Revisiting Stance Voluntarism: In Defense of an Active Stance Pluralism

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Abstract

Bas van Fraassen's stance voluntarism has raised the question of how to justify one's own stance choice if one is to follow the voluntarist dictum that all rational stances, i.e. all those that don't lead to 'self-sabotage by one's own lights', are equally rational. van Fraassen's response is that one justifies their stance choice based on one's own values, but the problem is that those values only appeal to holders of the said stance and not others. In this paper I propose a pragmatist approach to justifying stance choice. I argue that we can provide stance-transcendent justification for our choice of stance based on its stance-transcendent benefits. Consequently, multiple stances having stance-transcendent benefits should all be embraced as it is the epistemically virtuous thing to do. I advocate a move away from the standard voluntarist position of being a stance monist in practice – i.e. defending and holding only one stance – while acknowledging other rational stances only begrudgingly. I defend an active stance pluralism where we strive to actively hold different (apparently conflicting) stances depending on the context. Where that's not possible, I propose that we should at least enthusiastically encourage multiple stances (taken by others). In Section 1 I introduce epistemic stances via a discussion of stance empiricism and stance scientific realism. In Section 2 I discuss the problem of stance justification and explore a few different existing teleological proposals for stance choice. Finally in Section 3 based on numerous examples from science and philosophy, I argue for a pragmatic, active, normative stance pluralism. I conclude with some clarifications on the rationale behind active stance pluralism.

1. Introduction to Stances via Empiricism and Scientific Realism

Bas van Fraassen (2002) championed the idea that empiricism is to be seen not as a doctrine or belief, but rather as a 'stance' – a coherent web of commitments, goals, values, and beliefs. In van Fraassen's (2002) words, "A philosophical position can consist in a stance (attitude, commitment, approach, a cluster of such–possibly including some propositional attitudes such as beliefs as well). Such a stance can of course be expressed, and may involve or presuppose some beliefs as well, but cannot be simply equated with having beliefs or making assertions about what there is." (47-48) Although van Fraassen was the one to formally introduce (at least in philosophy of science) the term stance to describe a philosophical position – specifically empiricism – others before and after him have had a similar take on other positions as well, in particular scientific realism. There have broadly been two routes to seeing empiricism and realism as stances and I discuss each of these in turn.

It has been acknowledged for a while now that the traditional realism-empiricism debates have reached an impasse (for instance Wylie 1986, Chakravartty 2004, Forbes 2017). Many arguments for and against each side have been on offer for at least several decades now and while there has been progress in terms of nuance and precision of arguments within each side, consensus on which side triumphs – either as a descriptive or a normative account of science – has remained elusive. The no-miracles argument for realism, that infers the (approximate) truth of scientific theories based on their success has been challenged by the (historically informed)

pessimistic meta-induction argument as well as arguments from underdetermination of theory by evidence. Among the replies that realists have offered – again often by turning to historical and contemporary case studies – is that realism doesn't apply wholesale to any successful theory but only to those parts of it genuinely responsible for its success and that have persisted through time. Counterresponses to this include questioning if such a neat separation of "wheat from chaff" (Chang 2001) is always possible, and that preservation of certain parts of a theory over time might just be owing to quirks of particular scientists and may not be indicative of the truth. Realists have also offered arguments based on the indispensability of (certain) theoretical entities, but of course, indispensability does not imply reality or truth. Despite counterarguments, a realist line of argument that has been among the most persistent is that realism paints a highly intuitive picture of science and helps make sense of and motivate scientific practice, particularly the more theoretical areas (Wylie 1986), and helps achieve a coherent image of the world (Psillos 2011). Empiricists – constructive empiricists in particular, whose brand of empiricism has been the most prominent since Bas van Fraassen's *The Scientific Image* – on the other hand maintain that belief in the existence of theoretical entities is supererogatory and that empiricism works adequately – and in fact better – as both a descriptive and normative account (science aims not at truth but at empirical adequacy) of science. This persistent divide has made philosophers on both sides reimagine their core positions. If evidence-based (among other strong) arguments on each side have proven insufficient to convert members of one camp to the other[1] for so long, then perhaps these positions shouldn't be viewed as truth-apt propositions to be argued for or against in the first place.

For instance, Allison Wylie (1986) argues that the realism debate has come down to a choice between not just 'theories' or sets of beliefs about science, but broader, meta-philosophical principles and values about whether to be more charitable or more critical of scientific claims about unobservables. She sees realism and antirealism[2] as distinct philosophical research programs: the antirealist program values epistemic asceticism and abstinence from beliefs about theoretical entities. This is good insofar as it helps us realize the "tenuousness of our epistemic situation" (294). On the other hand, the realist program values interpreting claims about unobservables charitably, the rationale being to go with rather than against the grain of scientific practice. Such a realism according to Wylie has the pragmatic benefits of being able to make sense of scientific practice and also contributing to its progress. Although research programs aren't identical to stances, Wylie's description of a research program certainly resembles that of a stance in many aspects (although a stance is arguably broader) such as being distinct from a doctrine or belief and involving pragmatic goals and values. Once viewed as stances – or something like them – we can see why realist and empiricist (among other) core positions seem so deep-seated and unyielding: they are a function of an individual's personal values, attitudes,

[1] As Anjan Chakravartty (2017) notes, case studies do not help decide whether to be realist or antirealist because they present a case of (meta) underdetermination. He cites the example of case studies on the caloric that has led Stathis Psillos on the one hand, and Hasok Chang and Kyle Stanford on the other, to opposing views, *viz*., realism and antirealism.

[2] What I refer to by 'antirealism' is what she calls "consistent" antirealism: an antirealism that takes seriously the point that it is impossible to draw a line between the observable and the unobservable and hence adopts a uniformly skeptical epistemic attitude toward both. This is debatable – van Fraassen for instance insists that a line can be drawn, and the basis is human sense perception. Regardless, Wylie's larger point of realism and antirealism (of whatever kind) being metaphilosophical research programs rather than doctrines is the point of interest here.

commitments, as well as beliefs, rather than solely beliefs. Let's call this the *descriptive account* of realism and empiricism being stances.

In parallel, there has been some interrogation of the core view within each camp internally – the issue of persistence of the debates apart – that has also led proponents on both sides to deliberately reimagine their positions as stances. Let's call this the *normative account* of realism and empiricism being stances since it involves philosophers on each side recommending that their position be taken as a stance. Arguably the most notable arguments against traditional empiricism coming from an avowed empiricist are those presented by Bas van Fraassen (2002). van Fraassen notes that traditional empiricism, i.e., empiricism taken as a doctrine – something like, 'Experience is the source of all knowledge' would itself be metaphysical since it is itself not rooted in experience. Hence, since 'doctrine empiricism' cannot defend itself against its rival i.e., metaphysics, van Fraassen argues that it is better reimagined as a stance. van Fraasen takes a pragmatic, voluntaristic approach to stance adoption. I return to this in more detail later, but briefly, the idea is that choice of stance – rather than being rationally forced – is based on one's personal values and aims.

In a similar vein on the realist side, Stathis Psillos (2011) advances Reichenbach's and Feigl's views against verificationism and for a more pragmatic/ conventionalist approach to realism. The idea is that in order to have debates about whether theoretical entities like electrons and genes exist, we first need to have a "realist framework" – a framework that posits such entities to explain the behavior of macroscopic entities – already in place.

"…the very idea of counting empirical success as being in favour of the truth of a scientific theory—the very idea of evidence making a theory probable, or the very idea that a theory is the best explanation of the evidence, and the like—presupposes that theories are already placed within the realist framework. For the no-miracles argument to work at all it is presupposed that explanation—and in particular explanation by postulation—matters and that scientific theories should be assessed and evaluated on explanatory grounds. Hence, the no-miracles argument works within the *realist* framework; it's not an argument *for* it." (312, emphasis as in original)

Realism is hence not to be seen as a theory about science but rather as a framework that "makes possible certain ways of viewing the world". Adoption of the framework is not a forced decision; it is a matter of convention and pragmatics. Adopting it will best serve certain specific aims, among which the aim of achieving "a causally-nomologically coherent image of the world" (309) is particularly salient. Once adopted, those posits within the framework that are indispensable to such an image are taken to be real. Such a scientific realism is said to occupy a middle ground between the extremes of instrumentalism/ fictionalism on the one hand and metaphysical realism (one that posits a reality that transcends science and any human access) on the other. Psillos' 'framework' is evidently very similar to van Fraassen's 'stance': they're both not beliefs or theories but larger structures; the adoption of both are unforced and tied to individual aims and both are hence rooted in pragmatics.

In summary, both kinds of arguments – descriptive and normative – have culminated in advancing the idea that realism and empiricism are to be understood not purely as theories or beliefs but rather as larger cognitive structures involving pragmatic considerations such as

personal values, attitudes, and goals. But once we get into the realm of values, do we descend into relativism? How do we adjudicate among values? If we cannot, are all values and goals equally legitimate, hence making all respective stances equally legitimate from a higher, transcendent perspective? Epistemic voluntarism which van Fraassen advances, answers this in the affirmative. If voluntarism is right, the problem that arises is that of evaluating stances and one objectively and justifying their own stance choice against others. I now discuss van Fraassen's epistemic voluntarism and this thorny issue of the justifying stance choice.

2. Rationales for Stance Choice: Voluntarism, Pragmatism

2.1 The problem of justifying stance choice

2.1.1 Relativism

How do we adjudicate among stances? van Fraassen has two minimal criteria: First, a stance should be rational in the sense of being internally coherent. It shouldn't lead to 'self-sabotage by its own lights'. This includes both having beliefs or statements that aren't mutually contradictory, as well as pragmatic coherence, i.e. not holding unsatisfiable aims, or beliefs or attitudes that would sabotage any goal internal to the stance. Any stance that satisfies this criterion is considered rational. Second, our values decide our choice of stance. Values are relative to an agent though, and are in this sense, not objective. For someone who values epistemic caution, takes an austere attitude toward ontology, and has a distaste for explanations and metaphysics more broadly, an empiricist stance makes sense. Similarly, for someone who values explanation and has a more permissive attitude toward ontology, a realist stance makes sense. But this sense-making is internal to each stance. As Psillos (2011) notes along similar lines, the no-miracles argument for scientific realism itself operates *within* the realist framework: it sits within a framework that already takes explanation as legitimate and valuable. So, the no-miracles argument cannot be an argument *for* realism simpliciter, rather, rather it works within the realist framework. And as above, choosing that framework depends on one's values and commitments.

van Fraassen's rationality criterion is evidently minimal and very permissive. van Fraassen advances a voluntarist epistemology[3] according to which rationality underdetermines our choice of stance and there is an element of choice in adopting epistemological stances. While *my* values guide me to adopt a certain epistemological stance, I cannot rule a contrary stance as irrational if it is self-coherent. This has naturally led to allegations of relativism and brings us back to the question of how we are to adjudicate among (equally rational) stances. If rationality doesn't compel us to adopt a stance, and if we are to be voluntarists about epistemological stances, then we must conclude that all stances that aren't internally incoherent are equally acceptable[4]. To be

[3] van Fraassen's voluntarism is based on William James' pragmatist epistemology. James sees our epistemic life as consisting of two goals: increasing the number of truths we believe and reducing the number of falsities. But the two cannot be jointly maximized. So we must settle on a certain balance between the two, which is obviously based on an individual's tolerance to error which is in turn contextual and guided by pragmatic values and involves an ineliminable role for the will. While this is focused on propositions, van Fraassen applies the general lesson to stance adoption as well.

[4] This is similar to problems with 'indulgent pluralism' – as opposed to 'abstemious pluralism' in epistemology discussed by Rowland and Simpson (2021)

clear, the issue is that of someone justifying their own stance while at the same time acknowledging other rival stances as equally permissible. As Peter Lipton (2004) puts it, "the stance empiricist denies [that one's stance is epistemically obligatory] but aims rather to show the [stance] to be the most attractive option relative to one's values" (151). Another way of putting it is to show that the stance empiricist cannot mount a genuine critique of stance metaphysics (Jauernig 2007, Chakravartty 2007, 2017) So, it seems we either must find a way out of voluntaristic relativism and find something substantial to say about justifying stance choice or accept the relativism and consequently accept that we simply cannot objectively justify our own stance choice.

van Fraassen underlines that the voluntarism he advances does imply relativism, but not a "debilitating" relativism. He comments, "If this is relativism, it is certainly not debilitating relativism—it is only an acknowledgement of the logic of this aspect of the human condition (unpublished, 11)." Martin Kusch (2020) reasonably interprets this to mean that this kind of a relativism is not one that disallows a stance-holder to discuss, judge, or argue for or against their and other stances. This is reminiscent of Thomas Kuhn's (1977) view on theory choice in 'Objectivity, Value Judgement, and Theory Choice' where he argues that theory choice is a matter of *judgement* involving individual/ personal factors, as well as shared criteria, and that judgements – as opposed to mere tastes or preferences – are 'eminently discussable'.

How do we discuss stances? An empiricist could say to a scientific realist – as van Fraassen does – things like, 'belief in unobservable entities is supererogatory' or as Nancy Cartwright (2007) does, 'we are creatures bound in a world of sensation' and so on. They could also point to – in their eyes – the historical failings of metaphysics. It is possible that two people adopting opposing stances have some shared background values/ beliefs on the basis of which such discussions could be meaningful and might even in fact result in 'conversion'. But importantly, van Fraassen's point is, regardless, we don't *have* to buy into the opposing stance. While the rationality criterion may not rule it out for us, *our values* do. In fact, van Fraassen (2004) goes further to say, "To take a stance is however, ipso facto, to rule out all competitors as stances for oneself." (186) And this ruling out is done on the basis of one's values. He says he is not advocating a general principle of tolerance here. But if we take a certain stance – thereby ruling out other stances – while also accepting this minimal account of rationality – according to which any stance that doesn't result in self-sabotage is acceptable and stance choice is primarily value-based – then it seems that stance adoption is arational, for there doesn't seem to be a rational way of adjudicating between various stance-defining values. Even if we're able to discuss and debate and have conversations about rival stances, our values may ultimately make us stick to our original stance. And with this, we're back to relativism – arguably a 'debilitating' relativism at that, for even though it may not be the kind of relativism that prevents any possibility of discussion, it prevents any conciliation.

Chakravartty (2011) makes just this point: stance relativism is inevitable if we follow voluntarism – even if dialogue across rival stances is possible – and argues that we *ultimately* cannot have anything illuminating to say about our stance choices even if those choices are philosophical in nature and made reflectively. Stance choice is an act of the will – and while we can say that it is based on our values, this doesn't say much: "The will is utterly impervious to theoretical analysis, and yet we simply cannot do without it here." (46) He goes on to say,

"Sadly, palaeo-anthropology has uncovered no evidence to suggest that our Pleistocene ancestors faced selection pressures likely to produce descendent populations of hominids inclined towards realism and constructive empiricism in the relevant proportions. Perhaps we have simply arrived at one of those places in philosophical investigation where we have no further option but to follow Wittgenstein's advice and remain silent. Or perhaps slightly better, to quote him (1963, §217) in another infamous mood: 'If I have exhausted the justifications, I have reached bedrock, and my spade is turned. Then I am inclined to say, "This is simply what I do."' (47)

2.1.2 Is it irrational to choose an epistemic stance for non-epistemic reasons?

I now discuss another issue related to the alleged irrationality of stance choice raised by Peter Baumann (2011). As a reminder, in our present context when we say 'stance' we're talking exclusively about epistemic stances (as opposed to say, moral stances). What is an epistemic stance? Chakravartty (2011) gives a broad definition: "My interest here is in epistemic stances in particular, *viz*. ones concerned with the production of knowledge…" (38) Baumann defines it somewhat differently: "Call a stance an "epistemic stance" just in case it is adopted with respect to some epistemic activity or project." (30) Further, "Call an activity or a project an "epistemic activity" or an "epistemic project" just in case its main inherent *telos* or the main goal it is directed at is epistemic in nature, that is dedicated to finding out the truth about something." (30) Now recall that beyond the thin rationality criteria proposed by van Fraassen, stance choice is dictated only by one's values. These values are non-epistemic in the sense that they are personal and pragmatic and aren't expected to be truth-conducive. Based on this, Baumann's criticism of stance voluntarism is as follows.

- The stance voluntarist is irrational because she takes an epistemic stance (such as empiricism) without having epistemic reasons for doing so.

(Note that this is not the same as the earlier problem of relativism. Not having epistemic reasons for stance choice isn't the same as seeing all stances as equal: you could have epistemic reasons and still be a stance relativist, and you could lack epistemic reasons and still be a non-relativist.)

Baumann claims that the above is somewhat Moore-paradoxical and hence irrational. It would be more clearly (quasi) Moore-paradoxical if the stance voluntarist claimed to be taking an epistemic stance while also claiming not to have any reason to think that the stance is epistemic. This is not what the stance voluntarist is doing. (See Appendix 1 for a critical discussion of Jamee Elder's (2019) response to Baumann.) But there is a bigger problem with Baumann's argument.

First, an assumption in Baumann's approach is that an epistemic stance is one that is adopted with respect to an epistemic activity. This makes it sound like epistemic activities are prior to stances. While this may well be true in many cases as we will see later, this isn't on my reading of van Fraassen, *his* construal of 'taking a stance'. On his account, taking a stance is more 'global' and isn't taken in response to a specific project. In fact on this account, often, activities or projects are internal to stances. For example, choosing the activity of constructing and evaluating explanations is internal to the metaphysical stance. An empiricist would not be interested in this activity in the first place. (For this reason, I think Chakravartty's (2011) more

general characterization of an epistemic stance as one "concerned with the production of knowledge" works better for van Fraassenian stances.) Once we appreciate this, we can see that the only relevant question that remains in cases of global stance adoption is that of stance choice simpliciter, and not stance choice in response to some goal at hand. Baumann acknowledges this kind of global stance adoption himself but argues that even in such cases the stance couldn't at all help with activities within the stance directed at inquiry since it is not adopted for epistemic reasons. But a stance-to-activity relationship isn't like that between a woodworking tool and a carpentry project. In the latter, the reasons for choosing the tool must be suited to the goal at hand. But *there is, and need be, no rational link between the reasons for stance choice and the epistemic nature of the activities within it*.

An analogy might help. Take someone's choice of science as a career. Once that choice is made and pursued, say the person works on the problem of protein folding. The point of relevance here is that the person's reasons for choosing science for a career have nothing to do with the epistemic nature of the project of protein folding. That link, like the choice of doing science, is *arational.* Granted that 'science career' isn't a stance (although there are obvious similarities), but the link between choice of a science career and epistemic projects within it is relevantly similar to the link between epistemic stance choice and epistemic projects within it: they're both arational and opaque to philosophical analysis. Both an epistemic stance and a science career can be chosen for value-laden reasons such as personal disposition; the associated methods and projects being expedient; influence of a parent/ friend/ mentor. Both produce epistemic products – and hence can be considered an epistemic stance and an epistemic area or field respectively – but these reasons for choosing them have nothing to do with the epistemic nature of the products. Even if the hope or promise of producing epistemic products (truths etc.) is a reason for the choice, this isn't an epistemic reason either: it would be teleological (Sandy Boucher (2018) makes this point). It would be up to the psychologist/ cognitive scientist to study the link between the reasons one chooses a stance, and the epistemically fruitful work they do within it.

But what about cases where stance adoption isn't global in the sense discussed above and is in fact in response to a specific project or activity? In such cases, stance choice certainly has to be rational in the sense that it has to be suited to the project at hand. However, 'rational' does not necessarily mean 'epistemic'. It is pragmatic rationality that is relevant here. So if say, a realist attitude is adopted 'locally' in response to a scientific activity – or towards doing science more broadly – the reasons may be motivational for instance (and hence non-epistemic). Motivation may be what is pragmatically helpful or required in the given circumstance. So, while the realist stance is a pragmatically rational choice and may in fact lead to epistemic benefits, the reasons for choosing it are still non-epistemic, and similar to the previous global case, I see no tension between such reasons and the stance advancing an epistemic project.

As a case in point, consider Albert Einstein's realist attitude toward his science as discussed by Fine (1996). For Einstein, taking a realist stance – including in particular the belief in an objectively and mind-independently existing external reality – was what motivated and gave meaning to his pursuit of science. How come such motivational reasons resulted in his mind producing such epistemically fruitful – not to mention groundbreaking – work? This is not a question that can be examined by philosophy. Here is an especially relevant quote from Fine on Einstein in this regard:

"Motivational realism is really not a doctrine but a way of being, the incorporation of a realist imago and its expression in the activities of one's daily, scientific life. That this incorporation and way of life actually produces confirmed theories, and hence "knowledge," was—appropriately—considered by Einstein to be a "miracle," concerning which he wrote to Solovine (March 30, 1952): "The curious thing is that we must be content with circumscribing the "miracle" without having any legitimate way to approach it" (Solovine 1956, p. 115)." (111)

So far, it seems that stance choice is arational if one subscribes to voluntarism: one is unable to justify their choice on grounds other than one's own values. This is separate from Baumann's criticism that one is irrational in choosing an epistemic stance for non-epistemic reasons – which as we have seen, is not tenable. As discussed above, stance choice is arational due to the issue of relativism. In a bid to mitigate the relativism charge and show that we *can* say something illuminating about stance choice that doesn't just preach to the choir, some have taken a pragmatic route and highlighted the benefits of choosing (epistemic) goal-appropriate stances. This I believe is the right way to look at stances. As we shall see though, a pragmatic approach doesn't have to only apply to local stances adopted in response to specific goals. We can also take a pragmatic approach to global stances where justification involves stance-transcendent benefits.

2.2 Teleological approaches to stance choice

Stance voluntarism is inherently pluralistic in that it allows the existence of multiple stances as long as they are rational in the minimal sense it requires. All the same, I contend that a pluralist attitude a voluntarist can take toward stances falls on a spectrum. First we must distinguish between what I call pluralism/ monism in principle and pluralism/ monism in (one's own) practice. The van Fraassenian voluntarist for instance, while a stance pluralist in principle, is a stance monist in practice since she personally embraces the empiricist stance only. Due to this, I imagine other – especially conflicting – stances would be accepted only begrudgingly, simply allowed to exist as an inevitable consequence of the minimal rationality of voluntarism. Here then is the abovementioned spectrum of attitudes from more monist to more pluralist:

1. Stance monist in principle and in practice (anti-voluntarist).
2. Stance pluralist in principle but stance monist in practice; accepting of other stances solely as a consequence of voluntarist rationality. (Token pluralism)
3. Stance pluralist in principle, stance monist in practice but wholly appreciative of other stances for their contextual benefits. (Weak active pluralism)
4. Stance pluralist in principle and in practice. (Strong active pluralism)

I associate the second on the list with those who argue in favor of a single stance for everyone to the exclusion of other stances. For instance, van Fraassen advocates empiricism for all. According to him, it is rational to take any stance based on one's values that doesn't result in 'self-sabotage by one's own lights'. That is, one must be stance pluralist in principle. But at the same time, he holds that taking a stance that conflicts with one's own preferred stance (in his case, the metaphysics stance) is misguided or inadequately justified, and this makes him a stance monist in practice. This kind of a voluntarist is hence only a token stance pluralist.

2.2.1 A monist (in principle and in practice) approach to stance empiricism

One position that takes the monist attitude even further and in fact borders on stance monism in principle as well as in practice – the first option above – is Jonathan Reid Surovell's (2019). Surovell defends what he calls 'stance empiricism', which for him is simply empiricism taken as a stance and of which van Fraassen's (and Carnap's) stances are instances. Unlike van Fraassen and Chakravartty (who hold that stance choice is ultimately arational), Surovell argues that the choice of the empiricist stance *is* rational and that we do have *epistemic* reasons for stance choice. Surovell presents what he calls a 'teleological' argument that there are epistemic reasons for stance empiricism. The argument is premised on the results of contemporary biology and psychology, particularly that "experience is the [one and] *only* signal from the external world to human cognition" (emphasis as in original) and that "coherence and incoherence with well confirmed scientific theories are good reasons for and against believing a given proposition, respectively." (710-711) The claim that experience is the one and only signal from the world to us is said to be supported by the evidence, based on which the conclusion drawn is that an empiricist stance is the one that will best serve our epistemic goal. And further, this would be an epistemic reason for adopting the empiricist stance.

First, such an argument advances just the kind of 'objectifying epistemology' that van Fraassen argues against. An objectifying epistemology, for van Fraassen, is a descriptive-explanatory scientific epistemology, in particular, a theory of cognition, as opposed to a normative epistemology that transcends the science of the day. van Fraassen's main reason for opposing objectifying epistemologies is that they do not capture the changing epistemologies in scientific revolutions. As Martin Kusch (2020) puts it:

"According to [*The Empirical Stance*], the litmus-test for every epistemology is whether it is able to preserve the rationality of scientific revolutions while acknowledging the element of "conversion" at their very heart. Objectifying epistemologies that describe and explain how our cognitive apparatus fits into the world do not pass muster. They fail the litmus-test since they invariably are enmeshed with the scientific theories of their day. The objectifying epistemology *en vogue* during the reign of the old paradigm licenses the old paradigm's epistemic ways. It therefore cannot but reject as irrational the epistemic practices of the new paradigm" (135)

I believe this point holds for (epistemic) stance conversion in general as well. Appealing to the empirical sciences to advocate stance empiricism as Surovell does, is akin to preaching to the choir. Such an objectifying empiricist epistemology based on current science, as Kusch says, "cannot but reject as irrational the epistemic practices of" (135) conflicting stances and importantly, will not appeal to those holding conflicting stances. Stance adoption and conversion are matters of the will, and as Chakravartty (2011) notes, "the whys and wherefores of the will do not appear to be amenable to study under the microscope." (46)

But let us for the moment grant that the sciences have primacy in being the basis for defending empiricism, and that those who remain unconvinced are being irrational. There's still another (related) problem. Let's take a closer look at Surovell's evidence for the thesis that experience is the one and only informative signal from the world. Surovell says the claim that experience is an informative signal is based on "current scientific thinking about human sensation" and the fact

that "evolutionary biology explains the development of reliable sense perception in humans." (712) He then says that the claim that experience is the *only* informative signal is based on the finding – after extensive exploration – that there is no connection between the human brain and the contents of *a priori* intuitions, as well as because "Nor do we have any evolutionary explanation, of the kind available for the reliability of sense-perception, of how the human brain might have evolved to track facts through a priori intuitions." (713) There are two kinds of reasoning one can identify here. First, in talking about "scientific thinking" and "extensive exploration of the brain", if Surovell is referring to *empirical* evidence, then his argument that the evidence supports the claim that experience is the one and only informative signal is circular. But second, if the emphasis is rather on explanatory power (as mentioned in both quotes above), then insofar as explanatory power isn't an empirical good, Surovell's argument seems to defend empiricism on non-empirical grounds. So either way, the argument doesn't seem to hold up. Regarding the first problem of circularity, Surovell says that the claim that experience is the one and only informative signal is to be taken as a naturalistic rather than a normative one, and that doing so avoids circularity. Nevertheless, given that support for empiricism is the bone of contention here, appealing to the empirical sciences for that support cannot, as Surovell does, be *assumed.* It needs to be argued for.

Another key issue here is that of 'epistemic goal'. According to Surovell,

"The account I find most plausible is Feldman's (2000) grounding of epistemic goals in our cognitive *role*. As Feldman points out, most of us play a variety of roles—e.g., teacher, parent, cyclist— and must do certain things in order to play them well. These are the "role oughts" to which our various roles give rise. Thus a teacher ought to communicate clearly with her students in that it is part of the successful fulfillment of her role. According to Feldman, one of our roles, *qua* cognizers, is to form beliefs in response to evidence and on the basis of reflection. Like any role, the epistemic role can be played well or poorly. To say that our epistemic goal is to φ is to say that by φing, we would do what is required or recommended by the cognitive role we are playing." (721)

But why should "forming beliefs in response to evidence" be a universal goal for everyone, all the time? One might say in response, along the lines of Cartwright's (2007) comment, that "we are creatures bound in a world of sensation" (37). But as Chakravartty (2011) responds, "…how confident should we be in the claims of anyone in particular to know what sort of creatures we are most fundamentally, or how we are bound?" (43) and cites examples of those who are a lot more interested in non-empirical matters and live lives of the mind. He also reminds us of Plato and Aristotle who held "philosophical speculation to be the highest form of inquiry" (43) We should note that there are other worthy epistemological goals besides responding to evidence and maximizing true beliefs, such as understanding. Surovell claims that to understand something, one must be correct about it and that hence, furthering the goal of understanding also benefits from the empirical stance. But there is a whole host of ways of understanding. Sometimes we want the kind of understanding given by empirically adequate theories and models. But at other times, we want the kind of understanding given by an instrumentalist/ fictional model, and at yet other times, we want the kind of understanding given by (what we think is) the true (not just empirically adequate) picture of something. (See Bhakthavatsalam and Cartwright (2017) for a detailed account.) Correspondingly, depending on the context, an instrumentalist or a realist

approach may be what gets us understanding. What the stance empiricist can claim is something a lot more modest: that *for* someone with the goal/ value of avoiding explanation by postulation, expanding their arsenal of empirically true beliefs more than anything else – or *when* anyone is in these situations – the empiricist stance makes sense. And this brings us back to van Fraassenian voluntarism: the value criterion and 'self-sabotage' rule jointly cover this point. Further, while Surovell rightly concedes that "stance empiricism does not enjoy a similar advantage over rationalism with regard to wisdom understood as humility, extensive knowledge, or knowledge of living well", he claims that "it does not suffer a disadvantage either." (722) This claim isn't straightforward though and no argument is given for it.

I have shown that an attempt to rationalize stance empiricism and present it as the single best option – i.e. stance monism in principle and in practice toward empiricism – doesn't work. And at least one of the reasons above – that we cannot have a single, universal epistemological goal for everyone at all times – would rebut similar attempts to be monist-in-principle about any other stance as well. So we're back to voluntarism where one is pluralist in principle about stance choice but monist in practice. And as we've seen stance choice in this case is arational and relative.

2.2.2 Endorsing multiple stances: Weak active pluralism in practice

A recurrent line of response to the criticism that voluntarism makes stance choice arational that has been advanced in many ways in the literature is to justify stances based on their pragmatic benefits. This allows for the possibility that multiple stances can work equally well in different contexts if they are all equally fruitful with respect to each of their context-specific goals. This characterizes the third position on the above list: pluralist not only in principle but supporting multiple stances despite being monist in practice. Although this camp advocates stance monism – i.e. that a person or group of people adopt one stance that is suited to their goals and values, it simultaneously endorses the existence of many such stances, each suitable in different pragmatic contexts. Curtis Forbes (2016) defends such a view. Forbes contends that even if we are unable to say anything edifying about stance choice since it is a matter of the will, we can say something about more and less appropriate stance choices: "the best way to do this is by resisting the urge to determine some specific epistemic stance as *universally* best for everyone. Instead, we should strive to look at agent- and context-relative questions about which epistemic stance is best for some individual, whether actual or hypothetical, while taking their specific set of values as given." (3332)

He gives the example of late nineteenth century electrodynamics research where three distinct approaches were operating contemporaneously – Weber's action-at-a-distance approach; Maxwell's field-theoretic approach; and Helmholtz's action-potential approach – and argues that each benefitted from a different epistemic stance. While Weber's work was rooted in an ontology of charged electrical particles – Weber was a "committed realist" about these and consequently engaged in precise measurements to reveal the true nature of these particles – Maxwell's work took an instrumentalist approach in "imagining invisible cogs, elastic solids, flowing waterways, or "displacement currents" – the Maxwellians saw as their end goal the formulation of analytic principles capable of describing and predicting physical phenomena." (3341) At the same time Helmholtz, with the central aim of producing novel phenomena, was

unambiguously an empiricist, believing that experiment could not reveal truths about unobservables and that we could make observations and performs experiment on only the observable part of reality. Based on this case study, Forbes' point is that specific stances support specific kinds of scientific research, such as a realist stance supporting the goals of making fine-tuned measurements of natural constants and theoretical parameters. This way, rather than trying to settle once and for all whether the empiricist stance or the realist stance (or the instrumentalist stance) is universally better, we have an account of how each stance has its own unique benefits and is best suited for specific people in specific epistemic contexts with specific goals.

There are two aspects of Forbes' account: 1. Pluralism, 2. The apparent help it provides in choosing stances based on one's goals/ values. I think the pluralism advanced by Forbes is certainly right. Encouraging multiple (conflicting) stances keeps multiple lines of inquiries alive which seems to me an obvious good. It encourages debate, discussion, and a healthy exchange of ideas. Last but not least, as we shall see below, each stance can have its own unique benefits. However, I think the more clearly normative part of Forbes' account that concerns guiding people on what stance to adopt, is not compellingly argued for and his account could benefit from some clarifications and modifications. I give a detailed discussion of that in Appendix 2. For now, suffice to say that I do agree with Forbes' overall idea that stance choice can be seen as a pragmatic response to the goals at hand (although, as I argue in Appendix 2, I think his own three examples don't fit the bill). So, at least in situations where a stance is deliberately chosen in response to an activity we now have an answer to "How to justify my stance choice while at the same time acknowledging all rival stances as equally rational?" that goes beyond "this is simply what I do": the answer lies in pragmatics. One could say, "Given my goals, this particular stance makes the most pragmatic sense." Note that this is still an intra-stance justification though. Also, this doesn't work in the case of van Fraassenian stance adoption which is global and not specific to an activity. Wouldn't it be even better if we could say something about stance justification from the outside, and that would also apply to global stance adoption? I believe Boucher helps with this in suggesting that we turn to stance-*transcendent* 'epistemic[5] fruits'.

In the case of Einstein's motivational realism for instance, while the motivational aspect of the realist stance by itself served to justify adopting the realist stance for the realist herself, there are epistemic fruits of such a realist stance for everyone including non-realists to see and appreciate, i.e., the useful and generative theories and models constructed by such a scientist. Another example that Boucher discusses is that of a scientific stance: the punctuationist stance in evolutionary biology. Steven Jay Gould famously defended the thesis of punctuated equilibrium, the idea that per fossil records, speciation is not gradual and continual; rather, species are "born rapidly by cladogenetic branching" (528) and remain stable until they go extinct. Evolutionary development is punctuated by episodes of rapid speciation. As Boucher notes, this is an empirical claim, part of a scientific theory, and makes testable predictions. However, punctuationism has also been taken as an attitude, a perspective, a way of seeing things,

[5] Boucher uses the term 'epistemic benefits' quite narrowly to mean "positive effects […] on empirical scientific inquiry" (524) and "positive epistemic pay-off for scientists in helping indirectly to generate true beliefs…". But given the notoriety of the concept of truth in philosophy (of science) and the gamut of values widely taken to be epistemic despite not being truth-indicative such as explanatory power, I use the term more broadly. Perhaps a better term, following Laudan (2004), would be 'cognitive' instead of epistemic, but I stick to tradition in using the term 'epistemic' to distinguish this set of values from the social and ethical.

particularly by Gould: "Gould suggests that this kind of metaphysical punctuationism is a "style of thinking" that is characterised by a focus "upon the stability of structure, the difficulty of its transformation, and the idea of change between stable states" (Gould 1982; qtd. in Gould 2002, 1012)" (529) The point of interest here is that punctuationism the stance, led to the scientific thesis of punctuated equilibrium. If this thesis is empirically confirmed, it would be an "epistemic fruit" of the punctuationist stance that transcends its stance.

Boucher's account advances stance pluralism in that even if, say, you're an empiricist or a biological "gradualist", you should be able to appreciate the realist stance or the punctuationist stance respectively, for their stance-transcendent benefits. In fact Forbes also makes this point but doesn't couch it in terms of stance-transcendent benefits. He notes for instance, that although Weber's electrodynamics has been rendered obsolete, "without the data provided by Weber's distinctly realist efforts, Maxwell's theory would not have enjoyed the successes it did, and scientific progress in electrodynamics would have suffered as a result." (3341) The very precise measurements that Weber made could be expressed as absolute magnitudes and this "allowed them to be directly incorporated into other electrodynamic theories, such as Maxwell's field-theory." (3340) So Weber's distinctly realist stance had benefits that went beyond the stance.

Boucher, however, stops short of evaluating stances based on their fruits in the sense of pitting rival stances against one another and ranking them. For instance, while he highlights the benefits of (motivational) realism, he doesn't say that this is *better* than empiricism. I think this is a good thing and in the true spirit of pluralism. If a stance has failed to produce any stance-transcendent results at all, then its adopters should perhaps rethink their choice. But if rival stances both have comparable benefits in the form of sustained track records of results that transcend the respective stances – i.e., they can be appreciated by those taking other/ opposing stances as well – then both stances deserve to be considered seriously.

We now have something of a response to both the questions of how one can give an intra-stance justification of stance choice – it is relativized to one's values and aims – *and* a stance-transcendent justification – it has stance-transcendent benefits. All in all, I endorse the kind of stance pluralism advanced by Forbes and Boucher. I think we should strive to encourage multiple stances – particularly those with stance-transcendent benefits – even if we are monist in practice. But I think stance pluralism can go further. If a stance other than your own current one has compelling stance-transcendent benefits, then why not you take that stance as well (if and when the situation allows)? Why not we be stance pluralists in practice as well? This argument warrants a separate section.

3. Active, Normative, Pragmatic Stance Pluralism

3.1 Preamble: What is a Stance?

I want to begin by taking a step back and revisiting the idea of a stance. My discussion of pluralism will pertain to different kinds of stances, and I want to first acknowledge and clarify them. The discerning reader might have noticed that we have discussed several different types of stances without differentiation. The stances we have discussed so far can be broadly classified into four types:

1. Stances within science (that are reflective/ philosophical in nature) such as the punctuationist or the gradualist stance in biology
2. Philosophical stances for scientific (and related) work such as Einstein's realist stance
3. Philosophy-of-science stances such the realist and antirealist (instrumentalist and empiricist) stances taken by philosophers toward science
4. Global epistemological stances such as empiricism and metaphysics

As one can see, the above types are listed in order of increasing broadness of range or 'globality'. The first includes stances that are specific to a narrow scientific area. The second includes broader philosophical stances adopted towards one's scientific activity. The third includes philosophical stances adopted (generally by philosophers) toward science. The fourth and last includes philosophical stances simpliciter. At this level a stance isn't adopted towards, or with respect to, anything. It simply indicates the position one takes in general in their epistemic life. It can be captured by a claim such as "This is who I am – the kind of person that values the methods of science and has a disdain for the demand for explanation in terms of unobservable things."

Do these all equally qualify as stances? To address that question, let's go back to what a stance is. According to van Fraassen (2004), ""stance" is a technical term" (174) which, like a policy or strategy, if adopted, guides the adopter on their (epistemic) problems without providing an algorithm. It involves values, attitudes, commitments, preferences, policies, strategies, perspectives, emotions, and beliefs. For van Fraassen, a stance is mainly characterized by pragmatic coherence among its various components – this is what gives a stance its 'unity'. So far, so good: these characteristics can apply to all the above types of stances.

But van Fraassen (2004) says more. He distinguishes between philosophies and scientific methodologies (following Kant), and between "philosophy and the practice we are philosophizing about" (178) In particular, he distinguishes between the 'empirical stance' as an *epistemic* policy adopted by a scientist – who may 'not be philosophical at all' – and the 'empiricist stance' as an *epistemological* position. van Fraassen is interested in the latter and considers only this a *philosophical* stance. To elaborate, a scientist taking an empirical approach to her work – where empiricism is a scientific methodology – is to be distinguished from empiricism, the epistemological – i.e. philosophical – stance which, as above, is characterized by attitudes such as respect and admiration for the methods of science and a distaste for explanation by postulation, especially the more speculative ones. So, according to van Fraassen, the stance types listed above are in increasing order of 'philosophical-ness'. The first two I believe would certainly not count as philosophical at all according to him. It seems that the third – while philosophical – still isn't the target of van Fraassen's discussion in *The Empirical Stance*, although it is the target of his discussion in *The Scientific Image*. It is the fourth type that van Fraassen is concerned with in his discussions of stances and voluntarism.

While there is across the list an obvious difference in the degree of separation between stances concerning scientific practice on the one hand and those that are the result of purely epistemological reflection on the other, it seems a little exclusionary to only count the last one (or even the last two) as philosophical. In response to the question, 'What is the point of reflection and philosophy?', Simon Blackburn (1999) identifies a high ground, middle ground,

and low ground response. The high ground response is that reflection is good for its own sake, even if it is far removed from everyday practice. The middle ground response is that reflection is continuous with practice and influences it, and the low ground response is just a stronger version the middle ground response: reflection is sometimes very intimately bound with everyday activities. All this is to say that reflection happens at various epistemic levels and these levels form a continuum. Epistemic – as opposed to epistemological – stances such as the punctuationist or the gradualist stance in biology can also arguably be considered philosophical in nature if adopted as a result of reflection, i.e., considering their benefits and limitations, the consequences of adopting them etc. (Relatedly, in the second category discussed in Section 3.2.1 below I present Sharon Crasnow's (2000) views on what makes an attitude philosophical.) If stances internal to science can be philosophical, then of course, so can stances of the second type, such as realism and instrumentalism taken in scientific practice. As Forbes (2017) notes, while questions about the pragmatics of say, the realist stance, in scientific practice don't (and aren't meant to) address the philosophical debate about realism vs. antirealism, "this does not, of course, imply that such pragmatic questions about the role of philosophy of science in scientific practice are unimportant or unanswerable…" (3338)

I think that it's a mistake to equate a philosophical stance to an epistemological-for-its-own sake stance especially given the family resemblance between all of these types of stances. I follow Paul Teller (2004) in taking an epistemic stance to be an epistemic guide whose characterization is to be seen as open-ended. He notes, "It makes no more sense to try to say both exactly and generally what things will count as an epistemic stance than it would be to say exactly what physical objects will count as chairs or valve lifters." (163) He says, "…insofar as it is positively characterized, [it is to be] characterized functionally" (163), i.e., in terms of what it does. Thus, as long as the members of each set in 1-4 above are epistemic guides or epistemic *policies* – which Teller likens stances to – there should be no problem in counting them all as stances. At the very least, the first two (and obviously the third) types of stances are clearly of philosophical (in addition to scientific, sociological, and psychological) *interest* given that the examples are drawn from the philosophical literature. Thus, in what follows, I will discuss stance pluralism with respect all of the above stance types.

3.2 Pragmatic, Active, Normative (PAN) Stance Pluralism

We saw via Forbes' and Bouchers' accounts, a kind of stance pluralism where someone who is a stance monist in practice encourages other stances. I want to go for a stronger pluralism where one individual can and should – when possible – hold multiple stances. What I want to advocate is a stance pluralism that is, to borrow some of Hasok Chang's (2012) adjectives about his scientific pluralism, pragmatic, active, and normative. It is pragmatic in that the basis for stance choice will be rooted in pragmatics: our guiding question will be that of what a stance is good for – both for the stance holders and for those who don't take stance. While van Fraassen believes that a stance-holder stick to their values and therefore their stance no matter what, I ask that *à la* Boucher, we consider the stance-transcendent benefits of a stance. From a pragmatic perspective, a stance that cannot boast of stance-transcendent benefits should give us pause. 'Active' comes in degrees. As above, a less active/ weak pluralist stance would actively encourage the holding of different, even conflicting, stances among various epistemic individuals and communities even if they are monist in practice. A more active/ strong pluralist stance would mean being pluralist in

practice. Here I conceive of each individual stance holder as holding multiple, perhaps even opposing, stances within and across epistemic domains. And as we will see below, this doesn't just apply to holding different stances towards different objects of study: we often can (and should) hold different, even conflicting, stances toward the same object of study. I think that we should all try to be strong active stance pluralists to the extent possible, and where not possible, we should at least be weak active stance pluralists. Finally, my pluralism is normative in that I recommend it as the preferrable meta stance as opposed to stance monism. Voluntarism allows us to stick to our stance based on our values even in the face of stance-transcendent benefits of competing stances. My pluralist meta stance implores us to open our minds to the benefits of other stances as well. This is obviously not to say that we blindly adopt any stance that has served someone well. A stance that served someone well may not serve you well. But the point is that we should consider it with an open mind before rejecting it. And even if you don't adopt it yourself, you could still be a weak active pluralist. Since PAN stance pluralism is the one that is most opposed to standard voluntaristic pluralism, I believe it warrants the most detailed discussion.

3.2.1 What a PAN stance pluralism can look like in each type of stance

1. Scientific stances

Stance pluralism within the sciences is going to be identical to pluralism of methods of inquiry, practices, and thought styles conceived of by several pluralist philosophers of science. The idea as above, is simply that it would be productive to hold multiple stances not just toward multiple objects but toward the same scientific object of study. Which stances to take would depend on the (stance-transcendent) epistemic/ pragmatic fruits of each. So for instance, if the gradualist stance benefits, say, our understanding of, or makes correct predictions regarding, speciation in certain contexts, then it would be apt to adopt it in those contexts while adopting the punctuationist stance in contexts where *it* has more benefits.

Hasok Chang (2012) presents a revisionist history of the Chemical Revolution of the eighteenth century, arguing that Priestley's concept of phlogiston died a premature death, contrary to the popular view that Lavoisier's idea of oxygen being responsible for combustion and calcination of metals unequivocally triumphed on grounds of rationality. More to the point here, he looks at phlogiston and oxygen each as part of a "system of practice" as opposed to the traditional idea of a collection of propositions. For Chang, a system of practice is a coherent cluster of epistemic activities, aims, values, and rules. As a coherent whole, this cluster is meant to successfully satisfy the aims within it. Among other aims, the phlogistonist system or stance was characterized by the aim of explaining key properties of materials in terms of their constituent "principles" or fundamental substances. The oxygenist system on the other hand – while it did share some aims with the phlogistonist system – rejected the aim of explanation in terms of constitution. It was rather characterized by questions regarding heat and changes of state. Further, while simplicity and elegance were highly regarded epistemic values by the oxygensists – they liked to focus exclusively on cases where their "theoretical conceptions worked out beautifully" (22) – the phlogistonists gave greater importance to completeness, "wanting to account for all the observed phenomena in a given problem-area and for all the observed aspects of those phenomena." (22) even if the explanations got cumbersome. In addition, while

superficially both camps shared some values such as empirical adequacy, they differed in the way the values were interpreted: each camp for instance considered their hypotheses to be empirically supported. Importantly, while Lavoisier was very interested in precise weight measurements through chemical changes, phlogistonists were not so interested in weight. The oxygenists adhered to the philosophy of what Chang calls "compositionism" according to which chemical substances are to be viewed in terms of elements, or compounds composed of elements. Consequently, chemical reactions were explained as "the rearrangement of distinct and stable building-blocks which retain their identity throughout even when their properties are not manifest in a state of combination." (38) On the other hand, the phlogistonists followed "principlism" where the focus was on explaining in terms of principles or fundamental substances. Consequently, phlogistonists were preoccupied with activities such as "classifying substances according to observable properties; explaining the properties of substances by reference to principles; and effecting transformations of substances by the application (or withdrawal) of principles." (38) Quite clearly, Chang's 'system of practice' closely resembles a van Fraassenian stance[6].

Chang's key point is that a central reason for the wide adoption of the oxygenist system and rejection of the phlogistonist system was due to the gradual ascendance of compositionism over principlism, which was a matter of preference and convention rather than any hardcore rational or evidential factors. Chang shows that the phlogistonist system had several (stance-transcendent) benefits to offer and if allowed to survive, would have probably accelerated scientific progress in multiple ways. Phlogiston was closely related to the modern idea of metals having free electrons and could have possibly led to the discovery of the photoelectric effect earlier; it gave a good explanation of the production of flame in combustion; it "served as an expression of chemical potential energy" which the oxygenist system entirely ignored. And from the modern perspective of course, the oxygenist stance has huge benefits as well, one of the most obvious being that of the simple and elegant practice of balancing weights on either side of a chemical reaction. Chang also discusses the advantages we could have had if the two systems coexisted and interacted with each other. For instance, he asks, "how would Lavoisier have done what he did, if Priestley hadn't made oxygen and showed him how to do it, and if Cavendish hadn't made water from hydrogen and oxygen and let Blagden tell Lavoisier about it?" (49) Chang hence calls for a pluralistic approach where both ideas are entertained simultaneously and given their due.

Recall that I advocate not only a weak pluralism where multiple stances held by multiple people coexist, but a strong pluralism where a single individual holds multiple stances where possible. I want to bring up a point that Chang makes that is especially relevant to stance pluralism within scientific practice. What do we have to gain from ourselves being able to take multiple stances toward a phenomenon (rather than monistically take on one particular stance ourselves and delegate other stances to others)? Chang shares that he has become adept at thinking about chemical reactions from both the oxygenist and phlogistonist perspectives and draws an analogy

[6] We should note that the route Chang takes to this approach is quite different from the route that van Fraassen and the like take, to view philosophical positions as stances. Chang comes at it from the point of view focusing primarily on scientific activities and practices as opposed to finished products such as theories and models. But both agree on viewing debate and discussion within the respective fields (science and philosophy) in terms of something other than plain doctrines.

to multilingualism. Although an "imperfect metaphor for scientific thought" (265), I find the comparison instructive. A multilingual person is able to easily switch between thinking and communicating in different languages thereby being able to navigate different cultural/ linguistic contexts with ease. They can also use the language they deem most suitable for their private thoughts regarding a certain matter and switch easily. Similarly for a 'multi-stance' person in the scientific context. In any case, multimodal thinking seems to me to be an intrinsic good. Given the much more technical nature of stances in science as opposed to the more purely philosophical stances to be discussed below, the language metaphor seems especially pertinent here.

2. Philosophical stances in the service of scientific (and related) work

As discussed earlier, Forbes' approach is to make specific recommendations for stance adoption to specific people depending on their goals and contexts. So if a person has the aim of making novel predictions for instance, Forbes' recommendation is for them to adopt the empiricist stance. (This is somewhat similar to Psillos' view that the realist stance is suited for a certain set of aims as discussed at the start of this paper.) His case study serves as an instructive case supporting the idea of stance pluralism. Enthusiastically supporting all three of Maxwell's, Weber's and Helmholtz' stances regardless of what your own stance is, i.e. adopting weak active pluralism, would result in three diverse, productive lines of inquiry, each giving rise to stance-transcendent benefits as we saw earlier. But to take the pluralism a step further, how about, rather than recommending specific stances for specific (groups of) people, thereby essentializing them with respect to goals and activities, we recommend different stances for different *situations*, leaving open the possibility – and in fact recommending – that the same person adopts different stances depending on the situation? That is, how about we be strong active pluralists? Imagine if a single person thought like and did what all three physicists in Forbes' case study did. They would take a Weberian realist stance and carry out precise measurements of properties of unobservable entities (or more broadly, explain observable phenomena in terms of the unobservable and work towards finding/ manipulating theoretical postulated entities); they would take a Maxwellian instrumentalist stance and come up with fictional models; and they would take a Helmholtzian empiricist stance and work on making novel predictions. Imagine the extent of multimodal thinking that this person would engage in and the wide-ranging contributions they could make to electrodynamics given the stance-transcendent benefits of each of these stances. Of course, it may not be possible for a person to engage in three distinct research programs by themselves, but that is a practical constraint that I'm not concerned with here. My point is that such multi-stance thinking should be encouraged (to the extent practicable): among other things this intellectual open-mindedness and '*cognitive flexibility'* can lead to better collaboration and cooperation among scientists. This would be the strong version of the active pluralism I advocate. Short of that though, we should at least take the weaker pluralist stance: multiple conflicting stances (taken by different people) should be enthusiastically encouraged so that they can each lead to productive lines of inquiry.

Another interesting kind of strong active stance pluralism is one where a scientist takes a certain epistemic stance toward her pursuit of science *while* engaged in it, but takes a different stance towards it while standing on the outside, reflecting on her pursuit. This was exemplified by Pierre Duhem. There has been an active debate in the literature on whether to interpret Duhem as an antirealist or a realist, for he makes claims in favor of both interpretations. In one of his best-

known works, *Aim and Structure of Physical Theory*, Duhem argues that the aim of physical theory is to classify experimental laws: for instance, the empirical laws governing prisms and raindrops go together, while the empirical laws of diffraction spectra go elsewhere. And this classification, according to him, could only be convenient or inconvenient, but not true or false. He also claims that "Agreement with experiment is the sole criterion of truth for a physical theory." (21) Duhem also famously argued for the autonomy of physics from metaphysics. According to him, the job of physical theory is solely to classify and predict empirical laws and not to explain. Physics is not to concern itself with any underlying reality. This, for him is the appropriate stance of the physicist while engaged in theory-building. But at the same time, Duhem was also a realist of sorts – not about unobservable entities, but about the classification of empirical laws constructed by a logically unified theory. He argued that as a theory progresses, its classification of laws approaches what he called a *natural classification*: the classification showing "the real affinities among the things themselves" (26). And the mark of a theory approaching natural classification was its success at making novel predictions. For Duhem, this idea of natural classification could not be supported by the strictly positivist methods of physics itself. All the same, the rationale behind this realist stance towards theory – that it was approaching a natural classification – was that this was what rationally justified the physicist's pursuit/ activity of theorizing[7]. His argument was as follows. It's part and parcel of being a physicist to try to construct logically unified theories (as opposed to a disorganized "heap"), and invest her credence in the theories she crafts. When she makes a prediction based on a (fairly well worked-out) theory, she has faith that the theory is going to get it right. And what justifies this pursuit of logical unity and the confidence in the theory's prospective empirical success is the belief that physical theory is approaching a natural classification. Further, for the historian and philosopher, it made the historical development of physics comprehensible:

"Everything therefore urges the physicist to postulate the following assertion: To the extent that physical theory makes progress, it becomes more and more similar to a natural classification which is its ideal end. Physical method is powerless to prove this assertion is warranted, but if it were not, the tendency which directs the development of physics would remain incomprehensible. Thus, in order to find the title to establish its legitimacy, physical theory has to demand it of metaphysics." (298)

Duhem acknowledges that such a positive attitude towards the idea of theory approaching a natural classification is on an epistemically shaky ground: he frequently points out that this view isn't based on evidence, but on 'reasons beyond reason'. But since it is indispensable to scientific life – and also for the philosopher if she wants to make sense of the historical development of physics – it is justified.

Duhem's realist stance consisted in the value of finding motivation and justification for one's scientific work, a commitment to constructing logically unified theories (for non-epistemic, aesthetic and motivational reasons), and a belief in mature theories approaching a natural classification that was metaphysical in nature. It can be argued that Duhem was ultimately a stance monist – he was ultimately a realist about physical theoretic classification of laws, but he comes close to being a pluralist in the sense of a. to the extent he could, genuinely occupying a

[7] I give a detailed account in Bhakthavatsalam (2015).

different stance from his own in staunchly separating physics from metaphysics while doing physics and b. being acutely self-aware of the limitations of his own stance: as above, he repeatedly emphasizes the lack of evidential support for his thesis of natural classification. The bottom line is that Duhem adopted a pragmatic, (quasi) pluralist meta stance of holding different, conflicting stances in different contexts.

I now discuss yet another version of strong pluralism presented by Sharon Crasnow (2000), which considers taking multiple (opposing) stances towards the same object of study. Crasnow's goal is to clarify and develop Arthur Fine's (1991) views in 'The Natural Ontological Attitude' (NOA). Fine's main argument is that neither scientific realism nor antirealism works as an interpretation of science for the key reason that they are both global, essentialist views of science in that they both present science as having global, essential features. Realism takes science as a whole[8] to essentially reveal underlying truths about unobservable things in nature, and antirealism – for instance constructive empiricism – takes science as a whole to aim at, and reveal, just empirical truths about observable entities. Realism commits the "sin of metaphysics" whereas empiricism commits the "sin of epistemology" in locating "the essential features of science in scientific method and so dictates proper methodology to science using an a priori conception of its methodology." (122) Why is Fine against this globalist, essentialist picture of science? According to Crasnow, the main reason is that science isn't a monolith and scientists don't always view science – even one and the same part of the ontology of science – in the same way all the time. Nancy Cartwright (1999) famously argued that the world is "dappled". It is arguably even more obvious that science is dappled. Fine wanted to present a picture of science that is free of philosophical, i.e. essentialist metaphysical and epistemological, baggage – this was the rationale behind his NOA. According to Crasnow, Fine wanted a non-philosophical view of science that takes scientific claims at face value.

But Crasnow argues that if 'natural' in 'natural ontological attitude' refers to the attitude of the scientist, then there is no such thing. That is, there is no one, single 'natural attitude' that a given scientist has all the time either toward science as a whole, or towards some specific part of its ontology. Further, since Fine himself is averse to a global position, he couldn't mean 'natural' in a global way. So is NOA then just a stand-in term for the localized, specific attitudes that scientists have at different times towards the ontology they're working with? Should the philosopher's view on science keep changing with the scientist's attitude? Should she then just read her philosophical view off scientific work? Is there really no philosophy left? Crasnow argues to the contrary. She agrees with Fine that global, essentialist views of science don't work. But she disagrees that globalism and essentialism are essential features of a philosophy of science. She argues that ontological attitudes *can* be philosophical (in fact, how *couldn't* they be?) without being global and essentialist. How so? By being reflective – i.e., by carefully considering the ramifications of acting according to the attitude in question; benefits and limitations of the attitude; alternatives; and the way in which we are using a particular piece of ontology. In short, by taking on the attitude self-consciously. "The attitude is not generated from the science itself, as Fine rather ambiguously suggests, but rather the attitude adopted depends on

[8] One might argue that the common rendering of scientific realism based on the No Miracles Argument is only about so-called mature theories/ sciences: it is only mature theories that are taken to reveal truths. But this is also a global view in that it applies to all those mature theories at all times.

what one wants to do with the science." (129) In other words, for Crasnow, Fine's natural attitude is unreflective whereas the *philosophical* attitude she recommends is reflective.

Crasnow discusses the case of the orbital in physics and chemistry. The leading question for her is, "Should I be a realist or an antirealist about orbitals in chemistry?" (128) Following Eric Scerri, she notes that according to quantum mechanics, it is problematic to assign electrons to orbitals in multi-electron systems and hence, strictly speaking, quantum physics is incompatible with the idea of the orbital. Nevertheless, she argues that isn't easy or even appropriate to give up a realist attitude toward orbitals in all contexts, particularly for the chemist, since atomic orbitals are extensively used in chemistry research and teaching. In fact, I think talk of "taking a realist attitude" or "taking an instrumentalist attitude" towards orbitals after the fact isn't the right way of talking about the situation. Rather, the existence of orbitals is an (ontological) *assumption* that chemists make in order to get on with their work. In chemistry, orbitals are reified to such a great extent – in say, talking about covalent bonds in organic molecules – that *while* working with them, asking a chemist if they're a realist or an instrumentalist about orbitals is but a distraction. Chemists talk about orbitals as though they were robustly real. In chemistry, orbitals acquire a life of their own: unlike in physics, they aren't even explicitly viewed probabilistically. They're talked about as though they were well-defined entities. It thus seems practically imperative to adopt a realist stance toward orbitals while directly and extensively working with the idea.

Sure, if you caught a chemist on a break and asked to have a discussion on their ontological attitude toward orbitals outside the context of their work, they might say that they follow quantum physics in believing that orbitals in multi-electron systems in general, and especially in molecules, are at best approximations of the actual probability distribution of electrons. In particular, orbitals in multi-electron systems are obtained by numerical – as opposed to analytic – solutions to the Schrödinger equation. They might even say that the use of orbitals in chemistry, from this perspective, is purely instrumentalist. But I contend that philosophy unduly privileges the 'purely epistemological' view, divorced from the epistemic stances adopted in (scientific) practice. As discussed above, if the concept of orbitals is adopted reflectively for work in chemistry, it is arguably a philosophical position. Why is the view of the chemist (or the philosopher) in the armchair to be taken as *the ultimate* philosophical view on orbitals? What makes the realist *working* attitude towards orbitals less worthy of philosophical interest? The appropriate (meta) stance, I think, is pluralism: take a stance that's appropriate to the context and goals at hand.

The argument for a realist attitude toward orbitals applies to teaching as well: when teaching about orbitals, adopting a realist stance would be more suitable so as to not lead students to develop cognitive dissonance[9]. As Crasnow says, "…the pragmatics of adopting orbitals as real when chemistry is taught, for instance, are clear. The visual model is an excellent way of explaining key concepts to the student." (130) Further, "While teaching or working on particular problems the chemist might treat the orbitals as real. The quantum physicist or the computational chemist will not, however, and there may be certain occasions (when doing theoretical work, for example) that require the treatment of orbitals in a nonrealist, instrumentalist manner." (129)

[9] I make this point made in the more general context of teaching of false theories in Bhakthavatsalam (2019).

I add – stance pluralism toward orbitals would be very helpful for instance, to the computational chemist who is also a teacher. She would be able to seamlessly switch back and forth between a realist and an instrumentalist stance toward the orbital. In fact, it would be cognitively useful and better for collaborative work to switch between realist and instrumentalist contexts even within science (and not just between doing science and teaching it) – by taking on diverse problem areas like say, organic chemistry and computational chemistry (especially when working with density functionals where orbitals don't carry any physical significance and are treated entirely mathematically) – that would benefit from conflicting stances, here a realist stance and an antirealist stance towards orbitals respectively. And again, the benefits we're talking about here are stance-transcendent.

One may have noticed that I have used Crasnow's term '(philosophical) attitude' interchangeably with 'stance'. How do the two relate? A stance, again, is a coherent cluster of values, aims, attitudes, commitments, and beliefs. If a chemist values the explanatory and predictive power of the orbital idea and has related aims and commitments, it will serve her well to adopt a positive epistemic attitude toward orbitals while working with the idea. She is aware of the quantum physical result that assignment of electrons to orbitals cannot be maintained, strictly speaking. Yet, that knowledge does not come in the way of working with orbitals. She assumes their existence to carry out her work – on, say, explaining reaction mechanisms – and in this way has a realist attitude toward them. She straightforwardly answers questions about the properties of an orbital such as its shape and energy level; thinks of it as the (real) probability distribution of the electrons, and so on. Similarly for a science teacher teaching about orbitals. So the attitude discussed here is part of a relevant stance. The stance I'm talking about here of this chemist or teacher is not epistemological. Rather, it is a *working* epistemic stance adopted for pragmatic reasons. As argued earlier, as long as it is adopted upon reflection – i.e. thinking through the benefits and limitations, considering alternatives etc. – it should qualify as philosophical. (It is in fact significant that van Fraassen (2004) himself says that Crasnow's discussion of philosophical attitudes is an example of stance-speak.)

Other noteworthy contexts in the discussion of philosophical stances on science are those of science policy and public health. Consider a science or medical advisor holding a position in government. There's a vaccine hesitancy crisis. This is a situation where an empirical stance – focusing on the empirical success of the relevant science – is going to make the most sense for the goal of getting more people to get vaccinated – a stance-transcendent benefit. It seems that focusing on the unobservable reactions and mechanisms the vaccine sets off in the body is going to be futile. Instead, it would be more productive to focus on the "it works and is safe!" part of things[10]. An empirical stance will play a big part here – not just the part about focusing on experience and observation, but also the more general respect and admiration for science that is key to the empiricist stance. And the kind of stance being discussed here is indeed often philosophical in Crasnow's sense in that the medical advisor should reflect on the best ways to approach the subject with the public, consider alternatives and the consequences of each, etc. Note that the epistemic stance under discussion here is a. not about ontology, and b. a stance

[10] I acknowledge that I'm oversimplifying the scenario here. As Maya Goldenberg (2021) has persuasively argued, vaccine hesitancy is rooted much more in a lack of trust in science than a lack of knowledge. So first, advisors and policymakers would have to engage in trust building. Nevertheless, the point that an empirical stance will be a big part here, stands.

taken to guide *others'* beliefs and not one's own[11]. Of course, it's very likely that the medical advisor is a realist about microbes while wearing other hats, for instance, her researcher's hat. Why, she could even consistently hold in her mind a realist attitude towards microbes while giving a talk/interview solely on the empirical success of vaccines. I concede that there's an important difference between a stance about ontology and one that's not about ontology, as well as a stance taken to guide one's own beliefs and a stance taken to guide others' beliefs. However, for reasons similar to those discussed earlier for why the working attitude of a chemist shouldn't be discounted in philosophical discussions, I think that such stances of medical advisors are equally philosophically interesting.

But for Crasnow, an important aspect of a philosophical *attitude* toward some piece of ontology, as opposed to what she calls a "position", is that it is less than a (full-blown) ontological commitment. That is, one can be temporarily committed toward it in one context and not committed to it in another. One can believe in its reality in one context, and not believe it in another. She compares taking on a philosophical attitude to wearing a mask or a costume: one is aware that they're not the character they're dressing as, nevertheless, play the part. And once they're done playing the part, they can move on. Is a stance like this as well? While a van Fraassenian stance isn't like this given that he is a firm stance monist in practice, I think that we can reconceive stances along these lines. I make a case for this in Section 3.2.2 but let me briefly say a few things here. Two key ingredients of a stance are values and beliefs. So changing our stance means changing our values and beliefs. Is this tenable? It seems hard enough to think about changing our values, especially the core ones, and from the usually default perspective of doxastic/ alethic monism it seems even harder to think about changing our beliefs. The latter has been an especially fraught topic in philosophy.

van Fraassen discusses stance change in the context of scientific revolutions and views it as something of a grand mental transformation involving emotion (for there is no other way one can come to accept the post-revolution paradigm from the perspective of the rationality of the pre-revolution paradigm). On this picture, one can only hold one stance at a time on a particular issue. But I think of stance change as something rather mundane – one can switch easily from one stance to another and go back as needed. While core, deep-seated values may be hard to shake off, values in the context of scientific work seem easier to take on and shed as needed. But even here, it is not uncommon for scientists to have certain fixed values: "As a theoretician, I would never do experimental work.", "Science produces objective truths not influenced by social values.", "Scientific hypotheses cannot be explanatory black boxes, making machine learning not science." For reasons discussed earlier, I respond with a plea for pluralism of values and developing the ability to deftly switch between different modes of thinking.

[11] One might argue that science teaching and communication aren't the right sorts of contexts for the discussion of epistemic stances since epistemic stances have to do with one's epistemic goals, values, and beliefs for oneself whereas the context of communicating (about) science involves other agents and hence taking a stance for the sake of furthering others' epistemic goals. Such stances – the argument might go – aren't genuine targets of discussions on epistemic stances. I think this view has roots in the pervasive idea that epistemology should be centered on the individual. I follow Jason Kawall (2002) in taking this to be problematic. There are important questions to address regarding our epistemic virtues, conduct, and responsibility toward others and these questions are arguably, still epistemic. A full discussion of – to use Kawall's term, "other-regarding", epistemic stances is beyond the scope of this paper, but I believe would be an important line of inquiry.

Let me now briefly touch on beliefs. An alethic monist wouldn't at all find it sensible to believe conflicting things about a single object of study even in different contexts – her answer to "Are there orbitals?" for instance must be a simple 'yes' or 'no' for there is only one truth according to her. And a reductionist view is pervasive: what fundamental physics says must be *the* truth. First, if one is truly flexible about their values, their beliefs would also likely correspondingly change since values (and a stance as a whole) generate beliefs – this is the crux of the idea of a (epistemic) stance. But also, I think the right attitude to have towards truth and beliefs is again, pragmatic, and pluralistic. Chang's (2016) views on pragmatic realism seem particularly apposite: "…*a putative entity should be considered real if it is employed in a coherent epistemic activity that relies on its existence and its basic properties (by which we identify it).*" (116) and "*I define (pragmatist) coherence as a harmonious fitting-together of actions that leads to the successful achievement of one's aims.*" (112) Thus, orbitals can be real in some situations but not so in others. There is no conflict between a realist stance based on such an account of reality, and an instrumentalist stance: an entity could both be 'merely' an instrument, as well as real in Chang's sense. A full defense of this kind of truth-pluralism is beyond the scope of this paper; I direct interested readers to Chang's (2016 and 2017) work.

3. Philosophy-of-science stances on the interpretation of scientific outputs

In the previous category we looked at a few ways of being pluralist with respect to philosophical stances in the context of scientific work. Let us now look at philosophical stances towards science outside the context of scientific practice and in the context of philosophical practice. I consider here the most common subject of focus in this domain: the interpretation of scientific outputs. Let's look at 'standard' scientific realism first. There is a wide variety of realist views and I can't consider them all here. But a common core is the idea that the outputs of scientific investigation should be met with a positive epistemic attitude. Let me consider arguably the most common version of scientific realism – the 'explanationist' version, according to which those parts of our best – i.e. most empirically successful – theories, for instance concerning unobservable entities, that are indispensable to explaining the phenomenon under question, and therefore responsible for the empirical success, should be met with a positive epistemic attitude. Otherwise – the argument goes – that success would be a miracle: the reality of entities whose conception is indispensable to the theory at hand is what explains the theory's success. This was the kind of realism advanced by Psillos – in particular, as stance-like – that we saw at the start of this paper. This is more global compared to Crasnow's realism, but still local or selective in the sense of being restricted only to those parts of our most successful theories that are truly indispensable to their success. Often (although not always) the realist stance values science's search for truths about the natural world to be a *goal* as well. Recall Psillos' and Wylie's arguments to the effect that the no-miracles/ indispensability argument isn't an ultimate argument for realism – rather, it operates within the realist 'framework' or stance: it is relative to certain aims and values of which explanation is an important one. An empiricist stance towards science on the other hand is characterized by a distaste for explanation in science, epistemic conservatism, and – as the name suggests – the empirical methods of science. It interprets the outputs (theories, models) of successful science as empirically true/adequate but remains agnostic about the truth of those parts concerning unobservables. Again, often (although not always), the empiricist stance takes the *goal* of science to be empirical adequacy as well – this view is most famously attributed to van Fraassen's *The Scientific Image.*

We've seen in Forbes, Duhem, and Crasnow a range of situations where (some version of) realism is good for the scientist. But what good is a realist stance (as described above) towards science for the (non-scientist) realist philosopher? As discussed at the start of the paper, Wylie argues that it is valuable for philosophy to take the scientist's realist route as well: "…it is worth seeking a philosophical account of scientific inquiry that makes its presuppositions out to be largely true just as a matter of general methodological principle and, second, this principle of charity (in particular, its application to science) is warranted on independent pragmatic grounds because inquiry that embodies it stands to contribute to the research enterprise itself." (292) As Wylie notes though, we should carefully decide what particular things to take as real – particles, fields, strings etc. – based on how successful the theory postulating them has been. But overall, such an attitude helps the philosopher of science make sense of and comprehend scientific practice. Fine (1991) makes such a point – he takes the pragmatic strain even further and says that even if his philosophy of science were false, it is still pragmatically valuable. He says this about the NOA, but this could very well have been said by (a certain kind of) a realist philosopher about realism –

"…I am sensitive to the possibility that explanatory efficacy can be achieved without the explanatory hypothesis being true. NOA may well make science seem fairly intelligible and even rational, but NOA could be quite the wrong view of science for all that. If we posit as a constraint on philosophizing about science that the scientific enterprise should come out in our philosophy as not too unintelligible or irrational, then, perhaps, we can say that NOA passes a minimal standard for a philosophy of science." (273)

So if as a philosopher, you value going with the grain of the scientific practice, particularly the explanatory parts of science – those parts that postulate entities without doing which we couldn't generate – in Psillos' words, a "coherent causal-nomological image" of (that part of) the world – then a realist stance makes the most sense. Similarly, as Wylie, notes, an anti-realist stance towards science has its own benefits as well (although, according to Wylie, it is far more limited): it "has a good deal to offer in making clear the tenuousness of our epistemic situation" (294)

As we have seen, multiple realist philosophers have noted that a main rationale behind taking a realist stance is to be in harmony with science and scientists. Similarly, van Fraassen (2002) lists "an admiring attitude" towards the "forms and practices of [scientific] inquiry" (63) of science as a core feature of the empirical stance. Based on these views, the philosopher *must* be sensitive to the scientist's stance. But this, as we have seen (although van Fraassen focuses narrowly on just the empirical aspect of the sciences), isn't monolithic. None of methods, values, practices, and attitudes across the sciences is unitary. What an empiricist can say is that her stance is based on an admiration for those parts of science that are strictly empirical; similarly the realist – the kind discussed in this category – can only say that her stance is based on the attitudes of scientists who – and when they – postulate and engage with unobservable entities in a specific way. If a philosophy of science is to mirror the dappled nature of science, then – as Fine and Crasnow argue – there can be no single, universal philosophy of science[12]. This could mean holding

[12] In a similar vein, David Stump (1992) argues that if philosophy of science is to be naturalized then its methodology should be pluralistic in keeping with the plurality of methods in science.

different stances towards different (parts/ objects of) sciences, or as Crasnow shows, at least in some cases such as that of orbitals, holding different (conflicting) stances towards the same object.

Let's for a moment set aside the kind of pluralism described above, where stance choice changes from one scientific object of study to another. Let's also set aside orbitals-type cases for the moment and just consider the standard cases of philosophers' global realism and antirealism towards certain entities (those that are indispensable in the way described earlier). We can also add another (global) stance to the discussion here: the sociohistorical where – in the spirit of the numerous case studies in the history and philosophy of science, philosophy of science-in-practice, and science studies – one examines the sociocultural, contextual values influencing the genesis and trajectories of scientific facts about the object under study. A core view of those taking this stance is that scientific outputs – theories and models – are inevitably value-laden and to be situated in a sociohistorical context. I think there is still a case to be made for pluralism, although not as robust as in the previous two categories. In all the pragmatic views of realism discussed above (Wylie, Fine, Psillos), we can see strains of stance voluntarism: a given stance, be it realist or empiricist, embodies certain aims and values in philosophy of science; other stances may be more suited for other aims. But an explicit stance pluralism is hard to come by in armchair philosophy of science, with most philosophers picking a preferred stance for themselves and arguing for it. Consider the common case of unobservable entities in physics. A realist would have a positive epistemological attitude towards say, the Higgs boson. An empiricist would stop short of that. One taking the sociohistorical stance would look into non-scientific contextual factors shaping scientific facts. For instance, as Kent Staley (2017) shows through a case study of the discovery of the Higgs boson, the setting of the 5σ standard for the level of significance for results involved considerations of impact on future physics inquiries as well as broader goals of the relevant research groups including the ATLAS and CMS groups as well as the HEP community and scientists more broadly.

Earlier I argued that a motivation for being pluralist about stances is appreciating the stance-transcendent benefits of stances other than one's own. And I said this is what justifies one's stance choice. But stance-transcendent benefits are harder to come by in this domain compared to the scientific (and related) domains discussed in the previous two categories. Notice that the benefits of the realist, empiricist, and historical-social stances for the philosopher discussed here are intra-stance benefits. An avowed empiricist for instance wouldn't buy into the idea of philosophy of science making the explanatory parts of science intelligible, or the philosopher's stance piggybacking on the realist stance of the scientist. And an avowed realist wouldn't appreciate the idea of social factors shaping scientific facts. But it is the nature of the "purely philosophical", i.e., interpretative, and speculative, versions of philosophy of science – especially of epistemological stances on scientific outputs – to work at the level of ideas, quite separate from pragmatic concerns within the practice(s) of science. And so – given that this is a "war of ideas" zone – it shouldn't be surprising that stance-transcendent fruits are hard to come by.

To the pragmatist guided by the question, "What is a stance good for?", such stances without stance-transcendent benefits seem unattractive. From a pragmatist perspective, holders of such stances should probably think about what is it that makes them hold on to their stance so dearly. It's their values of course, but with nothing (external to the stance) at stake, it is a little hard for

the pragmatist to appreciate such stances. The scientific realist and sociohistorical stances fare a little better than the empiricist stance here since they seem to have somewhat clearer benefits. Even if one isn't personally interested in explanation in general or explaining the success of science in particular, or making sense of the scientific enterprise, surely they can see *some* (intuitive?) appeal in these aims and the stance that helps realize them. Similarly, even if one isn't interested in situating science within larger sociocultural structures or analyzing the role of (non-epistemic) values in scientific practice, surely, they should see value in such projects insofar as science exists within society. (In fact, the sociohistorical stance has arguably produced several stance-transcendent benefits in many contexts such as feminist interventions in biological sciences leading to objectively better science.) The empiricist stance on the other hand, as Wylie notes, is a "self-consciously limited program" (293). But let's grant for the moment that these stances in the context of 'pure' philosophy of science – at least the realist and empiricist stances – are ultimately indeed parochial, not affording any stance-transcendent benefits. All the same, these stances *are* minimally important in a stance-transcendent way in the sense that each of them makes the debates as a whole, and hence the discipline itself, progress. Each challenges the opposing stance to come up with good responses. It is undeniable for instance that each of the realist and empiricist (or in general, any antirealist) stance owes a debt of gratitude to the other for coming up with more and more refined and nuanced arguments over time. At least for this reason then, stance pluralism should be encouraged here as well.

An extreme kind of pluralism would be to not have a "home stance" at all – to not have any one stance that you "truly" hold – and just be an itinerant stance holder, hopping from one stance to another: you'd be a realist about a given entity in one context, an empiricist in another, and take the sociohistorical stance in yet another. This kind of a robustly pragmatic pluralism wasn't so hard to imagine in the first two categories in this section involving scientific goals. But here in the realm of pure philosophy (of science) it seems harder to imagine, particularly since in philosophy, these stances are usually viewed as global stances taken towards (a certain part of, if not the whole of) science. Short of that, I contend that it should be relatively easy for a trained philosopher to be a stance pluralist in the minimal sense of being able to occupy various stances since defending and adopting positions regardless of personal convictions is a core part of the philosopher's skill set. And it is good to hone this skill since I think it is valuable – not to mention, intellectually virtuous – to genuinely try to put yourself in a position that isn't yours and defend it to the best of your ability. Doing this reflects the virtues of intellectual empathy, humility, and/or cognitive flexibility as discussed earlier. And then if and when you return to your home stance, you return with more clarity.

4. Global epistemological stances: Metaphysics vs. Empiricism

At last, we get to the category to which I believe the stances in the original discussions initiated by van Fraassen belong. van Fraassen primarily focuses on the empiricist and metaphysics stances. These are the broadest and 'purest' kind of epistemological stances. They are meant to generate and shape one's beliefs at large and guide one's epistemic life, broadly speaking. But given that science is one of our most important pursuits of inquiry, issues in the epistemology of science will of course a big part of our discussion of these stances. So for instance the empiricist stance here isn't specifically about science aiming at empirical adequacy or believing that scientific theories are empirically adequate (as opposed to revealing the nature of underlying

reality), although it entails these views. Rather, it is about the general epistemic stance one takes in life in which one admires the empirical methods of science, is committed to empirical standards for carrying out and evaluating inquiry, and has a general disdain for metaphysics. At the same time though, the paradigm of empirical inquiry is of course, empirical science. So the empiricist stance simpliciter *is* going to have a lot to do with the empiricist stance in the scientific realism-antirealism debates. Similarly, the metaphysics stance is going to have a lot to do with scientific realism and more generally, scientific ontology. (So the four categories of stances are of course, not mutually exclusive. There's bound to be trickle-down of ideas and influences from the broadest to the narrowest stances. For instance, if you're a 'philosophical' empiricist, you're also probably going to have an empiricist philosophy of science, and pursue empirical scientific projects. But it is worth appreciating the distinction between the types of stances to see the differences in scope.)

So what can we say about pluralism with regard to these stances? Consider the empiricist and metaphysics stances. We've already characterized the empiricist stance. What is the metaphysics stance? Chakravartty (2017) characterizes it as follows:
"M1: Accept demands for explanation in terms of things underlying the observable.
M2: Attempt to answer these demands by theorizing about the unobservable." (p. 212)
This is evidently quite a broad characterization that makes a lot of what gets done under the label of science, fit the bill. Is the empiricist opposed to *all* metaphysics? Chakravartty (2007, 2017) has extensively argued to the contrary. He makes three key points: 1. Any serious, viable empiricism cannot be devoid of metaphysics and needs (at least some) metaphysics, 2. A naturalized metaphysics – one that is usually acceptable to empiricists – is (unsurprisingly) delimited by empirical constraints, and 3. Scientific metaphysics and speculative metaphysics – the kind that is usually not acceptable to empiricists – fall on a continuum: a clearcut distinction between the two isn't tenable. Let me elaborate on each point.

As an example of someone denying the presence of metaphysics in science, Chakravartty cites Humeans who might claim that they're not engaging with metaphysics when saying that laws are just regularities. But regularities themselves are unobservable and ontologically interesting. Basically, he notes, only an excessively strict version of empiricism, i.e. phenomenalism of the present moment, may be entirely metaphysics-free. But no one today takes this seriously.-van Fraassen is himself not an empiricist who only endorses claims about sensations – he does sanction a lot more. Consider the most basic kind of things that modern empiricists sanction belief in – observables. Chakravartty notes that even belief in observables isn't devoid of metaphysics. It is a well-known point that observation is theory-laden. In order to get to truths about observables and avoid falsities – such as believing that a straw dipped in water that looks bent is actually bent – "one inevitably makes use of a multitude of categories and classifications of objects, events, processes, and properties." (57) Add to it the variety of shared principles and background metaphysical assumptions in the form of tacit knowledge operating within scientific communities that help the practitioners extrapolate from observational evidence – *a la* Kuhn's disciplinary matrix – and we have a wide range of "cognitive, heuristic, culturally transmitted [unobservable] entities" (58) Secondly and more obviously, the empiricist is also not averse to ontological posits in science such as genes and electrons. Indeed, van Fraassen (2004) says he isn't opposed to scientific realism. So – as Chakravartty notes – there are two ways in which metaphysics commonly enters science: in the form of metaphysical assumptions and

presuppositions, and in the form of metaphysical inferences "made in interpreting the outputs of science such as theories and models." (71) So what makes these pieces of metaphysics acceptable to the empiricist? That brings us to the second point above.

Chakravartty holds that for metaphysics to be naturalized – and therefore acceptable to the empiricist – it should be sufficiently "directly informed by or sensitive to the relevant empirical evidence" (76) This makes its "epistemic risk" low and "empirical vulnerability" – "which concerns how susceptible a proposition is to empirical testing" (85) – high. This explains why entities like neutrinos are fine by empiricists whereas universals and possible worlds are not. At the same time though – moving to the third and final point above – Chakravartty contends, naturalized metaphysics – metaphysics with a 'small m' – and metaphysics that is quite removed from science – metaphysics with a 'big M' – fall on a continuum. "*There is no objective distinction between theorizing and speculating in the context of scientific ontology.*" (89, italicized as in original) This is because none of the commonly considered demarcation criteria achieve a clearcut demarcation. For instance, the ability to make novel predictions isn't a universal indicator of acceptable vs. unacceptable ontology in science, since often, if a theory has great explanatory power, then its (in)ability to make novel predictions can be discounted. A case in point is natural selection. On the other hand, the wide explanatory power of the Standard Model is regarded by empiricists as inadequate to lead someone to believe in associated ontology. So there's variability and subjectivity with respect to assessing the value and role of explanatory power and ability to make novel predictions. Secondly, metaphysical inferences don't simply fall out of the science – they are "interpretations and explanations *of* the data" (94, emphasis as in original) and this is obviously a matter of debate and disagreement in many contexts. Finally, 'experiential distance' – how far something is from direct, sensory experience is also no help. This is a matter of degree and has been a moving goalpost in science. Also lots of things that aren't experiential at all are considered legitimate parts of science such as laws/ regularities. (We can't touch/ smell/ see regularities.) "Metaphysical inferences will always require leaps of faith from the data of observation and experience, no matter how they are naturalized." (95)

The ultimate takeaway from Chakravartty is that in science, empiricism and metaphysics are not divorced from each other and the very idea that naturalized and speculative metaphysics lie on a continuum should give the staunch empiricist some pause. Importantly, scientific practice for the most part involves both stances operating in tandem although the degree and kind of each varies with context. This exemplifies an interesting kind of stance pluralism not considered so far: the two stances in question are being held together and shaping the results of each other. So evidently, both have stance-transcendent benefits.

But also, there is pluralism within each stance. As Chakravartty notes – and as should be clear from the variety of scientific realist positions – there is a wide range of positions within the metaphysics stance. Two people taking the metaphysics stance might be at different points in the 'm….M' spectrum. One person may adopt the metaphysical stance with respect to things on one part of the 'm….M' spectrum, but another stance with respect to things on another part of the spectrum. So despite all the consilience between metaphysics and empiricism discussed so far, ultimately, *where* on the spectrum of more speculative/ less empirically vulnerable to less speculative/ more empirically vulnerable one stands is a matter of voluntarist (sub-)stance choice

often involving dissensus, for one party isn't likely to view the benefits of another's stance as stance-transcendent. For instance, the divide in the physics (and philosophy of physics) community over string theory is well known. (Although string theory is a theory, it can arguably be seen as stemming from a stance in the sense of being a way of looking at things, embodying certain values and commitments.) Similarly, Elder (2019) discusses issues regarding the idea of the inflationary multiverse in cosmology in terms of stance disagreements.

Like with the metaphysics stance as discussed above, the empiricist stance can also be adopted to different degrees depending on the context. For instance, Cartwright and I (Bhakthavatsalam and Cartwright 2017) have argued that when the goal is predictive success or truth, it makes sense to pursue theories that are empirically adequate. But for a host of other goals in science including multiple types of understanding – such as those obtained via unifying explanations and explanations that provide plausible stories – empirical adequacy, and in fact any proximity to the empirical, isn't needed. Insofar as pursuing empirical adequacy is a core part of taking the empirical stance, these cases show that the empirical stance needn't be universally adopted even within science. But again, this kind of pluralism may not be appealing to the standard empiricist who wouldn't see value for instance in explanations that aren't empirically adequate.

So far, we've talked about metaphysics within science. van Fraassen (unpublished) clarifies though that he is only opposed to current analytic metaphysics. "I've said that I am really only against pre-Kantian metaphysics, and then only if practiced after Kant -- though I certainly take that to include the large swath of analytic metaphysics of the past half century." (12) So van Fraassen isn't opposed to the metaphysics stance as a whole as he often claims, but certain pursuits (and associated outputs) within it. These pursuits belong to a metaphysics that is far removed from science – the 'big M' metaphysics, so to speak. While as we've said before this is continuous with scientific metaphysics, admittedly, there are ideas within it – such as those of universals and possible worlds – that are far enough from science, or to use Chakravartty's terms, so empirically invulnerable, that the empiricist is going to undoubtedly dismiss them.

van Fraassen (2002) gives three reasons he is against analytic metaphysics: 1. It constructs simulacra of the real world (such as of 'world' and 'god') that are strange and very far removed from the real world, and lead to interesting logical puzzles but have little to do with real concerns – we perfectly understand and are able to work with notions of "world" or "god" without any aid from/ intervention of analytic metaphysics; 2. The method of metaphysics isn't in good faith: it might resemble scientific method in form – i.e. choosing of hypotheses/ theories based on values/ virtues, but doesn't subject itself to empirical investigation or natural selection; it doesn't get into/ give details of selection criteria or process of one theory as opposed to another; and 3. Its goal is just truth for its own sake, so there's absolutely no focus on collateral values. For instance, while we can be thankful to Newton for his theory of gravitation despite it being wrong – since it has other tremendous benefits – we can't say the same about Cartesian dualism. The first two reasons maybe seen as criticisms specific to the empiricist stance, but the third seems to me to be more objective, in that it is pragmatic. In terms of an idea that has come up throughout this paper, it seems van Fraassen is saying that analytic metaphysics doesn't have any stance-transcendent benefits. I do agree with this last. But while universals and possible worlds maybe pragmatically bankrupt and – in Chakravartty's (2007) words – "causally inefficacious" (199), there may be value in thinking in those terms towards the end of cultivating cognitive flexibility

and intellectual empathy which I think are important virtues. The extent to which one wants to engage in projects one doesn't think worthwhile is obviously one's own prerogative. The point is only that it would be good for one to do so to the extent possible (within the practical constraints of time, inclination, funding etc.)

What about the relationship between metaphysics and empiricism outside science as well as the narrow domain of analytic metaphysics, and in life more generally? This is too vast of a topic to get into here. For now, suffice to say that it is not difficult to find examples of stance pluralism – not to mention, even of the strong version. For instance, there are scientists who are theistic, yet staunchly empiricist in their work. Arguably, both boast of stance-transcendent benefits: motivation, discipline, and joy in one's life, inspiration for great art, music, architecture; and the remarkable achievements of empirical science such as life-saving drugs respectively. (It is worth underlining here that supporting a stance – any stance – obviously does not amount to supporting every aspect of the stance, in particular, all beliefs associated with it. Rather, supporting a stance amounts to a general support for its values, attitudes, perspectives, guidelines, and core beliefs.) Hence at least a weak active pluralism towards these (sub-)stances is warranted if not a strong one. (Of course, these benefits are contextual and a stance should be adopted only in contexts where it has shown to pay off.)

3.2.2 Does stance pluralism go against the very idea of taking a stance?

van Fraassen (2004) says a stance is not a state: "the term ''stance'' has its own connotations of commitment and intention: specifically, *the commitment to preserve oneself in that very stance*." (177; emphasis as in original) He says, "There is a pragmatic inconsistency in ''I am committed to doing X but not committed to maintaining this commitment''". (177) He says that a stance is a coherent whole (of values, attitudes, commitments etc.) and that for this cluster to have the status of being a coherent whole, it must involve a "*self-regarding commitment for its own preservation.*" (177) Given all the cases of stance pluralism that we have seen, this sounds odd, unless we can accommodate the contextuality of stance-taking within this view. If "commitment to preserve oneself in that very stance" means a contextual commitment that can change, then it's consistent with stance pluralism. But it doesn't look like van Fraassen wants to allow this. Elsewhere (unpublished), he makes the point about sticking to one's guns in an even stronger way. He says he is "proud of [his] empiricist values" and "To take a stance is not to deny the possibility of other values and beliefs, but to stand firmly by one's own." (8) Again, it is possible to interpret this as standing firmly by one's own stance *in a particular context* but given van Fraassen's overall views, it is quite clear that this is not what he has in mind. He says that to take a stance is to rule out other stances. He says, "rejection of the game of metaphysics is part of what it is to be an empiricist." (unpublished, 6) Maybe this is true of this particular pair of stances since the core beliefs of both are at loggerheads, but it doesn't seem generalizable. Stances in general are certainly not necessarily defined by a rejection of other stances. In fact – recall Duhem's pluralism in addition to Chakravartty's discussion of naturalized metaphysics – it's not even the metaphysics stance as a whole that is fundamentally opposed to empiricism, but analytic metaphysics in particular. But even if two stances were fundamentally opposed to each other, like say, scientific realism and antirealism, we have still seen ways of being pluralist about them.

I want to remind the reader of Crasnow's (2000) view of philosophical attitudes as being "less than [permanent] commitments" and her metaphor of wearing and taking off a mask. In several (if not all) of the cases of stance pluralism I've discussed, this is what is happening: a stance is adopted in a particular situation but dropped for a different stance in another situation. If this is fundamentally opposed to van Fraassen's view of taking stances, it is intriguing that he says that Crasnow's philosophical attitudes is an example of stances.

But the question now arises, is this kind of staunch commitment to a stance a defining feature of stances according to van Fraassen? Does stance pluralism then go against the very idea of taking a stance? This is just a matter of semantics. I see what I have done here as reconceiving the very idea of taking a stance to accommodate stance pluralism. I think this is fair since the stances I've discussed all do have the fundamental characteristic of being a cluster of values, attitudes, policies, commitments, and beliefs, that generate and shape beliefs. A stance isn't a natural kind (as Teller (2004) indicates too as we saw earlier). But if taking a stance is essentially characterized by the sort of staunch stance monism in practice that van Fraassen espouses, then we can simply call what I've been talking about so far something else, say "schmances". The point would then be to give up the idea of taking a stance and embrace the idea of taking a schmance.

4. Conclusion

I began this paper by noting the well-known problem of justifying one's stance choice while being what I call a token stance pluralist and a stance monist in practice. How do you justify your stance choice to yourself and fellow stance-holders going beyond declaring, in Chakravartty's (2011) words, "This is simply what [we] do." (47)? And how do you justify – to those taking other stances – your (singular) choice while at the same time granting that any stance that doesn't lead to self-sabotage by its own lights is equally rational? We saw that stance monism in both principle and in practice, i.e. rejecting voluntarism, doesn't work since there seems no way of convincing oneself and everyone else about the value of one stance over all others. In cases of adopting a stance in response to a specific goal or activity, one can justify their stance choice by appealing to the fitness of the stance with respect to the goal. But narrowly focusing on activity-to-stance fitness only works within the stance in question, for others need not see value in the chosen goals or activities. And this also doesn't work in cases of van Fraassenian global stances. Can we have reasons that go beyond one's own values – reasons that would resonate across stances – to hold a certain stance? I have argued that we can. Appealing to stance-transcendent benefits[13] is a helpful route to take towards justifying one's stance choice to those taking other stances, and this works for both local and global stances. The idea is that if a stance has clear objectively stance-transcendent benefits, then it is only reasonable to accept that stance wholeheartedly. At a minimum, one should see value in the stance and actively encourage its takers even if one doesn't adopt it oneself. This would be weak active stance pluralism. Even better, one adopts multiple stances based on stance-transcendent benefits oneself – this would be strong active stance pluralism.

[13] In an interesting coincidence, stances have sometimes been associated with Kuhnian paradigms, and Kuhn (1977) talks of appealing to the "technical results" (367) of a paradigm as a way of communicating across paradigms and persuasion in the face of incommensurability.

Note that a significant consequence of the kind of stance pluralism I'm advancing is that it is opposed to stance voluntarism. This is ironical given that voluntarism and pluralism are generally seen to go together. But as we've seen, traditional stance voluntarism is only aligned with what I called token pluralism. Since I'm advocating for an active pluralism that's consequentialist and (pragmatically) rational, there isn't as much of a free rein with regards to being staunch about your stance choice. Such a pluralism takes a self-consciously pragmatic and open-minded approach as opposed to van Fraassen's voluntarism, which when applied across the board entails a closed-minded adherence to one's own stance based on one's (fixed and unchanging) values.

Why be active stance pluralists though? Why couldn't we stick to our chosen stance and just be token stance pluralists despite stance-transcendent benefits of others? Well, we could. After all such a pragmatist argument isn't a forced choice. I said above that once the pluralist (meta) stance is adopted, first-order stance choice isn't exactly voluntaristic. However, the stance of pragmatist active pluralism I'm advancing is itself a stance subject to (second-order) voluntarism. Appreciating stance-transcendent benefits and eagerness to consider various stances are values. So I cannot argue based on reason or logic for embracing active pluralism. Rather, I lay down my arguments on the table and enthusiastically invite you to consider them as seriously as you can. I submit, for reasons based on pragmatics as well as epistemic virtues, that we take beneficial stances seriously. I ask that we don't view our values as so rigid and immutable that we cannot at once hold multiple stances. van Fraassen does allow for one to change their stance, but a. according to him a person can only hold one stance regarding a given matter at a time, and b. this shift is akin to the 'conversions' that happen in scientific revolutions and is an intellectually arduous process involving emotion. But why does moving from one stance to another have to be something as grand as a conversion, involving emotion? I have argued here that we can switch simply based on pragmatic considerations. Appreciating the benefits of stances other than "your own" shows open-mindedness, epistemic humility, anti-essentialism, and taking multiple stances builds cognitive flexibility. Note that in defending an active stance pluralism, I am not saying that one should be open to all possible stances. I'm not advocating an unbridled pluralism leading to relativism. Stance-transcendent benefits put a bridle on the pluralism I'm advocating. How about stances without stance-transcendent benefits? It would be good to "try out" these stances based purely on considerations of the above epistemic virtues. If such stances can't be put to good use though then from a pragmatist view, the recommendation to stick to them won't be as strong.

Rather than seeing stance choice as part and parcel of one's intellectual identity, I see significant value in cultivating flexible, non-essentialist minds. Epistemic virtues aside, as we have seen there are pragmatic payoffs of stance pluralism as well. Above I discussed stance-transcendent benefits of first order stances. What I'm saying here is that there are also benefits of the second order stance of stance pluralism itself. It encourages keeping multiple lines of inquiry alive which in turn is good for the overall state of the field, be it science or philosophy. It's true that this is the case anyway and token pluralism allows for this as well, especially in philosophy where lack of consensus is the norm. But a. having a cheery attitude that comes with a (weak) active stance pluralism towards this diversity can only help, and b. I add that it's beneficial for a single individual or group to occupy multiple stances. For instance, hopping from one stance to another as Crasnow describes helps one do scientific (and related) work effectively. Further, as

in the case of metaphysics and empiricism, one stance can constrain/ condition/ shape another. Last but not least, I have shown that stance pluralism is also *descriptively* accurate in several contexts of scientific and philosophical practice. So while I'm a stance pluralist in the ways discussed so far, I'm monist about being pluralist. Given my (higher order) stance of pragmatism, I don't think there is an inconsistency here: at the first level (scientific and philosophical stances discussed above) as well as the second level (pluralism about those stances), I value stances that are pragmatically beneficial. And this pragmatism, as I said above, is a voluntaristic choice.

Before I close, here are a few caveats/ clarifications. I have defended taking a strong active pluralist stance when and where possible. The clause at the end of the statement is there because there are always going to be practical constraints like resources and personal inclination. One might appreciate the stance-transcendent benefits of a stance and still not take that stance for various reasons like lack of interest in pursuing activities within it, lack of time, funding, or other constraints. And that is fine. But if that's the case then I ask that you at least be a weak active pluralist toward the said stance: you enthusiastically acknowledge and support it even though you don't adopt it. I'm also not claiming that any and every pair of stances can be coherently held by the same person: for instance – setting aside the question of stance-transcendent benefits for the moment – an idealist stance and a metaphysical realist stance. But based on the multiple examples I've presented, it seems that stance pluralism is a lot more common and desirable – in many if not all contexts – than one may have thought. Finally – this may be obvious but is worth underlining – stance-transcendent benefits are contextual. A stance may have benefits in one context but not another. So the lesson is to only adopt the stance in contexts where it pays off. For instance – going back to an earlier example – if an instrumentalist stance towards orbitals works in the contexts of quantum physics and computational chemistry, then the lesson is to adopt the instrumentalist stance in just those contexts and not across the board.

My project here has been to problematize and reconceive the traditional idea of taking a stance. First, philosophical stances come in multiple shapes and sizes. I don't see why taking a stance about X should necessarily be associated with what one believes about X in their "heart of hearts". I've reconceived stances contextually and pragmatically. Second, relatedly, we don't always have to take *a* stance. I've come to be an active stance pluralist – embracing pluralisms of different kinds as in the many examples discussed – since I genuinely cannot see the rationale behind necessarily being a stance monist. Contrary to the traditional view, it doesn't seem to me that everyone necessarily takes or needs to take one 'home stance' on every matter. I've reconceived stances on Feyerabendian lines, as not being like rigid ideologies but being more malleable. I urge us to move away from declarations such as "I'm an empiricist, period." I don't think it the mark of a respectable thinker to necessarily have one home stance on a given matter: it is perfectly fine, and in fact maybe pragmatically sound, to be itinerant.

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Appendix 1 – On Jamee Elder's Response to Baumann

Elder (2019) starts by reconstructing Baumann's argument. Following Baumann she talks specifically about an empiricist, but this could apply to the holder of any epistemic stance. Here is the part of her reconstruction relevant to our present purposes. Apparently following Baumann she says a voluntarist empiricist is committed to believing that:

"(4) epistemic stances should only be adopted/held when an agent has epistemic reasons for doing so." (3028) She goes on to say, "However, Baumann's presentation of the objection suggests that our empiricist's commitment to voluntarism also lead them to a further commitment: the belief that (5) epistemic stances may be adopted/held when an agent has no epistemic reasons for doing so. That is, if they do have reasons for adopting the stance, these reasons may well be non-epistemic, or epistemically irrelevant reasons. Assuming that the present case of the empiricist is such a case, then it follows that (6) the empiricist adopts the empiricist stance without having epistemic reasons for doing so." (3028)

She notes that (4) and (5) taken at face value contradict each other and *this* is the problem of irrationality with voluntarism. Her response is that this is based on equivocation between two senses of the term 'epistemic reasons': those applicable within the stance, and those outside. She argues that there *are* epistemic reasons for choosing an epistemic stance, but that these are internal to the stance – these are the 'epistemic reasons' referred to in (4) and include the likes of simplicity and universality (of explanations). These cannot apply at the meta-stance level according to the voluntarist. The 'epistemic reasons' in (5) however, refer to those at the meta-stance level. She underlines that *according to the voluntarist*, no meta-stance epistemic reasons are needed to justify stance choice. So, in alleging that the voluntarist is irrational because she does not have epistemic reasons for her choice of epistemic stance, Baumann is equivocating between the stance-level and meta-stance level reasons.

I contend that this is a strawman argument. On my reading of Baumann, first of all, he does not attribute the kind of apparent contradiction present in taking (4) and (5) together to the voluntarist, because he simply does not claim that the voluntarist does accept (4). Rather, he seems to argue that (4) is obviously true and *should* be accepted by everyone including the voluntarist, but that the voluntarist *doesn't* accept (4). Crucially, on my reading of Baumann, the 'epistemic reasons' in (4) apply to the meta-stance level in his criticism. So essentially, I think Baumann's complaint is about the central tenet of voluntarism itself, which is that there are no stance-transcendent epistemic reasons (going beyond the thin criteria of rationality discussed above) for stance choice. Elder raises this as a possible reading of Baumann but rejects it saying this would be a "new objection" that would be "an upstream problem with the assumptions made by voluntarism, rather than the downstream problem that *accepting* voluntarism leads to tension when one also adopts an epistemic stance." (3033) However, it doesn't make sense to think of voluntarism as an empty meta-stance, without involving any lower level (epistemic) stances. Being a voluntarist obviously involves taking a (or multiple) stance(s) and believing that there is an element of will in stance choice and that rationality permits multiple stances. If this is the

case, then the difference between the 'upstream' and 'downstream' problems disappears. Baumann is pointing to the apparent irrationality in the assumptions made by voluntarism (upstream) which means an irrationality in being voluntarist *about adopting epistemic stances* (downstream).

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Appendix 2 – On Curtis Forbes' Pragmatic Account of Stance Choice

While the idea of suggesting stances to individuals or groups based on pragmatic considerations would make sense in a range of situations, I don't think it applies to Forbes' own examples. With respect to those examples, it is not clear how Forbes' account is distinct from van Fraassen's own account of stance rationality. In particular, it seems that Forbes describes through the case study just the kind of pragmatic coherence that the 'no self-sabotage' rule requires. What exactly is meant by self-sabotage here? In Chakravartty's (2007) words, "Self-sabotage is broad enough to include such unfortunate circumstances as believing contradictions and probabilistically incoherent combinations, as one might do on the level of facts, but it may also include circumstances in which the stance one adopts has pragmatic failings, such as consisting in combinations of attitudes or policies that tend to undermine or conflict with one another." (191) As I see it, Forbes' case study illustrates (the absence of) such "pragmatic failings". For instance, adopting an anti-realist stance while carrying out refined measurements of properties of unobservable charged particles as Weber did seems to exemplify such a pragmatic failing. It seems incoherent to maintain that you're carefully measuring properties of particles that don't exist. (Similarly with Maxwell's and Helmholtz's stance and goal choices.)

Forbes claims that although our stance choices depend on our values, it is not just rationality that underdetermines our stance choice; our values underdetermine stance choice as well, for "it is not always immediately obvious which stance best serves our values." (3332) 'Values' is a broad term and I contend that although Forbes' claim maybe true with respect to some values, it isn't with respect to others. 'Respect for science' is a value for instance that is too broad to uniquely determine a stance. But if goals or activities can be taken as values as well – such as constructing explanations because you value that or working to predict novel phenomena because you value *that* – then it seems that values do determine stances. For instance, if you value explanation by postulation, you *will* have taken the metaphysical stance if you don't wish to commit self-sabotage. So at least in the examples that Forbes gives of nineteenth century electrodynamics research, it seems that his account sits squarely within van Fraassen's own account of rationality.

In keeping with van Fraassen's idea of a stance in which the stance is not consequent to value choice or activity choice – a stance is a *coherence* of values, choice of activities, attitudes, and beliefs – the three scientists Forbes discusses seem to have indeed adopted a stance first. It's not as though they started out with values/ goals and then were told or realized along the way, that a certain epistemic stance would be best suited to their goals. As Forbes himself notes, all three of them were already committed to their respective stances. In fact, from the perspective of van Fraassen's account of stances, their stance choice is what explains their goal/ activity choices since stance choice is conceptually (although not temporally) prior to activity choice when it comes to the kind of activities discussed in the case study. As above, it seems to me that Weber's

activities for instance are enmeshed within the realist stance. So it's not clear that Forbes' examples show how his account can "help people make more well-informed choices about epistemic stances" (3332) if we're talking about van Fraassenian stances. Also as observed earlier in the context of Baumann, for van Fraassen adopting a stance is a deliberative, philosophical activity independent of specific tasks, and the stance one ends up taking is global in its scope in that it directs all of the individual's epistemic choices within the relevant domain[14]. Having said that, I think Forbes' point about adopting goal-specific stances is applicable in a range of situations and important – I have in fact argued that we can and should reimagine stance-taking in such a way that you take a stance to further specific values, goals, or activities. But it is important to acknowledge the departure from van Fraassen's view.

In what situations would Forbes' idea of suggesting stances to individuals or groups make sense? Consider the case of taking on a task unreflectively at first, without having taken a relevant stance. For instance, consider someone who follows someone else's lead and is *given* tasks, such as a junior researcher, as opposed to scientists who pick out their stances after experience and philosophical reflection. Say, a junior researcher working in a lab is tasked with fine measurements of properties of some unobservable particles. Further, say that she hasn't engaged in much philosophical reflection and doesn't have a chosen stance of her own yet. She has no views whatsoever on whether to be ontologically committed to those particles. Here, Forbes' pragmatic account of stance choice can help this researcher choose a stance that will best guide their efforts. This researcher can follow the lead of Weber for instance and take a realist stance to effectively carry out their tasks. However, in this case, the 'no self-sabotage' rule will also lead to the same stance.

Are there situations where the 'no self-sabotage' rule underdetermines stance choice and Forbes' account is actually able to help? Yes. For Forbes' account to do work that van Fraassen's already doesn't, an individual needs to have:

- Some relatively open-ended values that don't constitute/ uniquely determine a stance
- Picked out (or assigned) a goal or activity that doesn't constitute/ uniquely determine a stance
- Not already taken a relevant stance

Then, as Forbes suggests, such an individual can be helped by recommending a stance relevant to their activity. Forbes' own examples don't satisfy the second, and hence the third, criterion above and the case of the junior researcher doesn't satisfy the second. Sandy Boucher (2018) discusses some scenarios where I think Forbes' account would work. Among Boucher's examples of pragmatic stance adoption is Einstein's adoption of the realist stance for its motivational value discussed earlier. In Boucher's words, "Without realism, scientists would not have the same drive or passion for their work. So for scientists, realism is to be assumed, rather

[14] It is for this reason that I think that choosing a stance *à la* van Fraassen, isn't like choosing between salad and lobster at a restaurant as Forbes argues. While both choices are indeed value-laden and involve pragmatics, a van Fraassenian stance is chosen prior to such situations of choosing between two specific items. It seems to me the choice of lobster vs. salad is narrower, more like the choice between two specific (types of) explanations. To be in that situation, you already need to have taken a stance – in this case, the metaphysical stance. A better comparison to epistemic stance choice would be a wider, more global dietary choice, such as vegetarianism vs. non-vegetarianism, going gluten-free vs. consuming gluten, or being pro or anti consuming red meat.

than proven." (525) For Einstein, a realist attitude is what drove his pursuit of science: realism for him was a "prescientific metaphysical assumption that is pragmatically justified on the basis of the positive motivational effects it has on the work of scientists." (526) Note that here, the activity is science in general which obviously does not uniquely determine the realist stance. It looks like Einstein's case fits Forbes' account since Einstein's adoption of the realist stance wasn't entailed by his goals or other values like motivational power. Boucher in fact makes a point similar to Forbes' with respect to the stance-value[15] relationship: "Given that one values X, and it is an empirically verified fact that the only way that X can be realistically brought about is by employing the strategy S, one can draw the inference that one should adopt a stance that at least includes among its elements an inclination to advance the imperative "do S."" (534)

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[15] Boucher distinguishes between core and non-core values: while the former are subjective in the sense of not being discussable, the latter are entirely discussable and debatable. For e.g., valuing human life is a core value which if shared between two people who don't agree about the ethics of abortion, leads to the possibility of debate about, for instance, which life is to be valued more: the fetus' or the mother's. In the current situation, I think of valuing science as a core value, and motivation to carry out scientific work as a non-core value. While some people can carry on with their science on 'autopilot' mode without seeking a stance that will give them motivation per se, some others might really need a source of robust motivation. Both valuing science and needing motivation to pursue it are clearly values that underdetermine stance choice. The point then is that based on the example of Einstein a realist stance is pragmatically helpful for someone with these values.

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