On Epistemically Detrimental Dissent: Contingent Enabling Factors versus Stable Difference-Makers

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The aim of this article is to critically build on Justin Biddle and Anna Leuschner's characterization of epistemologically detrimental dissent (EDD) in the context of science. We argue that the presence of nonepistemic agendas and severe nonepistemic consequences offers neither necessary nor sufficient conditions for EDD to obtain. We clarify their role by arguing that they are contingent enabling factors, not stable difference-makers, in the production of EDD. We maintain that two stable difference-makers are core to the production of EDD: production of skewed science and effective public dissemination.

1. Introduction. The aim of this article is to critically build on Biddle and Leuschner's (2015) characterization of epistemologically detrimental dissent (EDD) in the context of science. We follow their lead in taking 'dissent' to be a particular kind of criticism: the act of objecting to a widely held conclusion. When done properly, dissent is welcome within scientific practice. As Longino (1990, 69) has clearly established, "Scientific knowledge is produced collectively through the clashing and meshing of a variety of points of view." Criticism, when done properly, is integral to the collective advancement of science.[1] Dissent, when an instance of proper criticism, is thus epistemically valuable in the context of science.

Now, there are some instances of dissent that come out as epistemically detrimental. That is to say, some instances of dissent seem to impede, not

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1. Longino (1990) offers an account of some of the various kinds of epistemically beneficial criticism within science.

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promote, the collective advancement of science. Many examples come to mind that have been well described in the recent literature (Oreskes and Conway 2010; Biddle and Leuschner 2015; Harker 2015). Roughly speaking, EDD is about manufacturing controversy in a particular scientific field. The typical story goes something like the following scenario. The research involved has some severe nonepistemic consequences in terms of, on the one side, industry profit and, on the other side, public welfare; large amounts of money are invested by industry-related groups to (1) produce some skewed research, (2) largely publicize the results through the media, (3) produce an atmosphere of confusion and doubt in the public, and (4) launch some campaign against the leading scientists in the field in the media and political world (often through personal attacks and threats); this results in an atmosphere in which the scientists subjectively feel a lot of pressure and discomfort and also objectively waste precious time and limited resources to address the well-publicized skewed research. At this point, the collective advancement of science is clearly impeded. We have an instance of EDD.

The aim of this article is to properly distinguish, in that story, between (1) contingent enabling factors and (2) stable difference-makers in the production of EDD. Our most contentious claim is that the intrusion of nonepistemic agendas and the presence of severe nonepistemic risks are contingent enabling factors, not stable difference-makers, for EDD. We maintain that two stable difference-makers are core to the production of EDD: production of skewed science and effective public dissemination.

In section 2, we offer what we take to be the most straightforward argument for the claim that intrusion of nonepistemic agendas is not sufficient in the production of EDD: it may lead to EDD only if it leads to skewed science. In section 3, we argue that it is not necessary either. Section 4 is devoted to a clarification of the role of intrusion of nonepistemic agendas in EDD on the basis of a distinction between contingent enabling factors and stable difference-makers. Section 5 investigates the consequences of our analysis for the inductive risk account of EDD proposed by Biddle and Leuschner (2015).

2. Nonepistemic Agendas: Not Sufficient for EDD. That intrusion of nonepistemic agendas is not sufficient to the production of EDD has been discussed by Wilholt (2009) and Biddle and Leuschner (2015). Roughly, the point is simply that, unless intrusion of background nonepistemic agendas is such that the work produced fails to satisfy some of the conventional standards for proper science, there is no problem. We offer here what we take to be the most straightforward argument for this point.

As the community of philosophers of science has recently come to recognize, intrusion of nonepistemic values in scientific practice is quite common (Douglas 2009). Now, obviously, that does not necessarily result in

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skewed science. If a scientist defends a conclusion C on the basis of evidence E, the fact that some background nonepistemic values enter into her reasoning does not matter if (1) she can publicly produce an instance of reasoning in defense of C and (2) that reasoning can be assessed as adequate scientific reasoning by her peers, including peers who do not share the same background nonepistemic values. If these two conditions are met, then the conventional standards for proper science are met, and we do not have a case of skewed science. Now, if proper scientific work was produced, there is no a priori reason to think that her work cannot partake in the collective advancement of scientific knowledge. It might do so in various degrees, but that will depend on its heuristic value, which is a priori unrelated to whether there was intrusion of nonepistemic values.

Let us push this line of argument a little further. It is important here to underline the fact that the reasoning rendered public by the scientist might not be the actual reasoning through which she came to accept either E or its relevance with regard to C. From a subjective point of view, for example, she might well have accepted C long before she produced E and the reasoning defending the relevance of E as supporting C. She might well have accepted C for nonepistemic, value-laden reasons. However, such considerations over the subjective state of scientists do not matter. The collective assessment of scientific research is not in the business of mind reading. No matter what kind of reasoning (or nonreasoning) actually brought a scientist to believe C, the relevant question is whether she is capable of producing an instance of reasoning in defense of E and its relevance with regard to C that can be publicly, and positively, assessed by the experts in her field. To put it bluntly, the most biased and ill-intentioned scientists are a priori capable of producing good scientific work.[2]

This line of argument applies to the production of dissenting views. Dissenting claims proposed by scientists motivated by nonepistemic agendas do not necessarily lead to skewed science and hence to EDD. If an instance of reasoning can be publicly produced, and if the members of the scientific community, including members of that community who do not share the same values as the dissenting views' proponents, assess that reasoning as scientifically adequate, then we do not have an instance of skewed dissent. As an instance of work that satisfies the agreed-upon standards of proper scientific practice, the dissenting view could well participate in the advancement of scientific knowledge. It could do so in various degrees, depending on how important the dissenting views are, but that would not depend on

2. This is not denying the actuality of implicit bias. By definition, implicit bias is still bias. As such, it can be recognized by the scientific community for what it is. What is implicit about it is that the biased author (and possibly some of her peers as well) is not even realizing her own bias.

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whether the dissenting views are the products of scientists with nonepistemic agendas. Considerations about the subjective intentions or background beliefs of the scientists are irrelevant, unless one can show that skewed science was produced.

3. Nonepistemic Agendas: Not Necessary for EDD. At this point, we have shown that intrusion of nonepistemic agendas does not necessarily result in the production of EDD. Note that EDD does not require intrusion of nonepistemic agendas either. What would it take to have a case of EDD without any intrusion of nonepistemic agendas? We know that EDD is about manufacturing controversy within a scientific field. First, the controversy is "manufactured," not genuine, because the dissenting view is not based on proper science; it violates some of the commonly accepted standards for proper scientific practice; it is an instance of skewed science. Now, skewed science can come to be in many ways. It does not have to result from the intrusion of nonepistemic agendas. One can imagine the case of a scientist, say, Jack, who is genuinely interested in partaking in the collective advancement of scientific knowledge but is also a poor scientist. One can imagine that Jack is very wealthy and thus has both the time and financial resources to pursue his research and produce a large amount of work challenging the commonly held views in a given scientific field. Jack, albeit misguided in many ways, could conceivably do all of this with the "purest" goal in mind.

Now, one immediately sees that the production of bad science is not enough to produce EDD. Jack's research is likely to be ignored by the scientific community. So, what would it take to "manufacture" a controversy on the basis of Jack's research? The answer seems rather straightforward: Jack's research needs to be effectively disseminated so that scientists feel pressured to respond to Jack's challenges. The standard avenue, however, for dissemination of scientific research—peer-reviewed publication—is not likely to be an option for Jack, since his work is widely recognized by the community as being of poor scientific quality. He must then bypass this avenue and manage to effectively disseminate his research among the public. Mass media would be a likely option for this. This in turn forces scientists in the field to waste time and resources to address Jack's research. Hence, we have a case of EDD, with the purest epistemic goal at its source.

The case above might seem far-fetched. One objection could be that, unless some nonepistemic values were at stake, it is unlikely that the media and the public would get interested in Jack's research, and Jack would fail to manufacture the controversy. It might be unlikely, but it is surely conceivable. If Jack's public-dissemination machinery is effective enough, (mis)understandings over the state of research in the field of concern could well have serious repercussions on public funding. Jack could well have a very strong network of communication—he could well be the owner of a

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very large cable and press network. Repeated reporting on public funding of supposedly controversial science could well spur outrage in the public. "Debates" in the mass media would ensue. As soon as scientists engaged in that conversation, Jack's claims would gain in credibility.[3] In the end, Jack's campaign could well be so effective that scientists would indeed be forced to repeatedly address his research to defend their own. So, intrusion of nonepistemic agendas is not necessary to the production of EDD.

4. Stable Difference-Makers versus Contingent Enabling Factor. From the discussion above, we conclude that intrusion of nonepistemic agendas is neither necessary nor sufficient for the production of EDD. Such a conclusion might strike many as unsatisfactory, however. Is it not the case that intrusion of nonepistemic agendas was an important factor in the production of the common cases of EDD that we have witnessed over the last 50 years? Some may even want to claim that, as a matter of fact, in all of the cases we know of in recent history, no EDD would have occurred if it were not for the intrusion of nonepistemic agendas. This is an important intuition, and arguably any satisfactory account of EDD ought to make sense of it. Fortunately, we believe there is a way to do so, and that is by appealing to the distinction between contingent enabling factors and stable difference-makers as discussed by Thomson (2003) and Woodward (2010).

Thomson (2003) makes the point (contra many theories of causation) that just because 'E would not have happened without C', it does not follow that 'C has caused E'. She argues that the proposition 'E would not have happened without C' only entails that 'C was physically necessary for E'. Consider her example. John built a bridge over the Rapid River. The Rapid River is notoriously wild, and only John, a master builder, could have done it. From the bridge being built, it ensues that Smith crosses the river. Now, John's building the bridge was physically necessary to Smith's crossing the Rapid River, but most would agree that it is misguided to take it as a cause for it. John's building the bridge, even if "physically necessary" in the whole process, remains largely irrelevant to Smith's crossing the river. It belongs to the background conditions, or environmental conditions, that make Smith's crossing possible, without causing it in any genuine sense of causation. In Thomson's vocabulary, it is only an enabling factor.

Woodward (2010) is interested in analyzing a similar distinction between the core difference-makers and the background conditions. His analysis is useful to flesh out some of the characteristics of enabling factors à la Thom-

3. This is a point that Arendt (1967/2005) made clear in her insightful analysis of controversy- and doubt-manufacturing in a completely different context, the (non)issue of the reality of the Holocaust during World War II.

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son.[4] One of the intuitions that Woodward is trying to capture is that some causal relationships are robust, that is, insensitive to environmental change, while others are contingent on the presence of a specific environment. To do so, he articulates the notion of "stability."[5] A causal relationship, according to Woodward, is stable if and only if it holds over a wide range of background conditions. Some examples might be useful at this point.

A paradigmatic example of an unstable relation would be as follows.[6] "Star" professor P writes a letter of recommendation for Jane, thanks to which Jane gets a job at university U. She would not have gotten the job without it. Jane meets Joe at U; they get married and have children. Challenged by the difficulties of coupling an academic career with quality parenting, Jane falls into depression. Now consider the following claim: P's writing a letter for Jane caused Jane's depression. Given the story here, there is a sense in which P's writing a letter for Jane enabled Jane's suffering from depression, but there is also a strong sense in which it is misguided to take it as a cause for it. The reason is that the relation between P's writing the letter and Jane's suffering from the disease would cease to hold under many small, contingent changes in the background conditions for the story (Jane and Joe could not have met, they could have decided to not have children, U could have had a very progressive parental leave policy, etc.). The causal relationship between the letter and the depression is thus highly unstable because it holds only in a very specific environment.

Now, contrast this with a paradigmatic example of a stable relation. I turn on the heat under my closed pressure cooker (with some water in it). The pressure goes up and the valve shuts down. Clearly, heating up the pressure cooker is a stable cause of the pressure valve to shut down. Many of the most stable causal relations are backed up by the kind of generalizations that we take to be the laws of physics or chemistry. These generalizations hold over a wide range of background conditions.

There are obviously various degrees of stability in between these two extreme cases. Stability is not an all or nothing affair. It might also be difficult to figure out which causal relationships are more or less stable. That said, it could also be worth the effort of looking into it, because how stable a factor is

4. Note that we do not claim (and neither does Woodward) to have unveiled the set of necessary and sufficient conditions for factors to qualify as enabling factors by contrast to stable difference-makers. We will only claim that enabling factors are typically unstable and hence that lack of stability serves as a good indicator for a factor to be only enabling, not causing.

5. Two other notions are articulated in the article. The notion of proportionality serves to address the issue of the proper levels of explanation. The notion of specificity serves to address the issue of coarse versus fine-grain causal influence.

6. This example is inspired by Woodward (2010) himself, who in turn was inspired by Lewis (1986).

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could be a measure of how well we can target change by targeting that factor in a given situation. As Woodward (2010, 315) explains, "Other things being equal, causal relationships that are more stable are likely to be more useful for many purposes associated with manipulation and control than less stable relationships." Applied to our case, if ultimately we hope to be able to alter the manufacturing of controversy and EDD, it could turn out to be very useful to clarify the causal landscape behind EDD by distinguishing between the contingent enabling factors and the more stable difference-makers.

Thomson's and Woodward's analyses are clearly related. Thomson's bridge example is a clear case of a very unstable causal relationship: it holds only under very specific background conditions (the Rapid River could have been gentle, Smith could have decided not to cross the bridge, etc.). Some unstable causal relationships as discussed by Woodward are so at least partially because they are relationships of contingent "physical necessity" à la Thomson. So, a causal factor may be highly unstable, despite being 'necessary' to the causal process, if its influence on the process is highly contingent on a specific environment. No matter how "necessary" in that sense a factor F is, F being unstable suggests that F is an enabling factor, not a stable difference-maker.[7]

The discussion above allows us to bring home two important points. First, it allows us to identify two stable difference-makers for the production of EDD: the production of skewed scientific research and its effective public dissemination. That the combination of these two factors produces an instance of EDD holds over a wide range of conditions. What changes in background conditions would make that causal relation fail? First, one could think of a world in which scientists could ignore even well-advertised skewed science. For example, that could possibly be the case in a world in which the production of scientific research would not depend on getting public funding or in a world in which the public is generally knowledgeable about (the philosophy of) science and hence is able to recognize that the well-advertised science is skewed. Arguably, these do not qualify as small changes in the background conditions for scientific practice.[8]

7. Two points of clarification are in order. First, Woodward convincingly argues that the extent to which a cause is stable is related but not equivalent to its distal/proximate character vis-à-vis the effect. Second, Woodward also argues that stability is not dependent on the level of explanation: degrees of stability are not necessarily correlated with how "reductive" the explanation is. So, our distinction between contingent enabling factors and stable difference-makers is not trivial in the sense that the most stable difference-makers would always be the most proximate causes described at the level of fundamental particles.

8. There is also a possibility that some cases of EDD could come out of seemingly proper science "distracting" the public from the most widely held views within the scientific community. We believe that even in these cases, dissenting views do not entail EDD unless there is a violation of some conventional standards for proper science. This interesting issue belongs to another essay.

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The second point is a clarification of the role played by the intrusion of nonepistemic agendas in the production of EDD. Intrusion of nonepistemic agendas is not a stable difference-maker for the production of EDD. This is because there is a large range of conditions under which intrusion of nonepistemic agendas does not result in EDD. These include the conditions for all the cases in which intrusion of nonepistemic agendas does not result in skewed science. If we take seriously recent work on science and values, intrusion of nonepistemic values is actually the rule, not the exception within the practice of science (Intemann 2001, 2015; Douglas 2009; and references in all three). Note that, if our take on Thomson's and Woodward's analyses is correct, then the claim that intrusion of nonepistemic agendas is not a stable difference-maker but only a contingent enabling factor is consistent with the fact that it has been "physically necessary" in many of the well-known instances of EDD. One can consistently say that, while not a stable difference-maker, it has been an important enabling factor for the production of well-publicized skewed science. Intrusion of nonepistemic agendas has been necessary for some groups to develop an interest in funding the production and public dissemination of skewed research. That said, it is important to distinguish between factors that are characterized by this kind of 'necessity' (the bridge or letter kind of necessity) and factors that are true stable difference-makers. It is all the more important that, if one of our goals is to alter the production of EDD, then our analysis suggests that intrusion of nonepistemic agendas is not the proper target. Once again, nonepistemic values are the common rule within the practice of science. A more efficient approach in the prevention of EDD would be to understand the various ways skewed science may be produced. This includes the important discussion on how to identify when or how the influence of nonepistemic values is legitimate (Douglas 2009; Elliott 2013; Elliott and McKaughan 2014; Hicks 2014; Intemann 2015). This in turn includes an investigation of the mechanisms by which intrusion of nonepistemic values does result in skewed science. Implicit bias might be one of these mechanisms. Inductive risk bias, as we will explain in the next section, is another one. Before we turn to this point, let us take stock.

We have clarified the causal landscape for the production of EDD. We have identified two stable difference-makers—production of skewed science and its effective public dissemination—and we have characterized the important role of intrusion of nonepistemic agendas within science as contingent enabling factors for the production and dissemination of skewed research and hence for EDD.

5. Consequences for the Inductive Risk Account of EDD. Biddle and Leuschner have articulated what they call the "inductive risk account" of EDD. According to this account, the following conditions are jointly sufficient for the production of EDD:

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> Dissent from a hypothesis H is epistemically detrimental if each of the following obtains:
>
> 1. The nonepistemic consequences of wrongly rejecting H are likely to be severe.
> 2. The dissenting research that constitutes the objection violates established conventional standards.
> 3. The dissenting research involves intolerance for producer risks at the expense of public risks.
> 4. Producer risks and public risks fall largely upon different parties. (Biddle and Leuschner 2015, 273)

Biddle and Leuschner admit that these conditions are not necessarily related to the production of EDD:

> We are not arguing that, in all possible worlds, research that meets the conditions of the inductive risk account inhibits the progress of science. It is possible, for example, to organize science and to regulate industry in such a way that dissent that meets these conditions is not widely disseminated, does not acquire political authority, and is not used to attack mainstream scientists. But this is not the way in which science and society are currently organized. Dissent that meets the conditions of the inductive risk account is, given current societal arrangements, likely to inhibit knowledge production, particularly because of the success of political, economic, and ideological interests in structuring the dissemination of research. (275)

We think that the framework used in section 4 can help clarify the causal landscape for the production of EDD offered in the inductive risk account. Our contention is that Biddle and Leuschner, by focusing on inductive risk, have identified a particular and important but still contingent enabling factor yet have failed to clearly distinguish the proper core of stable difference-makers for the production of EDD. Let us make that point in more detail.

The four conditions above can be seen as dividing into three groups. Condition 2 identifies one of the stable difference-makers: production of skewed science. Conditions 1 and 4 together specify some particular enabling conditions for the formation of nonepistemic agendas—the presence of severe and opposing nonepistemic consequences (SONEC). Condition 3 identifies a mechanism by which intrusion of SONEC-related nonepistemic agendas may enable the production of skewed science. In other words, the inductive risk account of EDD identifies an important series of enabling causes leading to one of the two stable difference-makers we identified in sections 2–4: the production of skewed science. That series of causes is something like this: from the presence of SONEC to biased inductive risk reasoning and then to skewed

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science. This is an important contribution to the understanding of EDD precisely because it identifies not only some particular enabling factors (the presence of SONEC) for the formation of epistemic agendas but also a mechanism by which intrusion of SONEC-related nonepistemic agendas may enable the production of skewed science (via inductive risk bias). Now, it is also important to clarify the causal landscape and recognize that fulfillment of condition 2 is the stable difference-maker that fulfillment of conditions 1, 4, and then 3 enables as a matter of contingent fact. Biddle and Leuschner seem to have missed that useful distinction.

If our analysis in section 4 is correct, they also have failed to include the second stable difference-maker for EDD: effective public dissemination. As they admit (see the quotation above), the presence of SONEC obviously does not imply that effective public dissemination will ensue. Conversely, as Jack's case shows, effective public dissemination could well be obtained without the presence of SONEC. How (un)likely this is obviously is an empirical question. No matter how unlikely, however, it is important for our understanding of EDD to mention effective public dissemination as a core stable difference-maker. The inductive risk account fails to do so. Let us underscore, however, that Biddle and Leuschner (2015, 275) once again have identified an important mechanism by which the presence of SONEC enables effective public dissemination and the manufacturing of controversy: the presence of SONEC enables not only the production of skewed science but also the establishment of a "sophisticated, private-funded network for disseminating [dissenting] results."

This brings us to our conclusion on the inductive risk account: Biddle and Leuschner have successfully identified an important contingent enabling factor for EDD, namely, the presence and influence of SONEC. That said, they have failed to distinguish between the different roles that enabling factors and stable difference-makers play in the production of EDD. We hope to have clarified the situation.

6. Conclusion. Well-known cases of EDD seem to have in common various forms of intrusion of nonepistemic, often SONEC-related, agendas within the science. We have argued that such intrusion is not core to the production of EDD: neither necessary nor sufficient, it is also not a stable difference-maker. We have clarified its causal role: intrusion of nonepistemic agendas is a contingent enabling factor. Reduced to its core, EDD is just well-advertised bad science. Because it is well advertised, it has an impact on the collective building of scientific knowledge. Because it is bad science, it does not advance that endeavor but in any case negatively affects it instead.

To make the distinction between contingent enabling factors and stable difference-makers is important for at least three reasons. First, it is important to clarify the causal landscape that leads to the production of EDD, as it

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simply increases our understanding of EDD. Second, it might suggest more efficient avenues for targeting change. Finally, it is crucial to make room for the intrusion of nonepistemic values within the science without it being epistemologically detrimental. As the community of philosophers of science comes to recognize that such intrusion is the rule rather than the exception, one must leave conceptual room for a distinction between "legitimate" and "illegitimate" roles for, or kinds of, nonepistemic values within science (Douglas 2009; Elliott 2013; Elliott and McKaughan 2014; Hicks 2014; Intemann 2015).

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