



Does scientific research need to be more
inclusive to be more relevant and useful?
And how?

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Building deliberative democracy: insights from citizen science
Venice, 19 December 2019

THIS WEEK

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Beyond the science bubble

Research leaders in the United States and elsewhere should address the needs and employment prospects of taxpayers who have seen little benefit from scientific advances

One question dominated discussions at the annual meeting of the American Association for the Advancement of Science (AAAS) at the weekend. Researchers, journalists and science lobbyists squeezed into conference rooms, perched on recycling bins and sat on the floor between rows of filled chairs as they strained to listen to those who tried to offer a response. The question was phrased in various ways, but the variations all boiled down to: how should science and scientists respond to the administration of President Donald Trump?

The answers were numerous too—from political activism to better communication—and were met with cheers, applause and the odd standing ovation. Many scientists will have left the Boston conference with renewed hope, or at least a sense of combined purpose. They had an answer of sorts to their question.

But it's the wrong question. It is not Trump that scientists must respond to. The real question is what science can do for the people who voted for him. Exactly who did support him, and why, is still being debated by political scientists, but it's clear that many of those who voted Trump are those he canvassed in his campaign and credited in his inauguration speech. It is people who feel left behind by supposed progress and who have suffered a real or perceived collapse in their quality of life.

PERSUADING THE UNCONVINCED

One speaker at the AAAS meeting appropriately sharpened the challenge. There are two types of taxpayer: those who pay up voluntarily because they believe in the public good that the money generates, and those who pay only because they will be put in jail if they don't. How many scientists, he suggested, could confidently say their project was so important to people that those people should be thrown into prison for not supporting it?

Just telling the same old stories won't cut it. The most seductive of these stories—and certainly the one that scientists like to tell themselves and each other—is the simple narrative that investment in research feeds innovation and promotes economic growth. 'It's the economy, stupid', so the saying goes, and as nations become a little less stupid by pushing against the frontiers of knowledge, so the benefits of all this new insight spread from the laboratory to the wider population, as improvements in the standard of living and quality of life.

This comfortable story has all the hallmarks of a bubble waiting to pop. For a start, it always has a happy ending. The hero of various quests, science slays the dragon of childhood disease and retrieves the elixir, if not of everlasting life, then at least of increased lifespan. And, like all good stories, this one comes with a pleasing twist: for when it sets off on its quest, science does not know exactly which good deeds it is planning to perform. Pure of heart and research, it is merely enough to send our science hero out into the world, with its consumables, over heads and a postgraduate squire paid for by donations from a grateful and trusting public.

This narrative is truthful enough to have sustained itself for many

decades. From the famous discovery of the apparently useless laser that launched uncountable applications to how Einstein's theories of relativity underpin the Global Positioning System—these stories indeed make a case to Trump and his supporters that continued investment in science will help to create companies and jobs.

But as this journal and others have pointed out, it is also clear that the needs of millions of people in the United States (and billions of people around the world) are not well enough served by the agendas and interests that drive much of modern science. There are plenty of reports that show, for example, how public investment in the Human Genome Project has paid off many times over and created firms and jobs, but rather

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than trickling down through society, these benefits of discovery science arguably deepen the pools of wealth and privilege already in place—creating expensive new drugs that most people cannot afford.

It is right that more scientists should tell stories of the good their research can do. But it is more important and urgent than ever that researchers should question how these stories really end—and whether too many of the people they claim to act for don't really get to live happily ever after. Equally, they should focus more effort on how science education and scientific research can help the many whose jobs are going to be displaced by the very inventions that scientists are producing.

As they ponder their next move in response to the election of Trump, science organizations—universities, funders, supporters and the rest—should look harder at social problems and opportunities, and seek ways for science to help.

For example, some universities are increasingly engaging in climate-change adaptation. There will be employment opportunities in creating companies that help cities and other regional communities to protect themselves from climate change (whatever the sceptics may be saying), stimulated by the readily applicable and intellectually stimulating insights and improved decision-making that research will deliver.

More universities, for example, could follow the example of Michigan State University in East Lansing, in building stronger links with their local communities, and seeking to work with them to tackle research problems that affect their quality of life. These include monitoring soil and water quality, for example, and addressing the challenges of regional demographics, such as the large numbers of elderly people who live alone in some regions and how to deliver health care to them.

There is also a need to tell these stories compellingly—stories that are harder to tell and of less global impact than the hunt for fundamental particles or new materials. And the most important audiences may not be inclined to listen. But those audiences matter. ■

« Beyond the science bubble », *Nature*, February 2017



Beyond the science bubble

Research leaders in the United States and elsewhere should address the needs and employment prospects of the people who have made it to the point of publication

Over the past few decades, the United States has become a global leader in research and innovation. This success has been driven by a combination of factors, including a strong commitment to research and development, a highly skilled workforce, and a vibrant ecosystem of startups and venture capital. However, as the country continues to lead in research and innovation, it is also facing a number of challenges that threaten its long-term success. One of the most significant challenges is the growing gap between research and the needs of the workforce. While the United States has a large number of researchers, many of them are trained in fields that are not directly related to the needs of the workforce. This mismatch between research and the needs of the workforce is a major barrier to innovation and economic growth.

One of the most significant challenges is the growing gap between research and the needs of the workforce. While the United States has a large number of researchers, many of them are trained in fields that are not directly related to the needs of the workforce. This mismatch between research and the needs of the workforce is a major barrier to innovation and economic growth. Another challenge is the lack of funding for research in areas that are not considered "sexy" or "high-tech". While there is a lot of funding for research in areas like artificial intelligence and biotechnology, there is much less funding for research in areas like education, infrastructure, and the environment. This lack of funding for research in these areas is a major barrier to innovation and economic growth. Finally, there is a growing concern about the future of research and innovation in the United States. As the country's population ages and the workforce shrinks, there is a growing concern that the United States will no longer be able to maintain its leadership in research and innovation. This concern is a major barrier to innovation and economic growth.

Research leaders in the United States and elsewhere should address the needs and employment prospects of the people who have made it to the point of publication. This means that researchers should be encouraged to work on projects that are directly related to the needs of the workforce. It also means that researchers should be encouraged to work on projects that are not considered "sexy" or "high-tech". Finally, it means that researchers should be encouraged to work on projects that are not funded by the government. By addressing these challenges, the United States can ensure that it remains a global leader in research and innovation for many years to come.

« The needs of millions of people in the United States are not well enough served by the agenda and interests that drive much of modern science »

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Introduction

- Growing dissatisfaction with scientific research and innovation: global contribution to economic growth is still of course on the agenda but it does not exhaust today society expectations
- *Relevant* and *desirable* research and innovation outputs are also expected

Introduction



❖ ***RRI Responsible Research and Innovation*** H2020

“Responsible Research and Innovation (RRI) implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole research and innovation process **in order to better align both the process and its outcomes with the values, needs and expectations of society.**”

Implementation: public engagement, open access, gender, ethics, science education

Introduction

- Public participation in research and innovation is thus seen and *advertised* as a mean to foster and achieve responsible research and innovation
- More broadly, various political benefits are expected : building active political communities, structuring public debates, empowering citizen, increase trust in scientific expertise, etc
- Increasing visibility and displayed institutional support for “participatory science”, etc



Introduction

- Widespread academic and political discourses in favor of direct participation of the citizens, as an appropriate response to the following society's evolutions:

Six hypotheses (Blondiaux 2008):

- i. An increasingly complex society
- ii. An increasingly divided society
- iii. An increasingly reflexive society
- iv. An increasingly rebellious, disobedient society
- v. An increasingly defiant, challenging society
- vi. An increasingly ungovernable society

Outline of the talk

Central question: Does scientific research need to be more inclusive to be more relevant and useful (more responsible)? And how?

➤ Discuss some *specific* potential benefits and challenges of citizen participation in science

- I. In the very process of producing knowledge
- II. In the setting of research agenda

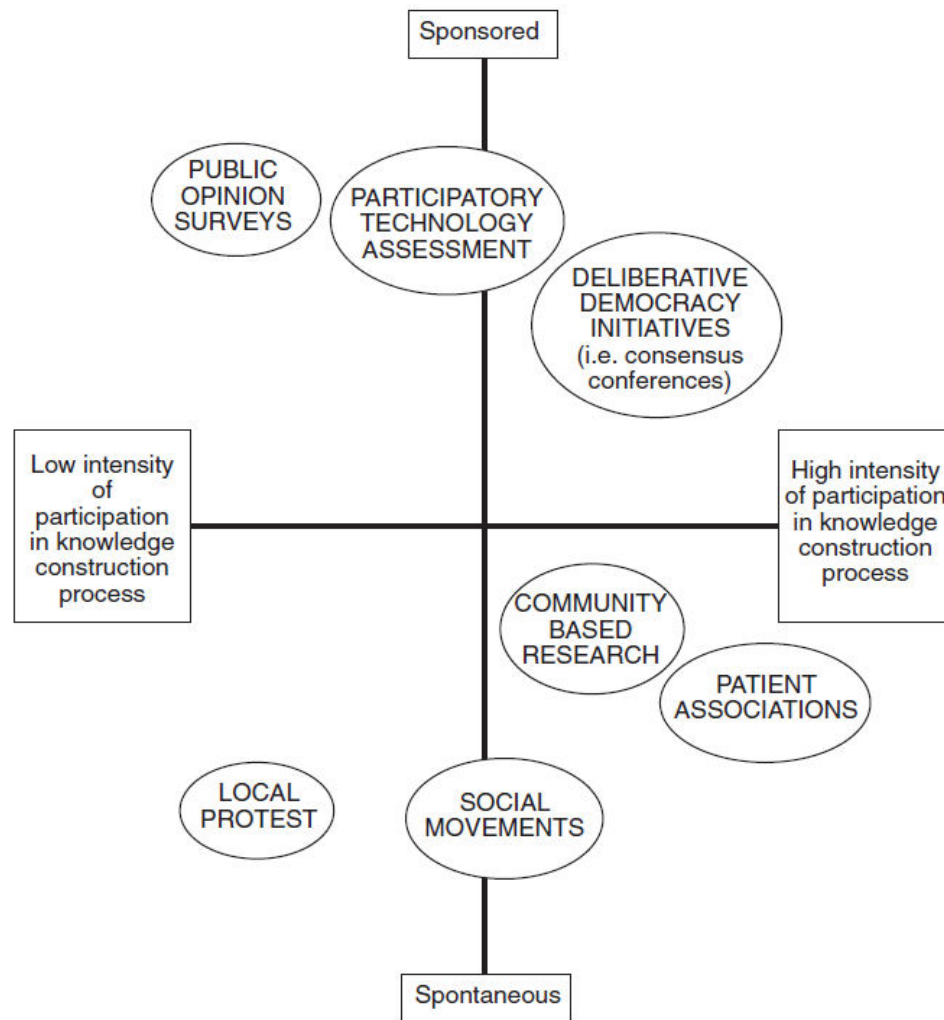


Figure 19.1

A map of public participation in science and technology.

I- Citizen participation in the very process of producing knowledge

❖ Epistemic (and practical) benefits of drawing on lay expertise:

- Alison Wylie's analysis of collaborative practice in Archeology (with descent communities, especially Aboriginal and Indigenous communities)
- Brian Wynne's study "May the sheep safely graze?"
- Positive role of Associations of patients in research on Aids (more actionable scientific findings)
- Etc.

➤ **Main challenge: (lay)science education for... professional scientists**

I- Citizen participation in the very process of producing knowledge

Well-known insights from social epistemology on the virtues of diversity and inclusiveness

- ❖ Cognitive-social norms of “organized scepticism” (Merton) / “transformative criticism” (Longino)
 - Public forums and **shared standards of criticism**
 - **Uptake of criticism**
 - Tempered equality of intellectual authority
- Heterogeneity of perspectives increases the objectivity and reliability of the knowledge produced
- **Key issue:** Who should be included? Should one go beyond the frontiers of scientific communities?

Potential difficulties for a more inclusive process of transformative criticism:

When a shared professional training and culture is lacking:

- ❖ Possible lack of symmetry in response to criticism/ disagreement on central norms of justification (ie “don’t question authority or tradition”)?
- ❖ The “double-edged sword” of the effects of diversity: “demographic diversity may generate obstacles to communication and trust, which may impair group performance” (Steel 2019)
 - Such difficulties are under-analyzed (empirical studies are very sparse...)
 - **Open question:** To what extent does the lack of a common

II- Citizen participation in the setting of research agenda

Still a theoretical topic (at least at the scale of national and supranational research and innovation strategies)

In real life... mostly “epistemic elitism”



In real life: “epistemic elitism”



Conseil stratégique de la recherche

(auprès du premier ministre)

Research Strategic Council

(to the Prime Minister)

Mission: “identify and propose a limited number of big research and technological priorities to prepare and construct the future of France”

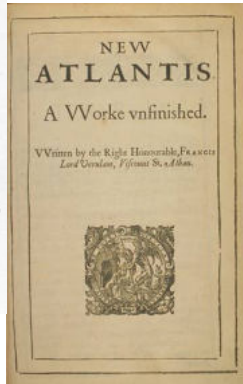
Who is involved in the choices made about research priorities?

II- Public participation in the setting of research agenda

- ❖ Composition of the French Research Strategic Council (26 members)
 - majority of very distinguished scientists (but mostly from the natural sciences)
 - a few representatives of big companies (Orange, Total, EADS, etc.)
 - three elected representatives

And... a novelist, Marie Darrieussecq (representative of the lay citizens?)

- Francis Bacon's House of Salomon (1627), a bit renovated, again



The wise experts (the members of Salomon's House) can be expected to know what's objectively in human interests, the good at which scientific inquiry should aim.

- Such epistemic elitism would be just fine... if the goal of science were to produce new knowledge in general, for its own sake.
- But there is a shift toward more targeted, exogenous expectations in relation with society's problems
- Scientists' epistemic expertise (in their own field) is not the kind of

II- Public participation in the setting of research agenda

- More democratized governance of science, in order to respond to society's expectations:
 - “Leave it to the market” option
 - Our elected representatives
 - Direct participation of the citizens

- ❖ Criteria of comparison:
 - Better alignment between the outputs of scientific research and innovation and the needs and expectations of society

II- Public participation in the setting of research agenda

I- “Leave it to the market” option:

- when guided by economic interests, science can only respond to a limited (albeit central) subset of society needs

II- Public participation in the setting of research agenda

II- Our elected representatives

- They are supposed to convey the whole range of needs and interests of the people they represent but...

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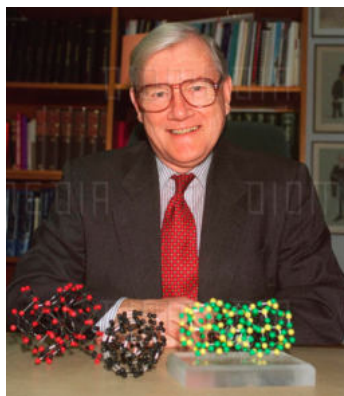
III- Direct participation of the citizen

- Avoid the pitfall of a possible gap between the actual needs of the citizens and the needs taken into account in the setting of research priorities but...
- Lack of political representativeness, hence no “binding force on elected officials” (Brown 2004)

II- Public participation in the setting of research agenda

Opposition from scientific communities on two (related) grounds:

- Resistance to a shift of the very goals of science toward more targeted, exogeneous problems (tension blue sky research vs. use-inspired research)
- Defense of the autonomy of science (when it comes to the setting of the research agenda)



“The nature of all politics and politicians means it is easier for our paymasters to feel comfortable about the proclaiming of programmes relating to Energy, Health, Materials, Climate Change, the Hydrogen Economy and so on, rather than to announce, let alone trumpet, that money is available for scientists to follow their curiosity in their own disciplines”

Sir J. Cadogan (+ 41 members of the Royal Society, 2014)

III- (Un)conclusive remarks and pending issues

❖ To sum up, more public participation is promising...

- Potential epistemic benefits: A more inclusive science can be (sometimes) a (epistemically) better science, especially when it is about “local” epistemic or practical issues to solve

But... issues of lack of shared training/culture/”ethos”, to be addressed not only by “educating” lay people, but also by “educating” professional scientists

- Potential political benefits: direct citizen participation in the setting of research agenda may contribute to fill the gap between research agenda and the needs of citizen in terms of scientific findings (especially at micro-levels of research strategy)

But...

Issues of lack of shared views on the very goals of science

- Need to change scientists' views on these goals (again, some form of "science and society" education for scientists) in order to facilitate the articulation between "epistemic elitism" and democratized options for the governance of science

- Direct citizen participation in science is not and should not be intended to produce decision **but it has to be clearly designed in relation with a decision (taken by our policy makers)**

A precise policy horizon is always needed (Blondiaux 2008)

Otherwise...

III- (Un)Conclusive remarks and pending issues

At stake: how to avoid usual suspicions vis-à-vis direct citizen participation?



“Se vogliamo che tutto rimanga come è, bisogna che tutto cambi”

III- (Un)Conclusive remarks and pending issues

- ❖ Institutional discourses in favor of “public engagement with science” seen as just an alibi to reduce political conflicts and protestations against science-based policies (second-order “post-political, managerial discourses”)



*French Student Poster. In English, I participate;
you participate; he participates; we participate;
you participate . . . They profit.*



Thank you