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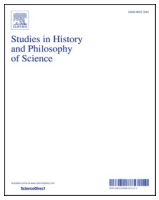

Pragmatic pluralism and problem framing: Why pragmatism demands pluralism

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A B S T R A C T

In this paper I focus on the benefits of scientific pluralism in practice. My main motivation is to investigate how do these benefits play out in practice, and how do different systems of knowledge come together to address particular questions? One might accept the epistemic benefits of plurality, yet still deem it undesirable for pragmatic reasons. My argument responds to this objection, which assumes that pragmatic demands can supersede the epistemic benefits of pluralism based on the problems at hand.

I argue that this objection fails because it assumes problems are independent of inquirers. Building on classical pragmatism, I argue that problems are framed by inquirers and cannot be seen as separate from practices. Rather than facing predefined problems, inquirers confront indeterminate situations, requiring judgements on how to formulate the situation. Different framings are possible based on who is involved in making these judgments. A lack of plurality among inquirers leads to frameworks that overlook certain aspects and complexity. Therefore, pluralism is pragmatically beneficial when framing a problem, enabling inquirers to explore various dimensions of complex situations and enrich problem framing.

I illustrate my argument by analysing the early responses to the UK COVID-19 outbreak, showing how the problem was initially framed as biomedical, neglecting social, logistical, and psychological aspects. The lack of plurality in the inquirer community led to shortcomings in the official response. Building on this case, I show that pragmatism demands pluralism when dealing with complex situations, demonstrating that plurality must be promoted in practice, going beyond recognized epistemic benefits.

1. Introduction

Many pluralists have already argued convincingly for the benefits of plurality in science, showing how having multiple systems of practice allows scientists to explore and explain different aspects of phenomena (Chang, 2012; Kellert et al., 2006). Given the multiplicity in scientific practices, however, it has become important to consider how these benefits play out in practice and how different systems of knowledge are brought together to address particular problems.

This consideration is vital in times of crisis where policymakers need scientific expertise to decide how to handle the crisis. Pluralists like, Lohse and Bschir (2020), Lohse and Canali (2021), Bschir and Lohse (2022), have argued that insufficient pluralism in public health policy during the COVID-19 pandemic led to many shortcomings in different European countries. They highlight that policymakers need to use the right set of expertise and make best use of available resources to overcome the crisis. They also warn that pluralism can involve pragmatic constraints, especially during a crisis. However obvious this statement might seem, I will show that it raises many questions about the way we think about the benefits of plurality in practice when we consider wider social, economic, and political concerns. My aim here is to build on these arguments by addressing a potential objection to pluralism: one might accept the epistemic benefits of plurality, yet still deem plurality *pragmatically* undesirable in a crisis. This would be a serious limitation on how widely we accept pluralism in practice. Here, I lay out and respond to this potential pragmatic objection to pluralism. While this objection tries to pull pluralism and pragmatism apart, assuming that pragmatic demands supersede the epistemic benefits of pluralism, I will argue that pragmatism actually demands pluralism.

In section 2, I summarise the key arguments for pluralism, which focus on the epistemic benefits of having multiple approaches to explore and explain the world, before developing the putative objection that pluralism might be pragmatically undesirable in a crisis. The thought is that, in a crisis, we ought to prioritise the scientific practices that can solve the problem, even if we restrict plurality.

In section 3, however, I will argue that this objection fails because it assumes that problems are given, independently from policymakers and scientists. Instead, I will use Dewey (1938) as well as more recent works in pragmatism (Brown, 2012; Henne, 2023; Serrano-Zamora, 2022), to help me argue that problems are not given but framed by the inquirers. Following Dewey's theory of inquiry, I will argue that inquirers do not encounter problems directly, but instead experience indeterminate

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situations. When faced with an indeterminate situation, inquirers must judge whether the situation is problematic and what aspects of the situation are problematic. I will argue that inquirers from different systems of knowledge, with varying interests, will focus on different aspects of the situation. As a result, what aspects of the situation are brought into frame when articulating the problem depends on who is involved in the inquiry. I will argue that problems are not independent of the inquiry, therefore cannot be used to make normative judgements on the benefits of plurality in practice. I will also argue that lack of plurality when framing a problem will lead to overlooking various aspects of the situation and potentially inadequate framings. When faced with an indeterminate situation, we need to promote plurality in order to explore different aspects of the situation and better inform the inquiry. Hence, pragmatism demands pluralism.

In section 4, I will make my arguments concrete by analysing the early responses to the UK COVID-19 outbreak. I begin by demonstrating the lack of plurality in the community of inquirers who had the power to frame the problem and shape the policy response (Costello, 2020). I will argue that due to lack of plurality among the community of inquirers, the outbreak was framed as a biomedical problem, where the main focus was on the biological aspects of the situation. I will show how this narrow framing overlooked important aspects of this complex situation (social, logistical, and psychological, to name only a few) which, in turn, led to controversial decisions, including whether to introduce social interventions like lockdowns. Building on this case, I will argue for the benefits of plurality among the community of inquirers, showing how it would have better helped recognise the complexity of the situation when making judgements about the problem and deciding on how to overcome it.

In section 5, I generalise my argument beyond the COVID-19 crisis, arguing that plurality in general has both epistemic and pragmatic benefits. Plurality helps inquirers study different aspects of the situation, which is vital for inquiry in any complex situation, crisis or not. Hence, pragmatism demands pluralism in making judgements in any complex situation. This is in line with pluralist arguments acknowledging the complexity of the world and furthers the pluralist argument by showing the value of pluralism when framing problems. However, I am not saying that there is no restriction whatsoever on plurality. It is important to think about the wider consequences of promoting plurality, and when we do want to exclude certain systems of practices. Building on the values literature in philosophy of science and wider literature from science and technology studies, it is important to study the social, ethical and political consequences of promoting pluralism in practice and address the issues that arise in science policy and governance. Ultimately, I will show that it is not a case of pragmatism versus pluralism but that, on the contrary, pragmatism demands pluralism.

2. Scientific pluralism

With greater attention to studying scientific practices, the multiplicity in scientific accounts, models, theories, explanations, and methods has attracted the attention of many philosophers of science, yielding a rich and multifaceted debate. Many pluralists were motivated by the state of affairs in current and historical science and aimed at demonstrating the benefits of having multiple systems of knowledge. My aim here is not to provide an exhaustive review of scientific pluralsim. Ludwig and Ruphy (2024) have written an extensive review that explores the plurality of pluralisms demonstrating the wide range of arguments developed in this field. The pluralist argument I develop here takes the pluralities in scientific practices as its starting point, and approaches epistemic and metaphysical questions in light of the multiplicities in practice. This argument is informed by the *practice turn* in philosophy of science, as outlined by Ankeny et al. (2011).

I will begin by surveying some key arguments that take practices as their starting point—first examine those directed against monism, and then turn to a more positive case for pluralism. I will finish, however, by looking at some recent arguments for pluralism in practice and raising what might be seen as a devastating objection to pluralism: if pluralism is beneficial because of the aims of science, are there some cases where the aims require us to abandon pluralism—particularly, cases where urgent action is needed?

2.1. Arguments for pluralism

In the 2000s, influential pluralists like Kellert et al. (2006) built their argument for pluralism against *monism*. As described by Kellert et al., monism is the view that the ultimate aim of science is to come up with a single complete and comprehensive account of the world based on fundamental principles. This position relies on a set of assumptions: the world is such that it can be explained through a complete and coherent scientific account; such an account can be knowable by scientists; and the aim of science is to one day provide this account. Therefore, according to monism, having multiple accounts is a deficiency that must be resolved with a single unified account, through either integration or elimination of the inferior account. Kellert et al. argue that there are no definitive arguments for monism, and reject the view that multiplicity in scientific practices is a deficiency. For Kellert et al., the monist assumption that the world can be completely explained by a single, complete account should be considered as an open, empirical question (Kellert et al., 2006, p. x). Instead, they argue for replacing the monist commitments with, "an openness to the ineliminability of multiplicity in some scientific contexts" (Kellert et al., 2006, p. xiii).

Following Kellert et al., Chang (2012) calls for a re-examination of fundamental assumptions about scientific practices and their accounts of the world. Chang argues that the aim of science is to serve *whatever ultimate aim* we may have, but monism (or the unified account of the world that monists fantasise about) should not be that aim. Chang defines pluralism as a doctrine advocating the *cultivation* of multiple systems of practice in any given field of science. Chang argues that losing sight of the abundant potential of having multiple approaches to study phenomena restricts what we can *learn* about the world. Thus, it is necessary to preserve and promote the plurality of systems in order to maximise how we acquire knowledge.

Underlying Chang's argument is the observation that the world is complex and cannot be captured by a single complete account "no matter how much help we have from increasing computing power" (Chang, 2012, p. 257). Therefore, through plurality of systems we can explore and account for more aspects of reality. Chang calls his position "Active Normative Epistemic Pluralism", where he argues that in order to improve how we acquire knowledge, we must promote plurality in science. Chang argues that pluralism is more beneficial to science than monism, and aims to promote plurality directly in scientific practices to reap the epistemic benefits of having multiple systems of practices, which explore different aspects of the phenomena in question.

The pluralist arguments presented above emphasise that each system of knowledge is limited by its methods, theories, and models. The focus is on the benefits of having multiple systems of knowledge to explore and explain different aspects of phenomena. The important point here is that pluralists are motivated by the apparent complexity of the world. Kellert et al. see the nature of the world (whether it can be explained by a single account or not) as an open-ended empirical question with openness to the ineliminability of plurality in scientific practices and explanations. Chang is motivated by the observation that each domain of nature we choose to study reveals a level of complexity that cannot be accounted for in a simple coherent account. Hence, he concludes, plurality in scientific practices is epistemically beneficial in explaining and exploring different aspects of the world that is complex. Both pluralist arguments maintain that plurality maximises our ability to learn more about the world.

2.2. Pluralism in practice

The arguments above have been widely influential and are now accepted by many, especially among philosophers interested in scientific practices (Ankeny et al., 2011; Ruphy, 2017; Soler et al., 2014; Van Bouwel, 2014; Veigl, 2021).

There has been recent focus on pluralism in practice, where Lohse and Bschir (2020); Bschir and Lohse (2022, 2024) argue that insufficient pluralism is a problem in evidence-based policy, particularly in public health policy. They use the COVID-19 case to demonstrate the danger of insufficient epistemic pluralism, where (1) the biomedical approach was prioritized over other approaches in policymaking, and (2) policymaking was further constrained by epidemiological modelling, ignoring perspectives from other biomedical disciplines and social sciences. These two points, according to Bschir and Lohse, are examples of a lack of pluralism regarding viewpoints external to science and within science respectively. Building on this case, the authors further elaborate on why the lack of pluralism is a problem. First, the lack of pluralism can lead to a 'myopic' description of reality, where a single approach, like epidemiology, can lead to unbalanced policy decisions by overlooking potentially useful knowledge that could be "crucial for more rational policy interventions" (Lohse & Bschir, 2020, p. 3). Secondly, they make a wider point about the fallibility of knowledge, where even our best models can be wrong. Hence, in a complex and largely unknown world, we need to keep our options open and not restrain ourselves in advance. Finally, they argue that to be able to recognise the shortcomings of a given approach, we need to develop alternative approaches to any given epistemic problem (Lohse & Bschir, 2020, p. 3). Therefore, they conclude that many more perspectives should be included in providing evidence for policymaking and a wider range of stakeholders should have a voice in policy counselling.

Lohse and Canali (2021) develop this position further to ask the question "what kind of knowledge should we incorporate into public health policy?" (p. 1). Just like Bschir and Lohse, they ask this question in the context of the COVID-19 pandemic in Europe, where they argue that the policy making was dominated by biomedical sciences. According to these authors, biomedical sciences, particularly epidemiology, were given an excess of epistemic authority, whereas disciplines like social sciences only played a marginal role. It is important to note that both papers are concerned with evidence-based policy, and are interested in making pluralism work in practice. Building on the COVID-19 case, these authors address important epistemic and methodological questions about pluralism in evidence-based policy and show how these questions are entangled with ethical, legal, and social issues.

Lohse and Canali (2021) argue that insufficient epistemic pluralism is problematic because the lack of plurality can "limit our options to understand a vastly unknown but policy-relevant reality" (p.9). Building on Bschir and Lohse, they highlight that the lack of plurality is particularly problematic when we consider the general point that knowledge is always fallible and perspectival. Using the COVID-19 case in Europe, they argue that social sciences can provide both a unique perspective on the situation and, more importantly, essential evidence for understanding and managing pandemics. For instance, they highlight how social sciences can improve efforts in surveillance prediction and intervention by helping biomedical sciences and policymakers understand the local conditions and social factors that exacerbate the spread of diseases as well as other factors that influence health outcomes. The social sciences can also improve data interpretation, integration, and harmonisation by questioning and challenging assumptions built in to scientific practices and policy. They highlight that medical sociology can provide modelling on the potential public responses to the outbreak and inform the potential policy measures.

These are very important points raised both by Bschir, Lohse, and Canali, and the same points were made by other stakeholders and scholars, such as Costello (2020), Jasanoff et al. (2021), Ballo et al. (2024). The pluralism developed by Lohse and Bschir (2020) and Lohse and Canali (2021) offers a reflection on the benefits of pluralism and, more importantly, a reflection on the challenges to plurality in practice. Their position is similar to the integrative pluralism developed by Mitchell (2003). Lohse and Canali (2021)), in particular, argue that the solution to the lack of plurality is to integrate different approaches to address the problem at hand, making their argument similar to Mitchell's (2003) view that different scientific models and methods should be integrated to fulfil specific scientific aims. For Lohse and Canali (2021), addressing biomedical problems requires integration of social sciences into evidence-based policymaking. Therefore, studying challenges to the integration of social sciences into evidence-based policymaking will allow us to understand why the social sciences were sidelined during the COVID-19 crisis in Europe, and help us change the epistemic status quo so that we can have sufficient plurality in evidence-based policymaking.

2.3. Pragmatic constraints to pluralism

The challenge here is to find a way to promote pluralism in practice. Bschir and Lohse (2022, p. 441) state that pluralism is developed as a negative response to monism, and it is not always clear how to promote it in practice. They identify three challenges to promoting pluralism. The first challenge is the pragmatic challenge, where inclusion of multiple perspectives can be constraining, especially during a time of crisis. The second challenge is how to facilitate plurality without allowing groups that are self-interested and not open to the exchange of ideas to hinder scientific practices. And finally, the third challenge is the differences in the epistemic standards and authority among different groups, which can lead to imbalances in discussions and dynamics, making pluralism unproductive.

Lohse and Canali (2021) identify similar challenges for achieving a pluralist evidence-based policy framework, especially in public health policy. They argue that to overcome the insufficient pluralism in this case, social sciences need to be integrated into public health policy in a way that supplements biomedical approaches. To achieve integration, we need to overcome a series of challenges. The first challenge is *conceptual,* where the concepts of health and disease are predominantly understood in biomedical terms. Therefore, we need to rethink these concepts to overcome the dominance of biomedical sciences in public health policy. The other challenges to integrating social sciences in public health policy are *epistemological* and *methodological*, where pluralists must consider the questions that arise regarding data integration and the weighing of different types of evidence. They highlight the differences in the types of knowledge available and aimed-for in the biomedical and social sciences (social sciences produce knowledge that is context-specific and qualitative, whereas biomedical knowledge is quantified and aims for generalisability). The *epistemological* challenge is how to weigh and amalgamate these different types of knowledge. The *methodological* challenges include issues like what needs to be measured, how it is measured, and how the data get processed, stored and used. In their conclusion, Lohse and Canali reiterate that the social sciences could contribute essential expertise and evidence to public health policy in *biomedical emergencies.* More generally, they argue that pluralism is justified on epistemic and ethical grounds because bringing different approaches and perspectives together will allow us to challenge and avoid one-sided and biased views of reality. Hence, these challenges are

not to be seen as objections to pluralism altogether but as pragmatic challenges for pluralism that need to be considered case by case.[1]

These arguments show that scientific practices do not exist in isolation from their social, political, and ethical context. Therefore, the normative assessment of pluralism beyond its epistemic benefits needs to take the context into account. I agree with these points raised by the authors. Where my argument differs is in the way I construct the normative argument for pluralism. Integrative pluralists demonstrate the benefits of pluralism in addressing a particular problem at hand. On this line of thought, once we identify the problem, we can assess the benefits of plurality based on the problem at hand and the wider context. As a result, we might conclude that plurality is: impractical in times of crisis, when we need to act urgently; undesirable politically and socially in some cases, as it can lead to information overload, particularly when we need to provide clear public communication; irresponsible, as it allows fringe ideas that go against the scientific consensus to flourish (for example, during the COVID-19 pandemic, the idea of anti-vaccination would have led to vaccine hesitancy). There are also contexts where, as Lohse and Canali have shown, a form of integrative pluralism is beneficial in dealing with a biomedical emergency by integrating social sciences with the existing evidence-based policy framework. Conceived this way, the aims may favour a very specific form of plurality or, in some cases, may not favour plurality at all. In Lohse and Canali (2021), the aim to stop the spread of the virus requires a form of integrative pluralism. Plurality is desirable if it serves the particular aim of overcoming a problem. More broadly, pragmatic benefits are contextual and need to be assessed case by case, based on the problems we face.

If correct, this leaves pluralist arguments open to a potentially devastating objection. It allows pluralism to be considered as a luxury that we can have when it is convenient. It is nice to have lots of different ways of studying the world in theory but when there is a crisis, we need to pick the best one dictated by the problem. While we can acknowledge the epistemic benefits of plurality, monism is what we end up with when there is an urgency or scarcity of resources. This objection seemingly has a pragmatic grounding as it shows how scientists' aims vary and pluralism may be beneficial depending on the context. In that sense, the objection tries to pull apart the epistemic argument for plurality from the pragmatic argument. However, I will show that this is a naïve view of the pragmatic benefits of plurality. In the remainder of this paper, I will develop this point further to argue that it is not possible to separate the pragmatic and the epistemic benefits and show instead that pragmatism demands pluralism.

3. Pragmatism

In this section, I will argue that the putative objection to pluralism and the pragmatic constraints raised by integrative pluralism are not satisfactory because they pull apart the epistemic and pragmatic arguments for pluralism. I have already underlined that there can be multiple potential solutions to a problem, developed by different systems of practices. Plurality in that sense is desirable as it allows us to explore different ways to address a problem and potentially integrate various approaches to address complicated issues. This position is compatible with integrative pluralism. However, my main objection to so-called pragmatic constraints to pluralism is that the problems are not given or independent from the practices. I will argue that problems are framed by inquirers and problems can be framed in different ways. Once we consider that problems can be framed in multiple ways, we cannot appeal to problems to make normative judgements on the benefits of plurality based on problems at hand. Here, I will argue that we need the plurality of approaches to explore different ways in which we can frame problems. This is particularly important given that the ways problems are framed have epistemological, methodological, social, and ethical implications for scientific practices and beyond.

3.1. The nature of problems

The putative objection to pluralism, as presented above, takes problems as given, and this is what integrative pluralists do as well. The problem is given, in the sense that it is taken to exist independently of the inquirers. If this is so, the solution to the problem should be clear if we understand the problem well. Take a simple example to see how this assumption plays out: we come across a viral infection that causes pneumonia and recognise it as a problematic situation. In this case, the problem is assumed to be the virus that is causing the pneumonia and by eliminating the virus, we eliminate the problem. More broadly, whether plurality is beneficial, in this view, will depend on the problem. Plurality may be beneficial in many cases, but if the problem is better solved by abandoning plurality, then plurality does not benefit the aims of science in that case and should be – for such cases only – abandoned.

This putative objection to pluralism is not satisfactory because it overlooks that there can be multiple viable solutions to the problems, provided by different systems of practice. There are cases where we can appeal to different systems of practices to provide us with different potential explanations and solutions to choose from. This point is well articulated in the pluralist literature in opposition to monism. Furthermore, Lohse and Canali (2021) have shown how biomedical sciences can benefit from social sciences during a pandemic, calling for the integration of two approaches in the evidence-based policy framework in public health. However, the assumption about problems remains, putting epistemic and pragmatic benefits in opposition.

For instance, in the argument presented by Lohse and Canali (2021), integrative pluralism is justified via social sciences' ability to aid biomedical sciences during a *biomedical crisis*. Hence, integrative pluralism focuses on how social sciences can be integrated into the policy framework, dominated by biomedical sciences, to solve a biomedical problem. The aim is to improve the policy framework by, for instance, better informing biomedical models of the complexities of the context. While the integrative pluralist arguments I discussed in section 2.2 raise valid and important points, the benefits of pluralism are still linked to the problem, with the implicit assumption that we can appeal to the problem at hand to figure out the best way to address it. [2]

This assumption needs to be challenged because considering problems as given is to take them to be an independent criterion to determine whether a plurality of approaches is needed or desired to address it. Hence, the benefits of plurality in practice will always be context-dependent, determined by the problem at hand; in some cases, a form of pluralism (like integrative pluralism) will be desirable, while in other cases, pluralism will be constraining. Therefore, the integrative pluralist position is not immune to the putative objection developed earlier, given that integrative pluralist positions also justify the benefits of plurality based on problems. Consequently, we end up with pluralism and pragmatism in opposition, where pluralism is good to have when the problems at hand allow it. However, once we remove the assumption that problems are given, we see that such pragmatic objections to pluralism are not satisfactory. For pragmatists, problems are not independent from

[1] They point to integrated assessment models for pandemics as the long-term goal, similar to models that are used in policy discussions on climate change. They propose these models to "combine aggregated evidence from different academic fields to project possible developments depending on different policy options and feedback effects" (Lohse & Canali, 2021, p. 9). This is an important point that I will come back to later when discussing complexity, but it is important to note that climate change is a wicked problem that is hard to define, where stakeholders need to make judgements to frame the problem itself, articulating what is at stake and what we care about in that situation.

[2] While this argument could be extended to include other integrative pluralist accounts, such as Mitchell's (2003), a detailed engagement with these perspectives would take us beyond the scope of the current paper.

practices. Problems are framed and articulated by scientists and other stakeholders as part of the scientific practice. It is important to underline that the pragmatist argument I am developing here is in line with integrative pluralism. Bschir and Lohse (2024, p. 554) acknowledge that problems are framed: "[f]irst, framing and analysing problems with no clear boundaries requires value-laden choices concerning the selection of experts, methodologies, or types of evidence and may also involve latent assumptions about ideal policy outcomes." However, this line of argument is not developed explicitly when the authors assess the benefits of pluralism. My aim here is to take a step further to show how problems are framed by inquirers and clarify the pragmatic benefits of pluralism independently of problems. To develop this argument further, I will start by introducing John Dewey's pragmatism to advance the idea that problems are not given but framed. Once I have established that the problems and aims of scientific practices are products of judgments made by inquirers in light of the context, I will argue that we cannot appeal to problems to assess the benefits of plurality. I will further argue that pluralists must pay attention to the way problems are framed.

3.2. Pragmatic inquiry and framing

To have a better sense of what I mean by *problems being framed by inquirers,* I turn to John Dewey's work on inquiry. My main aim here is to demonstrate how problems are linked to scientific practices. Broadly, Dewey defines inquiry as the controlled and directed transformation of an indeterminate situation to a determinate one (1938). Here, *situation* refers to the set of conditions experienced by the inquirers. And specifically, an indeterminate situation is where inquirers experience doubt and uncertainty. According to Dewey, what makes a situation indeterminate is a change in the conditions, interrupting the habits and practices of inquirers, casting uncertainty and doubt over their actions in that situation. For Dewey, the experience of doubt and uncertainty is the motivation behind the inquiry. The first step of inquiry is the judgement on what is causing the inquirers doubt and uncertainty in an indeterminate situation. Hence, the inquiry does not start with a well-defined problem but rather starts with a judgement on whether the indeterminate situation is problematic. In Dewey's words, the first evocation of inquiry "… is that the situation is taken, adjudged, to be problematic." (Dewey, 1938, p. 111).

The important point here is that the result of this judgement is contingent on multiple factors and there is no sure way to settle this judgement that is independent from the inquirers or the practices. This is very different to the common misconception where pragmatism is thought of and used as a shortcut for problem solving where inquiry starts when inquirers encounter a problem. Brown (2012) stresses this point stating that:

> "Rather than problem solving, which assumes that problems are given as the input to inquiry and that the resulting process is an attempt to give a satisfactory solution to the problem as given, Dewey conceives of inquiry as the attempt to overcome an indeterminate situation, what in less technical writings he sometimes calls a '*perplexity*.'" (2012, p. 274)

Following the judgement on whether a situation is problematic, inquirers engage in an iterative process where they explore different aspects of the situation to articulate what the problem is and explore potential solutions. This process involves inquirers making sense of their experiences based on what they already know about the situation, informed by their specific system of knowledge. This is the process in which inquirers frame problems where they deem particular aspects of the situation relevant or significant to understand and address the problem.

It is important to remember the indeterminate nature of the situation, where inquirers can have different experiences of the same situation. Hence, inquirers can end up framing situations differently based on their backgrounds. To have a better sense of this, it is important to clarify a few points about *situation* as a concept. For Dewey a situation does not refer to the totality of the physical and temporal space inhabited by the inquirers. According to Alexander (2019) *the situation*, as conceptualised by Dewey, refers to the category of traits and objects *experienced* by the inquirers at a given time. In short, the *situation* is the "context within which objects arise and are investigated" (2019, p. 36). Brown (2012) argues further that a given *situation* can be experienced differently by different inquirers. Each inquirer will be drawn to different aspects of the situation based on their particular interests and the tools they have available to investigate the situation. For example, when facing an indeterminate situation like a disease outbreak, different scientific disciplines will have different interests and will have different tools to explore the particular aspects of it. A biomedical scientist would be interested in disease mechanisms and have tools to explore and explain biomedical aspects of the disease. An economist would be interested in the impact of disease on the labour market and have the tools to explore the economic aspects of the same outbreak. In short, when making judgements about a given situation an inquirer would be interested in different aspects of the situation, guided by their interests and disciplinary backgrounds. Hence, inquirers from different disciplinary backgrounds could prioritise different aspects of the situation as more salient, resulting in problems framed in different ways.

In short, different inquirers can experience the same situation differently, focus on different aspects of the situation and have a different framing. This is not to say that the problems are all relative. Instead, this means that both problems and their proposed solutions are not independent of practices. As Serrano-Zamora (2022) argues,

> "Problems are, to a certain extent, given to us, but they are also made by us in the practices in which we define them. To a relevant extent then, the standards by which we measure whether problems have been effectively defined and solved are immanent to those practices." (2022, p. 1447).

Serrano Zamora further argues that, given that problems are dependent on our practices, it is not possible to have "standards of correct outcomes that are independent from decision making practices" (2022, p. 1447)This is to say because problems are products of practices, they cannot be used as independent criteria to judge practices.

In short, when framing problems, inquirers set standards of success and potential ways to solve them. In light of this connection, Dewey argued that the relationship between ends we want to achieve and means to achieve them are connected (1928). First, the means available to an inquirer will influence how they frame the problem and how to solve it. Recall Maslow's hammer (1966) – if the only tool you have is a hammer, all your problems look like nails. Second, the ends we think are desirable ethically or socially will inform what means are acceptable. Recall the restrictions and bans on human germline gene editing as an example. The broader point here is that, when we frame a problem, we also decide the acceptable ways of solving the problem and what practices are relevant to solving it. As Dewey puts it:

> "The way in which the problem is conceived decides what specific suggestions are entertained and which are dismissed; what data is selected and which rejected; it is the criterion of relevancy and irrelevancy of hypothesis and conceptual structures." (Dewey, 1938, p. 112)

Hence, the way a problem is framed will determine what aspects of the situation will be taken into account and which practices will be considered as relevant to solve it. If the community of inquirers lacks plurality, it can lead to different aspects of the situation not being taken into account. It also means that lack of plurality among the community of inquirers will lead to overlooking potential ends and means that can be considered to transform the situation.

This takes us back to the issue of insufficient pluralism in the public health response to the COVID-19 outbreak, identified by Lohse and Canali (2021). While I agree with Lohse & Canali's diagnosis of insufficient pluralism, I want to develop pluralism further, building on the pragmatic insights discussed above and look at how the pandemic was framed as a biomedical problem and by whom. More precisely, my goal

here is to extend pluralism beyond looking at how plurality can help address particular problems, to show the need for plurality when we frame the problems. The upshot of my argument is that pluralism is not seen in opposition to pragmatism; instead the pluralist argument needs to be applied at different stages of inquiry, starting from the way problems are framed. The UK response to COVID-19 is a good example to show how the initial framing of the situation and the construction of the COVID-19 outbreak as a biomedical problem led to insufficient pluralism in practices. The pandemic, despite affecting all parts of human life, was framed as a biomedical emergency. Because of this narrow framing, public health policy overlooked social aspects of the pandemic, and sidelined public health interventions that would help control the spread of the virus in the UK.

4. COVID-19 in UK

The UK suffered one of the highest death-rates per capita among comparable countries, despite being among the countries classified as 'most prepared' in the *Global Preparedness for The Next Pandemic* published by the Global Health Security Index in 2019. There is an ongoing public and academic debate as well as an official inquiry into shortcomings in the UK's response which no doubt will provide more information and detail on what happened. However, the existing reports and documents provide a useful insight into the way politicians and their expert scientists made various judgements about the unfolding situation and made decisions on how to respond (Ballo et al., 2024; Costello, 2020; House of Commons, 2021; Jasanoff et al., 2021). For instance, the UK House of Commons report (2021), written together by the Health and Social Care Committee and Science and Technology Committee, states that "decisions on lockdowns and social distancing during the early weeks of the pandemic – and the advice that led to them–ranks as one of the most important public health failures the United Kingdom has ever experienced" (House of Commons, 2021, p. 31). I will argue that this failure is linked to the way the problem was framed by the community of inquirers. I will show that, initially, the pandemic was framed narrowly as a biomedical problem, focusing on the biomedical aspects of the outbreak. This narrow framing, I will argue, was due to a lack of plurality among the community of inquirers from the beginning of inquiry, resulting in an inadequate public health policy that did not take into account important aspects of the pandemic, hence failing to control the spread of the virus and protecting the population from infection.

4.1. Framing COVID-19: biomedical emergency?

Throughout the pandemic, the UK government relied on the Scientific Advisory Group on Emergencies (SAGE) for expert advice to manage the COVID-19 outbreak. The UK public was constantly reminded that policy responses were guided by best science and the government was guided by the best scientists. However, in the early stages, SAGE contained a narrow range of expertise and was criticised for this in the media. For instance, in a newspaper column Castello (2020) highlighted this point, arguing that SAGE did not include relevant expertise for managing a disease outbreak, including social scientists who could work on community engagement, logisticians planning for the delivery of supplies and resources, and mathematical modellers who could work on the model of the community testing programme (Castello 2020, np). We shall see that Castello's early arguments are substantiated by the House of Commons report, which stated that 'Until the social care working group was established in May 2020, SAGE either did not have sufficient representation from social care or did not give enough weight to the impact on the social care sector' (House of Commons, 2021, pp. 7–8). The House of commons report further criticises SAGE for being a closed group and not learning from approaches being taken elsewhere, stating that the UK's pandemic planning was *inflexible* and *narrowly constructed* on flu models and failed to learn the lessons from SARS, MERS, and Ebola (2021, p. 6).[3] The report states that SAGE and politicians were in a groupthink where they were not open to outside criticism, which meant that the UK's early response was informed by an advisory group dominated by biomedical scientists, with other seemingly relevant expertise not included in the decision-making processes.[4]

To understand the early response in the UK it is useful to look at the broader picture and see how it compares to other countries. Comparative Covid Response: Crisis, Knowledge, Politics (CompCoRe) is a good source edited by Jasanoff et al. (2021), providing a comparative overview of various responses to COVID-19. In the CompCoRe report, the early responses, particularly public health measures, are divided into two: measures targeting the virus and measures targeting social practices. The authors highlight that each measure relies on different modes of interventions that require different forms of technical knowledge and expertise. For instance, targeting the virus relies on expertise in biomedical sciences, particularly clinical medicine, virology, cellular biology, and genomics, and the imagined mechanism of action is through technological fixes. That is, targeting the virus involves developing technological tools that allow you to identify and eliminate the virus, such as protective equipment, treatments, and vaccines. In comparison, the CompCoRe authors argue that the measures targeting social interventions rely on "epidemiology, mathematical modelling, and the social scientific aspects of public health expertise", and they target personal or group behaviour, imposing restrictions on everyone's daily lives.

This analysis supports the view that the situation can be framed in different ways and highlights how each framing emphasises a different mode of intervention. The UK government's early response was to target the virus before they had to shift to also targeting social practices. More specifically, the UK's initial response was to target the virus through minimal interventions, especially in the very early stages of the pandemic. There was a desire to avoid lockdowns "because of the immense harm it would entail to the economy, normal health services and society" (House of Commons, 2021, p. 7). Hence the approach was the gradual and incremental introduction of non-pharmaceutical interventions with the aim to manage infections as opposed to suppressing infection. The rationale was that a strict suppression of transmission would prevent any exposure therefore prevent people acquiring any immunity. In such a case, a population without any immunity would be vulnerable to a second wave. Hence the aim was to achieve herd immunity by allowing the virus to circulate at manageable levels among the population. Introducing mitigation would keep the numbers manageable by the National Health Service (NHS) and allow the development of a level of immunity that would protect the general population in the future. In light of this, people with specific symptoms[5]

[3] Moreover, previous exercises of the pandemic preparedness plan were based on "what you do in the period at which lots of people were already dying." (House of Commons, 2021. p.18) The report claims that these exercises lacked any reflection on what type of pandemic is most likely or what are the different characteristics of different pandemics.

[4] A full list of SAGE members was not made public until it was revealed by journalists. That list included 23 participants including clinical researchers, microbiologists, behavioural scientists with backgrounds in disasters and terrorism, geneticists, civil servants and political advisers (Sample 2020).

[5] The list of symptoms changed through the process but initially focused on new and continuous cough, fever and lack of smell or taste (British Medical Association, 2021).

and their households were asked to self-isolate without imposing any restrictions on public life. Many gatherings and public events were allowed to carry on without any restrictions as countries like Italy were in the grip of the pandemic (British Medical Association, 2021).

However, this response overlooked many complicated aspects of the pandemic. The House of Commons report states that the experts worked with the assumption that the levels of infection could be controlled by turning on particular interventions at different times:

"Indeed such was the belief in this ability to calibrate closely the response that a forward programme of interventions was published with the suggestion that they would be deployed only at the appropriate moment. In hindsight it seems a dubious and risky assumption to think that a new, unknown and rampant virus could be regulated in such a precise way. Even more so when—due to the early failure to establish a meaningful testing programme—the UK had very little data on the prevalence and spread of the virus across different settings and different groups of people." (House of Commons, 2021, p. 36)

This finding suggests that the focus on the virus lacked the perspective on the epidemiological and social aspects of the pandemic. This is evident in the implicit thought that the pandemic can be controlled and manipulated with great precision, similar to an experiment taking place in a laboratory setting where scientists have an overview and control in experimental conditions. SAGE expected to be able to control the spread of infection in a step-by-step way. This expectation is an indicator that the complexity in the real world was overlooked by the community of inquirers. What led to this is the fact that the community of inquirers lacked the scientific expertise that would better inform their judgement on important aspects of the situation. The community was narrowly focusing on the biomedical aspects of the pandemic and controlling the virus. The problem was conceptualised in abstract, biomedical terms, assuming great control over the progression of the pandemic and the spread of the virus, without taking into account the complex epidemiological, social, and economic aspects of the pandemic. Here we see the reciprocity of ends and means, where the biomedical scientists and epidemiologists thought they had the means to control the spread of the virus to achieve the end of mitigation, an assumption that went unchallenged due to groupthink identified in the reports.

It became clear in the House of Commons report that there was a consensus between politicians and scientists in SAGE. Between January and March 2020, the UK government and SAGE opted to control and delay the infection rather than taking a more cautious approach. What changed this view was models showing the scale of infections was higher than initially thought, with infections doubling every three days. The new models, particularly one from Imperial College London (Ferguson et al., 2020), revealed that the pandemic could not be controlled with precision. It became clear that the strategy of controlling the spread put many vulnerable people, like care home residents, at risk. Birch (2021) provides a detailed account on how policy options that seemed too radical like lockdowns and sustained school closures became the main policy. Birch (2021) provides a detailed analysis of the complicated relationship between scientific advisors and the ministers, highlighting how the (Ferguson et al., 2020) report changed the government's perception of the worst-case scenario and presented what was considered as a radical policy option as the only viable option. The result was the UK going into its first lockdown with high rates of infection among the population, including elderly patients who were discarded from hospitals to care homes. So, it is important to ask why the community of inquirers resisted lockdowns and other social interventions for so long even though they were shown to be effective in other countries? One answer I give here was that the community of inquirers overlooked the complexity of the situation. This oversight, I argue, is down to lack of plurality amongst the community of inquirers, when framing the problem and establishing the means to address it.

4.2. Narrow framing

As I argued in section 3, the community of inquiry frames the problem, and establishes the means to address it. Lack of plurality among the community of inquirers leads to a narrow framing, where many pertinent aspects of the situation are overlooked. As I demonstrated in section 4.1, the UK government initially focused on mitigating as opposed to suppressing transmission, without imposing any restrictions on public life other than asking people with a set of symptoms and their households to self-isolate. This was due to SAGE's working assumption that it was possible to control the spread of the virus. Support for this position included another assumption that prolonged lockdowns would not work in the UK and should only be put in place when the situation was extremely dire. The Chief Medical Advisor, Chris Witty claimed that if lockdown measures were introduced early that would lead to behavioural fatigue and therefore non-compliance.

Ballo et al. (2024) argue that these claims were not backed by behavioural science and were largely based on an imaginary co-constructed by politicians and SAGE experts, prescribing how they expected the British public to behave. The British public was imagined as 'freedom-loving' and resistant to any stringent policy interventions limiting public life. Therefore, lockdown measures to suppress the transmission of the virus were not considered early on because of the view that lockdowns would lead to 'behavioural fatigue'. Ballo et al. (2024) argue that there is no empirical or scientific basis for 'behavioural fatigue'. These authors use the concept 'imaginary public' and argue that in this case the imaginary public, co-created by the politicians and the experts, was characterised as freedom loving, and used to inform decisions when designing policy measures, as well as shaping communication of messages to public audiences (Ballo et al., 2024, p. 8). Notice that here, the imagined public played an important role in the process of defining the problem and aims, ruling out a range of possible solutions. Now that we know the lockdowns worked in the UK, does this mean the community of inquirers, in this case politicians and the experts, misjudged the situation? A charitable answer to this question would be no, because we only know this to be true in hindsight. However, as Ballo et al. (2024) argue, the community of inquirers misjudged the situation because the assumption underlying their imagined public was not supported by behavioural science. Moreover, it was not challenged due to a lack of behavioural scientists participating in the community of inquirers. That is to say, the lack of plurality amongst the community of inquirers allowed an unsubstantiated assumption ('the freedom-loving public' could only be relied upon to comply for a short period) to go unchallenged.

We now know that the mitigation approach where UK authorities targeted the virus was not enough to keep the transmissions low enough so that the NHS would not be overwhelmed. The modelling from Imperial College London (Ferguson et al., 2020) showed that the transmission rates would overwhelm the NHS, which forced the UK government to introduce nationwide lockdown on the March 23, 2020 (British Medical Association, 2021). The UK stayed in a full lockdown for over two months (with variations amongst England, Wales, Scotland and Northern Ireland) and saw a high number of hospitalizations (including the prime minister Boris Johnson) and deaths in this period. Analyses since then have revealed that the decision to delay lockdowns led to longer lockdowns, more hospitalizations and deaths (ibid.). It is easy to say it was an unprecedented situation and SAGE experts and politicians were doing their best with the information they had, but this was not the case. The House of Commons Report states that there was a *groupthink* present between SAGE experts and the politicians at the time which meant that "we [UK] were not open to approaches being taken elsewhere–such as earlier lockdowns, border controls and efficient test and trace– as we should have been" (House of Commons, 2021, p. 126). This report goes on to say that the initial strategy to mitigate should have been questioned at the time in light of the fact that other countries in Asia and in Europe had chosen to implement lockdowns and other

non-pharmaceutical interventions earlier with success. The community of experts failed to inform their judgements based on the experiences of other countries facing similar situations. The House of Commons report also highlighted that given the uncertain nature of the situation, suppression of the virus would have bought time to better inform their judgements on the best way to manage the pandemic by taking multiple strategies into account, particularly those strategies being pursued elsewhere with recent experience with SARS and MERS outbreaks (House of Commons, 2021, p. 126). This is an important point as these decisions were justified based on the narrow framing of the problem, which legitimised biomedical approaches, and overlooked social sciences.

When we look at the wider picture, the British public was repeatedly told in the early stages that the policy response was guided by science and the UK had the best scientists to deal with the problem. There are multiple issues with these assertions, but the main one I focused on here is that the problem is seen as a given and independent from the inquirers. Instead, I argued that we need to see problems as the product of a deliberative process that the community of inquirers undertake where they have to make judgements on the problematic situation they are in. I have also shown how lack of plurality at this stage resulted in significant oversights in the way the problem was framed.

This case shows that our analysis of scientific practices must start from the way the problems are framed and by whom. This allows us to push against the common mantra touted at the time "we are just following science". Looking at the reports, it was clear that the government ministers and advisors played a significant role in the way the pandemic was framed as a biomedical problem, concentrating power to make decisions within a small group of experts. In this case we see the advisory group, dominated by biomedical scientists, focusing on biomedical aspects of the situation. Here I have shown that the narrow understanding of the problem amplified the voices of some experts and obscured the others. For example, the dominant biomedical understanding led to the social aspects of the pandemic being overlooked or being poorly understood. We see this clearly in the way that behavioural sciences were not consulted on questions regarding public behaviours, instead relying on false public imaginaries. The lack of plurality in expertise has led to the overlooking of various aspects of the situation and left many assumptions unchallenged. The community of inquiry's understanding of the problem determined who had the power to contribute. However, this was not forced on us but was rather a choice we made.

At this stage it is worth addressing a potential response to why the biomedical approach needs to be prioritized even when we acknowledge the complexity of the situation: we could accept that we might be missing important social effects of policy measures against an emerging pandemic, because we think that dealing with the biomedical aspects are more important.[6] Birch (2021, p. 12)might be taken to be making this point when he argues for 'normatively heavy' advice being appropriate only in an emergency. This line of argument, while acknowledging the complexity of the situation, still makes the assumption that I am arguing against: that the emerging pandemic was a biomedical problem. My point is that making a judgment on what is most important is still a particular framing. If we accept Dewey's point, then it is not possible to simply assert that the biomedical aspects are more important, as this framing needs to be justified. In fact, I have argued extensively in this paper that framing was not justified (as indeed so do Castello 2020, Jasanoff et al., 2021; Ballo et al., 2024) even in an emergency.

The COVID-19 outbreak was as much about human behaviour, economics, logistics, and primary health care as it was about a virus. Hence it was not adequate to think about the pandemic as a problem that can be understood solely in terms of the virus and its biomedical effects. Critiques might say that we can have this view because we have the benefit of hindsight. However, I argue that the lack of plurality in the community of inquiry is to blame for the narrow framing and the overlooking of many crucial aspects of the pandemic. This point was raised at the time as I mentioned above. The lack of plurality here led to the misjudgement that we need to focus on the biomedical aspects of the situation, because we mis-took the problem to be a biomedical problem. It is important to note that I am not arguing that anything goes. Not all means or ends will be desirable, however, these need to be settled by the community of inquirers by thinking about the epistemic, ethical, social, and political consequences of pursuing different ends through different means. But in this case, the crucial step of framing was overlooked, and decisions were legitimised as scientific or rational choices, i.e. independent of the community of inquirers.

It is worth reemphasising that we cannot abandon pluralism on pragmatic grounds even in times of crisis. This is because pragmatic judgements of indeterminate situations demand plurality within the community of inquirers to explore and understand different aspects of the situation. We can push this further to say that pluralism is beneficial even after completing our judgement on the problematic situation because in a dynamic situation it is crucial to reflect on the working assumptions and be open to external criticisms. This shows that any normative evaluation of plurality cannot take problems as given but must look at the way they are framed. In this case the narrow framing had major consequences, where biomedical approaches remained dominant in shaping the policy response and further marginalised social approaches by making them seem auxiliary. This meant that many unsubstantiated assumptions about our ability to control the virus and predict human behaviour went unchallenged for a long time, a time that was later proved critical in the UK's response to COVID-19 outbreak.

5. Pragmatic pluralism

The position developed in this paper is different to integrative pluralism discussed in section 2.3. Integrative pluralism is developed in response to insufficient pluralism in public health policy during the COVID-19 outbreak, raising a legitimate concern about the way social sciences were overlooked. They identify how integration of social sciences to policy response would improve public health policy in dealing with the problem at hand. What is missing however is the direct challenge to the way in which the problem is initially framed as a biomedical problem. Here I have shown that the way the problem is framed determines what approaches are the most relevant or important to overcome that problem as well as dictates what counts as good evidence, what counts as legitimate questions, or as relevant information, data etc. To overcome insufficient pluralism, we ought to think about the way problems are framed to avoid disciplines dominating. This builds on pragmatic insights from Dewey, as well as more contemporary work on pragmatism. What pragmatism offers to the pluralism debate is the insight that inquiry includes a deliberative process where inquirers have to make a series of judgements to frame problems. We cannot judge practices based on how well they allow us to address particular problems, as problems are not independent of the practices. This is why integrative pluralism developed by Lohse and Canali and Bschir and Lohse needs to be supported by pragmatism, rather than bounded by pragmatism. In the remainder of this paper, I will highlight two main contributions pragmatic pluralism makes to the broader discussion on pluralism that builds on and engages with scientific practices.

5.1. *Complexity*

The main point is that pragmatism demands pluralism including when framing the problem. This position builds on the argument for the epistemic benefits of plurality discussed in section 2.2, on how plurality can maximise our capacity to explore and explain different aspects of the world. Building on the pragmatist position, I extend the pluralist

[6] I would like to thank an anonymous reviewer for pressing me to be clearer on this point.

argument to show that having multiple systems of knowledge allows inquirers to explore different aspects of an indeterminate situation and provide better grounds to make judgements on what the problem is and its potential solutions. Pragmatism not only shows that the problems and aims are contingent on practices, as they are products of an iterative process, but highlights the importance of being able to better inform this process by taking various aspects of the situation into account when framing problems.

This raises a question as to whether we need to frame and reframe every problem, starting from scratch? This is especially important to consider here since scientists do not often address problems on the scale discussed here (a pandemic), and typically deal with situations as part of everyday practice without needing to deliberate on what the problem is. Usually, the problem or the question is clear, and can even be considered as given – solve a mathematical formula, discover the structure of a macromolecule, detect a sub-atomic particle etc. Henne (2023) argues that these are cases where the existing framing of a problem is apt in dealing with the uncertainties experienced by the inquirers in a specific field. These cases are different from the COVID-19 case, where existing frameworks were not apt in dealing with the apparent complexity and there is a need for a new framing. Henne (2023) uses an analogy with the legal domain where she presents two forms of cases that are subject to inquiry: *framed* and *framing*. For Henne, a *framed* case is the one that "falls neatly under the categories of the civil law or common law … [and] [t]he judgment therefore consists in applying the existing framework to the particular case at hand" (2023, p. 4). On the other hand, a *framing* case is one with no legal precedent "for which existing laws conflict, are ambiguous, or are deemed unfair. In those cases, depending on the judicial system, a creative decision has to be made by the judge, which sets a precedent for future similar cases (common law), or new legislation has to be passed, under which future similar cases will be subsumed (civil law)" (2023, p. 4). Henne's work is particularly useful to address potential responses that would object to the position developed here assuming that pragmatic pluralism demands that every inquiry requires framing and reframing. There are instances in the day-to-day practice of science where scientists take the existing framework for granted. This is often how scientists go about their research using the existing conceptual framework to pose and answer questions as part of their established practices. A lot of the cases are already framed in the routine practice where the problem and its solution are clear. This is very similar to Kuhn's idea of normal science operating under a paradigm that provides the tools for puzzle solving, but the connections need to be explored elsewhere in detail. The point I want to make here is that whether a framing is adequate or not depends on the situation and the particular experiences of the inquirer in that situation. In the routine practice there may not be any significant changes in the situation or the experience of the practitioner to merit a judgement about the framework. However, as we saw in the COVID-19 case, and in many other instances such as climate change, global health, or economic development, where scientific practices are brought to participate in policy to deal with complex challenges, we should not expect a single existing framework to be adequate. These are the instances where pluralism is most needed for pragmatic reasons.

The pragmatic pluralist argument I am developing here is supported by Mormina et al. (2024) who provide a detailed analysis on how to improve pandemic preparedness through a *systems thinking approach*. They argue that a systems thinking approach will "widen the knowledge base beyond data-intensive disciplines in order to develop a socio-ecological understanding of the problem and enable the identification of policy options that address the crisis as a complex dynamic system" (p.2). Their analysis is built on Mormina (2022), where she challenges the biomedical framing of the COVID-19 pandemic. Building on post-normal science theory, Mormina calls for epistemically diverse groups of experts in policy making to have "a greater repertoire of cognitive tools to perform knowledge intensive tasks" and have "collective epistemic virtues necessary in situations where thoughtful deliberation and shared understanding are key" (Mormina, 2022, p. 672). These points raised by Mormina (2022) further support the need for pluralism in dealing with complex situations where problems can be framed in different ways.

To make this point stronger it is important to go back to points I raised about complexity. As pluralists have shown, no single scientific model, theory, or method will be adequate in accounting for various aspects of the phenomena at hand. Furthermore, situations we deal with, especially in moments of crisis, are dynamic and can change, hence our judgements about the problem need to be able to evolve and adapt. Hence the way we define a problem needs to be able to account for different aspects of the problem and to be adaptable as the situation unfolds.

The apparent complexity of nature described by Chang and the uncertainty of indeterminate situations characterised by Dewey are two complementary points that allow us to connect pluralism and pragmatism. Considering the indeterminate nature of situations, one needs to consider multiple aspects of that situation to be able to develop an adequate framework. The ability to consider multiple aspects is particularly important in complex situations as I discussed above. Hence pragmatism, especially during a crisis, demands pluralism.

This does not mean that we need to constantly question every framing and reinvent the wheel for the sake of it. When adopting or working with established frameworks, scientists need to be able to justify how their framework is adequate in that given situation and at least acknowledge the limitations of their framework. For instance, when dealing with protein structures, the situation in which the problem was framed when developing three dimensional models remains relatively similar in the sense that we are still in a situation where we want to visualise the three-dimensional configuration of these macromolecules.

However, if we go back to my main point, when we face complex situations, such as disease outbreaks, plurality is particularly important for pragmatic inquiry. Lack of plurality would lead inquiry to overlook various aspects of the situation when conceiving the problems. As Dewey points out: "to mis-take [*sic*] the problem involved is to cause subsequent inquiry to be irrelevant or go astray." (1938, p. 112). I argue that failure to account for multiple aspects of a situation by not being pluralistic will result in inadequate judgements as it would overlook the complex nature of the problematic situation. Ignoring salient aspects has both epistemic and ethical consequences, especially in cases where inquirers are facing problematic situations like disease outbreaks where people's lives are at risk. In such cases, we not only risk limiting our understanding of the situation but also risk developing solutions that only target one particular aspect of the problematic situation.

5.2. *Community of inquiry*

Narrowing down the plurality of approaches on pragmatic grounds without assessing how the problem was framed risks happening when a single discipline dominates the field. We see an example of this in the dominance of biomedical sciences in the field of public health. In this field problems are often thought of in biomedical terms (Russo, 2022; Russo & Kelly, 2024). Following the argument I developed here, we can see that the medicalisation of health sciences comes about as a result of a lack of plurality amongst the community of inquirers making judgements about health problems as well as the power dynamics within the community. When the problems are framed or articulated narrowly in biomedical terms, the solutions are restricted to biomedical sciences. As a result, we see that systems of practices that explore social determinants of health at large are overlooked (Clark, 2014). The narrow framing of health problems as biomedical problems is the result of the lack of plurality of approaches, and it further restricts the plurality of approaches in dealing with the problem. The dominance of biomedical sciences in the judgments about the outbreak has led to many oversights in the social and economic aspects of this disease and resulted in many

shortcomings in the way policymakers and their scientific advisors dealt with the complicated situation identified above. In short, the issue of global and public health agendas being dominated by biomedical sciences is not new or specific to the COVID-19 outbreak, but has been an issue for a while, as shown by many sociologists of medicine.

If we take pragmatism seriously, pluralism is needed among the community of inquirers who have to make judgments about the situation. This follows neatly the pragmatist tradition that focused on the community of inquiry (Shields, 2003), particularly on the make-up of the community of inquiry and the dynamics of this community. Here I argued why the community of inquiry must be pluralistic in the sense that it must contain a range of expertise and members of the community must have the ability to dissent or raise alternative views. Analysis of the power dynamics within the community of inquirers is particularly important, as different members of the community should be able to contribute to the judgments and be able to criticise established views. Criticism is important as it can redirect inquiry to explore the different aspects of the situation, especially in problematic situations that are not static and bound to change. The changing situation necessitates the need to allow criticism from inside and outside the community. This point is similar to arguments developed by philosophers of science like Longino (2002), Wylie (2015), where they argued that healthy epistemic communities have to be able to accept internal and external criticism in order to identify potential biases and assumptions present in their practices. They make these arguments to highlight the importance of pluralism in making sure that epistemic communities are able to engage with complex situations in a way that allows for an iterative process that can account for different aspects of the situation as well as deal with various, potentially competing values and interests. However, deciding on what is the best framing, and other social and ethical questions that arise, needs to be dealt with by appealing to a wider, richer literature on science governance and political science. That is to say, pluralist arguments developed here and elsewhere provide normative arguments for both epistemic and pragmatic benefits of promoting pluralism in scientific practices, but questions on what should be the limits of pluralism needs to be addressed by taking into account specific structural power relations, considering questions around who is or should be considered as a legitimate knower in a given context, and analysing how inquirers adopt or co-opt framings of the powerful epistemic agents. For that, we need to be pluralistic in the sense that philosophers of science need to work with historians, sociologists, and political scientists to tackle these serious issues that arise in scientific practices.

6. Conclusion

In this paper I developed an argument for pragmatic pluralism that can withstand the potential objection that plurality is only desirable when it is convenient. One might accept the epistemic benefits of plurality in scientific practices but be opposed to plurality based on pragmatic grounds. I argued that this putative objection relies on the assumption that we can make normative claims concerning the pragmatic benefits of plurality based on the problem at hand. However, I have argued that the problems are not independent of the inquirers. Following Dewey's pragmatic thought, I showed that inquirers do not encounter problems but experience indeterminate situations where they have to define problems. I have shown that pragmatism demands pluralism because plurality among the community of experts would allow them to consider different aspects of indeterminate situations. Overlooking complexity in any given situation would mislead inquiry.

I used the COVID-19 outbreak in the UK as an example where lack of plurality among the community of inquiry led to several shortcomings in the UK's early response to the pandemic. Due to the lack of plurality, inquirers overlooked the complexity, focusing primarily on the biomedical aspects of the pandemic. This oversight had an impact on the policy decisions including when and how to introduce social measures like lockdowns. Plurality here would have allowed the community of inquirers to deal with multiple aspects of a complex and dynamic situation.

However, my argument for pragmatic pluralism is not limited to the COVID-19 outbreak or moments of crisis. What makes pluralism favourable is the complexity in the world. I argued that, to deal with complex situations, inquirers need to make judgments about the situation, defining problems and solutions. These judgments need to be informed by different aspects of the situation and consider different values especially when thinking about the consequences of how a problem is framed. Pragmatic pluralism does not, however, mean anything goes. As I argued here, to decide who is in and who is out we need to look at how different systems of practice would influence the judgements made by the community and consider the wider ramifications of including or excluding them.

Pragmatic pluralism highlights the deliberative nature of scientific practice where a plurality of systems enables inquirers to explore and explain different aspects of a complicated world to provide a level of understanding and propose solutions to many problems we face in indeterminate situations.

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No data was used for the research described in the article.

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