

Science in Times of Challenged Trust and Expertise

ALLEA GENERAL ASSEMBLY

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Foreword

These conference proceedings, jointly published by the European Federation of Academies of Sciences and Humanities, ALLEA, and the Bulgarian Academy of Sciences, present the topics discussed in the symposium “Science in Times of Challenged Trust and Expertise”, held in the context of ALLEA’s 2018 General Assembly in Sofia on 16 May, and makes the contributions available to the interested public.

The content of the symposium could not have been more relevant for the scientific community and the academies of sciences and arts represented within ALLEA. Organised by the ALLEA Working Group on “Truth, Trust & Expertise”, the symposium tackled some of the most important questions of our time surrounding very fundamental issues on the future

role of science in public discourse. Particularly, it discussed how scientists present themselves and convey their ideas in a changing world without being overshadowed by challenges such as the rise of right-wing populism, science denialism, digital transformations, or the financialisation of scientific publishing in an ever more complex world.

Academies have a tradition as independent, impartial and trusted brokers of knowledge. As proponents of evidence-based reasoning, but also as institutions highly affected by changing social landscapes, they should become more involved in the debate on the challenges they are facing. At the heart of these challenges lies the question of trust in science and expertise. The “March for Science” on 22 April 2017 was

a globally visible statement by the scientific community against the denial or wilful misrepresentation of scientific evidence. While international polls suggest that science and scientists in general maintain and possess a relatively high level of trust, some disciplines and fields of research are clearly suffering from a loss of trust. Simultaneously, trust in traditional media outlets is visibly on the decline and might also affect science communication and hence trust in science. In light of these developments, individual scholars and the international academic community also have to reflect on their own responsibility to ensure standards of research integrity now more than ever.

Trust has always been a core feature in societies around the world. It glues societies togeth-

er and enables communities to thrive peacefully. Trust is not only essential for the functioning of society at large, but especially for scientific research and individual researchers. Without a fair degree of mutual trust in the results of other researchers, incremental scientific progress would be unthinkable. Without trust from politicians and large parts of society, science would be meaningless. At the same time, trust is very fragile: every person has likely at some point experienced the difficulty and long-term efforts required to gain someone else's trust, and yet this hard-earned trust can be lost within seconds.

How can trust in science, expertise and scientific evidence be maintained and (re-)gained? What role do scientific institutions and practices play for the gen-

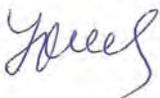
eration of trustworthy science? How do new (digital) tools and patterns of communication challenge trust in science? These were the main questions discussed in three thematic sessions during the symposium at the Bulgarian Academy of Sciences. The speakers of each session, renowned academics with a genuine research interest in the topic at hand, have tackled a broad range of issues from a wide variety of angles.

Following an introduction to the topic by Professor Ed Noort, past ALLEA Vice President and Co-Chair of the Working Group "Truth, Trust & Expertise", each session started with a keynote speech, followed by comments from a scholar of the Bulgarian Academy of Sciences and an international expert, and ended with a plenary discussion. Contributors included

representatives of academies as well as young researchers, covering expertise from various geographical and disciplinary backgrounds.

We are very proud to present you with this rich debate on an extremely complex and relevant issue. It was a day full of highly informative talks and controversial discussions. Our thanks go to all the contributors on stage for joining us, and to the active audience for engaging in the discussions. Special thanks also go to the ALLEA Working Group "Truth, Trust & Expertise" and their Working Group Co-Chairs, Baroness O'Neill of Bengarve and Professor Ed Noort, as well as to the staff of the Bulgarian Academy of Sciences and the ALLEA Secretariat, for their engaged and outstanding support in organising the event.

Professor Julian Revalski



President of the Bulgarian Academy of Sciences

Professor Günter Stock



President of ALLEA until May 2018

Professor Antonio Loprieno



President of ALLEA since May 2018

Introduction

Ed Noort

Distinguished Guests,
Dear Colleagues,

It has been a good tradition to combine ALLEA's General Assembly with a scientific symposium. In past meetings we have mostly chosen subjects related to science, e.g. 'Management of Large Data Corpora' (Berlin 2013), 'Enabling Early Career Researchers' (Oslo 2014), '15 Years of the Lisbon Agenda' (Lisbon 2015), or 'Freedom of Scientific Research' (Vienna 2016). However, our symposium today touches upon a problem that involves not only science and research, but our societies as a whole.

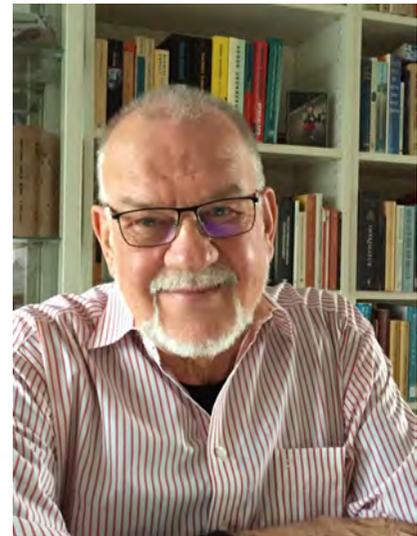
In recent times, we have learnt new expressions like 'alternative facts', 'fake news', 'fake media'; and quite an increasing number

of influential people have stated that science was only one opinion like any other. A growing concern over current political and societal developments and the present image of science reflected in them provided us with the theme for today's Symposium: "Science in Times of Challenged Trust and Expertise".

This symposium and its theme are related to the establishment of a new international ALLEA Working Group on "Truth, Trust & Expertise" in October 2017. The Working Group, composed of a wide range of scholars from various disciplines and European academies, aims at an interrogation and exploration of the current and past dynamics of public trust and the challenges facing academic research

in times of contested norms concerning what counts as truth, facts and scientific evidence.

Within the Working Group, we agreed to convene three thematic workshops in 2018. The



first one in London, chaired by my counterpart Baroness O'Neill of Bengarve, discussed the concept of trust and trustworthiness in general. We touched upon the question of the loss of trust, its relation to trustworthiness, what counts as expertise, and what kinds of expertise should be distinguished when we complain about a loss of trust, which after all might be well placed and legitimate in certain circumstances. The content of the workshop has been published as a briefing, in time for this symposium, in a first issue of the 'ALLEA Discussion Papers'¹. ALLEA has also produced a video on this occasion, introducing the Working Group and its main questions, which is available online.²

¹ Download the paper here: https://www.allea.org/wp-content/uploads/2018/05/ALLEA_Discussion_Paper_1_Truth_and_Expertise_Today-digital.pdf

² Watch the videos here: https://www.youtube.com/watch?v=r7f0OcYcB8I&index=2&list=PLiXD9JULojbtX_qEC9i3hdWjVSTniCPbv&t=1s

Thanks to our wonderful hosts, the Bulgarian Academy of Sciences, it was possible to have the second workshop organised here in Sofia. This time, the participants focussed on trust and trustworthiness specifically in relation to scientific knowledge production and perspectives from different academic disciplines, from physics to the humanities. We discussed the different attitudes towards science and the role of values, beliefs and emotions in practicing and communicating science. The role of ethics in scientific research was debated intensively, not as a limitation, but as an asset for researchers. We also anticipated the third workshop in Amsterdam in late August by debating the dramatically changing media landscape, as well as new dynamics of scholarly publishing.

The third workshop took place in Amsterdam on 31 August later this year. It was chaired by Professor José van Dijck and dealt with the aforementioned changing landscapes of commu-

nication, the role of new media and its effects on trust in science and expertise. The outcomes of the last two workshops are also published in the following issues of the 'ALLEA Discussion Papers'.

The three keynotes were chosen in line with the three workshops and their themes. The first one, "Trust in Experts? Knowledge, Advice and Influence in Environmental Policy" by Professor Susan Owens, Emeritus Professor of Environment and Policy at the University of Cambridge and member of the ALLEA Working Group on "Truth, Trust and Expertise"; she has long-term experience in independent scientific and political advice, and highlights the basic questions of trust and trustworthiness in relation to the specific case of the Royal Commission on Environmental Pollution, which advised UK governments on a wide range of environmental issues from 1970 to 2011.

The second keynote by Professor Antonio Loprieno, professor of Egyptology and incoming President of ALLEA, focusses on

European universities and academies of science, and the question of how to generate trust in knowledge production. He will provide us with an interesting overview of historical turns in the evolution of academies and universities and relates them to changing patterns of generating trust in science and research.

The third keynote is held by Professor José van Dijck. José is the outgoing President of the Royal Netherlands Academy of Arts and Sciences, member of the Working Group on “Truth, Trust and Expertise”, and distinguished Professor of Comparative Media Studies at Utrecht University. Her talk is related to the third workshop on the changing landscapes of communication and is entitled “Trust in Expertise: Communicating Knowledge in a Digital Age”.

After each keynote, academicians from the Bulgarian Academy of Sciences, members of the ALLEA Working Group on “Truth, Trust and Expertise”, and invited international experts comment on the keynotes. Afterwards, the

plenary has the opportunity to comment, make remarks and pose questions.

Finally, before starting with our first keynote, I would like to draw your attention to a reaction we received from the Global Young Academy, a worldwide network of young scientists. Grown up mostly as digital natives, they look for new means to regain confidence in science and propose not only to communicate results of science better, but to have an earlier and more direct outreach to the public. You will find 1-minute video clips online in which early career scientists explain why they do science, what their fascination for science is, and what they are dreaming of.

Now, let us welcome our first keynote speaker, Professor Susan Owens, with her talk “Trust in Experts? Knowledge, Advice and Influence in Environmental Policy”.

Ed Noort (Prof. Em. of Ancient Hebrew Literature and the History of Religion of Ancient Israel, ALLEA Vice President 2012 – 2018) is an outstanding scholar in the fields of Archaeology of Palestine and the literary traditions, the book of Joshua and the history of reception, hermeneutics, and historiography.

From 1979 on he held professorships at Kampen, Hamburg and Groningen. In 1998 he was elected as a member of the Royal Netherlands Academy of Arts and Sciences (KNAW). From 2008-2011 he was the Academy’s Foreign Secretary, focusing on scientific cooperation within Europe and with China and Africa. He is a member of the Academia Europaea (London) and of the Royal Dutch Society of Sciences and Humanities. He has been Vice President of ALLEA and Co-Chair of the Working Group “Truth, Trust & Expertise”. At Groningen, he was the Chair of the University’s Committee on Scientific Integrity. In 2009, the Queen awarded Professor Noort a Knighthood in the Order of the Netherlands Lion.

Trust in Experts? Knowledge, Advice and Influence in Environmental Policy

Susan Owens

Introduction

A paradox has become increasingly apparent in the twenty-first century – it is that the demand for ‘evidence-based policy’ has intensified even as trust in expertise seems to have declined. Bijker and colleagues⁴, in their fascinating account of the work of the Health Council of the Netherlands (the Gezondheidsraad), refer to this as “the paradox of scientific authority” (though the paradox extends well beyond the ‘scientific’ in the narrower sense of that word).

⁴ Bijker, W.E., Bal, R. and Hendriks, R. (2009) *The Paradox of Scientific Authority: The Role of Scientific Advice in Democracies*, Cambridge: The MIT Press.

Expertise takes many forms, and experts are called upon to practise or advise in a wide variety of contexts and for different purposes. I focus here on expert advisors in the context of policy-making in modern democracies. I draw on my own research in the field of environmental governance, including my extended study of one of Britain’s longest-serving advisory bodies, the Royal Commission on Environmental Pollution (RCEP), which advised governments on a wide range of environmental issues from 1970 to 2011.⁵

⁵ Owens, S. (2015) *Knowledge, Policy, and Expertise: The UK Royal Commission on Environmental Pollution 1970–2011*, Oxford: Oxford University Press.

It is worth considering briefly how we should define an expert. Conventionally, we might say that an expert is an individual with in-depth knowledge and/or skills relating to a particular field, and whose expertise is externally



validated through qualifications, certification, peer recognition and other widely accepted credentials. Note that, defined in this way, expertise is unavoidably a relational concept; this will be important in considering the actual practices of expert advice.

In what follows, I examine three interrelated sets of issues concerning expertise and policy-making. First, I ask how we (as scholars and citizens) think about expertise and its role in the policy process, drawing on a range of academic disciplines as well as public and political discourse. Then, I look at possible sources for the view that trust in expertise is in decline – and find a very tangled web. Finally, I try to distil out some of the characteristics of trusted (and trustworthy) advisory systems.

How do we think about expertise?

Below, I offer two familiar models, or representations, of experts and their relationship with the

policy process, before suggesting more nuanced, but potentially more useful, ways of thinking about these interactions.⁶

Rational analysts

In the first of the familiar models, experts are represented as rational analysts, providing dispassionate, authoritative advice for the guidance of those in power. This model, frequently invoked in calls for ‘evidence-based policy’, sits comfortably with ‘linear-rational’ conceptions of the policy process, in which experts provide the evidence and ‘the facts’, while it falls to political actors to make judgements of value. Thus, it embodies a ‘division of labour’, neatly encapsulated in Margaret Thatcher’s declaration (in response to a question in the British House of Commons in 1989) that “[a]dvisers advise, and Ministers decide”⁷.

⁶ See Owens 2015, Chapter 1, for more detail.

⁷ Hansard (official report of proceedings in the UK Parliament), HC Deb 26 October 1989, vol 158, c1044.

As many critics have pointed out (and as policy-making in practice reveals), this representation of expertise bears little resemblance to the role played by expert advisors in the real world, especially when complex and contested political issues are involved. If, as Stephen Turner observes, “[l]ittle about this model is *not* misleading ...”⁸, perhaps the most surprising thing about it is that it is so tenacious, and that we hear it rehearsed, in one policy context or another, almost daily.

Political symbols

A different, but equally familiar, model is one in which expert advice is called upon selectively and strategically to legitimise decisions or depoliticise contentious issues. Experts in this representation are political symbols, and their advice is used as am-

⁸ Turner, S. P. (2014) *The Politics of Expertise*, London and New York: Routledge, p. 4.

muniton. A letter to the Financial Times in April 2017 unconsciously invoked this model in arguing that commissions of the kind that I have researched are “black holes to which politicians consign intractable problems”⁹ — but one can find similar accounts of expert advice in the academic literature and (quite often) in everyday discussion.

This ‘strategic’ representation aligns with views of the policy process as having less to do with evidence than with what John Kingdon calls the “balance of organized forces”¹⁰. It might in some ways be more convincing than the ‘linear-rational’ model, but it is problematic nevertheless in its implication that knowledge ‘doesn’t matter’ in any substan-

tive sense, because policy- and decision-making emerge from the interplay of interests, institutions and power. Yet experience suggests that knowledge does have effect, even if not always directly or in the short term. It is inconceivable, for example, that the profound changes that have taken place in environmental policy over the last half century would have been achieved in the absence of environmental science and other relevant forms of knowledge.

Agents of learning and ‘boundary workers’

Looking closely, we can find elements of both the ‘linear-rational’ and ‘strategic’ models in the environmental sphere, but neither provides a fully adequate account of relations among knowledge, expertise and policy. Instead, in-depth investigations of advisory practices find more subtle and complex interactions in which advisors and advisory bodies act variously as agents of

policy learning¹¹ — synthesising knowledge, developing ideas, (re-)framing problems and articulating advice — and as ‘boundary workers’ (often when the issues have a scientific dimension). In the latter capacity, advisors have been shown to cultivate authority by constructing and defending boundaries between ‘science’ and ‘non-science’¹², while simultaneously bridging boundaries by framing arguments and recommendations so that they have meaning for scientists and policy makers alike.¹³

¹¹ After Hecló, H. (1974) *Modern Social Politics in Britain and Sweden*, New Haven: Yale University Press.

¹² Gieryn, T. (1983) ‘Boundary work and the demarcation of science from non-science: strains and interests in professional ideologies of scientists’, *American Sociological Review* 48, 6: 781–95. See also Gieryn, T. (1995) ‘Boundaries of science’, in S. Jasanoff, G. E. Markle, J. C. Petersen, and T. Pinch (eds.) *Handbook of Science and Technology Studies*, Thousand Oaks, London and New Delhi: Sage, 393–443.

¹³ See, for example, Bijker et al. 2009; Jasanoff, S. (1990) *The Fifth Branch: Sci-*

⁹ R. Ruda, letters, *Financial Times Weekend*, 1/2 April 2017; <https://www.ft.com/content/515caaae-1302-11e7-b0c1-37e417ee6c76> (last accessed October 2018).

¹⁰ Kingdon, J. (2003) *Agendas, Alternatives, and Public Policies*, second edn., New York: Longman, p. 163.

It is important to recognise that these roles, which some advisory bodies combine, have both epistemic and discursive dimensions. Whilst requiring in-depth knowledge and expertise in the 'traditional' sense, they also involve skilful framing, narrative, judgement and the building of trust as critical elements of the advisory process. So, for example, the reports of the Gezondheidsraad took the form of a "well-argued reflection on the state of knowledge in relation to the state of the world"¹⁴, while the RCEP's deliberations "came closer to a form of 'practical public reasoning'¹⁵ than to any technically oriented appraisal of 'the facts'¹⁶. Similarly, Sheila Jasanoff found that expert sci-

ence Advisers as Policy Makers, Cambridge MA.: Harvard University Press; Owens 2015.

¹⁴ Bijker et al. 2009, p. 142.

¹⁵ Weale, A. (2010) 'Political theory and practical public reasoning', *Political Studies* 58, 2: 266–81, p. 266.

¹⁶ Owens 2015, p. 166.

entific committees advising US Federal agencies were adept at producing "serviceable truths", meeting hybrid criteria to satisfy the needs of both science and politics.¹⁷

Not much use at all?

At this point, we might suggest that there is another way of thinking about experts – that they are really not much use at all. This view surfaced (for example) during the UK's EU Referendum campaign and still finds regular expression – as on BBC Radio 4's morning news and current affairs programme recently, when one discussant observed that "people don't want to hear from experts"¹⁸. This sense of rejection of expertise is perhaps an extreme version of the 'loss of trust' hypothesis, but we need to consider, nevertheless, whether and

¹⁷ Jasanoff 1990, p. 237.

¹⁸ BBC Radio 4 *Today* programme, 27 April 2018.

why such feelings have become prevalent, and whether any evidence exists to support the claim that experts are no longer trusted or valued.

Is trust in expertise in decline?

Certainly, claims of this kind are made with increasing frequency. The apparent loss of trust in science, in particular, has typically been portrayed as a negative trend, to be countered by 'public education'. Such '(information) deficit' models (like linear-rational representations of the role of expertise) are resilient, despite growing recognition of the complexity and contingency of science-society interactions. When we examine different sources of evidence on (loss of) trust, however, we find a tangle of apparently conflicting interpretations.

If we consider actual behaviour, we can agree with Onora O'Neill that across a range of their normal activities, people

“constantly place active trust in many others”¹⁹ – though we should also note the point made by Tom Nichols, that “[t]his daily trust in professionals ... is a prosaic matter of necessity [and is] not the same thing as trusting [them] when it comes to matters of public policy ...”²⁰.

We can also look at opinion polls to see what people say about their trust in different professions. Take, for example, the Ipsos Mori Veracity Index

¹⁹ O’Neill, O. (2002) ‘Spreading Suspicion: The nature of trust and its role in society, and is there real evidence of a crisis of trust?’ Lecture 1, BBC Reith Lectures, A Question of Trust, https://immagic.com/eLibrary/ARCHIVES/GENERAL//BBC_UK/B020000O.pdf (last accessed October 2018).

²⁰ Nichols, T. (2017) *The Death of Expertise: The Campaign Against Established Knowledge and Why it Matters*, Oxford: Oxford University Press, p. 172.

²¹ Ipsos MORI (2017) Veracity Index 2017, <https://www.ipsos.com/sites/default/files/ct/news/documents/2017-11/trust-in-professions-veracity-index-2017-slides.pdf> (last accessed October 2018)

published in November 2017²¹ (based on a survey of c. 1000 British adults), in which ‘scientists’ and ‘professors’ came out rather well (and certainly much better than politicians) in terms of whether they were trusted to tell the truth. Of course, individual polls present a snapshot of opinion (which may be influenced by many factors) at a particular point in time, rather than a deep understanding of how people form their views and values (and in interpreting the results, we should take careful note of the questions asked). But we can learn something about longer-term trends from broadly comparable polls conducted over several decades – for example, that levels of trust in ‘professors’ and ‘scientists’ in the UK seem to have risen substantially since the 1980s and the 1990s respectively.²²

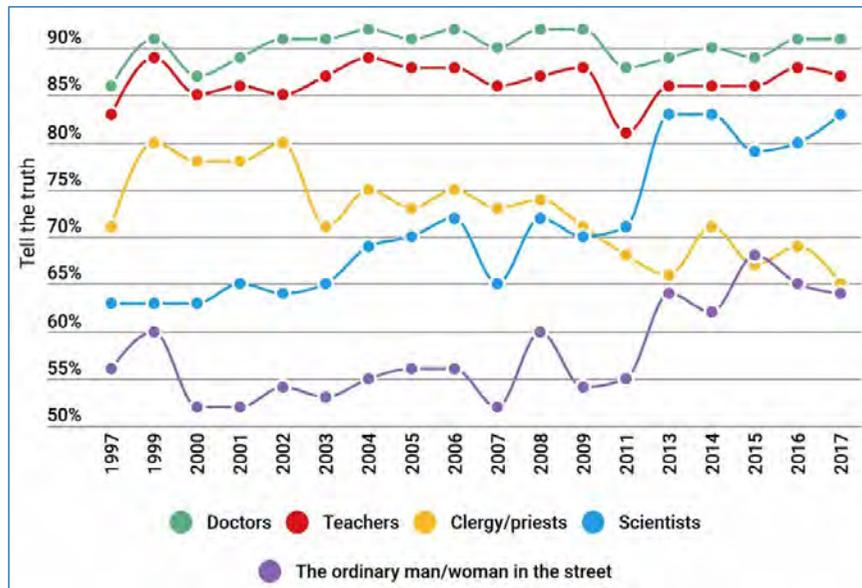
²² Ipsos Mori Veracity Index 2017.

Public Trust in Science in the UK

We might be encouraged, in addition, by apparently high levels of public interest in science – as evidenced, for example, by the popularity of documentaries about the natural world or astronomy. *Blue Planet II*, David Attenborough’s BBC series about life in the oceans, was the most watched television programme in the UK in 2017, with an audience of more than 14 million. Interestingly, the series has since been widely attributed with accelerating UK policy on plastic pollution of the oceans – an example of the kind of “focusing”²³ or “particularising”²⁴ events which have long been recognised as significant in policy formation.

²³ Kingdon 2003, pp. 94–5.

²⁴ Solesbury, W. (1976) ‘The Environmental Agenda: An Illustration of how Situations may Become Political Issues and Issues may Demand Responses from Government: Or how they may not’, *Public Administration* 54, 4: 379–97.



Public Trust in Science in the UK. Source: Ipsos MORI (2017) Veracity Index 2017

But there is countervailing evidence, too. Of great concern is the increasing production and consumption of misinformation and ‘fake news’, especially in digital media. I shall not dwell on these issues, which José van Dijck addresses in her plenary, but I acknowledge that they constitute important and worrying trends,

with substantial implications for trust in expertise. The connection to my argument here is that these trends need to be disentangled from a well-founded critique of, or healthy scepticism about, expert claims.

This is important, because the notion of declining trust in science or scientists has been

reinforced in some quarters by phenomena such as uneasiness about certain forms of scientific enquiry, challenges to expert claims in science-policy controversies, and opposition to some kinds of techno-scientific development (specific biotechnologies, for example). It would be misguided, however, to reach

sweeping conclusions about (lack of) trust in expertise from the existence of such concerns and challenges – even more so if it is concluded that ‘misunderstandings’ should be corrected by the relentless provision of ‘facts’. Instead, we should address the urgent need to distinguish wilful manipulation, ‘fake truths’, or unwarranted rejection of established knowledge on the one hand, from legitimate questioning of expert claims or resistance to particular directions of travel in science and technology on the other. After all, as Nichols argues, “[r]easoned scepticism is essential not only to science but also to a healthy democracy.”²⁵

There is one further point to make on the subject of questioning expertise: in some instances, mistrust in experts may be well placed (or at least, expert claims should not command automatic deference). There are a number of reasons for such caution.

²⁵ Nichols 2017, p. 28.

One is that experts are not omnipotent, and sometimes they get things wrong. Nor do they much resemble the neutral, disinterested advisors who populate the ‘linear-rational’ model of knowledge-policy interactions. Rather, as David Kennedy suggests, we should see expert knowledge as human knowledge, “a blend of conscious, semiconscious, and wholly unconscious ideas, full of tensions and contradictions, inhabited by people who have projects and who think, speak, and act strategically”²⁶. In other words, even the best-intentioned experts have biases and interests, and observers are not always wrong to think that they might be acting upon them, consciously or otherwise.

Further, while experts by definition have competence in

²⁶ Kennedy, D. (2016) *A World of Struggle: How Power, Law, and Expertise Shape Global Political Economy*, Princeton University Press: Princeton, p. 277.

their (often restricted) area of expertise, they do not always have what Turner calls “competence competence” – that is, they might not be competent “to judge the limits or the relevance of their competence”²⁷. Quite often, experts stretch their advice into areas beyond their particular expertise, and in this sense, too, a degree of scepticism about their claims is not necessarily misguided.

Finally, there is the crucial issue of framing. Sometimes, expert claims are rejected because the question the experts have addressed (often at the behest of policy-makers) is not the one that their intended audience is concerned about. The House of Lords Science and Technology Committee identified this mismatch in its enquiry on science and society: “Some issues [that are] treated by decision makers as scientific issues ... involve many other factors besides

²⁷ Turner 2014, p. 281.

science. Framing the problem wrongly by excluding moral, social, ethical and other concerns invites hostility”²⁸

Attributes of trust and trustworthiness

Despite all of the above complexities, it is possible to tease out some of the factors that help to generate (well-placed) trust in experts and expert advice. These include the attributes and practices of advisors and advisory bodies themselves; the institutional arrangements through which expert advice is sought and given; and the political context for that advice, including the nature of the issues involved. I shall deal only briefly with these

²⁸ UK House of Lords Science and Technology Committee (2000) *Science and Society*, Third Report 1999–2000, HL 38, London: The Stationery Office Ltd. <https://publications.parliament.uk/pa/ld199900/ldselect/ldsctech/38/3802.htm> (last accessed October 2018).

matters, providing pointers, I hope, for further discussion.

On expert advisors themselves, I take as an example the Commission that I studied in depth and which was, for the most part, a trusted body (of around fourteen members) throughout the four decades or so of its existence. Its key attributes in this respect turn out to have been authority and autonomy (“the independence thing”, as one senior civil servant put it when interviewed for the research²⁹).

But this statement is not enough. It is important to recognise that attributes like authority and autonomy cannot simply be proclaimed (on the basis of, for example, an individual’s credentials, or the standing of a particular body); rather, they have to be constructed and maintained in various ways. One is that the advisory body itself “must assert, cultivate and guard” its autho-

²⁹ Owens 2015, p. 150.

riety³⁰, and also its independence. Another is that these characteristics must be conferred upon the body by others as well as believed in by itself. And a third requirement is that we must see affirmation of these attributes in real material outcomes over time. All of these conditions held in the case of the RCEP, and they held in part because of the wide range of epistemic and discursive practices in which this body actively engaged. There is space for only two examples here.³¹

First, connecting with the point made earlier about boundary work, it is clear that from the outset, the RCEP acquired authority and legitimacy by positioning itself, and being positioned by others (including government), as a ‘scientific body’. The interest-

³⁰ Hilgartner, S. (2000) *Science on Stage: Expert Advice as Public Drama*, Stanford, CA: Stanford University Press, p. 5.

³¹ See Owens 2015, Ch 7, for further detail.

ing twist to this story is that it was, in fact, much more heterogeneous (in terms of the disciplinary backgrounds of its members) and took pride in being a ‘committee of experts’ rather than an ‘expert committee’. It was this breadth of perspective, combined with individuals’ epistemic authority in specific fields, that enabled the Commission to adopt its distinctive style of rigorous “interdisciplinary deliberation”.³² This in turn enabled it to be both reflective and reflexive in the face of complex environmental issues, and often, in consequence, to produce robustly argued, skilfully framed and ultimately influential reports.

A second illustration lies in the ways in which the Commission guarded and practised its independence. For the most part, it chose its own subjects for investigation, sometimes inconveniently as far as government was concerned; it resisted political or bureaucratic interference (being determined, as one senior civil

servant put it, not to be in any sense “an arm of government ... at all”³³); and, in challenging the dominant policy frame on many occasions, it exhibited a certain fearlessness in offering its advice.

There are many other examples. The point here is that the RCEP, by practising and reaffirming its authority and independence (and by demonstrating its effectiveness), was able to persuade environmental policy communities that it was a trustworthy advisory body. In this it was undoubtedly helped by its continuity and institutional memory, and by its positioning at the intersection of epistemic and policy networks. It remains the case, though, that ultimately the Commission was abolished – and therein lies another story.

Let me turn briefly to the institutional processes through which advice is sought and delivered. Space does not permit a detailed discussion here, so I suggest some questions that need to be asked

and make a cautionary observation. In assessing advisory institutions, we should ask, for example: Is the system open or closed, transparent or opaque? Are those seeking advice prepared for robust challenge (or wanting only reinforcement of their views)? In what sense are the advisors themselves accountable? My note of caution (drawing again on Onora O’Neill’s 2002 Reith Lectures) is that while all of these are important considerations, we should avoid mechanistic, ‘box-ticking’ interpretations of complex concepts like transparency and accountability – not least because (as the case of the RCEP again illustrates) there are genuine tensions between transparency and provision of space for deliberation, and between autonomy (one of the most widely cited correlates of trustworthy advice) and accountability. There are ways, I hope, to deal with such tensions, but they require a subtlety of understanding of expert advice in practice.

Finally, a few comments on the political context for advice,

³² Owens 2015, p. 148.

³³ Owens 2015, p. 151.

taking here the example of complex environmental controversies in which, as noted above, expert claims often fail to persuade and convince. Such controversies typically have some or all of the following characteristics. The evidence is almost always incomplete, and there are deep uncertainties as well as ignorance ('unknown unknowns'). Research may reduce but is unlikely to eliminate these problems, given the nature of the environmental systems and the human–environment interactions involved. The economic and/or political stakes are high. The underlying issues (as the House of Lords Science and Technology Committee³⁴ recognised) are often the subject of divergent values and beliefs, or 'world-views'. New information is filtered through these worldviews, which, significantly, tend not to divide along the familiar lines of 'experts' and 'the public'; instead we find informed people of goodwill

³⁴ UK House of Lords Science and Technology Committee 2000.

(scientists, policy-makers, journalists, civil society groups and others) on both sides. Environmental controversies therefore fall into the realm of "regulatory"³⁵ or "post-normal"³⁶ science, such that we cannot reasonably expect them to be resolved by 'the facts'. Whilst we might want to argue that 'good evidence is defensible evidence', the defensibility of the evidence itself becomes bound up in the controversy. In such circumstances, the most effective expert advice makes use of a wide range of cognitive and discursive strategies, as well as the purposeful hybridisation of science and politics.³⁷

³⁵ Jasanoff 1990.

³⁶ Funtowicz, S. and Ravetz, J. (1985) 'Three kinds of risk assessment: a methodological analysis', in C. Whipple and V. Covello (eds.), *Risk Analysis in the Private Sector* New York: Plenum Press, 217–31. See also Funtowicz, S. and Ravetz, J. (1993) 'Science for the post-normal age', *Futures* 25, 7: 739–55.

³⁷ See, for example, Owens, S. (2016) 'Science and environmental sustainability', *Editorial, Environ. Res. Lett.* 120203 (doi:10.1088/1748-9326/11/12/120203).

Susan Owens (Emeritus Professor of Environment and Policy, University of Cambridge, and Fellow of the British Academy) researched and published widely in the field of environmental governance, focusing on policy processes in modern democracies, relations between science and politics, and the role of knowledge, evidence, ideas and expertise in policy formation and change.

Her most recent book, *Knowledge, Policy, and Expertise* (Oxford University Press 2015) provides an in-depth analysis of the practices and influence of one of Britain's longest-standing environmental advisory bodies (the Royal Commission on Environmental Pollution, 1970–2011), as well as addressing wider questions about knowledge–policy interactions.

Professor Owens also has extensive experience of serving on advisory bodies and currently chairs the Science Advisory Council of the Stockholm Environment Institute.

Comments

Boris Grozdanoff

First, I would like to thank Susan for a very, very interesting paper. There are two things I would like to do in this comment: the first one is to pick up where you ended with your final suggestion and then, if that's permitted, I would like to ask no more than two questions.

I believe that given the rich structure of the problems you so clearly sketched in the paper, your suggestion at the end of the paper, for the hybridisation of science and policy, sounds very convincing to me and I agree with your suggestion. However, I am a bit sceptical about the prospects of implementing and achieving these suggestions. In fact, I believe that most of the people in this

room, scientists and politicians alike, who are confronted with practical aspects of science and policy advice, would see exactly what I mean.

When it comes to trust in experts, or when it comes to trust in scientific knowledge, there are probably three different attitudes towards trust in science, all of which you sketched in your paper. The first one is the level of societal trust in general, the second is trust in experts, and the third and last is trust in scientific knowledge. We are well aware that the latter faces various problems, and you mentioned some of them.

However, I would add another problem which I believe you did not mention in your talk: when the value of scientific

knowledge and science declines in the value system of a society in general, then, of course, it is great to have a heightened popularity of science, enabled by successful popular science. I have to say that the popularity of TV shows, digital media, even popular science books is understandable, but unfortunately it is a 'popular science'. This is great; I try to do popular science myself, and it is one of the basics to educate and to spark the interest of laypeople in science, but of course we must be very careful to still distinguish between popular science and hardcore science. It is in the hardcore sciences where the true knowledge lies, from which politicians and others should take advice.

I am not extremely optimistic about the dynamics regarding the value of scientific knowledge in societies. Naturally, there are different and quite diverse societies and, of course, there are huge differences within and across societies. For instance, the UK has a unique attitude towards scientists. In the US the attitude is quite similar, though still noticeably different. In my home country Bulgaria, trust me, I witness a very, very different attitude towards science and towards people who do science for a living. I am a bit sceptical on how the value system could back up your suggestion on a large basis, seeing as values are not universal.

A second possible attitude is obviously the one of professional science and scientists towards what they do, towards their own creation of scientific knowledge and biases. Yesterday, in the second workshop of the ALLEA “Truth, Trust and Expertise” Working Group, some

things were mentioned that are really, really interesting in this regard: that it might be in fact the scientists themselves who question their own procedures and results mercilessly and the most. That’s the way it is supposed to be. The question is now, how good are the different scientific disciplines at this? From what I heard yesterday, astrophysicists are quite successful at it, which maybe is a good model for other sciences, especially the social sciences and the humanities, to adopt. I believe that this attitude is probably the most promising to maintain and regain trust in science. I believe that scientists should manage sooner or later to achieve the balance that would allow them, as a global scientific community, not to sell scientific knowledge but put it forward in a carefully reflected and successful manner.

The third and last attitude is, unfortunately – or maybe fortunately – the attitude of the administration and the governing

bodies towards scientific knowledge and scientific advice. The two models you presented in your talk – I completely agree that this is roughly what we observe in modern society as to possible attitudes and possible and actual dynamics towards the advice of experts. But here I am again also a bit sceptical. I believe that probably we share in a way this scepticism that scientists are successful in conveying their knowledge to the public. This seems to be true no matter how good the expert is, no matter the veracity of their statements, no matter how clearly the advice is given to the politician, because obviously not all politicians are scientists, and, obviously, it can be a technical challenge to understand what a professional scientist is telling you.

What would happen if Professor Luke Drury, a renowned astrophysicist, goes to a politician who is not a physicist? I saw that he is more than capable of lucidly explaining complex things,

but it is a very difficult task to understand a specialist if you are a stranger to the field. So even if the politician has the best of intentions to act accordingly from a benevolent normative basis so that she or he tries to use the professional advice for the best of society, there remains the reality that he or she might not understand the implications of the scientific knowledge transmitted to them.

To conclude, I would like to connect your suggestion and my questions. Obviously, the way to go is, as you call it, hybridisation of science and politics – and to some extent we do see this happening. The question is then if it is realistic to expect, if not full, but a sufficiently rich level of hybridisation of science and politics, let's say 50% of politicians, to be professional scientists. Not necessarily people with degrees, but people who have experi-

ence in the scientific enterprise. Would such people be electable? We cannot tell the people who should be elected, we can do advertisements and promote them, but as scientists we have no power over the democratic election process. In fact, I am not sure if it is possible to achieve this sufficiently rich balance through the hybrid model you are suggesting.

Don't get me wrong, I am hoping with all my heart for this hybridisation to take place, I am just a bit sceptical. I believe that when we look at the differences between societies, you will see that some societies are much more prone to this model than others. Unfortunately, even within Europe, our countries seem to differ in a non-trivial way with regards to the attitudes of our respective governments and society in general towards hybridisation.

Boris D. Grozdanoff (Professor of Philosophy, Bulgarian Academy of Sciences) is a philosopher of science who works in the fields of scientific epistemology and metaphysics. He holds doctoral degrees in analytic epistemology from Central European University and in the philosophy of science from the Bulgarian Academy of Sciences. He won the prestigious Marie Skłodowska Curie Fellowship in 2008 and worked as a researcher at the Philosophy of Physics group at Oxford University until 2010. He has published intensively on the role of thought experiments in science, and on the a priori dynamics of scientific theories. Recently, Professor Grozdanoff has oriented his interests towards the multidisciplinary field of digital security, where he works on novel cryptographic approaches towards access control solutions.

Comments

Cathrine Holst

First, I must confess that I have no genuine quarrels with Susan Owens' subtle and thoughtful treatment of the topic under investigation. I think she, in precise terms, captured the role of expert advice in contemporary policy-making. She neither over- nor underestimates the problem of diminished trust in experts. And she interestingly lists some characteristics of an expert commission that people have tended to trust.

I have prepared three remarks, all primarily to be regarded as additions to Susan Owens' approach, and as input to our discussions.

First, I want to present and discuss some features of the expert advice commissions I myself do research on, namely the

Nordic style temporary advisory committees. Second, I will say a little bit about the democratic concern often raised in discussions of experts' political role. Thirdly, I will argue that some kind of rational model of expert advice may not be such a bad thing, if we make sure to define what a rational approach means in a sensitive manner.

First, a remark on the Nordic committees: Just like the commission Professor Owens presented to us, these committees are quite strongly trusted – they are generally regarded as well functioning and have high legitimacy. They are also committees where scientists and academic knowledge play a central role. These committee systems have furthermore a long history, go-

ing back to the 19th century, and are conceived of as a vital part of the Nordic governance model. The committees in question are typically temporary, not permanent – they work for 1-2 years synthesising knowledge in some area, formulating policy recommendations, and sometimes drafting legislation. They are relied on in the policy-formulation phase across policy areas, from economic policy and foreign policy, to labour market policy, family policy, and environmental policy. Finally, many of these committees are influential as agenda setters, establishing the knowledge basis, framing policy problems, and suggesting measures and tools to solve them.

Yet, in contrast to the commission Susan Owens just spoke

of, these committees, at least up until recently, have been so-called hybrid committees. They have consisted, typically, of a critical mass of academic researchers, but also of civil servants and interest group representatives. The high level of trust in these committees is thus not due, seemingly, to a specifically 'scientific' image. Rather, what people seem to put trust in is the way these committees combine competence and compromise between different societal interests.

Recent findings from our research on these committees show, moreover, that scientists and academics play an increasing role in these committees – there is a significant increase in the share of university professors and other academic researchers around the committee tables, and among the committee chairs. Notably, this growing role of scientists and academic knowledge does not seem to have increased public trust. Rather, these devel-

opments have spurred a more pronounced public criticism of 'experts taking over policy-making', 'experts becoming more powerful in our society', etc. At the same time, there is reason to argue that the epistemic quality of the committees' deliberations and reports have increased as a result of the growing role of scientists and academics – to the extent that we are able to study and measure this. One interpretation of such findings is that increased epistemic quality and increased public trust do not necessarily go together, so that delicate trade-offs may be needed.

Additionally, also in contrast to the commission Professor Owens describes, these committees have been highly trusted, even as the bureaucratic control has been and still is considerable. The ministry in charge selects the members and chairs of the committees, formulates mandates, and civil servants serve as committee members, and dominate in the committee secretari-

ats. Hence, independence from bureaucratic regulation is not a necessary condition, seemingly, for public trust in expert advice arrangements. However, regulations must be such that they do not compromise the experts' independence to deliberate freely and to apply their knowledge as they see fit. Furthermore, for these committees' agenda setting power, their relatively close links to bureaucracy may not have been such a bad thing. Civil servants have supplied the committees with important regulatory expertise and ensured, in many cases, a more effective implementation of the committees' recommendations.

My second remark: Susan Owens emphasises rightly that there are legitimate reasons not to have blind trust in experts, since it is well known how experts, scientists included, make mistakes and can be biased in a range of ways - by self-interest, by normative commitments, by their disciplinary approaches, etc. In addition, I do think there

is a legitimate democratic concern. Experts' agenda-setting power in policy-making gives them extra political power, and this extra power to experts may come in conflict with democratic norms of political equality and equal participation. This legitimate democratic concern should not make us too dismissive of experts. If we are to formulate sound public policies, we need, I think, to rely on a considerable amount of input from experts, as well as from other sources. However, the democratic concern must be addressed somehow, and some scholars have suggested that expertise itself must be democratised. Institutionalising lay participation and influence in expert bodies can work well, and increase accountability, but reforms along these lines must be designed with care so the epistemic qualities of expert advice are not compromised. Another way would be to increase participatory credentials elsewhere in the political system. Maybe

the problem is not so much the obviously limited democratic merits of expert organisations, but rather that party democracy seems to degenerate in many countries, that civil society is becoming less vibrant, etc.

My third, and final remark is on whether we need a rational approach or model for expertise and expert advice. We must first distinguish between empirical and normative considerations. Even if our current practices are not particularly rational, we may want to – and try to – make them more rational. Naturally, whether this is a good idea or not, depends immensely on how you define 'rational.' I agree completely with Susan Owens that the idea of experts as providers of 'pure evidence' is a flawed idea that we should dismiss. However, what we ought to strive for is to organise expert advice arrangements in ways that are reasonable, and that give adequate scope to reasoning, deliberation, and epistemic concerns.

In this connection, two issues that Professor Owens aptly raised should be highlighted in particular: First, there is every reason to think that cognitive diversity in expert committees results in better deliberations and recommendations. Over time, epistemic monism and dominance by one or few disciplines will be a problem for the quality of our policies. That is why we, in our research on the Nordic public advisory committees, have raised concerns over the steep increase in the share of economists in the committees. We certainly do need economists' advice when designing policies, but economics is not all there is.

Second, any expert committee will be confronted at some point with moral problems and broader societal concerns – policy issues are rarely, if ever, exclusively technical. We need thus to have our experts trained not only within their narrow field, but also in how to deal with moral and social concerns in ways that are both reasonable and trustworthy.

Cathrine Holst is a Professor of Sociology at the University of Oslo. She is also Senior Researcher at ARENA Centre for European Studies, University of Oslo. Previously she was Associate Professor in Philosophy of the Social Sciences, University of Bergen.

Her main fields of academic interest are political sociology and democracy research, social

and political theory, the role of expertise in policy-making, European integration, and gender and family policy. She is currently leader of two research projects on science advice in democracies, 'Expertization of public inquiry commissions' (EUREX), and 'Why not epistocracy? Political legitimacy and the fact of expertise' (EPISTO).

She has published in jour-

nals such as *Science and Public Policy*, *Acta Sociologica* and *International Studies in the Philosophy of Science*, and is editor of several recent and forthcoming special issues including in *European Politics and Society*, *Social Epistemology* and *Journal of Public Deliberation*. Her most recent book is *Expertisation and Democracy in Europe* (2018).

Reaction to Comments and Plenary

Susan Owens

Reaction to Comments

Those are absolutely fantastic comments and questions! Ed has instructed me to give short responses, which is a bit of an impossibility. I agree with a great deal of what has been said, but I will try to respond in some way at least.

In response to Boris' scepticism about the value of hybridisation, I agree that the concept of hybridisation is complex and difficult. I want to emphasise that it doesn't in any sense at all undervalue the contributions of both science and politics. It is not saying that science is less valued. What I would observe, though, is that when people – including myself, Cathrine Holst, Sheila Jas-anoff and many other colleagues in the field – have actually taken

a long look at an advisory system in practice, we see hybridisation actually working. When you talk to people who do documentary and other forms of in-depth analysis, hybridisation is not just an aspiration, it is an empirical observation of what is making the most effective advice work in practice. So, I think it's important to recognise that through research we have evidence that, when advisors employ both epistemic and sophisticated discursive strategies, their advice is more valued.

I also wanted to say a little bit about your questions on the relations between scientific advisors and policy makers, including politicians. I have thought for a long time that greater humility is needed on both sides of these relationships. We quite often say it would

be good if policy makers had a better understanding of science. I think it's true that all of us should have a better understanding of science, not only policy makers. It is, however, less frequently heard that scientists ought to have a better understanding of policy and political processes. I've heard expressions of the former view [that policy makers should have a better understanding of science] in many, many meetings. But I've also heard interpretations of policy processes that are the social science equivalent of thinking that the sun goes around the Earth! The relationship needs to work both ways.

I have been involved in another study of actual advisory practices with my colleague James Palmer. In this case, the UK system of having a Chief Sci-

entific Advisor in every government department on the whole seems to work rather well. One of the most important things is that trust is built between the advisor and the politicians that he or she is advising. Those relationships of trust have turned out to be, I am tempted to say, almost as important as the quality of the scientific advice given.

I think those are the main points that I wanted to make. I am sure, however, I could discuss at much greater length some of the things you raised.

Cathrine also raised very important issues. I meant, but didn't have time, to say that the linear rational and strategic models that I outlined at the beginning of my talk are in a sense caricatures, but they are quite lasting caricatures. I would argue that, when we look at environmental decision-making, for example, we do in fact see elements of both, depending on the issue. So, I like to think that some sort of hybrid model, in which advisors act as agents of policy learning and as boundary workers, does not preclude a

rational analytical approach, or a strategic approach, in certain circumstances. Certainly, on a number of occasions, the Royal Commission that I studied was used strategically – there's no doubt about that. But, certainly, when it was first formed in 1970, the intent was to create a rational analytical body.

I give you one last example: When the Commission published a very important report on lead in petrol in 1983, it produced no new scientific evidence but, in contrast to previous advice and to the government's established position, it said: "get lead out of petrol quickly". By then the government was in a very difficult position in the run up to a general election, when the opposition had accepted that lead should be taken out of petrol. That report turned out to be the fastest ever accepted advice from the Commission – a radical recommendation was accepted within 35 minutes. When I interviewed people, they could remember ministers running down corridors waving the Royal Commission's report

saying: "We've got it!" The report enabled the government to perform a U-turn without losing face. That is strategic use of advice, but nevertheless we should not underestimate the significance of the skilful framing of that report. So, I think we should be realistic about what to expect in practice. Advice isn't just a presentation of facts; a lot of other activities are involved.

You mentioned that Nordic committees were more hybrid in that they include policy makers. I understand that this is a very interesting and different model. However, the Royal Commission in a sense had some elements of that, too. Until the late 1990s, at least one of its members at any one time was also a member of the House of Lords and therefore a parliamentarian, so in that sense the Commission was linked directly into the legislature, which is of course rather important. And it always included two or three members with backgrounds in different sectors like industry or agriculture. It was never an entirely academic body.

Even so, it was sometimes criticised as being ‘too academic’.

On the very interesting point you raised about independence – of course, there were multiple opportunities for bureaucratic meddling with the Commission. There were opportunities for political interference. My argument is not that those opportunities did not exist. In fact, the members of the Commission were chosen by the ministry, sometimes in consultation with other ministries, and then had to be approved by the prime minister. One or two prime ministers are reported not to have approved a member every now and then. The formal situation was that members were appointed by the Queen, and all the reports went first to the Queen. My point is that the Commission exercised a functional independence in its actual practices. Every now and then governments tried to interfere with the reports but the Commission sent them packing every time. On some occasions, it chose subjects that the government of the day was horrified by.

In that sense and in the actual drafting of its reports, it demonstrated a functional independence.

Reaction to Plenary

Question: Do we need more scientific literacy in policy and society?

In education, certainly in our system in the UK, we increasingly create specialists. So, all through the system people are becoming more and more specialised. I think there is a deeper question: In some sense, sometimes, the natural sciences have been juxtaposed with culture. I used to serve as a social scientist on the Royal Society’s Science Policy Advisory Group and I was very impressed at that time by the determination of the Royal Society to try to engender an attitude whereby science was seen as a crucial part of our culture and not something separate from it. I agree very much about not just understanding certain things about science, but also under-

standing the scientific method and why it is so important. In that sense I agree with a call for more scientific literacy.

Almost equally, I’d like to see people who are literate in the workings of democratic institutions – how they go about their business; how decisions are made; why sometimes people must live with decisions they don’t like. When it comes to university learning and education, I think that we have more challenges, because in a sense we are trying to make people specialists in their field. In my own university, some graduates in natural sciences have also completed a course in History and Philosophy of Science, and I think this is tremendously useful. There should be some way of introducing every scientist to some of the basics of politics and policy making and also to provide people in the Social Sciences and Humanities with at least an introduction to the sciences. How you do this in crowded curricula is a challenge but perhaps it is one that the Academies can rise to.

European academies and University: How to Generate Trust in Knowledge Societies?

Antonio Loprieno

It's a distinct pleasure to be here as a scholar today before being officially enthroned – as if ALLEA needed a throne at all – tomorrow afternoon. What I'd



like to entertain in the next 20 minutes are some observations on trust from the point of view of the dual experience I have had in recent years, which was also mentioned by Ed Noort before.

One of it is my socialisation as a scholar: I am an Egyptologist, so I am a historian of culture, on the one hand. Then, second, I had the privilege to serve as president of my university for a longish – some colleagues would think too long – period of time. This provided me with a kind of double approach to the issues discussed here today.

What I would like to think about with you, is the role of the two main institutions concerned with expertise: The academies of sciences, and the universities. I will ask how the type of trust these institutions have generated

has evolved over time. We will accelerate this historical observation as we come closer to more recent times.

Let us start with the beginning, in this case the Middle Ages. In the Middle Ages, 'academy' was simultaneously the academy in the modern sense, as well as the academy in the sense of the university. So, to illustrate my point, and to be faithful to my own university, I chose one of the first representations of the University of Basel, called the *academia basiliensis*, which is in fact a classroom of people listening more or less attentively to the words taught by the professor.

In this intellectual milieu, which was synonymous with the intellectual milieu of Europe until the Renaissance, the acad-

emy was meant to create societal elites – basically in the three main areas of church, law and medicine – based on a scholarly (*trivium*) and scientific curriculum (*quadrivium*) in the faculty of *artes liberales*. There was a very strong embedment of the academy in professional life, which is something I like to remind us all of when we hear about the distance that has emerged – or that has been claimed to emerge – between academic life and real-life concerns. The consequence of this utilitarian perspective – closer to the contemporary discourse of return on investment in higher education – was the elevated position of academia vs. other societal groups. At the beginning, trust is linked with an expertise in the professional areas. Academia was thus eminently trustworthy.

This academy of the Middle Ages was also a very global enterprise. Scholars were free to move, it had no national dimension at all. Academic formation provided membership in a community of scholars who moved freely across

local political boundaries. There was no ‘national’ university in the modern sense. It was a very, very European endeavour.

At the same time, even earlier and at an equal level of intellectual distinction, in the Islamic world, universities emerged. Al-Azhar would be a typical example. Those universities were not based on the principles that I referred to – namely the embedment in a particular professional function – but rather derived from a religious point of view. This is an important aspect to stress here.

Things then change a little bit in early modern times. They see a kind of dualism – a double development – in which the concept of academia and academy acquired the double meaning that it now has. The Renaissance brought about a semantic split between academies as learned societies and universities as institutions of higher education. We have certainly observed that, when we use the adjective ‘academic’, it refers to the Latin word

academia and it basically refers to universities, whereas the noun ‘academy’ does not cover the same semantic field. Now, in the sixteenth century, there was a development, especially in Italy, of academies in the sense of learned societies, basically as a private enterprise. We would now probably consider those a think tank.

Slightly later, in France, there was a new, relatively different model of academy that developed. A model of academy which is founded on the idea that the support of science represents a ‘national’ endeavour. Academies were seen as players within the state’s scientific and educational policy. The general academic endeavour was to generate trust as part of a national enterprise.

Things changed rather drastically in the nineteenth century, when three models of academic practice, each with a different cultural setting and within a specific national agenda, find their way into academia: the Humboldt model (research-driven educa-

tion), the Newman model (liberal arts education), and the Grandes Écoles (technological training). The distinction in our minds between universities and academies is basically a product of this development.

(1) The Humboldt model holds a disciplinary view of academic formation: students are seen as junior colleagues and confronted with research. The idea is to build competent people in one particular field of expertise. *Ausbildung* (academic training) entails general *Bildung* (education). The institutional unit is the faculty (Dr. phil.).

(2) In the Newman, Anglo Saxon model, general education introduces students to a canon of texts and methods which prepare them for social, professional or scientific activity. It prepares them for citizenship in society. Education precedes specialisation. Main unit is the College (BA > MA).

(3) In post-Napoleonic France and in federal Switzerland, the Schools of Engineering are the ideal education path in view of an

elite profession and civil service. The purpose of academic training is professional qualification (Diploma).

These three models of academic life and higher education are mirrored by a relative unification of our concept of academy along the German model. Academies are developed based on an Enlightenment agenda, not only in Germany, but also throughout Europe and even in the United States. It sees the academy as an expression of a higher level of university activity. Academies are state funded, but autonomously run Learned Societies without a teaching function, have a strong research agenda, and are administered by professorial governance. They are divided into classes, usually for humanities and natural sciences, sometimes also for arts and medicine. Prototypical function is the support of long-term scholarly endeavours like dictionaries or collective works. In this model, trust is provided by the fact of providing and cultivating a certain

university-level research, which is mirrored by an elite position in society.

We could say that in this particular development in the nineteenth century, both, at the side of universities as well as on the side of academies, we find a conception of trust that derives basically from status. That is, by the very fact of being a member of academia/ academy you deserve trust and you expect trust, but you are also a steward of trust. There is an automatic development which considers the quality of being an academic, because of its eminent status within society, as a basis for the creation of trustworthiness.

This is the intellectual horizon that remained pretty much unchallenged until the end of the twentieth century. A conception in which trust in science and scholarship is firmly controlled by the academic communities in both senses: in the sense of academy, and in the sense of academia. While there were indeed considerable differences in the type

of academic education aimed at in these models, and in their impact on their respective societies, all of them entailed a hierarchical break between 'academia' and 'society' that – in largely poorly educated contexts – fostered the equation 'academic → eminent → trustworthy'. Until the end of the twentieth century, trust in science and scholarship was firmly controlled by the academic communities. Methodological debates (e.g. monism vs. dualism or positivism vs. hermeneutics) were confined to the academic circles. The appropriate reliability of intellectual or epistemic models was at that time basically an internal enterprise of the academic milieus and hence not so largely discussed within society.

Things changed dramatically, also in terms of the generation of trust, some time at the end of the twentieth century, which I describe as a 'cultural turn' in academia. This change has to do with a radically different model of university that developed in the last twenty years. One that is sur-

prisingly similar, but that has to a certain extent neutralised the original positions that existed between the three models that we saw before. It is a development that is basically mirrored by three main changes in university life.

First of all, a change in governance: public universities used to be embedded in their respective state, but they have increasingly acquired autonomy. Autonomy has become a buzz word in university life, but of course we all know that this is a kind of bizarre type of autonomy, because it is an autonomy under basic financial control by the carrier of the public university, which in very many cases is the state. European universities gradually emancipated from political control, but their newly acquired autonomy does not reduce their financial dependence on public policy makers. This has forced universities to develop strategies and replace traditional mission statements with more competitively oriented strategies, precisely because they de-

velop a common governance as institution.

The second development is on the organisational level. Universities, especially in the Central and Southern European world, were basically virtual entities divided into their institutes, faculties or departments, but with no cohesion at the institutional level. So, there was no rallying behind the logo of the University of Basel or the University of Zurich twenty or thirty years ago. The autonomy of the university creates a form of stress on the role of the institution per se – a kind of tightening the administrative screws of the institution, making it more compact.

The third level, which many complain about a lot, is a certain development of administration, which is also partly due to the autonomy of the universities. It started in Great Britain in the 1980s, but then soon developed in Continental Europe. Various forms of new public management are established in response to political and social expectations of trans-

parency and accountability. In this model, efficiency tends to be privileged over effectivity, including in instructional aspects, e.g. the recurrent curricular reforms in the wake of Bologna 1999. While institutions of higher education until 1999 were operating with a set of common values guided by a mission statement, since 2000 they were operating with different institutional goals and thus a strategic plan.

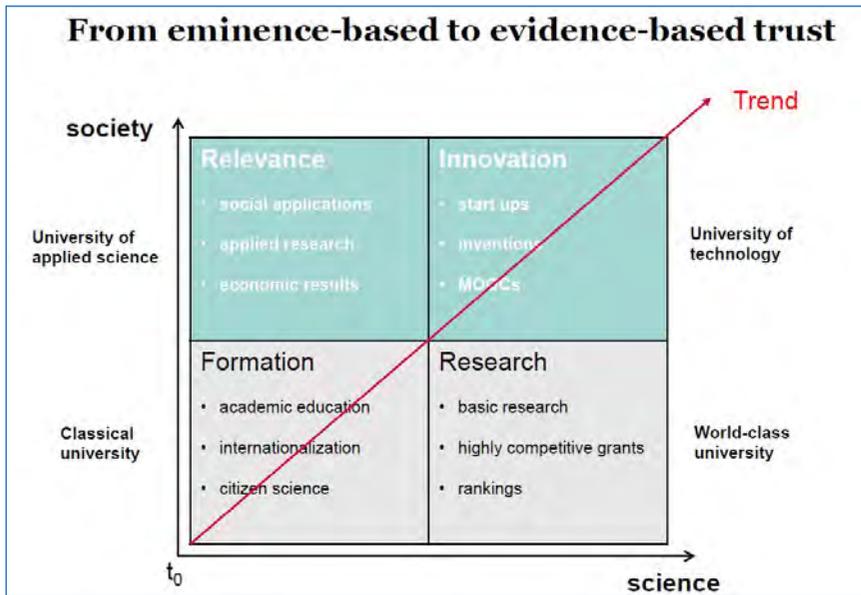
These changes around the turn of the 20th to the 21st century also challenged the monopoly of trust founded in the status we saw before. The 'societal turn' (*Vergesellschaftung*) of European higher education since the turn of the century has brought about the emergence of a competitive 'academic market'. The university is appropriated by society at large and becomes one of the stakeholders of society. As a consequence of these changes, the so-called 'economisation' of higher education or the development of a professional academic leadership, the ownership of scientific

'trust' – and of other emotionally loaded concepts such as 'excellence' or 'evidence-based results' – has shifted from the scholarly community as a whole to the academic institutions themselves. Trust shifted from the scientists to the institutions. This process has weakened the position of academies vis-à-vis universities, because they have remained at the margins of the institutional turn of the late 20th/ early 21st century. Universities were better at dealing with these societal changes.

The mentioned trends can be summarised as a move from eminence-based to evidence-based trust. Universities have acquired one of the controls of trust which were traditionally typical of academies: the dialogue between science and society. Universities are now much more in control, in stewardship, of this dialogue than they were before. They have also widened their portfolio, widened their perspective, depending on whether a university decides – or has the potential – to stress rather the application of

science in society, or pure science per se, or innovation. You find a variety of options at the institutional level, which makes universities extremely attractive partners, even more than the single scientist.

The latest development I would like to touch on is a relatively recent trend. Trust now seems to derive from algorithms. This comes together with a perceived loss of trust in science as the result of an inflationary availability of information, brought about by the 'digital turn' (big data), which dialectically interconnects with the success of populism. While the cumulative effects of previous layers – status-based and institution-based – are still in place, making a statement by a professor more trustworthy than a statement by a politician, and a paper by a scientist at Harvard more trustworthy than a paper by a scholar from a junior college, trust generally tends to be increasingly measured in quantitative terms. What is popular appears to be trustworthy. This 'democratisation' of trust



– in a somewhat idiosyncratic meaning – represents an enormous challenge for the classical understanding of trust based on Enlightenment values.

Another challenge is that the digital turn neutralises the individual, authorial or profes-sorial ownership of knowledge (from Wikipedia to Open Access to Massive Open Online Courses) and confronts academic educa-

tion with the constant need to emphasise the individual contribution to contextual social knowledge. As an example, selected articles on Wikipedia are by far better than an article by an individual and thus also more trustworthy, as they are constantly being checked and reviewed.

Moreover, the end of post-68 academic culture and the gradual emergence of a dichotomy

between ever more specialised research and ever less social openness calls for attention by the world of academic education, which should become more involved in securing a broader access to knowledge.

Last but not least, the knowl-edge society is based on a large number of specialised (fore-grounded) fragments of knowl-edge based on punctual re-search, rather than on general (backgrounding) interpretative horizons likely to generate trust. Thus, focus on research turns out to be a mixed blessing for academic education.

To meet these challenges, academic institutions (academies as much as universities) should concentrate on the contextualisation of knowledge: in times of social (as opposed to individual) knowl-edge, the challenge is not so much to convey knowledge that is in general broadly accessible online, but rather to provide hermeneu-tic frames that allow the public to discriminate between plausible and implausible knowledge.

Antonio Loprieno is a renowned scholar in Egyptology, Linguistics and Semitology with a special interest in science management. From 2006 to 2015, he served as Rector of the University of Ba-

sel and from 2008 to 2015 he was the President of the Rectors' Conference of the Swiss Universities (CRUS). He is currently Professor of History of Institutions at the University of Basel and has delved into

the history of organisational structures of the international academic world. In May 2018, he assumed his positions as President of ALLEA and the Swiss Academies of Arts and Sciences.

Comments

Nikolay Vitanov

First of all, Professor Loprieno is a historian, whereas I am a mathematician. It would thus initially seem, on a superficial level, not to be very productive for me to comment on his talk in great detail – which is devoted to the evolution of the academies of sciences as a distinct institution in contrast to universities, as well as to some modern trends of trust and trustworthiness that go along with these developments.

However, I nevertheless decided to follow an old Japanese tactic: you know, in ancient Japanese warfare, when there is a battle and the main Daimyō attacks, his move is usually accompanied by the move of another one, which is called Karō. The Karō usually makes a flank attack supporting the main Daimyō. Both are accom-

panied by a third actor, a very important person: he, or in this case, she, in the person of my fellow discussant Professor Zic Fuchs, has to kill everyone that is left after the attack of the main Daimyō and the Karō. What follows now is my move as the Karō supporting the main Daimyō, in this case Professor Loprieno.

Being a mathematician, my talk will be a rather technical one. We are mostly scientists from universities in this room, or from institutes of academies as in my case. We all engage in producing information, which should be based as much as possible on scientific evidence and which follows established conditions for 'good' science and research integrity. Our information is knowledge. However, there are many

other people out there that produce another kind of information, which is nowadays often referred to as 'fake news'.

All of us, the people who produce knowledge and the people who produce fake news, must 'sell' our product to society. Society, in turn, has several coordinating mechanisms. One of them is the market rules, which generate the consumer prices based on supply and demand, and whose shaping role has been brilliantly described in the keynote. I will not discuss this relation between universities, academies and the market here.

The second coordinating mechanism is social hierarchy. I do not want to discuss the hierarchies between universities and academies, either. Prof. Loprieno

has shown us convincingly that universities are much better integrated into societal hierarchies than academies. If we as academies want to survive, this has to change.

The third coordinating mechanism is trust, and this is what I will speak about now:

First of all, what is trust and why is trust connected to numbers? There are many definitions of trust. As a mathematician I would like to use the following working definition: trust is a subjective probability in our mathematical world. This is called a Bayesian approach: the subjective probability with which an actor engages with another actor or a group of actors and performs a particular action. Before engaging with other actors in such a way, one can monitor actions or one's capacity ever to be able to monitor it in a context which affects one's own actions. This is the definition of trust I am using in my work.

I would like to add another definition: Trust is confidence in

another's good will. Trust can be generated, so it has sources and measures. Trust also has targets. One source of trust is familiarity through repeated interaction. Second, interest can lead to trust: you calculate your interest and there is a mathematical utility function regarding the expected trust. This can lead to trust, too. Thus, values and norms can also lead to trust. In a very rough scheme, these are the sources of trust.

The mechanisms through which trust can be generated are: direct interpersonal contact, reputation networks, and our understanding of the way institutions shape other actors' values and behaviour. It is the shaping of other actors' values and behaviours that is called education.

We can also identify several targets of trust. A targeted object of trust can be a person, some system, or some form of community. Finally, there are some features of the object in which we show trust, and this is called contractual trust. It means the

other party is consistent, competent, and loyal. This is 'good-will' trust. The other party is honest, the other party is open, and trust can thus be generated.

Now, I would like to add some comments regarding one of the arguments brought forward by Professor Loprieno in his keynote speech. He stated that academies are not in the position to compete effectively with the universities. What can we do about this? Let us go back to the discussion about the conditions of trust: How can we generate trust to gain legitimacy and meaning?

As I mentioned before, one source of trust is familiarity through repeated interaction. My colleagues from the Bulgarian Academy of Sciences might remember that I constantly told them in this hall: "You have to go to speak to the government! Integrate yourself more with the government as well as with the wider society, our community."

The second issue is interests; we must know our interests. What are the interests of acad-

emies, especially the BAS? Do we know our interests? I fear that most of the times we do not fully know our interests. I will tell you one thing: There were more than 15 attempts to remove me from one important commission and more than half of the committee came from the BAS. So, OK, when you remove me from that Commission, it would not be in the interest of the BAS. This is just one example.

The third source of trust is values and norms. We can change norms! We are able to do that. The members of academies, the members of universities, and even if we are speaking about the entire academic community, we can change values and norms in society together. We are powerful! But at least here in Bulgaria, this is not done or not done effectively. Let us therefore remember the mechanism of direct interpersonal contact: Go to the governmental bodies and government commissions! Build reputation networks! Do not stay in your laboratories. Take

the example of Newton: when he became member of the House of Lords, he started to build reputation networks, too.

How to increase trust in the academic community? We have to work a lot in several directions so that the trust in us increases. The people must have confidence in our good will to produce true knowledge and not fake news. We must thus be consistent, competent, honest and open.

I want to stop this now, because I am also dealing here with people who are more practitioners than theoreticians. To conclude my speech for today, I would like to give our Bulgarian colleagues one final advice. In order to give this advice, I am wearing a special dress here today, you see? You can see the tigers? [pointing at tigers printed on his shirt]

We have to be like these tigers! There are different levels of activity in which we can engage, and I tried to sketch them in my talk. In Japanese, Tiger is Tora. Hence 'Tora' could mean to be active like a tiger. 'Tora, Tora'

could mean to be active like two tigers. Our activity can be even bigger. As some of you might recall, 'Tora, Tora, Tora' was the well-known Japanese signal to attack Pearl Harbour, for instance. As you can see, the tigers on my shirt are more than three. So be active! This is my practical advice to all of you. Any appropriate action has more value than thousands of words.

Nikolay K. Vitanov is Vice-Director of the Institute of Mechanics at the Bulgarian Academy of Sciences and Head of Department of Fluid Mechanics. Among his research interests are mathematical models of complex social systems. He is author of the book "Science dynamics and research production. Indicators, Indexes, statistical laws and mathematical models" published by Springer Publishing House in 2016.

Comments

Milena Žic Fuchs

Professor Loprieno, thank you very much. Discussing the presentation by the incoming ALLEA president appears to be a kind of delicate position and I will do my best to live up to the trust that ALLEA has awarded me. I will do so by touching upon certain aspects of your talk and pick up on a couple of ideas that I see critical.

To start with, I would like to thank you for a very thoughtful and inspiring talk on the historical trajectories of two academic institutions that most of us in this room here today have extensively dealt with in one way or another. I really appreciated your concise overview of the multifaceted development of universities and academies across Europe. I think

those historical trajectories are especially relevant because they imply the possibility of change from where we are right now. Picking up a point made by my preceding colleague Professor Vitinov: I would have loved to hear a bit more about the opportunities and potential dangers that this possibility entails, for example for the academies of sciences and humanities to resemble tigers, i.e. to become more actively involved in politics and society.

Secondly, at the very end of your talk, your point was that specialised knowledge and the loss of frames of reference have to be somehow compensated in order to rebuild trust. Here, my question would be: Which frames of reference are you re-

ferring to? When you talk about contextualisation, what does this mean exactly? 'Frames of reference' and 'contextualisation' can mean a lot depending on the norms, values, as well as social, political and cultural particularities of any given context. Hence, I would appreciate a bit more elaboration on this, especially regarding your stance on the ideas of post-structuralism and the notion that we can never entirely know what empirical truth is or if it exists at all.

Thirdly, not everybody seems to be overly excited about big data. In fact, I am a linguist by profession and my impression is that not everybody is enamoured with Wikipedia either – and for very good reasons. One thing I

teach my students in this respect is: Be very careful! If you look at Wikipedia or similar open sources of knowledge, always go back to evaluate the original source, and have a very, very critical look at what you are including in your academic work.

As I mentioned, I also have serious doubts about big data as valid referential knowledge. Big data studies should be, to my mind, taken with a grain of salt. As a linguist, and I have talked about it yesterday in the workshop of the ALLEA Working Group on “Truth, Trust and Expertise” already, I discuss corpora. Corpora are one of the tools that have been used to study discourse in literature, but in the end, a corpus is nothing but the reflection of the texts that are in it. In other words, you deal with a very restricted, limited concept, even when referring to the big ones, such as pan-European infrastructures that have millions and millions of tokens and items. The poten-

tial of big data must thus at least be further qualified and should not be taken as gospel. Big data does have its pluses, but I think it should be approached with great caution and great care. Unfortunately, I do not have time to go further into examples where big data has already produced misleading results, which have not enhanced trust in science and research.

Due to time constraints, I will just briefly mention three additional aspects that I would like to stress:

First of all, moral values, as mentioned in Susan Owen’s presentation earlier today, are something very, very important and should not be neglected when talking about the origins of trust and trustworthiness.

Secondly, trust and trustworthiness are very much tied to mutual respect. I believe that with regards to science and research, it is especially the respect between the so-called hard sciences and the social

sciences and humanities that is of crucial importance for the academic community’s ability to gain, regain and maintain trust.

My last point is on communication. I will not go deeply into that topic, because the third session with José van Dijk’s keynote is on that: I firmly believe that communication is essential for adequate contextualisation and the frames of reference that I mentioned in the beginning. I would be grateful for some elaboration from you on that issue. It is especially important in this digital age, for instance when it comes to the current debate about fake news. We face great challenges and problems caused by so called ‘filter bubbles’ and ‘echo chambers’ extrapolated from people’s increased reliance on social media platforms as their primary source of information. They have the potential to profoundly undermine trust in universities, academies, and in the whole scientific enterprise.

Milena Žic Fuchs is Full Professor of Linguistics at the University of Zagreb. In 2010, she was elected Fellow of the Croatian Academy of Arts and Sciences and, in 2013, a member of Academia Europaea.

She served as the Croatian Minister of Science and Technology from 1999 to 2000. From 2009 to 2012, she was Chair of the Standing Committee for the Humanities of the European Science Foundation. From 2013 to 2015, she was Chair of the

Scientific Review Group for the Humanities of the ESF. During her mandates, she instigated policy incentives for inter/multi/trans disciplinary research, as well as Digital Humanities. From 2012 to 2013, she was a member of the EC Expert Group for the ESFRI Roadmap.

At present, Professor Žic Fuchs is a member of numerous Science Advisory Boards at European level in the Humanities and Research Infrastructures and SSH. From 2008, she

was member of the ERC Advanced Grant Panel SH4 „The Human Mind and Its Complexity“, and chaired the Panel from 2014 to 2015. From November 2016 she is member of the High Level Group on Maximising Impact of EU Research and Innovation Programmes, set up by the European Commission, chaired by Pascal Lamy. From 2018 she is member of the JRC (Joint Research Centre) High-Level Peer Group of the European Commission.

Reaction to Comments and Plenary

Antonio Loprieno

Reaction to Comments

Having esteemed colleagues think about one's own contribution makes oneself revise or re-think particular dimensions. To what Nikolay said: if your call was that we should all acquire a form of 'tiger-ness' in order to present ourselves, I am absolutely with you. Academies re-imagined as tigers require a small leap of faith, but I am sure that we can certainly work in that direction.

What I also particularly liked was the re-description of trust as subjective probability, which is what I tried to express in a very informal and certainly not mathematical way as plausible versus non-plausible information.

With this, I come to Milena's insightful comments. I will con-

cede to you one thing, which is perhaps the underlying force of the entire attitude that I adopt vis-à-vis what I described: Yes, I think that to a certain extent we have collectively gone through the experience of post-structuralism. That's precisely why we should now all be aware that we cannot entirely know what empirical truth is. At the same time, we have learned that there is always a hermeneutic paradigm within which you can – or must – rely on evidence based on certain norms, rules and procedures. Precisely because of that, I have become a little bit freer – I feel myself freer – to admit what my own paradigm is.

So, yes, I think you are right to say that the frames of reference always imply a certain set

of values, a certain reading of the world which is not neutral per se. This is what I try to describe in this strange formula of 'Enlightenment 2.0'. With 'Enlightenment 2.0' I mean the following: Ultimately deriving one's frames of reference from the experience, from the moral values, or the values of critical thinking, knowing that at a very absolute level this is just one of the possible frames of reference, and not THE frame of reference, but still behaving as if it was THE frame of reference to not get lost in relativism.

Regarding the point you made about big data, I would like to stress one aspect: what I said is not what I think should be, and certainly not what I necessarily subscribe to from a moral or ethical point of view. I described sim-

ply what I see. The relevance of big data is not something that I particularly cherish or that I am particularly in love with. For the very same reason that you stressed. However, as a cultural historian I observe it in the same way as I try to observe the language of the ancient Egyptians: with as much enlightened neutrality as possible, knowing that it is not and can never be entirely neutral at all. It is this form of dual attitude that I try to apply. Coming back to your point on big data, I observe a certain trend towards privileging the quantitative dimension. This is something that I think we should, whether we like it or not, consider when we talk about issues of trust.

Reaction to Plenary

Question: What can we learn from the past and from the Enlightenment specifically for today's challenges of digitalisation and a loss of trust in science?

I observe a certain rediscovery of the emotional dimension

in science. Take simulation, for instance: simulation as a result of digital transformation is enormously emotionally charged, because it creates a reality that, to a certain extent, is a fictitious reality. It's a simulation of reality that challenges us on the emotional level. This is a rediscovery of the emotional level, the affective dimension of trust, which in the classical Enlightenment approach, in the classical approach to science that we all grew up with, had been removed and banished to the sidelines over time. So, even if you use the term intuition, right now there is a great predisposition towards including this type of perhaps not very rational dimension into the scientific analysis.

What can we learn from the past? Is a philosophical evolution possible? It so happens that digitalisation – I prefer to use the term 'digital turn' – took place in the history of our civilization at the very same time in which, at the level of intellectual development, of methodological ap-

proaches, there was a triumph of that post-structural dimension that I referred to before. We could say, simply put, of a relativistic approach. It is precisely in the very moment of our history, at the end of the 20th century, in which we as a society tended to lose faith in the value of empirical results as absolute rules to abide by. Precisely in that moment there is the development of what we call now the digital turn. Regarding this type of bizarre coincidences, one might say that the past doesn't really exist. Which is a strange way to put it, admittedly.

Certainly, what I can tell you as an Egyptologist is the following: I am sure that if Ramses II would come into this room and I tried to reconstruct the pronunciation of the ancient Egyptian language, which is my job, and I tried to use my rules in discussing with him, he would say: "What is this guy talking about!?" He would certainly not understand a single word. My reconstruction of ancient Egyptian, which is

the best possible interpretation I can empirically derive, certainly is very far from truth or from the way the past 'really' was. But it is the best guess we have; halfway between the maximum we can reach; and that can be constantly improved in the next twenty, thirty, even two hundred years and more.

Certainly, the past did not exist in the way you read about it in the history books. However, it is very dangerous to claim the books of history were just nonsense. It is not nonsense, because it's the closest approximation that we have got to reconstruct the past according to the scientific paradigms we have in mind. Of course, this is not a 'true' past, it is a clear simulation of the past. That is precisely the problem with trust: When someone asks you "are you 100% sure of what you say as an expert?", you can never possibly confirm this question. This is the subjective probability Professor Vitanov was talking about before. No, there's no absolute math-

ematically safe statement that you can make as an expert. But you must have this type of frame of reference, this type of education to probability that comes with your scientific life in order to say: "There is a very high likelihood that this piece of information is correct." There's no absolute truth! When you have this discussion with social scientists, these are basically the issues around which the conversation mostly evolves.

How, then, do we enable judgement in people when we witness a lack of willingness to understand complexity of the issues, especially facing the trivialization of knowledge that comes along with the digital turn? How do we make people aware of the complexity and at the same time enable them to judge? These are the most pressing questions that are being debated in scholarly meetings like ours. What I find fascinating is the problem of complexity. It is precisely what generates this kind of distrust that we are talking about. It is ex-

tremely difficult in a society that is governed by social media and that only requires limited attention, concentration, or level of focus, to present complexity in a way that it can lead to this educated judgment, to this subjective probability, the well-informed estimation of the level of likelihood. It is as if, through the digital age, we have lost the sense of the analogue mode. It is as if we, through the primacy of the digital mode, can only think in binary digital terms: yes or no! In most issues, there is no yes or no. There is a very broad hierarchy of analogue possibilities. A core issue of trust right now is that trust tends to be treated digitally, whereas it can only be treated analogically in all its complexities. That is the core problem.

Finally, there are certainly huge differences in various European countries and across cultures. Therefore, we can and should learn something from our exchange on these kind of very important topics within academic networks like ALLEA.

Trust in Science in a Digital Society

José van Dijck

Introduction

Last year, the 16-year-old daughter of a friend came home with the announcement that she wanted to become a vegan, because “eating meat causes as much cancer as smoking cigarettes.” When my friend asked her daughter for the source of her sudden persuasion, she referred to the World Health Organization (WHO), which, according to my friend’s daughter, had been quoted in *What the Health* – a Netflix documentary sent to her via Facebook by her girl-friends. And all of these friends were going to become vegan, she added. After my friend watched this so-called documentary for some five minutes, she replied to her daughter that it was perfectly

fine if she wanted to become a vegan, but that it was not okay for her to be a silly goose. Together they sat down to watch *What the Health* to check a few ‘facts’. And although this documentary indeed referred to WHO reports, it was soon clear to my friend that it also contained a variety of half-truths, distortions, manipulations, and outright nonsense.³⁸ Over the past year, many ‘debunk-

ing blogs’ appeared with critical reactions to the documentary, including some from scientists; since then, the hype surrounding

³⁸ For instance, the documentary *What the Health* claims that the WHO classifies meat as a group 1 carcinogen—the same group as cigarettes, plutonium, and asbestos. The WHO website classifies processed meat as category 1 and red meat as 2A; however, classification is not the same as risk, so the claim that eating meat is as dangerous as smoking cigarettes is unsubstantiated.



What the Health seems to have dissipated.³⁹

The mother-daughter scene touches on the essence of an important issue I would like to raise today. How can a 16-year-old learn to distinguish reliable sources in an online media landscape that inundates her with information and opinions? To answer this question, I first need to raise a more fundamental concern: what is the basis of trust in scientific expertise in a world that is becoming more digital every day?

The documentary *What the Health* is just one example of a

³⁹ There are many rebuttal and ‘fact-checking’ blogs refuting the claims made in this Netflix-documentary. See, for instance, “What the Health: The Ultimate Rebuttal” by the ONNIT Academy, August 30, 2017, available at: <https://www.onnit.com/academy/what-the-health/> See also this rebuttal by Harriet Hall “What the Health: A Movie with an Agenda” in *Science-based Medicine*, July 11, 2017, available at: <https://science-basedmedicine.org/what-the-health-a-movie-with-an-agenda/>.

widely disseminated source on the internet in which scientific research is presented as proof of a particular view. There are countless examples of what I would call ‘scientific disinformation’, ranging from the very subtle to the very blatant. Take, for example, this headline: ‘Zero US measles deaths in 10 years, but over 100 measles vaccine deaths reported’ or a Dutch example of a report claiming that vaccines ‘stimulate homosexual feelings in children.’

There is a very active group of climate change deniers online, who claim that the numbers of polar bears are not declining – I will return to them later on. You may be less familiar with the ‘flat earthers’: a group of advocates who claim to have evidence that our planet looks like a pancake. Like climate change deniers, they are very active in the online public debate.

As reflected by the *What the Health* documentary mentioned above, opinions or propaganda cloaked as ‘research’ can be distributed rapidly and on a large

scale through social media. For many citizens, students and youngsters, it has become increasingly harder to assess information and separate scientifically developed knowledge from humbug. Over the last year, much has been said on this multi-layered problem in the context of ‘fake news’, but the specific case of *scientific disinformation* warrants the special attention of scholars and society. What is at stake here is not just eroding trust in scientists who produce knowledge, or in journalists and citizens who disseminate that knowledge via media. The stakes are much higher than that, for the problem pertains to the complex ways for securing and anchoring trust in our digital society.⁴⁰

⁴⁰ In 2017, the European Commission published the foresight study *Trust at Risk. Implications for EU Policies and Institutions*. Available at: <https://publications.europa.eu/en/publication-detail/-/publication/e512c11b-e922-11e6-ad7c-01aa75ed71a1/language-en>.

Trust in science

Over the past decade, the specific issue of ‘trust in science’ has received due attention; in many cases, this debate centred on questions about the trustworthiness of individual scientists or scientists as a professional group, or questions pertaining to the reliable outcome of particular research.⁴¹ In 2013, the Royal Netherlands Academy of Arts and Sciences published an advisory report titled *Trust in science*, which argues that trust is based on four pillars: integrity, transparency, independence, and accountability.⁴²

⁴¹ Scientists are still regarded as one of the most ‘trustworthy’ groups of professionals. According to the longitudinal IPSOS survey, in 2017 ‘professors’ and ‘scientists’ are both in the Top-5 of ‘most trusted professions’ with an approval rate of respectively 85% and 83%. See: Veracity Index IPSOS Mori, 2017. <https://www.ipsos.com/sites/default/files/ct/news/documents/2017-11/trust-in-professions-veracity-index-2017-slides.pdf>.

⁴² The report *Vertrouwen in Wetenschap (Trust in Science)* published by the

Practicing science involves a process based on rules that should be articulated as clearly as possible. For academics, it is crucial to evaluate each other’s results critically, in particular because new insights need to be tested and verified, and errors should be amended. Consensus may emerge when there is respect for, and dialogue on, different insights. Although scientists or scholars are no arbiters of truth, they do operate on institutionally embedded trust in their judgment by including *checks and balances* in the research process.

This institutional system has long enjoyed much trust in society as a whole. Science has generated a plethora of facts about which consensus emerged after solid research: planet Earth is

Royal Netherlands Academy of Arts and Sciences (KNAW) was published in 2013; it was written in Dutch but has an extensive English summary. Available at: <https://www.knaw.nl/nl/actueel/publicaties/vertrouwen-in-wetenschap>.

more or less round, the ice caps on the North Pole decreased rapidly in the past decades, and smoking tobacco raises chances of contracting lung cancer. Many policy decisions are grounded in trust in the correctness of this knowledge. When, after decades of scientific debate, there is a 97% consensus among climate experts on human-induced causes of melting ice caps in the Arctic, this justifies a comprehensive climate agreement. And because we now have overwhelming evidence that smoking is harmful to people’s health, this justifies stringent rules against tobacco use in public spaces.

But there are many issues about which there is little or no consensus at all. In particular scholarly disciplines – such as religion studies, ethics, or aesthetics – consensus on specific topics is unlikely ever to emerge. Moreover, there are many other kinds of subjects about which doubts prevail and there is no consensus yet, or where research results are preliminary or tenta-

tive. Scholars and scientists are destined, after all, to keep pushing the boundaries of knowledge. They do so, moreover, in a world that is changing with each new day. Needless to say, this creates a sense of uncertainty, but without room for exploration, discussion, and experiment, scientists would never be able to move beyond those boundaries and create new knowledge – or they would do so only by accident.

Ultimately, trust in science will depend on a process of finding *common ground* – a gathering of facts and insights that was carefully established and therefore got accepted by a community. This is why it is important that we protect science as a *societal institution* by holding on to the demands of integrity, transparency, independence, and accountability. Researchers do so not only by communicating and collaborating, but also by evaluating each other's work critically (peer review), organising probes, and inviting replica-

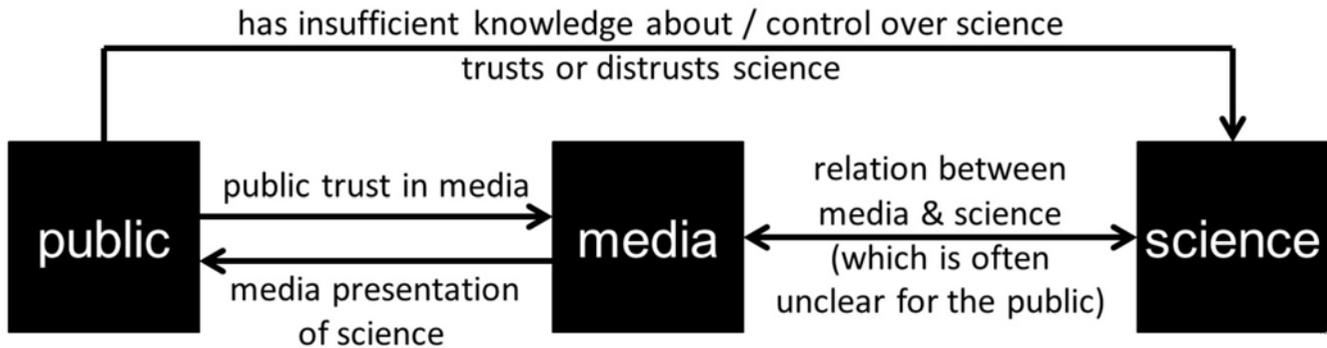
tions.⁴³ Institutionally anchored trust requires that they make available their data, methods, sources, and modes of reasoning for reanalysis and reinterpretation by their peers, as well as open up room for debate with the public. In short, the open system of *checks and balances* is vital for society's trust in science. Only by having such a system in place will it be possible for scientists and scholars to feature as 'trusted experts'.

Now there is nothing wrong with healthy distrust vis-à-vis common sense or some prevailing view; on the contrary, critical assessments are necessary to help stretch the boundaries

⁴³ Replication studies have been pushed to the fore in recent years, as they are increasingly considered a valuable tool for checking the outcome of experimental studies. See, for instance, *Replication Studies. Improving Reproducibility in the Empirical Sciences*. Advisory Report, 2018. <https://www.knaw.nl/shared/resources/actueel/publicaties/pdf/20180115-replication-studies-web>.

of knowledge. But it becomes quite a different ballgame when orchestrated *distrust* is meant to bypass or even undermine organised trust in science. In recent years this is precisely what has been happening in public debates on specific scientific outcomes, particularly in debates conducted via online blogs and social media. Increasingly in such debates, the opinions of ordinary citizens seem to carry as much weight as the findings of experts. According to the American historian Tom Nichols (2017), this prioritising of 'opinions' and rendering all opinions and judgements interchangeable will ultimately lead to 'the death of expertise'.⁴⁴ Although I think Nichols' conclusion may be overstated, I do wonder why scientific expertise is struggling in the age of digital media. What, in fact, do we

⁴⁴ T. Nichols, *The Death of Expertise. The campaign against established knowledge and why it matters*. New York: Oxford University Press, 2017.



Double Configuration of Public Trust

Source: M. Schäfer, *Mediated trust in science: concept, measurement and perspectives for the 'science of science communication'*, *Journal of Science Communication*, 15(05), (2016)

expect from (traditional) media when it comes to communicating scientific results and weighing expertise versus opinions in public debates? What has changed since the emergence of the internet and what has become the role of social media in this process?

Trust in traditional (mass) media versus social media

To start with the first: it is perhaps no coincidence that trust

in media *as a societal institution* rests on the same pillars as trust in science: integrity, transparency, independence and accountability.

We normally want to count on news being accurate, on journalists being honest and independent, and on documentary makers to not sell us opinions as if they were facts. Just like science, traditional media tend to rely on a system of institutional *checks and balances* – organised control that is crucial for embedding trust in

society at large. Where scientists are geared toward creating *common ground* in mutual dialog, journalism is after *common sense* by weighing a public debate's facts and opinions side by side, by contrasting them to other facts or views, and by presenting outcomes based on rationally sound arguments. Ideally, such debate is inclusive and balanced. Even if the real world is often erratic, trust in the media as an institution is inextricably bound up with this goal.

Over the past eight years, the rapid rise of online and social media created a whole new dynamic between citizens and institutions, including science and media. The focus of public debate shifted from traditional media to online media, in particular social media such as Facebook, YouTube, Twitter and thousands of networked blogs. Along with this media transformation, one can also perceive a political shift: since 2016 we see that the scientific discourse of logical reasoning and rational evidence – of *common ground* and *common sense* – has increasingly met with attacks from various sides. These two developments have seriously shaken the institutional pillars of trust in science and media. To explain this phenomenon, some refer to the digitisation of form and content, while others point to user behaviour, and again others to an overall transformation of public debate.⁴⁵ There are many poten-

⁴⁵ For a comprehensive study on the spread of misinformation in social

tial technological, sociological and political rationalisations, but let me briefly elaborate on these three explanations.

The arrival of the internet would have changed the relationship between expert and layperson: after all, every citizen or organization can now generate, publish, and disseminate information. Knowledge increasingly tends to be considered as something you can ‘search and find’ on the internet; in ten minutes, doctor Google will turn every user into a physician. A popular Dutch TV quiz called *Doctors versus Internet*, where an offline team of professional doctors competes with a group of online laypersons to diagnose an illness on the basis of given symptoms, reinforces this notion. However challenging such competition,

media, particularly the spread of scientific news, see M. Del Vicario, A. Bessi, F. Zollo, F. Petroni, A. Scala, G. Caldarelli, H. E. Stanley and W. Quattrociocchi (2016). ‘The spreading of misinformation online.’ *PNAS* 113: 3, 554-559. DOI: 10.1073/pnas.1517441113.

online searches for basic facts are something completely different than expert judgments. The digital channels for spreading knowledge often give users little basis as to who says what in which context and based on what authority or expertise. We refer to this phenomenon as *context collapse*: in an online environment where everything is content, the truthfulness of text, image, and sound can often no longer be determined directly from the context.⁴⁶ Information can sometimes be traced to recognisable organizations, but often users themselves will have to find and gauge the reliability of a source. Defining a source’s validation, independence, and accuracy may prove difficult if it has all the outer features of a ‘trustworthy’ scientific source.

⁴⁶ For an extensive analysis and description of the concept of ‘context collapse’, see L. Davis & N. Jurgenson (2014), ‘Context collapse: theorizing context collusions and collisions.’ *Information, Communication & Society*, 17:4, 476-485, DOI: 10.1080/1369118X.2014.888458.

A second explanation for the undermining of trust in science and media requires us to look at the behaviour of human users of social media. A recent study published in *Science* revealed that social media users pay more attention to misinformation than to 'true' items.⁴⁷ Moreover, many users let themselves be led by their prior knowledge or prejudice in assessing the value of a message.⁴⁸ We generally call this phenomenon *confirmation bias*.

Social media take advantage of this; by giving individual users exactly the kind of information to which they are receptive, platforms generate more clicks and hence attention. Since the Face-

book-Cambridge Analytica scandal, we know how many detailed information (or 'data points') tech companies can collect on every individual user. But besides built-in personalisation mechanisms that exploit confirmation bias, there is also a major role here for the human 'friend' who forwards the message. As we saw in the example of the documentary *What the Health*, Facebook-friends were central in disseminating certain information on veganism via social media – a process of peer pressure that impacts teenagers and young adults in particular.⁴⁹

A third explanation for the decline of trust in expertise holds that such trust is deliberately un-

dermined by actors who are out to organise distrust via blogs and social media. Their strategies are manifold and particularly the climate change debate is rife with examples of deliberate examples of what we may call '*polarisation push*.'⁵⁰

By stressing on as of yet unsolved aspects of a larger study, by highlighting a particular graph, or by defaming or promoting one particular expert, and by disseminating all of this at high speed via blogs or social media, someone may try to disqualify trust in science as a whole. Recently we saw an example of polarisation push when climate change deniers posited that po-

⁴⁷ See Vosoughi, S. Roy, D. & Sinan, A. (2018). The spread of true and false news online. *Science* 359: 6380, 1146-1151. DOI: 10.1126/science.aap9559.

⁴⁸ See, for instance, S. Knobloch-Westerwick, B.K. Johnson, N.A. Silver and A. Westerwick (2015). Science Exemplars in the Eye of the Beholder. How Exposure to Online Science Information Affects Attitudes. *Science Communication* 37: 5, 575-601.

⁴⁹ The relationship between peers and social media and the phenomenon of peer pressure in the use of social media has been extensively researched by psychologists and media and communication scholars. For an excellent overview, see Patti Valkenburg en Jessica Piotrowski, *Plugged In. How media attract and affect youth* (New Haven: Yale University Press, 2017).

⁵⁰ Polarization push and confirmation bias are phenomena that are related to, but not the same as, so-called 'echo chambers' in social media. The public debate on climate change has been well examined in terms of how echo chambers have impacted policy. See, for instance, L. Jasny, J. Waggle and D.R. Fisher (2015). 'An empirical examination of echo chambers in US climate policy networks.' *Nature Climate Change* 5, 782-786.

lar bear populations do not at all decline on account of climate change by widely disseminating a single disputable source. They deployed this strategy in an effort to discredit *all* climate science.⁵¹ For many scientists and scholars, such deliberate polarising efforts come as a shock – understandably, because they are nursed in a scientific culture marked by careful hypotheses and where balanced, nuanced reasoning reigns. Now, suddenly, they find they have to defend themselves in an online world in which all opinions are considered equal and where individuals claim to be right until proven wrong. This social media environment has come to epitomise a world where opinions are more profitable than facts, where statements do better than logical argument, and where polarisation prevails over *common ground* and *common sense*.

⁵¹ See Erica Goode, “Climate Change Denialists Say Polar Bears Are Fine. Scientists Are Pushing Back” in *The New York Times*, 10 April 2018.

Each one of the explanations I just mentioned – *context collapse*, *confirmation bias* and *polarisation push* – provides a partial clarification in response to the question of decreasing trust in expertise. But to fully grasp what online scientific disinformation does to our society, we cannot study media or science as isolated institutions, but need to come up with a more comprehensive interpretive framework. To get to the core of this dynamic we will have to reflect more fundamentally on the new meaning of ‘trust’ in a world that is likely to be guided more and more by digital structures.

Rearticulating trust in a digital society

The transformation toward a digital society currently finds itself in the phase of disruption – a transitional phase in which public institutions have to reinvent themselves in order to take root in a new and yet soggy terrain of big data, platforms, algorithmic governance, and worldwide

internet activity. That process of digitisation and ‘platformisation’ is in full swing in *all* sectors, including science, journalism and education. Trust in expertise is no longer rooted in the taken-for-granted authority that scientists and scholars, like teachers and physicians, traditionally derived from their professional status. In an online society, institutions are easily bypassed by platforms, knowledge replaced by search, and information passingly equated to data. This transformation may have imperceptibly destabilised the pillars of institutional processes for securing integrity, transparency, autonomy and accountability. Precisely these pillars will become even more important in the future, so this requires institutions to adapt to the demands of the 21st century. It would be impossible to describe in detail the implications of such transformation in this short contribution but let me outline a few major consequences.

For academics, the transformation to a digital society means

that they need to become even more transparent, more 'observable', and more public than before. In a world where all content and data are available at a mouse-click, and where institutional contexts can easily be bypassed, we need to reinvent how integrity and trustworthiness are anchored. The mantra of 'open science' is not enough to replace the traditional institutional anchors of trust; its meaning needs to be articulated and defined in each specific research context. Researchers are explicitly urged to elucidate the sources and origins of their data, but they also need to clarify their methods of data processing and interpretation. Open data implies the opening up of databases for fellow-experts, so they are able to verify and replicate studies. Archives and libraries in the public domain have to reinvent themselves to render knowledge open, accessible and reliable based on large datasets. The recently established European movement for Open Science promotes the ambition to make data findable,

accessible, interoperable and reusable – the so-called FAIR principles.⁵² Open science efforts are costly; they will require not only inventiveness and energy on the part of researchers but also substantial investments on the part of administrators and governments. Indeed, without transparency and openness, control on scientific integrity is simply impossible; but at the same time, 'openness' in and of itself does not guarantee a newly anchored trust in a digital society.

Transparency makes scientific experts accountable but also renders them vulnerable. Account-

⁵² For more detailed information on the European efforts to promote open science, such as the Declaration to Open Science and the European Open Science Cloud, see <http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud>. For an explanation of the FAIR-principles, see M. Wilkinson, M. Dumontier and B. Mons (2016). 'The FAIR Guiding principles for data management and stewardship' in *Scientific Data* 3. Doi:10.1038/sdata.2016.1. Available at: <https://www.nature.com/articles/sdata201618>.

ability means that academic research – including the kind of research that has not yet reached stable outcomes or consensus – remains open to dialogue to both colleague experts and the public at large. Such openness and accountability may perhaps be even more important when this public is more or less deliberately misled via online platforms and social media, or when particular elements exploit online instruments of misinformation as a means to spread doubt and to polarise. Some academics have bravely taken on the struggle by systematically refuting deceitful stories and outright fabrications in their fields, as they enter debates all the time. However laudable their efforts may be, it is ultimately undoable for scientists to check the factuality of all internet hypes – for they would not be able to do their actual job anymore. This is why scholars in information science, communication and media studies are working to develop online tools for assessing the reliability of sources in

digital universes. And journalists, for their part, have been developing automated tools for fact-checking, flagging, online linking and referencing that help citizens identify quality information.

All these attempts are part of a concerted effort of scholars, scientists and journalists to re-invent themselves in part as a response to our evolving digital world. Scientists can be expected to serve as role models by holding on to their search for *common ground* in a cacophony of opinions. Similarly, responsible journalists are trying to find ways to let *common sense* prevail in a sea of ideas and opinionated views. Both institutions will have to invest in digital innovation while acknowledging long-standing standards of trust. Resilient societies are anchored in scientific expertise whose instruments and tools need to co-evolve with societal needs. For this reason, the confidence of politicians, policymakers and citizens in scientists, and their moral as well as financial support of science as an institution,

are indispensable. Over the past two years, it came as a shock that such support for science and researchers can no longer be taken for granted worldwide, not even within the West. To underscore their concern about this development, scientists and citizens took to the streets in over 600 cities worldwide to join a March for Science on April 22, 2017.

Indeed, given the state of development in which our digital world finds itself today, the traditional benchmarks for trust are in need of an operational upgrade which cannot wait until the digital transition has been completed. As scholars, scientists, and educators, we find ourselves in the middle of such transition and we are expected with good reason to help shape that future, if not to play a leading role. This brings me back to the story of my friend's daughter and the question it raised. How can a 16-year-old learn to distinguish legitimate sources from nonsense in an online media landscape that inundates her with information and opinions?

It won't help simply to point to teachers and hope that they will train their students so many '21st-century skills' that they can beat the medical doctors in a TV quiz show. We really have to invest in restructuring the educational curriculum and bring it up to meet new realities. How can we ensure that high-school students learn to reason methodically instead of merely wanting to see their opinion confirmed? How do we teach them to develop autonomous judgment in a universe where everything is 'content' and 'context' is not a distinctive criterion? Students attending schools and universities will have to learn in old and new ways when expertise is trustworthy and particularly when it is not.⁵³ Teaching a few classes in media literacy or digital

⁵³ For an elaboration of the implications for education and educational policy, see for instance G. M. Sinatra and B. K. Hofer (2016). Public Understanding of Science: Policy and Educational Implications. *Policy Insights from the Behavioral and Brain Sciences* 3: 2, 245 – 253.

skills, even though these are important, will not suffice to meet future standards for research integrity in a world that favours open science and open data. The mission to bolster trust in expertise will have to be pursued at all educational levels and should be prioritised on the agendas of universities, science councils, and academies of sciences in the years to come.

A digital society cannot function properly without open and public institutions, but this assumes that those who run them actively engage in shaping the online dynamic of which they are inevitably part. To sustain common ground and common sense

as the basis for our digital society, we need to ensure that science and education continue to exist as *common good*. A democratic society means a society in which all people are equal, but not all expressions are equally true. It is a society in which students can find data and information along with the wisdom needed to evaluate knowledge claims. After all, we will soon have to rely on trusting *their* expertise for shaping society in new ways. This is why it is crucial to reflect on how we can effectively organise a democratic digital society in which trust in expertise is anchored in old standards wrapped in new mechanisms.

José van Dijck is a new media author and professor of Comparative Media Studies and former dean of the University of Amsterdam. She is the *author of recent books such as Mediated Memory in the Digital Age and The Culture of Connectivity*. Since 2010 Van Dijck is member of the Royal Netherlands Academy of Arts and Sciences. In 2015 she was elected by Academy members as the president of the organisation and became the first female to hold the position. In 2016 Dutch magazine Opzij named Van Dijck the most influential Dutch woman of 2016.

Comments

Vassil Kirov

It is a real pleasure to be here. First of all, I would like to thank the organisers for inviting me to join this panel and comment on the excellent speech of José van Dijck, entitled “Trust in Expertise in a Digital Society”.

I must admit that before accepting this invitation, I had never heard her name. This is probably because all of us, as researchers, are enclosed in some way or another in our own disciplines and closed circles. So, my first unbiased impression came from a quick look on the internet (I hope there is not too much fake news around) and the lecture of Professor van Dijck’s paper. I must say that I am really impressed with how she presents complex ideas in a very accessible way. We definitely need such an approach

when addressing the question of trust in expertise, especially in scientific expertise. A very clear, concise, and good speech; I have enjoyed reading and listening to it very much. It is extremely important to relaunch these debates before it is too late.

Basically, I agree with most of the arguments presented in the paper. What I would like to share now are a few concerns from the perspective of the social sciences and from Central and Eastern European countries (CEEC). Myself being an expert on work and employment issues and related changes/disruption, I have been researching the ‘digital society’ for a while.

In this room, academicians and participants come from different disciplines and probably

do not feel as comfortable as if we were among our disciplinary and professional communities, at conferences with people we have known for ages.

But let me come back to your talk, Professor van Dijck. I especially liked your whole introductory part. We are all surrounded by such examples in everyday life, and in our professional lives. People claiming that they are experts on nutrition, medicine, and so on. We have a joke here in Bulgaria that everybody is an expert in football and politics. In a way, the pattern in a digitalised world is that everybody is an expert on everything, from military airplanes, to science, policy and so on. While digitalisation is not new as such, its rapid and extensive impacts deeply transform

many aspects of life. However, this is a long and complicated debate, and I will not delve deeper into it now.

Coming back to your example, about the 16-year-old daughter of your friend that came home with the announcement that she wanted to become a vegan because 'eating meat causes as much cancer as smoking cigarettes', one of the first lessons learnt is that there were a lot of (scientific) experts acting to 'decode fake news', to be 'les décodeurs' as it is common to say in some French journals (e.g. Le Monde). The reaction of all these Internet and social media users, as the girl from the example, around the effects and the hype of fake news will certainly need such a 'décodage' from scientific experts. This is the whole debate about the role of the scientist in the digital world. Professor van Dijck argues that artificial intelligence and software tools might be able to do this selection. I would be a bit sceptical about this eventual dominance of 'tools'.

However, the big question in the paper is: What is the basis of trust in scientific expertise in a world that is becoming more and more digital every day? And, between the lines, how do and should our institutions adapt to those changes, e.g. social media platforms that have existed only for a few years but have already profoundly changed our way to communicate. What happens in these debates? As she claims, "increasingly in such debates, the opinions of ordinary citizens seem to carry as much weight as the findings of experts". This seems to be the pattern of behaviour within the new ways of communication. The paper provides a number of examples of those rejecting climate change, or the so-called 'flat earthers'. The central question is how to tackle truth. What is/should be the scientific language/approach to address this 'horizontal' ('user's') expertise? The erosion of scientific knowledge is at stake here, of expertise as such.

One thing is to discuss truth in natural sciences, another in social sciences, which are by definition poly-paradigmatic. So, how can consensus emerge? The speaker introduces the principles of integrity, transparency, independence, and accountability. I would also link those principles with the issue of the social utility of scientific expertise, an important part of the debate.

That is why the second big question raised by the presenter is about trust in media and social media. Over the past few years, the rapid rise of online and social media created a whole new dynamic between citizens and institutions, including science and media. They transformed the way to communicate, but also the professions. Not only are the principles for integrity called into question, but the entire system of 'dissemination' through social media.

Actually, the author puts forward three sets of explanations why trust is undermined. I will not address these explanations, but

they allow us to arrive at the central question about trust in a digital society. To what extent is there a disruption? I could argue here that part of the phenomena (in other spheres of digitalisation) is something akin to putting an old wine into new bottles. Is this problem only related to social media? There have already been debates why society pays, e.g. for scientific research and expertise. Even more relevant here in the context of Eastern Europe – science is seen as a ‘luxury good’. Can a small and poorer society afford it?

Going back to the question of communication, there is an important question: to what extent and how do scientific institutions find their place in this digital environment? The speaker is well positioned to explain the dynamics of this brave new world of communication.

And yes, we need to adapt institutions to the demands of the 21st century. I agree that it will be impossible to describe in detail the implications of such transformations, but we need to discuss

and learn how scientific communication should adapt!

It is fantastic to explore the advantages of open science, but we still have the paradox of MNC holding knowledge. Professor van Dijck is right: open science is costly. How are countries that do not spend immense budgets on scientific research supposed to cope with this?

To conclude, I would like to reaffirm that the messages from José van Dijck are very strong and clear, but there is a need for nuance. Yes, the digital world and social media could discredit trust, but at the same time, they can advance trust in science. And of course, scientists and scientific institutions need to adapt. But is this the only way to guarantee trust? It opens perspectives that should be connected with the need to ‘restructure educational curricula and bring them up to meet new realities’, and the question for democracy. My question at the end will concern the need to mobilise the scientific communities in order to build trust in scientific ex-

pertise. How to do it while those communities are fragmented, often with fragmented labour markets, both in Western and in Eastern Europe, and with a junior cohort living in more and more precarious conditions, jumping from one contract to another, is the big question of the future.

Vassil Kirov, PhD (Sciences Po) is Associate Professor at the Institute for the Study of Societies and Knowledge, Bulgarian Academy of Sciences (ISSK-BAS) and Associate researcher at the European Trade Union Institute (ETUI). His research interests are in the sociology of enterprise, work and organisations, employment relations, digitalization and Europeanisation. Currently he is a Visiting Professor at Sciences Po, France and LISER, Luxembourg. He has published several books and articles in international scientific journals.

Comments

Christiane Woopen

Thank you very much for this very clear and insightful analysis and your thoughts about trust in expertise in a digital society. In my short comment I want to take up especially your thoughts on the role of a common ground, the context collapse of online content and the conditions of consensus.

For the sake of stimulating our debate I will present two theses.

I. Trust is a question of truth-orientation

If I understood you correctly, you stated that ‘ultimately’ a common ground is a necessary prerequisite for trust in science, and you described a common ground as “a gathering of facts and insights that was carefully established and that therefore got

accepted by a community”. Thus, trust is less anchored in a specific scientific approach or finding itself, but rather in science as a societal institution that has to live up to integrity, transparency, independence, and accountability.

In the digital age, everything online appears as content, with no or only little evidence regarding important contextual features, like “who says what in which context and based on what authority or expertise” – the so-called context collapse. Thus, online content is undermining the institutional aspects of science.

It seems to not be primarily important whether there is a scientific consensus or not about some facts or insights. It is, instead, decisive that the process of practicing science is based on

sound rules. Thus, consensus is conceptualised as the result of a scientific process, not always – immediately – achievable, but once achieved it is a legitimate starting point for far reaching policies shaping societal life.

Starting from there, I want to claim that consensus undoubtedly plays an important role regarding facts and insights, but even more in a value-related respect: Let’s call the specific value at stake truth orientation. In the online-world, where – as is often deplored – one opinion counts as much as the other and scientific findings are worth not much more than opinions; context collapse opens up the room for arbitrary interests, preferences, and manipulating forces.

Regrettably, modern democracy and the prevailing human

rights approach of ethics – at least in the public sphere and in policies in the Western World – support this kind of arbitrariness in a subtle way. The main message is: Everyone has a lot of rights and only a few duties. Apart from some claims mainly grounded in freedom, autonomy and justice, everyone can choose his and her own values and life styles. There is no truth out there telling us how to live a meaningful life as individuals or as society. So why not go for what is most appealing individually, instead of looking for the common good?

This pertains also to societal institutions. Even if someone knows the context, appreciates the scientific approach, and believes in the authority of science as an institution – why should they behave according to scientific insights and support policies grounded in them? Truth only pays off if truth-orientation is a shared value – not only for scientists, but for society as a whole.

Where ‘true’ and ‘right’ do not play a major role anymore, trust

shifts from expertise to the arbitrary, and from the right to the convenient.

This approach has a further consequence. If truth-orientation is a prerequisite for trust in expertise, then society plays a role in defining and finding truth. Claiming that scientists and society should be truth-oriented entails that society is not graciously receiving the truth from science. The role of society should not be to simply understand science intellectually and to recognise and acknowledge its authority. Rather, society should provide the context and living environment of science, thus shaping the dialogue about what is true and right, based on whose authority or expertise.

II. Trust is a question of the human image

Let me finish by shortly adding to this coming from a different direction. In your talk, José, you mentioned that in some scholarly disciplines – and among them ethics – “consensus

on specific topics is unlikely ever to emerge.”

I completely agree. However, especially for the public debate, it is important to stress that the consequence of this is not that ethics is arbitrary. As an ethicist, you must argue in a methodologically sound way, and according to the chosen method you get different results. Arguing about the permissibility to kill a handicapped new-born child, a utilitarian approach will come to another conclusion than a theory starting from human dignity.

Scrutinising the decisive differences between the various ethical theories one ends up with two fundamental differences:

(1) The understanding of what is most important in a human action. For instance, it leads to different ways of assessing and to different yardsticks if a theory focuses on the consequences of an action – like utilitarianism –, on the underlying will – like deontology –, or on the acting person and her attitudes, inclinations and preferences – like virtue ethics.

(2) On another, deeper level of underlying concepts this points to different images of human beings. It makes a difference when conceptualising human actions and societal institutions if you see a person primarily as a being that strives to unfold and flourish, or if you see a person as a being who leads an autonomous life and strives for perfection, or if you see a person as a vulnerable being living in a social context.

I am convinced that society will only trust science, and that science will only come into close interaction with society, if underlying ideas of the human being become an explicit issue of debate.

Thank you very much for your attention.

Christiane Woopen is Professor for Ethics and Theory of Medicine at the University of Cologne. There, she is Executive Director of the Cologne Center for Ethics, Rights, Economics, and Social Sciences of Health (CERES). She also serves as Head of Research Unit Ethics and Vice-Dean for academic development and gender at the University Hospital Cologne. She is coordinator and leader of several international and national research projects concerning ethical aspects of reproductive medicine, neuro-ethics, quality of

life, ageing, digital autonomy, and genome editing. Professor Woopen is former chair of the German Ethics Council, President of the 11th Global Summit of National Ethics/Bioethics Committees 2016, and was member of the International Bioethics Committee of UNESCO. Since 2018, she is Chair of the European Group on Ethics of Science and New Technologies. Professor Woopen received her medical degree from the University of Bonn and worked in gynecology and obstetrics before focusing on bioethics.

Reaction to Comments and Plenary

José van Dijck

Reaction to Comments

I cannot thank you enough for your comments. There were definitely a lot of thoughts which I won't be able to dig into in detail. However, I will try to answer at least one of your questions, which I thought was really interesting:

You say that a lot of researchers have to work with new tools. This is true. They cannot solve the problem of scientific disinformation by inventing new tools alone, but they can also not afford to ignore the digital tools they are being attacked with. So, it is not a matter of 'either/or', it is rather 'both/and'. That is where the interesting notion of hybridisation pops up. You cannot step out-

side of these developments and judge them with standards that you brought along from the past. You must develop standards, measurements and tools along these digital developments. You cannot afford to stand apart from the whole field. For example, humanities scholars are developing tools to do the research from the past that they would otherwise no longer be able to do.

Another interesting issue you were referring to is common ground consensus. The context from which I was arguing about common sense, common ground and consensus, was explicitly not that it would work for scientists or researchers as an ultimate goal. On the contrary, I was asking this question in the con-

text where polarisation and a lot of disinformation has entered the equation. One has to somehow deal with that. I did not argue for consensus as a scientific ambition and you said that very well: Consensus is a value at stake. I completely agree. This is a value that should be part of our reasoning and our reasonable discussions of experts and non-experts. I very much like that phrase.

On the opposite end – that's the context I was trying to outline – vis-à-vis consensus we have opinion, just opinion. If you start with opinion as the most important value as opposed to consensus, this is going to be a very, very different discussion. I was trying to put the spotlight on what happens if you are moving around in

a world where it is no longer easy to distinguish between opinion and facts, because you no longer get to learn to distinguish between what's wrong on the basis of a certain publishing context that all of you over 50 have sort of learned.

Again, my daughter's friend who is 16 years old is one example: She is very well skilled in finding information in the internet. With the right guidance and balance of the right mentoring, she would be perfectly able to tell the difference between different sources. That is what I think we need to engage in. These are the kinds of new processes that these young students are confronted with. As a 16-year-old, I was probably not able to go to a library and find the right source exactly in the right context and do all that sort of research that I am able to do now, but certainly for these children there is another dimension added to that type of learning behaviour. We must engage with this, we simply can-

not afford not to. That's why it is such an important value to also teach that there's not only just a big link, but that there are different values and opinions and facts. That's the kind of engagement I was looking for.

Societies as such have to deal with the digital disruption of everything, not just science. We can see this in the context of the disruption of labour, transport, or education. There are all these different sectors that we need to investigate. Digitisation is not simply an issue we need to deal with within academia, but it is part of the entire societal transformation that we are going through.

Reaction to Plenary

Question: Is open science a solution to the problem you described, or is open science an essential part of the problem?

Open science is not the sole solution to any of these problems. However, in the context of

digital transformations it is an obligation. Once you are living in a digitised society, all of us, as public scholars, need to produce public knowledge in open institutions. What I said is that in the context of attacks on that openness, the risk of putting everything out in the open is to get more scientific disinformation, because everyone can attack this knowledge immediately from all sides.

In our modern world, open science is an inevitable requirement. We were already putting a lot of effort into making science public, open and accessible, but the digital tools we are using nowadays even require an additional effort. Now we not only have to get familiar with the data we use, but also with the scientific process of reasoning, collecting. You must make everything open, including the very process through which you make things open. That is the double effort we need to invest in when it comes to open science.

Being online all the time is not what open science is all about. Open science means that a lot of the new sources of knowledge are going to be digital only. A lot of these sources are not sources that we are digitising, but sources that are digital from the very beginning. To

make them open rather than closed in a private enterprise, like a company or any other corporate environment, makes a huge difference to society. A lot of algorithms that we are now using to process knowledge are not open knowledge, they can not be openly accessed, they

are closed in a sense of being privatised. Part of our mission as public scholars should be to keep academic knowledge open as a form of public good, to ensure that all the knowledge is accessible, especially the one that has been digital from the beginning.



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