' self-interested deliberation — were the CFs terminating in the choice of theoretical possibility aligning with popular ideology. Recall that the SOSS, as Fuller presents it, starts with the Intellectualist conceding local defeat to Forman in order to claim wider victory. This is not Lugg's approach. According to Lugg, Forman fails to show that the Weimar milieu occasioned self-interested rather than disinterested belief-generation. In his own words, Forman contends that Intellectualists cannot explain,

...how these “currents of thought,” evidently of negligible effect upon physicists at the turn of the century, came to exert so strong an influence upon German physicists after 1918. For it seems to me that the historian cannot rest content with vague and equivocal expressions like “prepared the intellectual climate for,” or “prepared, so to speak, the philosophical background for,” but must insist upon a causal analysis, showing the circumstances under which, and the interactions through which, scientific men are swept up by intellectual currents. (1971, p. 3)

Forman argues that Intellectualists cannot maintain both that readily-available indeterministic ideas had a “negligible effect” upon Weimar physicists pre-1918 and “so strong an influence” post-1918. Intellectualists’ supposed claim that available ideas merely “prepared the intellectual climate for” quantum indeterminism does not account for the sudden shift. What accounts for it is the post-1918 alignment of popular ideology with these indeterministic ideas, and the pressure it exerted upon Weimar physicists.

Lugg argues to the contrary that SFs can bring a theoretical possibility to scientists’ attention, or SFs can motivate scientists to more seriously test a particular theoretical possibility, without that subsequent process of testing and weighing of evidence being undertaken in anything less than epistemologically bonafide fashion. Lugg can agree that ideological pressure post-1918 constituted OFs that were more pressing than the mere availability of indeterministic ideas pre-1918. As Lugg puts it, these OFs only “resulted in [physicists] appreciating more fully the possibility of coherently introducing indeterminism into physics” (p. 187). Consider that SFs are largely responsible for why scientists research one problem rather than another, for why finding a cure for cancer is more important than determining whether there is an odd or even number of penguins in the world. Once SFs occasion the pursuit of a cure for cancer, deliberation to that end (i.e. CFs) can be epistemically bonafide.⁷

The version of Intellectualism Forman appears to have in mind is not nuanced enough to consider the possibility of scientific knowledge aligning with popular “currents of thought.” Perhaps he is working with the same version of Intellectualism Fuller targets. On

this version, Intellectualists “simply presume that the moment of theory choice was rationally selected, the only questions for them being whether the right theory was chosen at that time and for the right reasons” (Fuller, p. 234). But Intellectualists need not and do not presume this. Intellectualists can claim that occasions of disinterested deliberation need not themselves be disinterestedly selected. This is only to claim, as Lugg does, that SFs, and not just disinterested deliberation, can be OFs that kick-start knowledge-generating processes. Intellectualists need not maintain that all OFs are rational deliberations.

So, Fuller is wrong to assert that Intellectualists “deny any role to ‘social factors’ in the causation of scientific beliefs... relegating such factors to the causation of unjustified beliefs” (*ibid*, p. 237). The outright anti-sociology view Fuller targets is simply *Radical Voluntarism*, not Intellectualism at large. According to Radical Voluntarism, the only relevant input sociology can offer is toward accounts of why agents make *wrong* choices. SFs can result only in epistemic failure; they can only impede knowledge-generation. This means any sociological contribution is negative sociology — a sociology of error — concerned only with what epistemic success is not.

Intellectualists, not just Fuller’s Radical Voluntarists, indeed maintain a strict divide between sociology and epistemology: SFs are epistemically inert. However, Intellectualists, but not Radical Voluntarists, allow SFs a positive role: social OFs are necessary for full historical, sociological, etc. accounts of knowledge-generation. That is, Intellectualists, but not Radical Voluntarists, maintain that not all (or many) occasions of theory choice are disinterestedly selected. Fuller fails to even acknowledge that Intellectualists hold to Popper’s distinction between the context of discovery — the locus of OFs — and the context of justification — the subject of epistemology.⁸

To be fair, Fuller does interact directly with Lugg. Fuller first seems to recognize the key feature that distinguishes Lugg’s view (i.e. Intellectualism) from Radical Voluntarism:

Andrew Lugg (1984) would have us separate what *determined* the Weimar physicists to believe in quantum indeterminacy (as opposed to quantum determinism, or some other theoretical possibility) from what *occasioned* them to have such a belief when they did (and not earlier or later). (Fuller, p. 237)

Fuller acknowledges how Lugg “says that social pressures may force scientists to choose a particular theory without those pressures actually being part of the reason for selecting the theory” (*ibid*). As such, he seems to acknowledge that Lugg’s Intellectualism is not a view “denying any role to ‘social factors’ in the causation of scientific beliefs or relegating such factors to the causation of unjustified beliefs” (*ibid*). Fuller seems to recognize Lugg’s claim that some OFs, but no CFs, are SFs.

However, Fuller’s subsequent criticism of Lugg reads more like a criticism of Radical Voluntarism. Fuller rightly acknowledges that Lugg reframes the Forman Thesis “as suggesting that the physicists’ *recognition* of the anti-mechanism and anti-determinism then being advocated resulted in *appreciating* more fully the possibility of coherently introducing indeterminism into physics” (Lugg, quoted in Fuller, p. 237, emphasis original). The problem lies in Fuller’s three candidate interpretations of this claim and his appraisals of them (*ibid*, p. 237). According to interpretation (A), the Weimar physicists were *never consciously aware* of the social nature of the pressure exerted by popular ideology, and they chose the theoretical possibility aligning with that pressure (i.e. quantum indeterminism) *disinterestedly* (i.e. “for methodologically sound reasons”). According to interpretation (B), the Weimar physicists had *full conscious awareness* of the social nature of the pressure exerted by popular ideology, and they chose quantum indeterminism *disinterestedly*. According to interpretation (C), the Weimar physicists had *full conscious awareness* of the social nature of the pressure exerted by popular ideology, and they chose quantum indeterminism *out of self-interest*. Also on interpretation (C), fearing their credibility would

be undermined, the Weimar physicists did not acknowledge that they chose quantum indeterminism out of self-interest. Fuller’s interpretations of Lugg are summarized in fig. 1.

fig. 1

<p>“[Forman’s work] suggest[s] that the physicists’ recognition of the anti-mechanism and anti-determinism then being advocated resulted in appreciating more fully the possibility of coherently introducing indeterminism into physics.”</p> <p>– Andrew Lugg (1984, p. 237)</p>	
Interpretation A	Physicists were not aware of operative SFs and performed epistemologically bonafide deliberation.
Interpretation B	Physicists were aware of operative SFs and performed epistemologically bonafide deliberation.
Interpretation C	Physicists were aware of operative SFs and deliberated out of self-interest.

Fuller claims that all three interpretations are problematic (p. 238). Concerning (C), he judges that it would be too difficult to determine whether the physicists were indeed disguising their true intentions. Recall Fuller’s criticism of Forman: by continuing to focus on the quality of scientists’ deliberations, he perpetuates an irresolvable debate about the quality of scientists’ mental states.⁹ This is not the real problem with (C), however. The problem with interpretation (C) is that it involves Lugg conceding that the Weimar physicists’ original acceptance of quantum indeterminism was due to self-interested deliberation. We already saw that Lugg rejects this claim of Forman’s, so (C) is an inaccurate interpretation of Lugg. Therefore, I set it aside.

How do interpretations (A) and (B) fare? Fuller finds two problems with (B). First, it purportedly assumes “the inappropriateness of the social factors” playing a role (*ibid*). However, we saw that, according to Lugg’s Intellectualism, SFs are disqualified only from being CFs, not OFs. So, Fuller is wrong that this feature of (B) is problematic for Intellectualism. Fuller’s second contention with (B) is that, like (C), it is committed to the naïve view that the Weimar physicists were conscious of operative SFs (*ibid*). As implausible as Fuller finds (B), he thinks (A) is unacceptable for Intellectualists. Interpretation (A)

supposedly “portrays the scientists as labouring under false consciousness, with the ‘good reasons’ they offer for their theory choice becoming little more than a form of self-deception, epiphenomenal on the real social sources of their behaviour” (*ibid*, p. 238).

Thus, Fuller’s criticisms of his candidate interpretations of Lugg come down to the following dilemma. On the one hand, interpretation (A) is opposed to Intellectualists’ supposed view of scientists as being fully aware of operative SFs, so Intellectualists cannot accept (A). On the other hand, interpretation (B) respects Intellectualists’ supposed view of scientists as being fully aware of operative SFs, but this is implausible. As such, Fuller sees no viable interpretation of Lugg’s Intellectualism.

However, contrary to Fuller’s claim, interpretation (A) is perfectly acceptable on Intellectualism. Failure to have recognized that certain SFs occasioned theory choice does not imply that deliberations determining the choice of theory (i.e. the CFs) “are a form of self-deception” and “epiphenomenal.” Social OFs do not automatically impede knowledge-generation. Furthermore, the Intellectualist can insist that for an agent to choose disinterestedly, they need not have been fully cognizant of the nature of the operative OFs. A full historical, sociological, etc. recounting requires that the historian, sociologist, etc. be fully cognizant of which OFs kick-started a knowledge-generating process. But as for the actual agents who are subject to historical, sociological, etc. analysis, they need not have been fully cognizant of precisely which OFs kick-started knowledge-generation for them to have been sufficiently cognizant of the content of the theoretical possibilities and for them to have deliberated toward one of them disinterestedly. In short, before I can arrive at a bit of knowledge, I am not obliged to explain exactly how, or to be rationally responsible for why, I find myself in the position to gain knowledge. That would be too demanding.

By way of the supposed dilemma he proposes between interpretations (A) and (B), Fuller tries to force Intellectualists toward accepting (B) and its accompanying Radical

Voluntarism. According to Fuller, Intellectualists are guilty of “seeing the Weimar scientists as making an unconstrained choice from a set of seemingly self-generated possibilities” (*ibid*, p. 240). Instead, he would like “to see the scientists as moving within a possibility space constrained by a combination of unanticipated consequences of the activities of previous scientists... and their own imperfect anticipations of how contemporaries will react to what they do” (*ibid*). But this is a false dichotomy. Intellectualists do not see “the Weimar scientists as making an unconstrained choice from a set of seemingly self-generated possibilities,” and so they do not endorse this naïve conception of scientific agency. Indeed, viewing scientists as constrained is directly implied by Lugg’s Intellectualism, since it acknowledges the presence of social OFs over which agents have little or no control, and of which they may not even be aware. The view Fuller’s targets is a caricature.

After accusing the philosophical tradition at large of committing a series of elementary logical fallacies (Fuller, pp. xxviii-xxvix), Fuller argues from silence. He presumes that, since Intellectualists do not explicitly endorse the claim that SFs can play a role in generating knowledge, they must reject this claim. Intellectualists are understandably silent about this claim, since they do not take OFs (social or otherwise) to be epistemically relevant. Fuller fails to recognize this. This oversight is more curious considering Intellectualists’ silence obeys the Gricean Quantity Maxim of which Fuller is so fond. According to this maxim, “...tacit knowledge is *never* articulated... In fact, such assertions tend to be made only once... there is a sufficient reason for [a statement] being uttered” (Fuller, p. 112). Fuller is hoisted on his own petard: it took his faulty criticism of ‘Intellectualism’ to reveal that he has targeted a caricature.

3. Restricted Internalism & Restricted Externalism

So, according to Intellectualism, SFs can be OFs. Intellectualism is best understood as a subclass of internalism that focuses on deliberative capacities. Internalism more generally is the view that all constituents of belief-generating processes (i.e. CFs) are mental states or some subclass of mental states (e.g. in-principle accessible mental states). Given that much of mainstream epistemology for the last three decades consists of debates between internalists and externalists, it might be surprising that the central difference between internalism and the majority of externalist views makes no difference for the role of SFs. Externalists are more permissive about what can constitute a CF. According to externalism, some CFs are cognitive abilities grounded in non-mental aspects of the cognitive apparatus. A common example of knowledge generated through *only* non-mental cognitive ability is perceptual knowledge: when I walk into a room, I see that the light is on and, without mental intermediaries, I automatically know the light is on. But according to internalism (including Intellectualism) and most versions of externalism, all CFs are goods (e.g. evidence) or traits (e.g. cognitive abilities or disposition) possessed by the would-be knowledge-bearer. For example, William Alston (1995, pp. 11-12, 15-16) understands “proximate” causes of a belief, by which he means those located within the individual subject’s cognitive apparatus, as the only epistemically salient ones (i.e. CFs). In other words, according to internalism (including Intellectualism) and most versions of externalism, knowledge-possession entails the possession of all CFs. On these views, knowledge-bearers must be epistemically autonomous in this sense; both are strictly individualistic views. Thus, I call these classes of views *Restricted Internalism* and *Restricted Externalism*. According to both, no CFs or EFs are SFs. Like Intellectualism, these views afford SFs a positive role. However, their role remains epistemically inert: SFs are neither relevant for determining whether epistemic success obtains nor can they be

constitutive of knowledge-generating processes. If so, SFs are of interest only to historians, sociologists, etc., not epistemologists.

4. Social Contextualism

Reflecting on Giere's (1992) reply to Pickering (1991), Giere and Moffatt (2003) claim that,

[Giere was] quite tolerant in not insisting that the cognitive story could be the whole story about any scientific episode. Nevertheless, any social story was viewed as distinct and, indeed, supplementary to, the cognitive story. This has been pretty much the standard view among those who have explicitly pursued a 'cognitive approach' to science studies. (p. 302)

Looking at Giere and Moffatt's examples of "those who have explicitly pursued a 'cognitive approach' to science studies," (p. 308, note 3) it seems the term, "supplementary," in this passage should be given a Restricted reading. But another reading affords "the social story" more than an occasioning role. According to *Social Contextualism*, SFs can be constitutive of epistemic contexts in which knowledge is generated (i.e. EFs), relevant for determining whether or not belief-generation is epistemically successful.¹⁰

If SFs can be only OFs, then they are epistemically inert, relevant only for non-epistemological reconstructions of wider cultural phenomena. On this Restricted picture, epistemologists set aside SFs to focus on what is important to them: the mental and/or wider cognitive operations of actors residing in these social contexts. But as the name suggests, context matters epistemically according to Social Contextualism. This is the diverse family of views according to which epistemic success can be partly determined by the context in which knowledge is generated, including the social context. So, Social Contextualism affords SFs more than an occasioning role. It brings SFs within the purview of epistemology by permitting them to constitute EFs.

For example, according to some externalist models of epistemic justification, the good-making properties of some belief-generating processes (e.g. reliability for arriving at

the truth) are relative to the environments in which they proceed. Consider perceptual knowledge again: when I walk into a room, I see that the light is on and, without mental intermediaries, I automatically know the light is on. Some externalists would say it is only relative to normal lighting conditions that this perceptual-belief-generating process has some of the good-making properties required for knowledge. In reliabilist terms, these EFs are relevant for determining the *local* reliability of a belief-generating process.

Consider a related example from Tim Lewens (2005, p. 565).¹¹ Suppose Smith and Jones possess the same cognitive states and that each believes she presently stands in a cubic room. However, only Smith actually stands in a cubic room while Jones stands in an *Ames room*. An Ames room creates an optical illusion for a person standing at a certain point within it. From that point, it appears cubic, even though it is actually trapezoidal. On a simple version of reliabilism, only Smith's belief is reliably formed relative to the typical environment (e.g. rooms in which the human perceptual apparatus is sufficiently discriminatory). So, only Smith's belief is epistemically successful. On this simple view, determining whether Smith's and Jones' beliefs are epistemically successful cannot be accomplished by citing only cognitive factors. Some EFs that ultimately determine whether Smith's belief is epistemically successful and Jones' belief is unsuccessful are features of Smith's and Jones' belief-generating environments.

It is not hard to generate analogues in which good-making properties required for knowledge are relative to social EFs. For example, many epistemologists contend that one has a default entitlement to rely on the testimony of others, absent any defeaters, just as one has a default entitlement to rely on one's memory, perceptions, and inferential capacities. Suppose Smith enters the shop, *Rare Hockey Collectibles*, and orders a Wayne Gretzky rookie card. The shopkeeper informs Smith that the card is in the store warehouse and will be shipped later that day. Before finalizing her purchase, Smith consults online reviews of

Rare Hockey Collectibles. The reviews are glowing and do not contain any report of a customer failing to receive her item. Smith believes she will receive a Wayne Gretzky rookie card in the mail, and she does receive one. Suppose Jones enters the shop later that day and orders a Wayne Gretzky rookie card. The shopkeeper informs Jones in precisely the same fashion she informed Smith that the card is in the store warehouse and will be shipped later that day. Jones also scours online reviews before finalizing her purchase. She believes she will receive a Wayne Gretzky rookie card in the mail, but she does not receive one. The shopkeeper knowingly sold and shipped her last Wayne Gretzky rookie card to Smith earlier that day. After doing so, the shopkeeper was informed that her car would be repossessed by the end of the day. Being desperate for money, the shopkeeper knowingly took Jones' order for a Wayne Gretzky rookie card. Both Smith and Jones have an undefeated default entitlement to believe the shopkeeper's testimony. However, the shopkeeper's imperceptible dishonesty undercuts only Jones' justifiedness. Thus, it is due only to a difference in social EFs that Smith's belief is epistemically successful and Jones' belief is unsuccessful.

The caricature according to which SFs can only *inhibit* knowledge-generation (i.e. Fuller's depiction of Intellectualism) cuts both ways. Some popular, skeptical critiques of science, or of a particular branch of science, are grounded in little more than appeals to the social EFs in the context of research. For example, some common criticisms of climate science do little more than appeal to its dependence upon centralized funding bodies. But, of course, merely pointing out this dependence is an incomplete criticism.¹² Likewise, for critiques of Darwinism based upon the claim that Darwin's work reflects his culture.¹³ Social Contextualism allows for epistemic success to be relative to social environments. According to Social Contextualism, SFs can be EFs, not just OFs.¹⁴

5. Extended Externalism

According to a quite radical and recent class of views, SFs can constitute CFs. That is, they can feature in belief-generating processes themselves. To see how this departs from other views, consider Alvin Goldman's (1979) standard expression of externalism:

A justified belief is, roughly speaking, one that results from cognitive operations that are generally speaking, good or successful. But "cognitive" operations are most plausibly construed as operations of the cognitive faculties, i.e., "information-processing" equipment internal to the organism. (p. 187)

Up to "i.e.," Goldman identifies what can constitute CFs: cognitive operations. For Goldman, these include cognitive operations grounded in non-mental features of the cognitive apparatus. This rules out internalism. Part of Goldman's view is that factors beyond the individual "organism" determine the local reliability of a belief-generating process. If some of these EFs are social, this is a departure from Restricted Externalism for an externalist version of Social Contextualism. However, after "i.e.," Goldman retains a core feature of Restricted Externalism: CFs are strictly "internal to the organism." Were he to abandon this core feature of Restricted Externalism, Goldman would be a proponent of *Extended Externalism*.

Extended Externalism is the idea that knowledge-generating processes can extend beyond the knowledge-bearing subject and include the cognitive operations of others. That is, CFs can extend beyond the goods or traits possessed by the knowledge-bearer.¹⁵ This is not the same idea as Social Contextualism, which is the view that epistemic success can be partly determined by the context in which knowledge is generated and appraised, including the social context. According to Extended Externalism, knowledge-generating processes themselves, not just knowledge-generating contexts, can be constituted in part by SFs. So, on this type of view, SFs can play a *constitutive* role, not just an occasioning or contextual role. Extended Externalists abandon the idea held by Restricted Internalists and Restricted

Externalists alike (along with Social Contextualists who do not also endorse Extended Externalism) that epistemic autonomy is necessary for knowledge. By this I mean that all CFs are goods (e.g. evidence) or traits (e.g. cognitive abilities or dispositions) possessed by the knowledge-bearer — that knowledge-possession entails the possession of all CFs. Thus, Extended Externalists maintain that knowledge-bearers can be epistemically dependent in a quite radical sense.

Though quite radical relative to the mainstream epistemological tradition, Extended Externalism is becoming increasingly popular. Sanford Goldberg (2010), for example, is interested in knowledge acquired *via* testimony. He focuses on process reliabilists, who typically understand the cognitive operations of others as relevant for determining the local reliability of a testimonial knowledge-generating process, not its global reliability. Goldberg argues that in a testimonial exchange the speaker's justifiedness is often a salient part of why the recipient arrives at the truth. If justification is largely about the propensity to arrive at the truth, then the salience of the speaker's justifiedness for the recipient arriving at the truth suggests that the testimonial exchange is only the terminal phase of the testimonial-belief-generating process. Appraisal ought to extend over CFs possessed by the speaker (2010, ch. 4).¹⁶ For example, in the *Rare Hockey Collectibles* case presented earlier, the belief-generating processes resulting in Smith's and Jones' beliefs extend over goods or traits possessed by the shopkeeper. Social Contextualists ascribe some EFs to the shopkeeper. Extended Externalists ascribe some CFs to the shopkeeper.

Epistemologists of cognitive externalism have generated two other types of Extended Externalist accounts, both appealing to psychological theses. In cases of *extended cognition*, cognition can extend 'outside the head', over artifacts, environmental features, and other subjects. In cases of *distributed cognition*, cognition can be distributed across multiple subjects. Unlike in cases of extended cognition, there is no individual 'centre' of cognition in

cases of distributed cognition. Some philosophers contend that individual subjects can possess knowledge *via* extended or distributed cognitive processes.¹⁷ In such cases, a subject possesses knowledge without possessing all CFs. This is a brand Extended Externalism.¹⁸

6. Normative & Wholesale Sociologism

It is worth distinguishing between two kinds of sociologism. One leaves room for a normative dimension to the study of knowledge generation, so I call it *Normative Sociologism*. This view is really an advanced contextualism according to which all EFs are SFs. What constitute CFs are not directly relevant for this view. The important point is that the processes they constitute are appraised according to local, cultural standards. Fuller is one of few proponents of sociologism who advocates for a normative dimension to the study of knowledge-generation. So, Normative Sociologism is his view. Fuller does allow agents' deliberations to constitute OFs (e.g. 2002, p. x), though most OFs are SFs on his view. For example, he contends that the original generation of indeterministic physics was occasioned mostly by political and wider cultural pressures, and that whatever role the deliberations or psychology of physicists played, it was minor and is now inaccessible to historians. So, according to Normative Sociologism, all EFs and most OFs are SFs.

Wholesale Sociologism is an anti-normative view that shifts attention entirely away from the individual-level to wider social phenomena. On this view, knowledge is socially possessed, generated, and occasioned. Individual-level phenomena are to be understood as culturally determined, and so they are not analysable independent of wider cultural phenomena. There is no room for a normative program that appraises individual epistemic performance. There is room only for a program that describes the wider cultural determinates of individual phenomena. So, according to Wholesale Sociologism, all CFs, EFs, and OFs are SFs, though EFs are not employed for normative appraisal.

7. Conclusion: A Taxonomy of Views

In this paper, I compared different views on the role of SFs in generating knowledge. I revisited the External Factors Debate, which was part of the Science Wars of the 1970s, 80s, and early-90s, and which pitted Intellectualists/internalists against proponents of Sociologism. I tracked the changing role of the social through the Externalist and Social Turns in mainstream analytic epistemology to the more recent class of views I call Extended Externalism. I showed how views over the last half-century differ about what occasions knowledge-generation (OFs), what determines epistemic success (EFs), and what constitutes the very knowledge-generating processes that epistemologists appraise (CFs). These differences are organized below (fig. 2). The salient aspect of each view is highlighted.

fig. 2

	Factors Constituting Knowledge-Generating Processes (CFs)	Factors Constituting Epistemic Environments (EFs)	Factors Occasioning Knowledge-Generation (OFs)	The Role of Social Factors (SFs)
Radical Voluntarism	my volitions	my volitions	my volitions	strictly negative
Restricted Internalism	my internal states	my internal states	my internal and external states; SFs	some OFs
Restricted Externalism	my internal and external states	my internal and external states	my internal and external states; SFs	some OFs
Extended Externalism	my internal and external states; SFs	my internal and external states; SFs	my internal and external states; SFs	some OFs; some EFs; some CFs
Social Contextualism	depends which view Social Contextualism is appended to	my internal and/or external states; SFs	my internal and external states; SFs	some OFs; some EFs; some CFs if appended to Extended Externalism
Normative Sociologism	depends which view Normative Sociologism is appended to.	SFs	mostly SFs; some of my internal and external states	most OFs; all EFs; some/most CFs if appended to Extended Externalism
Wholesale Sociologism	SFs	SFs	SFs	all OFs; all EFs; all CFs

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Notes

¹ "Social factor" is an admittedly generic and reified term. But alternatives are equally generic and reified (e.g. "the social"). The purpose of this paper is to specify the different kinds of social factors at issue in diverse bodies of literature. Already I have rendered "social factor" more precise in three different ways.

² Several senses of the term, “external factor,” were conflated during the External Factors Debate (e.g. the demarcation between what is internal and external to science as a whole, to a particular scientific discipline, to a general scientific logic or method, to a logic or set of laws of scientific change, etc.). I set these issues aside and focus on SFs and the Forman Thesis.

³ Though his (1971) paper is most famous, Forman’s ideas are most systematically laid out in his unpublished dissertation (1967). Forman is particularly critical of Max Jammer’s (1966) Intellectualist account of the birth of quantum indeterminism.

⁴ Barry Barnes (1974, p. 111) and David Bloor (1982) interpret the Forman Thesis as showing how scientists sometimes side with the popular option when choosing between *conflicting* possibilities. However, I do not think Forman claims there was another, conflicting theoretical possibility that Weimar physicists would have otherwise chosen had certain social factors not been present.

⁵ Bruno Latour, in his preface to the French edition (1996, p. 14) of *Science in Action* (1987) outlines something very much like the shift in focus to external units of study, though to different ends than Fuller’s: “Instead of ideas, thoughts, and scientific minds, one recovers practices, bodies, places, groups, instruments, objects, nodes, networks.” Fuller is one of few proponents of a normative Sociologism. I return to this point late in the paper when distinguishing between two types of Sociologism. Barnes and Bloor allow for evaluation relative to local standards, though they do not construct a normative programme like Fuller does.

⁶ I use the term, “constitutive,” where Lugg uses the term, “determining.”

⁷ M. Norton Wise (2011) levels a similar criticism against Forman (1971), Barnes (1974), and Bloor (1991). The approach of the latter two in particular “thoroughly conflates cultural resources with cultural causes” (Wise 2011, p. 240). Wise’s resources/causes distinction is roughly equivalent to Lugg’s occasioning/constitutive distinction. Concerning Forman, Wise contends that abandoning his strict understanding of disciplinary identity allows us to avoid seeing social influence as compromising scientific integrity (*ibid*, p. 426). I worry that this conflates what is internal and external to a particular discipline with what is internal and external to science as a whole. Part of Schirrmacher’s (2011) recent argument is similar. Wise also contests Forman’s claim that the Weimar physicists’ conversion to acausal physics was sudden. Stöltzner (2003; 2011) agrees.

⁸ I contend that few to no Intellectualist philosophers are Radical Voluntarists. I will not say the same for scientists. For example, the American physicist, Steven Weinberg (1996, p. 56), in reply to Wise (1996), claims that “...cultural influences [that] went into the discovery of Maxwell’s Equations and other laws of nature have been refined away, like slag from ore.” This passage was discovered in Hacking (1999, p. 86).

⁹ Cornelius Borck (2011) argues similarly. He asks, “What could possibly be meant by conscious adaptation...?” Internal explanations, Borck argues, “would immediately generate more questions than they would answer” (p. 454).

¹⁰ Interestingly, the view Giere and Moffatt (2003) and Giere (2002; 2006; 2007; 2011; 2012) adopt affords SFs a more prominent role in generating knowledge than is afforded them on Restricted Externalism or even Social Contextualism. I turn to that view in the following section.

¹¹ Lewens employs this example toward the claim that epistemic realism is consistent with the four tenets of the Strong Programme in the Sociology of Scientific Knowledge, as presented by David Bloor (1991, p. 7). Defenses of epistemic or scientific realism against arguments from social construction also tend to employ externalist elements. Two additional are Papineau (1988) and Goldman (1999).

¹² In a separate paper, Forman (1974) addresses the dependence of post-World War I science in Weimar Germany upon centralized funding bodies. In a series of publications in the 1980s and 1990s (see especially Forman 1985), Forman develops what is sometimes called the Second Forman Thesis, according to which Cold War era American science was deeply shaped by the interests of the military granting agencies funding it. By referencing these arguments, I do not mean to suggest that Forman does no more than identify these dependency relations.

¹³ Lewens (p. 567-568) and Radick (2003) address this type of criticism of Darwinism.

¹⁴ I am using “contextualism” loosely in this section. Those contextualists who debate invariantists espouse a more particular sort of view, and “contextualism” is typically reserved in mainstream analytic epistemology for their family of views. Pragmatic encroachment can also be relevant but I set it aside.

¹⁵ I focus on reliance on other people, but what I say can apply, *mutatis mutandis*, to extension over any CF not possessed by a knowledge-bearer (e.g. attributable to an institution, system, or social practice). I thank Sandy Goldberg for prompting this clarification.

¹⁶ Joseph Shieber (2013) also proposes a “...standard reliabilist account of knowledge, requiring only that the notion of process be broadened to include genuinely social belief-forming processes” (p. 290).

¹⁷ Thagard (1997; 2010); Giere (2002; 2006; 2007; 2011; 2012); Green (2012; 2014); Kelp (2013; 2014); Brogaard (2014); Palermos (2014; 2016).

¹⁸ Giere and Thagard employ distributed cognition. The other philosophers cited in this paragraph employ extended cognition. Green explicitly endorses Extended Externalism by employing Goldberg’s work. The other proponents of extended cognition endorse Extended Externalism more or less indirectly. Extended Externalism does not imply cognitive externalism (Goldberg 2010, pp. 127-132). Cognitive externalism offers specifically psychological explications of Extended Externalism. *Philosophical Explorations* 15:2 (2012), *Philosophical Issues* 24 (2014), and Carter, Clark, Kallestrup, Palermos, and Pritchard (forthcoming) are three collections of papers concerned with the epistemology of cognitive externalism. There is one version of cognitive externalism that lends itself only to a Restricted Externalism. Any type of cognitive externalism says that cognition extends ‘outside the head’. But according to the most moderate version of cognitive externalism, embodied cognition, a subject’s cognition is partly constituted by processes in her body other than those in her head. So, all ‘embodied’ CFs are parts of the knowledge-bearer’s physical body. Embodied cognition, on its own, lends itself only to a Restricted Externalism.