

# Scientists as experts: A distinct role?

## ABSTRACT

The role of scientists as experts is crucial to public policymaking. However, the expert role is contested and unsettled in both public and scholarly discourse. In this paper, I provide a systematic account of the role of scientists as experts in policymaking by examining whether there are any normatively relevant differences between this role and the role of scientists as researchers. Two different interpretations can be given of how the two roles relate to each other. The separability view states that there is a normatively relevant difference between the two roles, whereas the inseparability view denies that there is such a difference. Based on a systematic analysis of the central aspects of the role of scientists as experts – that is, its aim, context, mode of output, and standards, I propose a moderate version of the separability view. Whereas the aim of scientific research is typically to produce new knowledge through the use of scientific method for evaluation and dissemination in internal settings, the aim of the expert is to provide policymakers and the public with relevant and applicable knowledge that can premise political reasoning and deliberation.

*Keywords:* Expert role; Science in policymaking; Moral responsibility; Policy relevance; Non-epistemic values

## 1. Introduction

The active contribution of scientists in policymaking – indirectly to panels or committees or directly to government officials – counts among the most influential forms of knowledge transfer from the scientific community to society and its political institutions. Policymakers rely on scientific knowledge so as to make well-informed and legitimate decisions in technical and complex policy areas such as agriculture, defense, energy, environmental issues, and public health. However, there is currently much public distrust of scientific experts (Collins, 2014, p. 15; Kitcher, 2011; Leiserowitz, Maibach, Roser-Renouf, Smith, & Dawson, 2013; Nichols, 2017) and the scholarly literature comprises a wide array of worries over the role of experts in democratic society (Holst & Molander, 2017, pp. 237-241, 243-244; Mansbridge et al., 2012, p. 14; Moore, 2017, p. 37; Turner, 2001). The contested nature of experts can partly be explained by the fact that there are diverging views on the role of science in policymaking (Hulme, 2009, p. 100; Pielke Jr, 2007, p. 12). Although there exists a relatively firm

understanding of the requirements of scientific research, the role that scientists play as experts in the public sphere and policymaking is more elusive (Jasanoff, 1990, p. 79). Moreover, in the philosophy of science, there are substantially diverging views on how experts should be involved in policymaking, especially of whether it is appropriate for experts to make moral, political, and social value judgments (Douglas, 2009) or whether they should aim for some version of political neutrality (Betz, 2013). In other words, the expert role of scientists is significant but contested and unsettled. Yet few attempts have been made to examine the distinct nature of the expert role and how it relates to ordinary research in a systematic manner.

The aim of this article is to provide a systematic account of the expert role of scientists. I do this by examining whether there are any normatively relevant differences between the role of scientists as researchers and the role of scientists as experts in policymaking and, if so, how these differences arise. Two different interpretations can be given of how the expert role of scientists relates to the research role. Both views can be formulated in different ways, but I examine the following two versions, which I find to be the most interesting and plausible.<sup>1</sup> According to the *separability view*, there is a normatively relevant difference between the two roles. This view can be based on the influential idea that scientific research requires insulation from non-epistemic values and external steering, whereas the expert role of scientists must not be insulated in this way. The alternative view is to see the relationship between the two roles as normatively inseparable in the sense that they are subjected to the same kind of epistemic and moral standards. According to what I call the *inseparability view*, there is no normatively relevant difference between the role of scientists as experts in policymaking and their role as researchers. In this view, scientists are equally responsible for the consequences of their results in the context of research and in the context of policymaking. The inseparability view does not amount to the highly implausible idea that there are no palpable differences between the activities of research and expert advice as such. Rather, it denies that these differences are *normatively relevant*.

The article is structured as follows. In section 2, I examine why the role of scientists as experts has not been a central topic in the philosophy of science. In section 3, I discuss one version of the separability view that can be reconstructed from the idea of scientific autonomy, as defended by Michael Polanyi in his classic writings about the governance of

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<sup>1</sup> For instance, an alternative version of the inseparability view is that the actions and activities of scientists as researchers and experts should equally be insulated from moral and political values.

science. Such a view has recently been criticized by Heather Douglas, who appeals to the cognitive authority of science and the potential social impact of any claim made by scientists in any forum. I discuss her position in section 4. In effect, Douglas holds an inseparability view, and although I agree with Douglas on many of her substantive points, I argue in section 5 that the nature of the role of scientists as experts requires some rather distinct normative considerations that, in the end, cannot be accounted for by an inseparability view. Therefore, I propose a moderate version of the separability view, according to which the move, as it were, from the laboratory to the roundtable of experts amounts to a clear normative shift but not a moral one.

## 2. The expert role: A neglected topic

Over the past couple of decades, a political turn has taken place in the philosophy of science. In particular, the contributions of Heather Douglas and Philip Kitcher have generated interest among philosophers in the question of the proper relationship between science and policymaking (Douglas, 2000, 2009; Kitcher, 2001, 2011). However, previous to the interventions by Kitcher and Douglas, there were conspicuously few discussions on the proper relationship between science and public policymaking in the philosophy of science. This is part of a larger trend in the philosophy of science. The classic contributions focus more on basic science and less on applied science in, for instance, industry, the military, or agriculture (Niiniluoto, 1993, p. 1). Let me suggest two tacit assumptions, which can be discerned in philosophy of science and science studies, to help explain why the active role of scientists in policymaking has not been a central topic.

First, in philosophy of science policy relevance is assumed to be an inherent property of scientific knowledge that flows from research (see for instance Longino, 1990, p. 164). To be sure, scientific knowledge can have an impact on public and democratic institutions without scientists making an active effort to achieve this. The dissemination of scientific results in journals and conferences can have a vast impact on policymaking without scientists seeking that particular impact. However, as I shall argue in section 5, relevance to policy is something that scientists as experts must themselves actively seek and contribute to carving out in their practice. In policymaking contexts, it can be futile or irresponsible merely to present the results of research. I shall argue that to make scientific knowledge relevant to policymaking, scientists have to take into account the values, needs, and knowledge of policymakers and the public. In other words, one must distinguish the *relevance* of scientific knowledge in political

deliberation, which scientific experts aim for, from the idea that scientific knowledge has an *impact*.

Second, many science studies scholars are skeptical of the traditional approach to science and policymaking and the idea that one can provide *normatively significant boundaries between different aspects of scientific activity*. In particular, the field of Science and Technology Studies (STS) has provided a wide array of studies on the nexus of science and politics for quite some time, often purporting to show how traditional distinctions such as those between basic and applied research, between epistemic and non-epistemic values, between science and politics, and between experts and laypeople are more unclear, vague, and ambiguous than have traditionally been assumed.<sup>2</sup> Because these boundaries are unable to provide sound understanding of how science interacts with policymaking, they should be abandoned and replaced, or so it is argued. Despite this opposition to notions of clear normative boundaries, I think that the central contributions of STS paradoxically provide material for the argument that the expert role is normatively separable from scientific research. In her study of advisory committees, *The Fifth Branch: Science Advisers as Policymakers* (arguably the most influential book in STS on science in policymaking), Sheila Jasanoff (1990) expresses a skeptical attitude toward “clean distinctions between various subtypes of science” (p. 76). Yet in the conclusion of the study, Jasanoff states the following:

In fact, the experts themselves seem at times painfully aware that what they are doing is not “science” in any ordinary sense, but a hybrid activity that combines elements of scientific evidence and reasoning with large doses of social and political judgment. (p. 229)

Jasanoff’s findings warrant a closer look at how the expert role can be said to differ from scientific research.

### 3. A strong separability view: An exemption from moral responsibility

According to the separability view, the role of scientists as experts in policymaking differs in a normatively relevant manner from their role as researchers.<sup>3</sup> One way in which the two roles

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<sup>2</sup> For a recent critical analysis of such arguments in the case of the distinction between basic and applied science, see Roll-Hansen (2017).

<sup>3</sup> The concept of role is understood in terms of what Hardimon (1994) calls “institutional roles” such as “political, familial, and occupational roles . . . using the term ‘role’ to refer to constellations of institutionally specified rights and duties organized around an institutionally specified social function” (p. 334). To take on a role means to accept a set of expectations, requirements, or standards, which Hardimon refers to as “role obligations” (p. 334).

can be separated is by claiming that scientific research ought to be a morally autonomous domain and that the role of scientists as researchers requires an exemption from moral praise and blame in a way the expert role does not. Apparently, very few scholars explicitly hold this version of the separability view. Should a shortage of explicit arguments be taken as an indication that the view of the moral exemption of scientists is a straw man or, at least, more of a fringe view about scientific research? I think not. Here I formulate a version of the separability view that can be derived from the idea of the autonomy of science as found in Polanyi's seminal writings about the governance of science, which epitomize the liberal ideal of science (1958, 1964 [1946], 2000 [1962]). A closer look at Polanyi's views might help in understanding how one can articulate a separability view by promoting an ideal for scientific research as a morally autonomous sphere. I do this here by reconstructing two arguments from Polanyi's famous article titled *The Republic of Science: Its Political and Economic Theory* (2000 [1962]). The first argument, which is less discussed in the literature, is a functional argument. It states that the ability of science to make progress is undermined when it is governed in accordance with moral, political, and social aims and by external institutions. The second is an argument derived from the moral remoteness of scientific research.

Let me first reconstruct the functional argument. This argument assumes that the aim of science is to provide epistemic progress (Polanyi, 2000 [1962], p. 3).<sup>4</sup> The realization of this aim is dependent upon a delicate social structure – a structure that has become constitutive of modern science – in which individual scientists cooperate in a free and open manner (Polanyi, 2000 [1962], p. 3) in accordance with internal scientific standards (p. 4). Governing science in accordance with non-epistemic values such as public welfare will hamper the ability of the scientific community to make progress and halt the functioning of the entire scientific enterprise. Polanyi (2000 [1962]) offers the following explanation: “Any attempt at guiding scientific research towards a purpose other than its own is an attempt to deflect it from the advancement of science” (p. 10). Hence, to make progress, scientists ought to set moral, political, and social values aside when conducting research. This is tantamount to saying that scientists are exempted from moral responsibility for the outcomes of their research. One can then discern a difference between the role of a researcher and the role of an expert who applies scientific knowledge in political contexts. Moral exemption is considered vital in the development and justification of scientific knowledge in the context of basic research;

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<sup>4</sup> Polanyi (2000 [1962]) seems to understand scientific progress in realist terms (i.e., it is about making new discoveries), stating that “[scientists’] coordination is guided as by ‘an invisible hand’ towards the joint discovery of a hidden system of things” (Polanyi, 2000 [1962], p. 3).

however, it is not so in the application of scientific knowledge for societal purposes, such as when scientists are experts in policymaking. This is arguably a version of the separability view.

However, the functional argument fails to provide a genuine moral argument for a moral conclusion, to wit the exemption from moral obligations. Any moral argument needs moral premises, and one cannot derive a moral conclusion from epistemic, technical, or professional goals in the way that the argument reconstructed from the article by Polanyi (2000 [1962]) does. In an article on the relationship between professional ethics and general moral obligations, Alan Gewirth (1986) exposes the problem with the functional argument, arguing that one should not take the fact that professionals are allowed to do certain things to their clients, such as physicians' examination of the naked bodies of their patients, as an indication that they are allowed to do things that are contrary to common morality (p. 283). These actions and the rules on which they are based "must themselves conform to the requirements set by the general principle of morality" (p. 300). Gewirth states that there are no plausible reasons for allowing professionals to violate the rights of individuals by appealing to the internal aim of their profession. Doing so would require a kind of moral autonomy, according to which the aim of a professional practice requires that the professionals do things that would otherwise be deemed morally unacceptable. Wrong actions are thus justified by appealing to the overarching value of the professional practice, which is tantamount to a form of the end-justifies-the-means argument (p. 284). In summary, the functional argument fails.

The second argument for the moral exemption of scientists as researchers that can also be reconstructed from the article by Polanyi (2000 [1962]) assumes that some forms of research are sufficiently remote from practical life to be morally relevant. Because scientists are often unable to foresee both what kinds of results their research will produce and the practical outcomes that their research will have, it makes little sense to ascribe a role to moral, political, and social value judgments in research, according to Polanyi. This reasoning can be drawn from the example by Polanyi (2000 [1962]) of the difficulties in foreseeing the applications of the theory of special relativity:

In January 1945 Lord Russell and I were together on the BBC Brains Trust. We were asked about the possible technical uses of Einstein's theory of relativity, and neither of us could think of any. This was 40 years after the publication of the theory and 50 years after the inception by Einstein of the work which led to its discovery. It was 58 years after the Michelson-Morley experiment. But, actually, the technical application

of relativity, which neither Russell nor I could think of, was to be revealed within a few months by the explosion of the first atomic bomb. . . . It is obvious that Einstein could not possibly take these future consequences into account when he started on the problem which led to the discovery of relativity at the turn of the century. (pp. 9-10)

In other words, scientists cannot be held accountable for the harmful applications of their research which they could not have anticipated. However, when scientists are more directly and actively involved in political decision-making as experts, moral insulation is unwarranted. Hence, a way to formulate a separability view is to argue that unlike the role of experts in providing advice to policymakers, the role of scientists in research is sufficiently remote from the context of application to be subjected to moral appraisal.

Now, I discuss Douglas's criticism of the idea that the role of scientists in internal contexts can be separated from the expert role because of its exemption from moral responsibility. Although I find the gist of Douglas's argument against a separability view to be sound, I argue that her view does not undermine a more moderate version of the separability view.

#### 4. Douglas's inseparability view: The authority of science in society

As a part of her overarching aim of undermining the value-free ideal for science, Douglas (2009) argues that scientists have a general moral responsibility to consider the foreseeable consequences of their work, even when making empirical claims (p. 85). The idea that certain aspects of scientific activity can – and ought to – be insulated from general moral responsibility is unsubstantiated and can be harmful in many cases, according to Douglas (2009, p. 79). Against this backdrop, Douglas (2009) finds the separability view similar to the one just discussed to be problematic:

One may want to hold to a distinction between the scientist qua scientist and the scientist qua advisor, accepting the need for values in the latter role while rejecting them in the former.

The attempt to draw a distinction in the practices of scientists between the two roles, scientist and advisor, is dubious at best. The scientist is called on to be an advisor because she is a scientist, and the advice is to be based on her expertise as such. But the problem runs even deeper. Scientists hold a broadly authoritative position in our society, regardless of whether they are functioning in a formal advising role or not. Thus, when scientists make empirical claims, whether in scientific conferences, in science journals, or on an advisory panel, those empirical claims carry with them a prima facie authority. (p. 82)

Douglas (2009) provides two arguments for the inseparable relationship between the role of scientists as advisors and as scientists. Both are tied to the fact that modern science has a significant cognitive authority in society. First, because the role of scientists as advisors is based upon their scientific expertise, it does not make sense to distinguish between these two roles, according to Douglas (2009). Put differently, scientists' performance of the expert role is based upon a cognitive authority that flows from their status as scientists. Second, the cognitive authority of science in society gives scientists a vast potential for external impact when disseminating their results. This gives scientists an obligation to consider the consequences of error also when disseminating knowledge in internal scientific contexts such as conferences or journals. The potential social impact of any claim made by scientists in any forum suggests that scientific researchers should not be exempted from their general moral responsibility. In effect, Douglas (2009) subscribes to an inseparability view, according to which there is no normatively relevant difference between the role of scientists as researchers and the role of scientists as experts in policymaking: "The authority of science in society makes a distinction between scientist qua scientist and scientist qua advisor untenable" (p. 82).

Let me consider Douglas's (2009) two arguments against the separability view, beginning with the latter argument. To be sure, the idea that the authority of science gives scientists a vast potential for making an external impact as researchers in internal settings is highly plausible. Scientific claims can travel from politically remote contexts of scientific research and reach members of the public, the media, or policymakers without the direct involvement of scientific experts as active intermediaries. Douglas (2009) acknowledges that endemic challenges exist for scientists in foreseeing the impact of science, and, therefore, she does not claim that scientists are morally responsible for *any* application of their research (p. 83). When one assesses whether scientists are responsible for some unfortunate outcome of their actions, one should therefore take into consideration whether they could *reasonably* have foreseen that outcome, according to Douglas (p. 83). Douglas's (2009) point can be interpreted as drawing attention to moral responsibility as an essential aspect of the professional ethics of scientists. As a professional *ideal*, one might say that scientists should take the possible societal impact of their practices into account.

In summary, I find Douglas's criticism of the separability view based on moral exemption to be convincing. Although it may be difficult for scientists to foresee the potential impact of their work, moral considerations should not be dismissed. Scientists can be morally



responsible for the consequences of their work – both in the context of research and in the context of expert practice alike. Hence, the strong version of the separability view fails.

Now, is it still possible to accommodate Jasanoff's (1990) observation that the role of scientists as experts is not science in an "ordinary sense"? I think it is. To see how, let me consider Douglas's (2009) first argument against the separation of the two roles: Scientists are selected as advisors because they are scientists; thus, the role of scientific advisors cannot be distinguished from the role of scientists *qua* scientists. This supports the plausible idea that the role of scientists is indeed a *scientific* role, which is not a trivial claim as one could well argue that when scientists are engaged in informing and advising policymakers, they are not doing that in virtue of being scientists.

However, a problem with this view is that it is unable to account for the uncontroversial differences between the many roles occupied by scientists – for instance, as lecturers and supervisors, administrative leaders, public intellectuals, and researchers – and the different set of normative expectations connected to these different roles. On the kind of view proposed by Douglas (2009), scientists have only one proper role, namely, that of scientists *qua* scientists. Douglas does not consider the view that the role of scientists as experts can be a genuine scientific role but at the same time normatively separable from what she calls the role of "scientist *qua* scientist." What she criticizes is a strong separation of the role of scientific advisors *from* the role of scientists *qua* scientists and not separation *within* the role of scientists *qua* scientists. On this latter and more moderate version of separation, the role of scientists as experts in policymaking – or in Douglas's (2009) terminology, "scientist *qua* advisor" – refers to a particular role of scientists, which can be taxonomically understood as a subcategory of the professional role of scientists. This view can be attributed to sociologist Robert Merton (1957), who developed the notion of role-set, which depicts the different roles that a given social status generates (p. 110).<sup>5</sup> The role-set of scientists includes the different roles in which scientists are involved, such as that of being a researcher, lecturer and supervisor, administrator, or expert in policymaking. Following Merton (1957), one might say that the activity of contributing their expertise to policymakers counts as a proper role within the role-set of scientists.

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<sup>5</sup> I thank Erik Børve Rasmussen for pointing out Merton's idea of role-set to me.

## 5. A moderate separability view

In this section, I flesh out the moderate separability view. I do this by pointing out some distinctive features of the expert role that differentiate it from the role of a scientific researcher in terms of the general concept of expert, its aim and context, its modes of output to policymakers, and a set of additional standards that should regulate the expert role. It is not based on what the role of scientists as researchers are exempted from but on *additional* considerations that scientists must take into account when performing that role.<sup>6</sup>

### 5.1 The general concept of expert

To be an expert, whether scientific or not, is based on a person's level of knowledge and skills relative to others who have an interest in or can benefit from that knowledge or skills. This definition depicts experts based on the following: i) their level of knowledge and skills, to wit, their *expertise* (Collins & Evans, 2006, p. 53); ii) the *epistemic asymmetry* between experts and laypeople (i.e., those who know more about a topic and those who know less about it) (Goldman, 2001, p. 19); and (iii) social significance.<sup>7</sup> This definition has some dimensions worth noting.

First, it provides a comparative definition in terms of the relationship between experts and laypeople. Goldman (2001) describes experts as having “a superior quantity of knowledge in some domain” (p. 19). According to this view, one cannot be considered an expert as such but rather in relation to other groups of would-be knowers or users of that knowledge. This means that one can lose or gain status as an expert depending on the epistemic developments of those with whom one interacts. For instance, a specialized area of inquiry can become common knowledge as a result of an increased level of education in the general population or its increasing or decreasing relevance to others. The comparative definition also entails that one and the same person in principle can be an expert in relation to one group of people but not to another group. The notion of expert is intimately tied to the idea of cognitive specialization. By having dedicated cognitive labor to a particular subject matter or task, experts have reached a level of knowledge and skill that most others have not.

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<sup>6</sup> Sandra D. Mitchell (2004) describes a similar view, drawing a sharp distinction between the role of scientists and the role of governmental advisors (p. 251). However, Mitchell describes scientists who act as advisors as wearing two hats, whereas I view scientists as fulfilling one integrated role.

<sup>7</sup> Social significance is rarely included explicitly in definitions of what experts are. Because I am inclined to see trivial and useless skills and knowledge as falling outside the kind of phenomenon that I am interested in here, I have chosen to include it.

Second, for an individual to gain status as an expert on some topic, it is not sufficient to have reached a certain level of knowledge and skill, however advanced it might be. To count as a proper expert, others must also appreciate one's expertise in one sense or another. Experts are ascribed their status because some expertise is deemed significant to the rest of society.

Individuals with detailed and advanced knowledge about topics that are trivial and without any public interest or conceivable applicatory value fall outside of this category of experts. Expert status is thus based on not only its epistemic significance but also its societal significance. Assuming the role of an expert – be it as a physician, auto mechanic, or climate expert – amounts to providing a service to people who, broadly speaking, might benefit from this expertise.

Finally, the aforementioned general definition is not skewed toward scientific or academic experts. To be characterized as an expert on a given topic is a result of one's epistemic level and ability in a given domain of inquiry or practice and not one's scientific affiliation.

According to the comparative definition, experts have been around long before the advent of modern science (see, e.g., Kitcher, 2011, p. 92). Moreover, because of the immense degree of specialization within the sciences, having scientific credentials in a scientific discipline is not a sufficient criterion for being considered an expert in a given field. Collins and Evans (2006) argue that “scientists, as scientists, have nothing special to offer toward technical decision-making in the public domain where the specialisms are not their own” (p. 54). In the public debates over climate science, specialism is a key issue. Some of the main climate skeptics in the United States are merited, even leading, scientists in their respective fields. Few of them, however, have research experience in climate science and do not count among the central contributors to climate science (Dunlap & McCright, 2011, pp. 151-152; Oreskes & Conway, 2010).

## 5.2 Aim and context

Similar to applied research, the role of scientists as experts in policymaking has a practical goal. Is the expert role then best understood as a branch of applied research? I think not. The reason for this is that both basic research and applied research correlate to genuine research activities that aim for new knowledge by using the scientific method. Experts, however, need not perform research to contribute to policymakers. Rather, they tend to apply already existing knowledge for the policy area in question. Thus, part of what differentiates applied research from the expert role is related to a distinction between *applied* science, on the one hand, and the *applications* of science, on the other, as pointed out by Niiniluoto (1993), stating, “The

former is a part of knowledge production, the latter is concerned with the use of scientific knowledge and methods for the solving of practical problems of action . . . where a scientist may play the role of a consult[ant]” (p. 9).

Moreover, the *modus operandi* of scientific experts tends to be rather different from the methods, rigor, and level of detail required in scientific research. It seems that scientists as experts in policymaking have different tools at their disposal than the scientific method. Their forms of dissemination are rather those of scientific assessments, reports, reviews, summaries, dialogues, and roundtable discussions with policymakers and other stakeholders. As experts, scientists apply established knowledge by translating the esoteric and often complex, uncertain, and inherently provisional knowledge from the scientific community for a political or public community of nonexperts.

Moreover, the aim of experts is a practical aim in a particular institutional context. Unlike the role of scientific researchers, the aim of experts is to apply their skills and knowledge so as to improve the epistemic basis for decision-making in a given policy area. For analytical purposes, the relationship between scientists and those who define their mandate can be understood in terms of a principal–agent relationship, in which the principal hires an agent to perform a certain task on behalf of the principal. Thus, policymakers (political institutions, politicians, bureaucrats) select, nominate, and appoint the scientists whose job is to provide knowledge on an issue pertinent to future policymaking. Understood in this way, scientists as experts have a more or less authorized assignment in the political process by acting as epistemic agents on behalf of policymakers. Taking on an expert assignment is tantamount to assuming an active role in a policymaking process, however remote it might be from the actual political negotiations and decisions.

### 5.3 Modes of output to policymakers

The role of scientists as experts in policymaking is by no means homogenous. It can vary in regard to institutional design, form of governance, and procedure. This is reflected in the different modes of output that scientists are asked to deliver. To obtain a better grasp of the different ways in which scientific experts are mandated to transfer their knowledge and opinions to policymakers, I analytically distinguish between three modes of output, namely, informing, describing possible lines of action, and recommending. These three modes of output correspond to answers to three main kinds of questions: What is the case? What can be done? What should be done?

In the first mode of output, scientists as experts are asked to *inform* policymakers. This primarily means providing factual and descriptive output to policymakers about the subject matter in question, which can premise political arguments, deliberations, and policy development. This mode is arguably the most common for the natural sciences and can be illustrated by the Intergovernmental Panel on Climate Change (IPCC), the world's leading expert authority on climate science. Its main task is to provide the international community with an objective assessment of the current state of knowledge on climate change and its impact on nature and society (IPCC, 2014). As it tends to entail the communication of complex and esoteric knowledge, the experts involved need to translate scientific knowledge into an accessible language that can be understood by external audiences. This means that a high level of detail found in scientific research is often omitted. It is conditioned on taking the audience's perspectives into account, their level of knowledge, their values, and their ability to understand and interpret the message. In the second mode of expert output, experts are mandated to *describe some possible and feasible lines of action, policies, and measures*. This mode is captured by Roger Pielke's (2007) idealized role of scientists as an "honest broker of policy alternatives," which "is an effort to expand (or at least clarify) the scope of choice for decision-making" (p. 2). In this mode, scientists are not giving advice about what should be done; rather, they are providing knowledge about what *can* be done, from which policymakers in turn can choose. The third mode of output is that of *recommending lines of action, policies, or measures*. Providing a policy recommendation is to make an explicit suggestion about what is the preferable policy. However, policymakers have the final decision-making authority and can choose to follow the advice or not.

Given the idea that there are three distinguishable modes of how scientists can provide output to policymakers, one might argue that there is a normatively significant discontinuity within the expert role. In particular, the difference between the informing mode and the recommending mode stands out as significant. It can be understood as corresponding to the fact–value distinction: Whereas informing amounts to providing claims in a descriptive manner, recommendations are clearly evaluative. This would be a problem for the moderate separability view that I develop here. Contrary to the separability view between the role of scientists as researchers and the role of scientists as experts in policymaking, one might claim that the main normative relevant difference is found not *between* these two roles but rather *within* the role of scientists as experts.

However, this normative discontinuity within the expert role is not as clear as it might first appear. The difference between informing and recommending need not correspond to a normative shift in how scientists contribute in policymaking. To what extent the difference between informing and recommending instantiates a significant shift depends on how one understands the role of non-epistemic values in expert reasoning. I think there are two ways in which the discontinuity between informing and recommending can be downplayed. First, and most importantly given my agreement with Douglas's criticism of the separability view, one can argue against the value-free ideal that the informing mode must involve non-epistemic values. Second, assuming the validity of the value-free ideal, one can argue that policy recommendations need not entail that the scientists themselves must make any non-epistemic value judgments but that they can defer those to policymakers. Let me show in more detail how the normative continuity within the expert role can be appreciated by those who challenge the value-free ideal and by those who adhere to it.<sup>8</sup>

The first way in which the discontinuity between informing and recommending can be downplayed is related to how scientists are not exempted from moral responsibility and must take the external impact of their work into account. More specifically, according to the argument from inductive risk, which is possibly the most forceful argument against the value-free ideal, scientists cannot and should not exclude non-epistemic value in the stage of justification and acceptance (Douglas, 2000; Rudner, 1953). Owing to the possible harmful consequences of making a mistake when accepting or rejecting hypotheses, scientists must make non-epistemic value judgments in setting the evidential standards required for acceptance. In cases of high uncertainty and major external impact, non-epistemic values play an irreducible and morally required role. According to this view, the mode of informing policymakers is infused with non-epistemic values. Hence, because the mode of informing involves non-epistemic value judgments, the discontinuity between informing and recommending is downplayed.

The second way in which the difference between informing and recommending can be downplayed is tied to *how values can be included* so as to provide recommendations.

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<sup>8</sup> It should be noted that my argument here for the normative continuity within the role also fits with a more pragmatic view toward the role of values, according to which non-epistemic values can sometimes be legitimate and sometimes not, depending on the context in which scientific experts find themselves. This view resonates with Pielke's (2007) approach to the four idealized roles for scientists in policymaking: "*Pure Scientist, Science Arbiter, Issue Advocate, or Honest Broker of Policy Alternatives?* All four roles are critically important and necessary in a functioning democracy" (p. 7, italics in original).

Recommendations can be formulated in two main ways.<sup>9</sup> A common way to make expert recommendations is by formulating what Kant called “hypothetical imperatives” and what von Wright called “technical norms.” They can be used to specify feasible means to politically defined ends given certain statements about the state of the world: “If you want *A*, and you believe that you are in situation *B*, then you ought to do *X*” (Niiniluoto, 1993, p. 12, italics in original). In the formulation of hypothetical imperatives, social and political values are explicitly part of the expert output through the recommendation of a line of action. However, the political and moral values and goals that the scientists as experts apply in the formulation of hypothetical imperatives need not be identical to the experts’ own value commitments. On the contrary, they can be based on normative premises defined by the policymakers. Thus, these imperatives should be understood as conditioned recommendations, according to which the experts make recommendations based on the values of policymakers (Tellmann, 2016, p. 321). If so, the normative difference between recommending and informing is downplayed. Hence, the discontinuity within the expert role can also be downplayed if one assumes the validity of the value-free ideal.

So far, I have provided an account of the expert role in terms of its expert–lay relationship, its aim and context, and its main modes of output and how these features differentiate it from scientific research. As experts in policymaking, scientists are not driven toward knowledge production and epistemic progress in the same way as when they operate as scientific researchers. Rather, they are mandated to provide their specialized knowledge, competencies, and skills so as to contribute to a policymaking process. The role of scientists in policymaking is thus best understood as a kind of hybrid activity between scientific research and political application – or, more coarsely put, between science and politics.

#### 5.4 Standards: Competencies and virtues

According to some science studies scholars, science is constituted by a set of shared norms and values. Merton (1973 [1942]) famously argued that science is constituted by a set of institutional norms that regulate the actions of scientists in producing knowledge. Thomas Kuhn (1977) introduced the idea that there is a set of shared epistemic criteria that function as values in guiding scientists when confronted with a choice between two theories (p. 103). In both Merton’s and Kuhn’s cases, the domain in which the norms and values apply is scientific research. Is there, to paraphrase Merton, something like an ethos of scientific experts? Are

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<sup>9</sup> Similar ideas can be found in Hempel (1965).

there any candidates for additional role-specific competencies and virtues that apply to the role of scientists as experts? There are few attempts in the literature at articulating the competencies and virtues of the expert role.<sup>10</sup> Based on the analysis presented in section 5, I suggest some plausible candidates here.

Because the moderate separability view I propose sees the role of scientists as experts to be a genuinely scientific role, there must certainly be a great deal of continuity between the two roles. A basic requirement that applies to research results and expert output to policymakers alike is compliance with *epistemic values* such as empirical and predictive accuracy and consistency. At the epistemic level, there is a normative continuity. Moreover, given the plausibility of Douglas's (2009) argument against the idea that scientists can be exempted from moral responsibility in some parts of their practice, there must indeed be continuity between the two roles in regard to common moral constraints.

However, there are additional standards that experts ought to take into consideration. First, given that the aim of the role of scientists as experts is to contribute knowledge to policymaking contexts, expert output to policymakers must, above all, be *policy relevant, applicable, and manageable*.<sup>11</sup> Failing to provide output that has a bearing on the political discourse and that can play a useful role in the policymaking process as a relevant premise about the subject matter in question seems to be tantamount to failure as an expert. This is no simple task. Contrary to the commonly held tacit assumption, which I discussed in section 2, that relevance is an inherent property of scientific knowledge, it seems fair to assert that relevance must often be carved out in the performance of scientists as experts. Mere adherence to epistemic considerations might lead to expert output that cannot be a part of political arguments and deliberations. Similarly, describing possible policies or basing recommendations on fringe values and interests is not likely to yield applicable output.

Second, given the epistemic asymmetry that constitutes the relationship between experts and laypeople, it is a major challenge for policymakers and the public to decide on which experts they should rely. Experts should also consider this challenge. Scientists who are selected to contribute as experts should be able to decide whether the task lies within the scope of their area of expertise. This requires a kind of meta-expertise of being able to recognize the

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<sup>10</sup> An important exception is a recent article by Keohane, Lane, and Oppenheimer (2014), which provides five principles for the communication of scientific knowledge under uncertainty, namely, honesty, precision, audience relevance, process transparency, and specification of uncertainty.

<sup>11</sup> Niiniluoto (1993) refers to manageability as a value for the applied science (p. 5).



limitations of one's expertise, which Turner (2013) calls "competence-competence" (p. 280).<sup>12</sup> The role of experts requires that scientists understand their contribution both in regard to the rest of the scientific community and in regard to how their knowledge will be understood and interpreted. This amounts to a different accountability relation than for researchers in the sense that experts are held accountable to the scientific community and its consensus as well as to the policymakers and the public. Performing that role requires a particular reflectiveness about one's own expertise and an ability to assess when one is competent and when one is not. Because scientific experts often have to draw on the work of other scientists, they have to aim for a balanced and reasonable interpretation of the current state of play in the scientific fields and avoid promoting only ideas that they themselves find appealing.

Moreover, the expert role requires *certain competencies in how to translate and communicate* knowledge in an effective manner. As Katie Steele (2012) convincingly argues, the role of scientists as advisors involves the use of coarser language and categories than the role of scientists qua scientists (p. 899). The more technical the science is, the more translation has to be done. Because the audience of scientific experts – be they bureaucrats, politicians, or citizens – comprises laypeople in relation to the scientific issue at hand, the experts' reporting of their scientific assessment requires simplifications and pedagogical ways of communicating what is often highly complex and uncertain science. Translating scientific knowledge presupposes not only in-depth insights into the status of scientific knowledge in the field under consideration but also a broader understanding of how the output might be understood in the development, formation, and implementation of policy. This translation must be effective in that it makes sense to its audience of policymakers. Sound expert practice should therefore include scientists who have a certain degree of knowledge about their audience and the context in which they are working.

## 6. Conclusion

In this paper, I argue that the role of scientists as experts in policymaking is a distinct and separable role within the set of roles that a scientist can occupy by virtue of being a scientist. The expert role is normatively distinct owing to its lay audience, aim, context, modes of output to policymakers, and set of additional competencies and values that the role requires. I find Douglas's (2009) criticism of the strong version of the separability view to be plausible.

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<sup>12</sup> The climate skeptics depicted by Oreskes and Conway (2010) fail to meet this standard.

The cognitive authority of science in society gives scientists a vast potential for external impact even when disseminating their results in internal contexts such as scientific journals and conferences. Thus, it is unfounded to base a separability view on a difference in moral requirements. I therefore propose a separability view that is moderate in three main ways. First, the role of scientists as experts in policymaking is not separable from the role of scientists as researchers in the sense that scientists who take on that role do not speak as scientists. The expert role is a genuine scientific role in terms of its expertise and authority. Scientists tend to be selected as experts in policymaking because of their merits as researchers and the knowledge and skills they have acquired in scientific research. Rather, the expert role is a separable role within what Merton (1957) referred to as the role-set of scientists, with a distinct set of normative expectations that differentiates it from the role of scientists as researchers. Second, there is a great deal of normative continuity between the two roles in regard to common morality and distribution of moral responsibility as well as compliance with epistemic values. Third, the two roles are entangled in many ways. Expert practice influences the advancement of science, for instance, by generating new data or problems that can be the basis of new research projects. These kinds of interactions do not refute a moderate separability view. Rather, they show how different aspects of scientific practice roles in reality can interact and coproduce new forms of knowledge.

In regard to the scientific community, I think my view is relevant in formulating guidelines and codes for how scientists ought to perform the role in policymaking contexts as it can be found in the laws for ethical research and the national academies of science, as well as the mandates for expert assignments. Moreover, as I indicate in section 1, the distrust in scientific expertise can be explained by unreasonable and diverging expectations in public and scholarly discourse. The account I provide here supports the view that the proximity of experts to politics is not a reason for distrust but an inherent property of the role that they are mandated to assume.

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