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Expertise and Self-Determination in Public Participation in Science

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ABSTRACT: I suggest that we assess the value of public participation at least partly by its effect on the public’s individual and collective self-determination, measured by how well the science aids the public to rationally and effectively pursue its own ends. I explore two areas of expertise relevant to science’s ability to foster rational, effective self-determination: expertise in evidential reasoning and expertise in value identification. I describe ways in which public participation may introduce trade-offs between accurate reflection of public values and evidential quality and precision, where loss of either may lead to a failure of public self-determination.

KEYWORDS: expertise, goals of science, instrumental rationality, means-ends rationality, public participation, self-determination, values in science

1. INTRODUCTION

Philosophers of science have increasingly recognized the influence of values throughout the scientific process. While “the value-free ideal” (Douglas 2009) declared that science ought to be objective and value-neutral, with value decisions limited to the application or interpretation of results and the choice of research projects and funding, the new model recognizes the inevitable role of value-laden decisions throughout science. The choice, for example, to use estrogen-insensitive rodents in a study on the safety of BPA might influence the study results (vom Saal and Welshons 2006) and the way slides of livers exposed to dioxin are read to determine tumor counts can influence those results. (Douglas 2000) If science cannot be value-neutral, we are faced with the question of what role of values in science is appropriate. One response is to declare that anything goes and that there are no constraints on those values or the roles they play. Another response is to attempt to draw a line between appropriate and inappropriate value-laden decisions, or at least identify some measure of appropriateness. This path seems plausible. While the influence of values in scientific inference may be inevitable, sometimes it seems clearly inappropriate. For example, it seems reasonable to consider the possible consequences of type I vs type II error in a drug safety trial when choosing not only one’s use of statistics but also one’s methods and materials, including choice of model organism. But it seems clearly wrong to choose a model organism with explicit purpose of getting a specific result that would serve the interests of one’s funders.

Similar questions about values in science and line-drawing are raised in science studies more broadly. Collins and Evans (2002) suggest that science studies has entered a third phase. Whereas the first phase of science studies emphasized scientific authority and privileged the
scientist-as-expert, the second phase democratized authority, legitimized the role of “external” influences and actors, treated science as a social process like any other, and granted various publics as much a right to have a say in scientific decision-making as any others. The third wave recognizes a special status for scientific inquiry and for scientific expertise while still identifying a need for public participation in science. A critical task for the third wave is to identify criteria delineating appropriate public participation.

It is clear that there are conditions under which more public participation in science would improve results: scientific experts modelling effects of particular agricultural practices in an area, for example, may not be as knowledgeable about facts about those practices as locals, and the right involvement on the part of those locals might help improve the models by indicating where other factors might need to be taken into consideration, where data may be biased, etc. Moreover, because scientific decision-making is value-laden, it seems appropriate for stakeholders to have a say in that decision-making to ensure that their values are represented. But there are also cases where more public participation would likely hurt the science, where individuals are not knowledgeable about the science or have goals that conflict with basic goals of the field.

In this brief paper I sketch a proposal for determining appropriate levels and forms of public participation in science, based on the idea that one of the goals of science is to help improve society and that one of the ways to improve society is through products (including information/knowledge) that improve our individual and collective abilities to do better for ourselves.

I do not suggest that there is only one measure by which to determine the propriety of public participation. I also do not suggest that there will always, or ever, be a clear line distinguishing proper and improper involvement or that appropriate levels and forms of involvement will generally the same across cases. The proposal does imply that more public participation, e.g., going higher on Arnstein’s (1969) ladder, is not always better. One the one hand, public participation can help ensure that science appropriately reflects and serves public values. On the other hand, the success of science in serving those values through the discovery of truths and making of predictions about the natural world depends on sometimes specialized methods and prior knowledge that not everyone has or can employ.

The proposal is that we assess the value of public participation in science on the standard of whether the participation aids or hinders rational and effective public self-determination at both the individual and collective level. The “rational” qualifier indicates mere instrumental or means-ends rationality: whether action is rational with respect to individual’s own ends, whatever they may be (I will also briefly explore how that qualifier would apply to include public goods).

In what follows I sketch an argument for why we should care about public self-determination and why we should use it as a standard for deliberating about public participation in science. I then describe possible trade-offs between scientists’ and public roles in terms of effects on public self-determination.

2. GOALS OF SCIENCE

It is generally (but not universally) held that legitimate goals for science include truth, knowledge, understanding, explanation, and predictive or empirical accuracy. However, that science ought to pursue truth or predictive accuracy, for example, does not indicate which
truths and what predictions matter. Older, value-free models of the role of science in society might have been able to claim that science’s job was only to find truth, etc., and that the determination of which truths are to be sought is external to science itself. But if value decisions occur throughout scientific inquiry as well in the initiation and application of science, scientists cannot avoid determining what truths and predictions to pursue and what “inductive risks” (Douglas 2000) of reaching the wrong conclusions are to be borne.

Another, more practical, goal for science that indicates what products matter is that it should improve human welfare and aid society through its products (e.g., NSF’s goal to “advance the national health, prosperity, and welfare”). Some truths and some predictions (and of course, some technologies and some applications) will matter more for this type of purpose than others. The approach in the paper will judge the contribution of public participation on the practical value of science to the public. This focus on practical outcomes is not meant to suggest that we judge all science with an immediate instrumental test. With respect to the question of how to determine appropriate levels of public participation, we are generally concerned with matters of public interest, for which it makes sense to attend to practical value. That is not to say that we should devalue basic research, for example, which can be justified on other grounds and in any case has long-term practical value even if no immediate practical value is obvious.

There are at least two (overlapping) ways of interpreting this goal of promoting human welfare and the good of society: First, we may as a society improve general public welfare with better knowledge and better technology (e.g., when knowledge of health risks of contact with human waste leads to the development of modern sewage systems). Second, we may all better achieve our own individual and differing ends with better knowledge and better technology. While the first may be approached in utilitarian terms of delivering products that increase human happiness, the second accomplishes its welfare goals through public self-determination. In the second, the goal is not merely to increase welfare but rather to do so by helping society better achieve what it wants, for example because science gives us more luxury to pursue goals we care about (and less time merely surviving) or because we have better understanding of how to accomplish our aims. The welfare goal alone does not say who determines what is best for society or how to make choices when there are value conflicts, and it does not obviously value autonomy or self-determination except instrumentally in terms of its effects on human welfare.

While there are reasons to value human welfare independent of autonomy considerations, the approach in this paper is to focus on the practical value of science in a way that recognizes the importance of both public autonomy and public welfare. I propose that we think of these goals jointly in terms of public self-determination, and ask how well the products and process of science help people accomplish their own goals by helping them decide what they want, providing them what they need to decide how to accomplish what they want, and allowing them to accomplish what they want—in short, we ask how well science aids public instrumental reasoning.

3. INSTRUMENTAL REASONING AND RATIONALITY

Successful public instrumental reasoning is reasoning by the public that leads to decisions and actions that best accomplish the public’s goals at both a collective and individual level. I will focus on the individual level first, and at the end briefly consider the collective level, which
raises questions about “the” public and whether it makes sense even to attribute preferences to that public.

Successful instrumental reasoning is both rational and effective. Instrumental or means-end rationality is a norm of instrumental reasoning that prescribes consistency between an individual’s preferences, beliefs, and actions/decisions, e.g., the person chooses the action that maximizes their expected utility, which is a measure of how well their own preferences will be satisfied according to the strengths of those preferences and their own beliefs about the states of the world. As such the norm of instrumental rationality is internal both with respect to individual values (their preferences or utilities, etc.) and individual beliefs (their assessments of the probabilities of different states of the world and the consequences of difference actions in those states, etc.). We might also, and for the purposes of this paper will have to (see below), attend not just to whether an action was rational according to an individual’s own beliefs and values, but also to whether the action was effective, i.e., whether it actually was likely to (or in the end, actually did) satisfy the individual’s values given actual facts about the world.

The notion of instrumental rationality and effectiveness prescribed here is neutral with respect to what the individual’s values are. It does not imply any notion of pure rationality or universal logic that would elevate some people’s values systems over others. Behaviors or ways of approaching problems are instrumentally rational or irrational only with respect to a person’s own values, not any external system or perspective. Values that in some analyses of “rationality” would be declared irrational or illogical are not inherently so—an individual may value emotion, relationships, spontaneity, creativity, faith, culture, religious traditions, or intuitive thinking and the products that come from them, and an individual acting in accordance with these values can be instrumentally rational. If spontaneous decision-making leads an individual to do poorly with respect to the things they hold most important, then that behavior is irrational by their own lights. If the behavior helps the person accomplish their goals and/or is accepted as part of who they are and valued as such, enough that any failures to accomplish some goals because of the behavior are outweighed by the value of the behavior and its positive outcomes, then the behavior is instrumentally rational.

The model of instrumental rationality I assume here is that individuals have ends or goals (I shall not distinguish between these); that there is some prioritization, valuation, or ordering over these ends; and that they have beliefs about the world, including, possibly, beliefs about the probabilities of different outcomes of actions (or probabilities of different states of the world). Rational behavior involves taking action (means) that best conduce to one’s ends according to one’s own views. Since some actions involve setting oneself up with new goals (e.g., to be on time in order to keep one’s job), some goals are instrumental—valued for their role in the accomplishment of other goals—and some are fundamental or final—

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1 I recognize that the groups science serves are diverse, so diverse as to justify in many people’s minds the plural “publics”. While I do not use the terminology “publics”, I do not intend to attribute unity or uniformity where it does not exist. I also recognize that differences of opinion make it difficult to attribute preferences to non-uniform groups of people.

2 This sense of “instrumental rationality” is not merely the first of Weber’s (1978) bases for social action. In the sense here, a person is instrumentally rational if her actions are consistent with her overall set of values, including her ethical or other fundamental or social values. This standard imposes only minimal requirements of consistency with respect to an individual’s own beliefs and values and is open with respect to what those values are. In this minimal sense it is inclusive of alternative values approaches such as that described by Etzioni (1999).
valued for their own sake and not as a means to another end.\(^3\) Since successful accomplishment of goals often involves having true beliefs about the world, rational behavior often involves updating one’s beliefs according to the evidence, but this model is open with respect to whether such updating is required (e.g., it allows goals that may require ignoring evidence). Since one may value other people and have goals that include the welfare of others (paradigmatically, children), rational behavior may include doing things for others. Since one may not be able to maximally achieve all one’s goals, rational instrumental decision-making requires at least some prioritization of those goals, so that when one is faced with a choice between them, one can choose according to one’s values. Outcomes of actions may fare well according to some measures but poorly according to others; decision-making often involves consideration of more than one goal at a time and the world (or one’s beliefs about the world) often imposes trade-offs between accomplishment of those goals. For example, one may have the goal to get to one’s destination and desire for it to be both quick and scenic; however, there may be a significant time difference between the fastest route and the next fastest route, and the slower route may be much more scenic. Sometimes one may not be sure about what one values, either because one is unsure what goals one actually has or, more commonly, because one is unsure how to prioritize those goals. Sometimes one may only realize this once one is faced with a difficult decision. Alternatively, one may know they do not have a clear set of prioritized goals about something but only are willing or able to prioritize once they are forced to. The resolution of belief or value conflicts is not necessarily itself a rational process because without prior beliefs, instrumental rationality cannot point to a resolution. But such resolution, through conscious deliberation or reflection or lucky happenstance, may be required before other decisions or action may rationally be taken. The ideal is generally to reach a “reflective equilibrium” of consistent beliefs and prioritized values that will allow action. Given a reflective equilibrium of beliefs and values, rational decisions are ones that will best accomplish one’s ends (whether self- or other-directed) according to one’s beliefs. Effective decisions are ones that actually best accomplish them.

4. FOSTERING PUBLIC RATIONAL, EFFECTIVE, SELF-DETERMINATION

I suggest that while science cannot hope to achieve the value-neutrality of the value-free ideal and the first wave of science studies, it can hope to achieve neutrality with respect to individuals’ fundamental values by not imposing on them and by helping people to determine when their fundamental values might be in conflict (or their fundamental goals not co-achievable) and what instrumental goals will help them accomplish those fundamental goals. I propose the following goal (amongst others) for science:

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\(^3\) The distinction is often drawn between instrumental and intrinsic values, but I follow Rabinowicz and Rønnow-Rasmussen (2000) and others in distinguishing intrinsic values—values inherent in or supervening on some property—from final or fundamental values—values that are valued for their own sake. The latter property concerns the nature of the valuation in the individual’s perspective, whereas the former concerns the ultimate source, objectivity, or realism of the value. This distinction mirrors Weber’s instrumental-rational/value-rational distinction, but here applied to the basis of the values upon which one is acting.
Science, through both its process and its products, ought to help individual and collective public reasoning and actions meet, as much as possible, the following ideals (here described in individual terms):  

4

Autonomy: The individual’s reasoning is “their own”. There is no external influence on the individual’s fundamental values except through a process of reflective equilibrium in which the individual addresses value conflicts or inconsistent beliefs by themselves by choosing between alternative sets of consistent beliefs.  

5

Rationality: The individual’s instrumental values are consistent with both their fundamental values and their beliefs about the world. The individual makes decisions according to their values and beliefs, i.e., in a way that will accomplish their goals if their beliefs are true.  

Effectiveness: The individual’s actions are actually effective at accomplishing their goals. To the degree that the individual’s reasoning is rational, this requires that the individual’s beliefs accurately reflect reality and that the individual is able to and actually does act as they choose.  

In short:

Science ought to foster public rational, effective, self-determination.  

To do well towards this goal, science needs to provide the right products of information or knowledge, and in the form needed, to the right people for decision-making according to the values and beliefs those individuals have. If a scientific product is irrelevant to an individual’s values, it will not aid rational, effective self-determination. Worse, it may decrease rational, effective self-determination if either it is false or it irrelevant but wrongly taken to be relevant by the individual.  

Consider now some simple examples of how science might increase or decrease rational, effective self-determination:

Suppose someone cares about the health of their child. Then accurate information about health risks, preventative care, etc., as well as the costs and other benefits of actions they may take, will help the individual decide for themselves how they can best pursue the health of the child, given the situation the individual is in and the individual’s other values. It may, for example, help the individual set an instrumental goal of feeding their child more vegetables, which if acted upon will make the individual more effective at accomplishing their goal of ensuring the health of their child.  

Suppose that same person believes, falsely, that vaccines carry a significant risk of autism. Then information about the relative safety of vaccines will aid in the person’s rational, effective self-determination if the person can process the information in a way that lets the

4 The description of the ideals of autonomy, rationality, and effectiveness are not meant to be either precise or comprehensive.  

5 There are of course many different conceptions of autonomy. Instead of relying specifically on any one, I choose an ideal of reflective equilibrium consideration of one’s own ends as a model of autonomous self-determination of ends consistent with the model of instrumental reasoning. I leave instrumental determination of instrumental values out of the description because to the degree the individual is rational, instrumental values will follow from fundamental values.  

6 Note that “self-determination” here means determination of an individual’s own goals, which may be other-directed, the effective pursuit of which may then involve pursuing the welfare of others.
person weigh beliefs against that evidence and decide to act in ways that actually increase health of their child.

Suppose that person worries that the use of a cleaning product will harm their children. Then scientific investigation into the health effects of the product and dissemination of relevant results in a form that allows the person to weigh the benefits and risks of the product against alternatives may help the person decide whether to use the product.

Suppose that same person both appreciates the convenience benefit of a particular product and cares about the health of their children. Suppose that person does not want to give up either, but also happens to believe that the product is definitely safe. Information about possible harms may help the person adjust their beliefs, decide what is best for them and their children, and possibly adjust their actions. If they revise their belief that the product is definitely safe, their actions should now depend on how they assess the possible risk and prioritize the values of health and convenience. If they continue to believe the risk is low or the harm is small, they may believe the benefit is worth the risk of harm. The science will not tell them what to do independent of such prioritizations, but if it says there are possible health effects, it will tell them they cannot maximally achieve both values they hold of health and convenience. Simply revising their belief that the product is safe would then put them into a non-equilibrium state of beliefs and values which could be resolved with a prioritization of those values. Alternatively, it may be rational to retain the belief that the produce it safe if the person also has a third value, prioritized above the others, not to have to prioritize the first two values. (Glymour and Tanona 2012) It is not irrational to ignore evidence if one’s most important values require believing against the evidence. However, it is irrational not to believe according to the evidence if one prioritizes goals that require for their accomplishment understanding of the world and ability to predict outcomes of actions.

Suppose that someone cares about both the happiness and the health of their children and stops providing their children with their favorite food because of a report that the evidence that that food is unhealthy is very strong, but the science actually shows that while the evidence is strong, the effect on long-term health is actually very small and there is no risk to short-term health. Then the science as reported may have reduced rational, effective self-determination, if the person values current happiness enough relative to long-term health, because they have acted rationally but not effectively according to their beliefs and values.\(^7\)

Suppose a test on a promising drug’s efficacy prioritizes avoiding type I error (false positive) over type II error (false negative) throughout the tests and comes back without a positive result, but individuals would prioritize avoiding type II (for example, because of a health crisis and a lack of alternative treatments that makes it important to avoid the rejection of an effective drug). Then the science did not serve to help the individuals accomplish their aims and did not increase their rational, effective self-determination. This might happen, for example, if there were a conservative approach to interpreting qualitative lab results and an insufficient sample size.

Suppose that scientists, with the aim of improving public welfare, decide to create and release into the air a drug that increases the happiness of nearly everyone without hurting their

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\(^7\) According to the description of the components of rational, effective self-determination above, faulty information may “accidentally” increase rational, effective self-determination with false information, e.g., if an individual acts irrationally and the information doesn’t change that but the person irrationally acts on the false information in a way that ends up helping them accomplish their goal, thus making the behavior more effective (at least in this instance).
motivation to improve their lives, etc. Then even if the scientists are effective at improving welfare, they will not have done so via the path of increased rational, effective self-determination, as the increased happiness did not occur as the result of more effective, or more rational, or more autonomous reasoning and/or action. However, that increase in welfare might nevertheless foster rational, effective self-determination, if the increased happiness makes individual decision making more effective, or more rational, or more autonomous.

5. PUBLIC PARTICIPATION AND SCIENTIFIC EXPERTISE

Public participation has the potential to improve the ability of science to foster public rational, effective self-determination, but also carries risks.

Below are some ways in which public participation may improve rational, effective self-determination:

- Including public stakeholders may make it more likely that the science addresses questions, applies standards of evidence, and delivers products relevant to their fundamental values, better helping them accomplish their aims.
- Widening the scope of values employed in science may improve science’s ability to address people’s aims in general, even if the participants are not direct stakeholders.
- Increased public participation may increase the uptake of relevant scientific products in the public because of increased buy-in and trust, increased knowledge of the products, or improved communication about the products. For those with aims served by those products, this increased uptake may improve their rational, effective self-determination.
- Non-scientists may have knowledge or perspectives not held by scientists. Their involvement may improve the accuracy and precision of the science, and so improve effectiveness for those individuals with aims that science can serve.
- Increased public participation may improve the involved individuals’ processing of value and belief conflicts related to the science. One may not know what one values, how strongly, or why, until one has to seriously consider relations between ideas, consequences of actions, etc. Joint decision-making about scientific and public values that are important may lead one to better understanding of one’s own (as well as others’) values, their prioritizations, etc., for example about type I and type II error, or about recreational use of public land and environmental concerns, or about religious and scientific values.

The first two mechanisms involve incorporation of values into scientific decision-making that would not otherwise have been incorporated. That increased public participation would change the values employed in scientific decision-making is not surprising. Scientists and non-scientific public tend to employ different values when deliberating about policy decisions. (Su, Cacciatore et al. 2015) Part of the rational for the second wave of STS was a rejection of the authority of scientists, and we are right to reject scientific authority over values—scientists generally ought not decide questions of public individual or collective value. We are right to

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8 These possible mechanisms are not well-specified, the list is obviously not exhaustive, and I make no strong claims about the probability of outcomes via these mechanisms either in general or in any particular situation. I list them not as novel points but to make more clear ways in which public participation might improve the ability of science to work for public self-determination.
reject scientific authority over values even if we both recognize scientific expertise in their fields (as, e.g., Collins and Evans (2002) do in their explication of the third wave) and assume or hope that scientists make their best efforts to attend to the role of values in their decision-making and to specifically consider public values in their decisions (as, e.g., Douglas (2009) recommends). Even if scientists are experts within their field and work hard to meet their obligation to consider the values explicit and implicit in their decision-making, they are not experts on the values of the public. Moreover, where there are value conflicts, they are not the proper people to be making prioritizations of values for others. Putting responsibility for decision-making in the scientists’ hands when they do not have such expertise risks both effectiveness and self-determination. Increased public participation may both improve inclusion of relevant values for rational, effective self-determination and allow self-determination necessary for rational, effective self-determination. (Of course, whether it actually does will depend on many other factors.)

However, increased public participation also carries the risk of decreasing public rational, effective self-determination. Collins and Evans (2002) describe levels and types of expertise with respect to field content and methods, and note that the public as a whole tends not to have sufficient relevant expertise to successfully engage in quality science at all levels. In terms of this paper, certain (but not all!) kinds of involvement of public who lack specific content and methodological expertise may reduce a science’s contribution to public rational, effective self-determination by producing faulty products. In addition to lack of specific content and methodological expertise, there other factors that may make increased public participation decrease, rather than increase, public rational, effective self-determination.

General beliefs and reasoning may also undermine public rational, effective self-determination in an individual with respect to some science in which they engage. It has become increasingly well-established that humans commonly use heuristics, motivated reasoning, and more generally un-scientific thinking that can lead us to conclusions inconsistent with our own goals and beliefs. (Kahneman 2011) Such reasoning, if employed in a science, can lead to scientific results that do not increase public rational, effective self-determination but rather make applied reasoning irrational or ineffective. Moreover, specific beliefs may be unconducive to scientific aims of finding the truth or making good predictions. For example, an unwillingness to adopt methodological naturalism may be perfectly rational if one’s most important values involve maintaining some non-natural beliefs. However, failing to maintain naturalism as a methodological tool for assessing evidence fundamentally undermines the ability to find useful and generalizable predictions. (Schick Jr 2000) For an individual whose own aims would be helped by products of science (for example, via good predictions in medicine) but is unwilling to themselves engage in a methodologically naturalistic thinking, ceding the scientific process to individuals who are so willing may improve their own rational, effective self-determination.

Scientists as well as non-scientific public are prone to bias and motivated reasoning. Bias can be ameliorated through social processes such as peer review, replication, and critique. Such social and professional processes are meant to assess, for example, whether methods employed in a study are appropriate for the stated aims of the study. Ensuring that helps improve the chances that the study will increase effectiveness of the reasoning of those who rely on the study results. Of course biases remain. (Lee, Sugimoto et al. 2013) Public participation widens the values invoked and may help address bias due to the employment of values not shared by the public or not aligned with the search for truths and predictions useful
to others (e.g., public participation may counteract personal motivation for fame or a corporate motivation for profit or political motivations unrelated to the practical or epistemic goals of science). However, there are no generally accepted processes to help ensure public adherence to inference methods appropriate for their goals. Without the right incentives, training, and social structure, public participation may rather produce products that are misaligned with the public’s own values and hence decrease public rational, effective self-determination.

While the exploration so far about the possible positive and negative effects of increased public participation contains much speculation, it suggests that there might be a trade-off in the risks of decreasing public rational, effective self-determination for two separate and possibly overlapping reasons: assessment/use of evidence, and choice of values. Reliance on scientific experts alone may lead to decisions with rational assessment of evidence but only with respect to a set of values that do not reflect public values. General public participation may lead to decisions with better representation of public values but with poorer scientific validity with respect to those more representative values.

This possible trade-off suggests some caution with respect to public participation. We can see ways in which public participation might improve the benefits of science to both those involved and other individuals, through both inclusion of specialized knowledge that would increase the ability of the science to be used for specific goals and a better alignment of those goals with public values. But the potential benefits of that involvement of course have to be weighed against the potential risks, and in our excitement to increase public engagement we ought not undermine the value of the science to provide benefit.

6. PATERNALISM?

The cautiousness of the end of the last section might appear to some to be too paternalistic. Consider a medical analogy. There are similar tradeoffs in medical practice, in which health care providers must sometimes balance potential benefits to the welfare of a patient through paternalistic interventions against respect for the autonomy of the patient in their care. (e.g., see Scoccia 1990) While we might generally want to avoid paternalism, there are conditions under which it may be justified, for example where a provider may both be fairly sure of a patient’s values and be confident that the patient will not be able to decide rationally according to their own interests. Conditions like these might justify a provider omitting some information or explicitly asking the patient to trust that they know what is best for the patient. If the provider is right about the patient’s values and the patient’s inability to process the medical information called for given those values, then the provider’s action may improve the patients’ welfare, according to what the patient themself values.

However, a significant reason to be suspicious of paternalism, even at the risk of patient health, is the risk of provider overconfidence: the provider may think they know the patient’s wishes and can better assess the evidence to determine the choice that would be best for the patient, but the provider is probably not in the best situation to know the patients’ values. Moreover, the patient may not even know their own values (or have them prioritized) until faced with a decision that requires weighing them against each other. As an alternative, it may be possible to identify the values that generally may be relevant (different measures of health, costs, etc.). A natural division of labor is then suggested: the provider may provide information relevant to more than one value (different options, assessment of the evidence about treatments relative to different values, etc.) and then let the patient decide. The provider’s expertise helps
avoid ineffective action that would not accomplish the patients’ own ends, but the patient gets to weigh the options and decide what they value most. Of course, there are challenges even in the best of cases: weighing options may require medical understanding the patient does not have even given the provider’s explanations, and fear and other factors may impair a patient’s ability to do this well with respect to what they have valued over their lifetime and what they may value down the line. But despite these challenges the general inability to know what a patient truly values should be a deterrent to paternalistic intervention even for those not opposed to it in principle.

It is not clear the case of public participation is similar. We are not generally worried about scientists deciding entirely on their own to intervene on the public without their consultation. But there is a legitimate concern that decisions scientists make influence decisions the public makes. Even when it may not appear that scientists are deciding things for the public, the choice of what to study, how to study it, how to write up results, and how to disseminate results all may make it more or less likely that a particular action is taken by the public. Such influence may not serve the public’s interests. Even if it does, we may ask whether it was appropriate for scientists rather than the public itself to have made those decisions. The questions of whether the patient is able to decide rationally in their own interest and whether the provider knows what the patients’ interests are translate to whether the public is able to decide in its own (individual or collective) interests and whether scientists know what the public’s (individual and collective) interests are. Both of these are complicated questions.

We may or may not have a better insight into the assortment of values the public holds than the provider has into the patient’s values. The range of values present in a group of individuals is likely to be greater than the range of values present in an individual health care decision. If we care about “the” public as a whole, there is no guarantee of a coherent set of values according to which we may assess rational, effective self-determination—indeed there many reasons to think there will not be such a set. (Arrow 1950) Different constituencies or “publics” are likely to have different values, and a decision serving one well may do poorly with respect to another, raising deeper questions about public rationality and ethical public decision-making. However, it may be possible to define public societal values that are not functions of individual values but rather constructed values of a society, e.g., basic liberties of a democratic society, and consider the ability of a science to improve public rational, effective self-determination with respect to those values.

If we are talking about serving individual interests, it is almost certain that no decision on the part of scientists will paternalistically well serve all individuals’ interests. But scientists can still learn of and attend to different values that individuals may have. For applied settings in which the constituencies are well-identified and there are opportunities to learn about and jointly discuss and debate priorities, it may be a realistic goal for scientists to learn of and to attend to the relevant values in ways in which they can then apply their scientific expertise with the relevant values, and the public interests, in mind. In other circumstances, scientists may be able to appropriately conditionalize their science and their results, making values involved and the way the science can serve different interests clear. In situations where the methodological and subject expertise of the scientific community better serves public rational, effective self-determination than the public’s involvement, limited involvement of the public may be justified, but only to the degree that the scientific community attend well to the public’s values and develop the science in ways that serve public rational, effective self-determination.
7. CONCLUSION

It is not, or at least ought not be, controversial that good science requires scientific expertise. But good science also requires proper attention to and incorporation of values, the knowledge of which is not necessarily an area of scientific expertise and the weighing of which is definitely not a matter simply of scientific authority. Public participation can be valued for its own sake, but also should be judged by results. One important result would be improvement of the ability of science to serve the public’s ability, both individually and collectively, to decide their own ends and make decisions that will serve their own ends. This is a broad criterion on which to judge public participation. It may not provide precise direction but can serve as a general guide for thinking about the value of public participation in science. It also suggests that we ought to attend to potential trade-offs between different types of expertise and different contributions towards that general goal.

REFERENCES


