Dialogues: Public Engagement in Science, Technology and Innovation

Mostar 06-07 July 2015
@Građevinski fakultet, Sveučilište u Mostaru, Matice Hrvatske bb
### 1st day: 06/07/2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>Introduction</td>
</tr>
<tr>
<td>09:15</td>
<td>Tour de table</td>
</tr>
<tr>
<td>10:00</td>
<td>Public Engagement in Context (with exercise)</td>
</tr>
<tr>
<td>11:00</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:30</td>
<td>Regulatory frameworks and Public Engagement (with exercise)</td>
</tr>
<tr>
<td>12:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>13:30</td>
<td>Methods and practice (with exercise: story, implementing a dialogue)</td>
</tr>
<tr>
<td>15:30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>16:00</td>
<td>Exercise (imagining the future of the city)</td>
</tr>
<tr>
<td>17:15</td>
<td>End of day one</td>
</tr>
<tr>
<td>19:30</td>
<td>Social dinner Hotel Bevanda - Restaurant</td>
</tr>
</tbody>
</table>

*Stara Ilika bb, Mostar*

### 2nd day: 07/07/2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>Dialogue in practice. “Dialogues is...”</td>
</tr>
<tr>
<td>10:30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:00</td>
<td>The Agora</td>
</tr>
<tr>
<td>12:30</td>
<td>Review</td>
</tr>
<tr>
<td>13:00</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:00</td>
<td>Social Circles</td>
</tr>
<tr>
<td>15:15</td>
<td>Coffee break</td>
</tr>
<tr>
<td>15:30</td>
<td>Boxing Ring</td>
</tr>
<tr>
<td>16:30</td>
<td>Review</td>
</tr>
<tr>
<td>17:15</td>
<td>End of day 2</td>
</tr>
</tbody>
</table>

*All lectures take place @Građevinski fakultet, Sveučilište u Mostaru, Matice Hrvatske, bb, Mostar.*
Organisation
Organising Committee

European Commission
DG Joint Research Centre
The Science and Technology Studies Project @ the JRC

Ângela Guimarães Pereira
Alessia Ghezzi
Lucia Vesnić Alujević
DDG01

Grăđevinski fakultet, Sveučilište u Mostaru
Marija Čutura
Assistant Professor at the Faculty of Economics, University of Mostar

Secretariat
Susanna Loffelhölz
Susanna.loffelhoz@ec.europa.eu

Web Science Hub

email
jrc-sts@jrc.ec.europa.eu
Twitter
@JrcXstS
Notes:
INTRODUCTION

Since the turn of the century, engagement of citizens and societal actors in science and technology has been an issue of rapidly increasing academic and societal importance. Citizen and societal actors engagement comes in many shapes and responds to different objectives, ranging from consultative exercises involving users in local technology development to cross-European or even global deliberative exercises. In addition to institutionalized and invited forms of consultation, participation and engagement of the public in decision making about emerging technologies and their applications, citizens have in the recent past also become part of the innovation and increasingly the research effort itself. Movements such as do it yourself science or concepts such as open innovation or community based-innovation are part of a emerging trend in research and innovation. Engagement of citizens and societal actors can be considered as a means for aligning research and innovation activities with societal needs and demands, and for ensuring an open, reflective, and accessible discussion about desirable futures and how research and innovation contributes to them. Public engagement activities inspire models of how the scientific community can best contribute to productive exchanges with society. The growing number of artefacts and services supported by emerging technologies call for a wider debate on what kinds of values and norms European societies wish to thrive. This debate can not be confined to the developers of techno-science or selected stakeholders. But how do we initiate such a debate?

The hands-on course proposed will therefore be looking at the practice of public engagement in Europe, on all its forms from invited to non-invited forms, including emerging phenomena such as citizen science, do it yourself and community based initiatives. It will look into participatory approaches to discuss science and technology developments as well as building capacity for professional support to provide science’s relationships with the public, using public engagement to improve decision making processes. Building that kind of capacity contributes to socially robust scientific advice. Modules will include participatory methods focusing on those that sustain dialogue; communication of science for public engagement; communication of uncertainty and ethics deliberation, hands-on and discussion of cases of public engagement in science and technology debates. The participants will work on a case throughout the course that interests the region in which the course is held.

Welcome to Mostar!

Ângela Guimarães Pereira, Alessia Ghezzi and Vesnić Alujević

July 2015
Setting the scene – What is public engagement?

Ângela Guimarães Pereira, Alessia Ghezzi and Lucia Vesnić-Alujević
Public Engagement in Context – by Ângela Guimarães Pereira

“Responsible Research and Innovation (RRI) is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)”

In the Horizon 2020, RRI is a “cross-cutting” action. A key pillar of RRI is citizen engagement in the processes of research and innovation. Given that one of the objectives of engagement should be alignment of social values, societal concerns, grand-challenges to the research and innovation proposals, we need to diagnose now what challenges and what needs lie ahead with the current practice of societal engagement in the debates of science and technology, so that different forms of “encouragement” can be sought within the RRI perspective. Public engagement has been justified in so many ways of normative and prescriptive nature, being embedded in many public policies as mandatory in, e.g. environmental planning, industrial risk assessments and the like. But that has not been the case for science and technology development. What we have most of the times is what we can call “experiments” that are often framed in the so called “public understanding of science” syndrome - rather than a perspective; i.e. the suggestion that the publics have a deficit of knowledge that needs to be cured. What the RRI framework suggests (and we concur) is that engaging the publics in research and policy is an ethical issue. It is a matter of responsibility in an uncertain and untrustworthy world, but is also a matter of solidarity: it is through collective enterprise that we will live the lives we wish to live on the basis of values and norms that we collectively decide upon. Hence, citizen engagement in science and technology (as opposed to consumer engagement), is not just needed it is an urgent matter that innovation and policy processes need to make genuine room for.

A review of the literature shows that a great deal of the reflection and learning about public engagement exercises is focused on its political and social reification, as well as process and practice evaluation (in particular methodological aspects) and offers less of what one can

understand as “measurable impacts” of public engagement in science and technology development. But about what dimensions shall one look for impacts of public engagement? In order to be able to respond to this we need to offer a “public engagement” concept that drives our enquiry; here we understand public engagement in science and technology development as “extended peer review” of those processes, a central concept on what Funtowicz and Ravetz² have described as “post-normal science”. Moreover, we frame our quest on the science policy model described by Funtowicz³: an extended model that acknowledges that “science” (understood as the activity of technical experts) is included in the (policy, innovation, research) process as one part of the relevant knowledge being brought in as evidence to a process. In this model, the ideal of rigorous scientific demonstration is replaced by that of open public dialogue. Engaged citizens become both critics and creators in the knowledge production process as part of an extended peer community.

Hence, here we articulate two levels and a side effect that need to be taken into consideration when planning or evaluating public engagement:

1) **Knowledge production**: for example, influencing or setting the research agenda; avoiding type III errors and contributing or scrutinising with values and knowledges beyond the techno-scientific. In practice, contributing to the enhancement of quality of knowledge production and acknowledging it as collective endeavour.

2) **Societal change**: for example, what types of societal processes change due to public engagements with science and technology? What involved communities make out of their engagement in those processes? What initiatives or strategies get activated at community level? Co-creation of governance practice in areas that are traditionally delegated to institutions;

3) **Outreach**: about the science but also involving people not usually involved, adding voices not usually heard.

This set of lectures will look into the practice of public engagement, its framings, its impacts and give practical guidance on methods.

---


Readings:


---

*This report is available at request from [jrc-sts@jrc.ec.europa.eu](mailto:jrc-sts@jrc.ec.europa.eu) and contains comprehensive bibliography on public engagement.*
Regulatory frameworks and public engagement – by Lucia Vesnić-Alujević

We will start with a question: How can citizens be included in the regulatory processes? This is the questions that interests not only us, but larger community and policy makers as well. The new culture of regulation which includes public engagement is important because through the deliberation between government and citizens, a better balance can be obtained between government and citizens or interests. In a report of an expert group to the EC, it is stated that “citizens have a right- and are expected- to be involved in the crucial decisions of what their futures will look like and how science and technology can contribute to its betterment”  

However, citizens fear that their voices will, despite their participation, remain unheard.

This lecture will give insights into European regulation framework where public engagement is used. We will discuss both positive and negative examples of it, through different EU directives. We will talk about Responsible Research and Innovation. A special focus will be on Horizon 2020 and how public engagement is framed in it, because the engagement of society is put as a necessary part of the entire research process. Then we will look at the citizen initiatives and discuss how citizens themselves can initiate the engagement in science policy.

The lecture will also include exercises and discussion on this topic.
Readings:


EU documents:

Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions (2015) 215. Better regulation for better results- An EU agenda.


The European Citizens’ initiative

Horizon 2020. Call for integrating Society in Science and Innovation

Rome Declaration on Responsible Research and Innovation in Europe
Imagining the future of the city

Practice exercise through material deliberation.
Ângela Guimarães Pereira leads the STS project at the European Commission’s Joint Research Centre. She works on governance of emerging techno-science. Her work is developed within the field of science and technology studies (STS) which includes social research activities, ethics assessments, knowledge quality assessment and communicating about techno-science. She has authored several peer reviewed papers and edited some books.

Alessia Ghezzi works at the European Commission’s Joint Research Centre. Graduated in Humanities at the Sapienza University in Rome. Degree in archival science and master on semantic cataloguing and indexing. Has worked at the National Archives of Rome, at the Vatican Library and at the Constitutional Court as librarian ad archivist and as video and audio documentalist for the RAI. Currently works on Digital Memories and its ethical implications.

Lucia Vesnić-Alujević is a Postdoctoral Researcher at the Joint Research Centre. She obtained her PhD in Communication Science from Ghent University in 2011 with the focus on the political campaigning online, European public sphere, online citizenship and political participation. Since joining the JRC in 2012, she has been working on ethical and societal impacts of the emerging technologies. Her research focuses on intersection between communication studies and science and technology studies. She has been involved in several research networks and international projects and has published in the area of communication science, political science and STS.
Dialogue in practice

Tom Wakeford and Fiona Macbeth
Introduction

Dialogue’s central role in public engagement – by Tom Wakeford

Public engagement takes it for granted that it is linked to processes of participatory or deliberative democracy. Public engagement therefore requires there to be mutually educative dialogue, that is a concerted, committed effort to cultivate conditions that foster, (or at least allow), dialogue between people who hold profoundly different perspectives that are born of locations in radically uneven social, material and symbolic circumstances. It requires forums for citizens and other stakeholders to discuss an issue, to make arguments for and against particular positions, and to inquire into the complexity of issues.

What we cover during the day draws on theory and practice of theatre for dialogue, a process that we have both used in science communication and other contexts.
Drama as a tool for exploring dialogue – by Fiona Macbeth

The roots lie in theatre forms that have emerged as a dynamic way of empowering communities facing oppression and struggle. These roots are clearly seen in the work of Augusto Boal and Theatre of the Oppressed. ([http://www.theatreoftheoppressed.org/en/index.php?nodeID=1](http://www.theatreoftheoppressed.org/en/index.php?nodeID=1)).

Drawing on the work of Michael Rohd and Sojourn Theatre ([http://www.sojourntheatre.org/](http://www.sojourntheatre.org/)), we wish to explore how to activate individuals, as well as communities, to re-shape the power structures that oppress. These structures are not only externally framed, but can be recognized in the values we embody as individuals. For example, an interaction between a male teacher and a female student where the teacher uses their power and rank as adult and male to manipulate the student into a situation not of her choosing, is an expression of oppressive, patriarchal values.

Using theatre techniques to explore the values and assumptions on which communication is based, is a process we refer to as Dialogic Theatre (DT). This approach is underpinned by the intention to offer a forum in which communication is invited and facilitated. It is a process wherein unacknowledged values can be identified, and dialogue can take the place of power-based communication that maintains oppressive values.
During the day the participants will work on how to create a respectful environment in which listening is valued and people experience positive communication and on how to explore the concept of democratic dialogue in relation to public engagement with science. There will be the opportunity for participants to further develop skills in dialogue-based communication. And the participants will also have practical opportunities to address potential obstacles and challenges.

The training day is based on a structure that will allow time for exploration of approaches to communication about science research and for the development and practice of related skills.

The following topics will be covered: mapping the territory; using writing and visual exercises to gain shared understanding of the expectations and opportunities involved in public engagement and placing yourself and your research (or role) within this territory; using interactive group exercises to clarify and explore a range of communication styles and approaches. Focusing on identifying possible challenges; using interactive group exercises to support participants in identification of personal goals and aims in the field of public engagement. Within the application of dialogic frameworks for building positive communication; bringing theoretical models for dialogue to life.

In the morning the first part will face the dialogue. Dialogue begins with us communicating together – usually face to face. Before we start exploring what dialogue looks like in practice, this session allows us to have a structured discussion about dialogue in the context of public engagement and citizen science. We will organise interactions so that we can identifying opportunities and pitfalls in verbal communication about research.

Followed by an interactive exercise where we will explore how we persuade others to see our point of view. It will expose the skills required for speak about ideas and listening to those of others. And then we will reflect on the issues arising and ask for informal feedback on the day so far.

After the lunch break we will work on Social Circles. So far we have mainly explored one-to-one interactions and small group dynamics This session looks at the complexities of communication with and within larger groups. It will focus on how to manage groups with differing perspectives and standpoints.

After the coffee break, we will have a Boxing Ring:
Dialogue can often happen in contexts that contain elements of controversy and a potential for mistrust. This structured group exercise will focus on identification of relevant tools, tactics and skills for dealing with challenging situations and building strategies for creating a dialogic space.

At the end of the day we will reflect on the issues that have arisen during the day and ask for informal feedback on the day so far.
Tom Wakeford is Reader in Public Science at Coventry University’s Centre for Agroecology, Water and Resilience. Trained as a natural scientist, he has been working with grassroots-based organisations for twenty years from universities in the UK and India. He has used dialogue and engagement approaches on issues such as the rise of racism in the UK, older people’s healthcare and the risks of industrialised food systems. Sometimes these processes have achieved positive change, other times they have failed and he has tried to join with others to collectively learn from mistakes.

For nearly 20 years Fiona Macbeth has worked with young people and community groups as a drama workshop leader, trainer and teacher and consultant. During the 1990s as a Drama Facilitator with The Leap Centre, a London-based youth arts project she ran drama workshops for young people in youth clubs and devised and directed issue-based interactive theatre projects with unemployed young people. These shows toured to youth clubs and probation centres throughout the UK. Fiona developed training courses for youth workers and probation officers facing conflict and aggression within their work. In 2000 Fiona became a Research Fellow in The Peninsula Medical School. She co-founded RAP: a sex and relationships programme for young people who have had a disrupted education. In 2003 Fiona took a post in the Department of Drama in the University of Exeter where she is currently Senior Lecturer in Applied, Community and Socially Engaged Theatre and teaches at both undergraduate and postgraduate level. Her recent work has included the establishment of a collaborative working relationship with the University of Texas at Austin for whom she runs Patchwork Stories, an annual community event to gather collectively-held wisdom from diverse communities within Austin, TX and Exeter, UK.

Publications: Playing with Fire: training for the creative use of conflict was published in 1992 by Youth Work Press. The second edition was published by Jessica Kingsley in 2011 and is a core text for a degree in Youth and Conflict at Leeds Metropolitan University. In 2014 Playing with Fire was re-published by Jessica Kingsley with updated material. Fireworks: creative approaches to conflict for young people was published in 1992 by Youth Work Press.
Further reading:

General

*From Citizen Science to Do It Yourself Science An annotated account of an on-going movement*


**Advanced**


[http://www2.warwick.ac.uk/fac/soc/sociology/staff/academicstaff/blencowe/participation/problems_of_participation.pdf](http://www2.warwick.ac.uk/fac/soc/sociology/staff/academicstaff/blencowe/participation/problems_of_participation.pdf)

ANNOTATED BIBLIOGRAPHY

Source: Science Technology Human Values Summer 2000 vol. 25 no. 3 283-308

Abstract and annotation: An important aspect of any meaningful public discussion about developments in gene technology is the provision of opportunities for interested publics to engage in sociable public discourse with other lay people and with experts. This article reports on a series of peer group conversations conducted in late 1996 and early 1997 with sixteen community groups in Perth, Western Australia, interested in gene therapy technology. With the case of cystic fibrosis as a particular focus, and using background resource material as a stimulus for discussion, the participating groups explored a range of value issues arising from the new genetic medicine. This more discursive context enabled participants to express a number of background or life-world concerns about genetic medicine, concerns that are often obscured by the dominant biomedical and bioethical discourses.

Bell, Sarah 2006. Concerned scientists, pragmatic politics and Australia’s green drought
Source: Science and Public Policy, Volume 33, Number 8, 1 October 2006 , pp. 561-570(10)

Abstract and annotation: The Wentworth Group of Concerned Scientists formed in Australia in 2002 in response to calls to ‘drought-proof’ the continent. Their model of engagement between science and public policy involves: clear simple science communication, which keeps scientific uncertainty and debate out of public view; pragmatic politics, which works within rather than challenges the dominant political agenda; and a focus on providing solutions rather than describing problems. This model has been successful in achieving policy reform at the expense of more participatory and critical approaches to ecological science and politics. This paper goes beyond the “Public Understanding of Science” model of involving society in scientific debates.
Brulle, Robert J. 2010. From Environmental Campaigns to Advancing the Public Dialog: Environmental Communication for Civic Engagement

Abstract and annotation: This essay examines the claims of environmental identity campaigns regarding the issue of climate change. Identity campaigns are based on the idea that more effective environmental messages developed through the application of cognitive science by professional communications experts can favorably influence public opinion, and thus support legislative action to remedy this issue. Based on a review of the sociological and psychological literature regarding social change and mobilization, I argue that while this approach may offer short term advantages, it is most likely incapable of developing the large scale mobilization necessary to enact the massive social and economic changes necessary to address global warming. Specifically, theoretical and empirical research on the role of the public sphere, civil society and social movements shows that democratic civic engagement is core to successful social change efforts. However, identity campaigns focus on a communications process that centers on elite led one way communications, which falls to allow for any form of civic engagement and public dialogue. This undermines the creation of a democratic process of change and reinforces the professionalization of political discourse, leading to a weakening of the mobilization capacity over this issue of global warming. The essay concludes with the outlines of an environmental communication process that aims at enhancing civic engagement and democratic decision making.

Bucchi, Massimiano. 1996. When scientists turn to the public: alternative routes in science communication
Source: Public Understanding of Science October 1996 vol. 5 no. 4 375-394

Abstract and annotation: This paper argues that both the traditional normative models and the more refined (`continuity') models of public communication of science fail to account adequately for cases of `deviation', i.e. those cases when scientists address the public directly by skipping the usual stages of scientific communication. It is hypothesized that most of such cases are related to crisis situations and to the definition of scientific boundaries. Therefore, at least two modalities of public communication of science should be distinguished: one is the routine, generally unproblematic itinerary of a scientific idea through the different levels of communication as presented by the continuity models; and the other is the dramatic (re)assessment of boundaries and professional competences in the public arena that is required by marginal situations. Continuity models need to be supplemented by a multilevel, multivariate model which enables us to explain this second modality and to understand in more detail the role that the level of public communication plays when such a modality is activated.
Carvalho, Mónica, Carvalho, Ana Sofia, Araújo, Joana, Brites, Marta. 2010. Between scientists and public: reframing public participation in science through bioethics
Paper available at http://iamcr.org/conference-abstracts

Abstract and annotation: Discourses and techniques about the relationship between science and the public have remarkably developed in the past four decades. Science communication has become an important issue for the scientific governance. Public confidence in science, decision-making and support to democracy have changed the predominance of a top-down communication model, from scientists to public, to a more participative one – the Public Engagement with Science (PES). The Institute of Bioethics at Portuguese Catholic University, in Oporto, is doing research in the role of science in society issues and the aim of this paper is to discuss the relevance of Bioethics to improve PES. The bioethical issues seem to draw people’ attention to certain scientific facts, confronting them with the consequences of science and improving their skills in deliberating on scientific issues. Moreover, ethics influences the way one understands public engagement, “scientific citizenship” or “science governance”. The role of ethics is not to re-edit the old fashionable deficit perspective, which usually focuses on the impact of science and technology from the perspective of non-experts. Ethics is a theoretical and practical reference for changing the science-making in the near future, and it makes us consider the public as playing a more important role than that of mere spectators with lack of scientific knowledge or with emotional concerns. The ethical reflection could redefine the non-experts place in the context of science, involving people with science, making them not simply aware of scientific issues but also involved in the process of decision-making. On the other hand, bioethics can also contribute to the participation of scientists in the ethical reflection that takes place outside the labs, broadening their role as citizen scientists.

Davies, S. R. 2008. Constructing Communication. Talking to Scientists About Talking to the Public
Source: Science Communication June 2008 vol. 29 no. 4 413-434

Abstract and annotation: Recent work has started to explore “scientific understandings of publics” alongside public understandings of science. This study builds on this work to examine the ways in which public communication is talked about by scientists and engineers. The author identifies a range of ways of talking about the purposes and content of science communication to the public, arguing that the dominant framework for these is one-way communication, and that, in addition, such communication tends to be constructed as difficult and dangerous. However, the author further identifies a range of minority discourses that understand public communication in more complex terms.
Davies, S., Ellen McCallie, and Elin Simonsson. 2009. Discussing dialogue: perspectives on the value of science dialogue events that do not inform policy  
Source: Public Understanding of Science May 2009 vol. 18 no. 3 338-353

Abstract and annotation: While theoretical work and empirical research have examined science policy-informing “dialogue events,” dialogue events that do not seek to inform public policy are under-theorized and under-researched, even though they are common and growing in popularity in the UK. We describe how, from a critical perspective, it may initially appear that such events cannot be justified without returning to the deficit model. But with this paper, we seek to open up a discussion about these non-policy-informing events by arguing that there are in fact further ways to understand and frame them. We deliberately draw on different literatures and seek to make use of practitioner expertise within our discussion, in order to display several perspectives on the value of non-policy dialogue on science as sites of symmetrical individual or small-scale learning —rather than institutional learning—through social processes.

Source: Public Understanding of Science May 11, 2010

Abstract and annotation: In this paper, we present a study of Science and Technology Studies (STS) perspectives on public engagement, specifically focusing on the gap between theory and practice. In aiming to develop a conceptual map of this gap, we identify five top topics of tension. These are related to the general questions of: “Why should we do public engagement?,” “Who should be involved?,” “How should it be organised?,” “When should it be done?” and “Where should it be grounded?” We employ nanotechnology as a paradigmatic case to help us explore these tensions. In practice, the choices one makes in relation to one topic of tension may influence the choices available for others. Enhanced awareness of the presence of these tensions, as well as their interconnections, can help build reflexive capacity and make visible the various alternative routes available for STS practitioners working in the “age of engagement.”

Durant, John. 1999. Participatory technology assessment and the democratic model of the public understanding of science  
Source: Science and Public Policy, Volume 26, Number 5, 1 October 1999 , pp. 313-319(7)

Abstract and annotation: It seems that the general public is somewhat disillusioned with science and technology and is demanding greater participation in important decisions as to their application in everyday life. Ideals of equality between scientists and non-scientists and of informed public debate as the preconditions for forging socially sustainable public policies need to be translated into new processes of deliberative democracy.

Abstract and annotation: This historical review surveys the evolution of the science–society relationship in post-war Britain. It observes the transformation since the 1980s of the idea of ‘public understanding of science’, in which scientists and laypeople differ by virtue of the scientific knowledge they have, into the idea of ‘public engagement which science’, in which scientists, laypeople and policy makers negotiate policy for future science and technology. We survey recent critiques of public engagement which draw attention to the ways in which it constructs particular publics, and which question its capacity to contribute to policy-making.

Source: Nature Reviews Genetics 4, 819-825 (October 2003)

Abstract and annotation: Science communication is developing a new approach that promotes dialogue between scientists and the public. A recent example is the debate on the possible introduction of genetically modified crops into the United Kingdom. As this exercise in public engagement draws to a close, we consider the context in which this debate has taken place, and the challenges of developing such interactions between science and society.

Source: Public Understanding of Science September 2010 vol. 19 no. 5 590-608

Abstract and annotation: The framing of issues in the mass media plays a crucial role in the public understanding of science and technology. This article contributes to research concerned with the analysis of media frames over time by making an analytical distinction between implicit and explicit media frames, and by introducing an automated method for the analysis of implicit frames. In particular, we apply a semantic maps method to a case study on the newspaper debate about artificial sweeteners, published in the New York Times between 1980 and 2006. Our results show that the analysis of semantic changes enables us to filter out the dynamics of implicit frames, and to detect emerging metaphors in public debates. Theoretically, we discuss the relation between implicit frames in public debates and the codification of meaning and information in scientific discourses, and suggest further avenues for research interested in the automated analysis of frame changes and trends in public debates.

Abstract and annotation: This chapter explores some different ways of thinking about science communication and risk management. In certain contexts, there has been a transition from ‘first order’ (or deficit) models of science-public relations to a greater emphasis on public engagement and dialogue (discussed here as ‘second order’ thinking); The chapter especially addresses certain problematic and challenging aspects of this partial movement between first and second order approaches. ‘Third order’ thinking about risk, science and public communication asks fundamental questions about the underlying relationship between ‘first’ and ‘second’ order approaches, the changes that have taken place (both in theory and practice) and the future direction of scientific governance and science communication; It is important to emphasise that first, second and third order thinking are not presented here as distinct historical stages nor as an inevitable sequence. This is not a story of one way of thinking inevitably giving way to the next and then the next. Instead, the situation in most national and local contexts is of these different ‘orders’ being mixed up (or churned) together. The deficit model co-exists with talk of dialogue and engagement. While some organisations and individuals look for quick and easy solutions to communication problems, others have begun to reflect upon the inherent limitations, contextualities and conditionalities of both deficit and dialogue; Importantly, not all parties will agree on any particular categorisation: what one party might view as ‘engagement’ can often be seen as top-down communication by another (especially if disappointed with the outcome). Thus, social experiments in ‘public engagement’ very often lead to accusations that the exercise was too restricted, too short and insufficiently democratic. From the perspective of this chapter, such accusations do not invalidate initiatives but can represent an essential resource within the public scrutiny of socio-technical change; This chapter presents the public communication of science and technology as more than a matter of communication style. Instead, through the device of ‘third-order thinking’, we confront basic issues of the shaping and direction of socio-technical change, the frameworks within which communication takes place, cultures of governance and control (especially relating to the institutions of science) and the choices which are available to citizens within modern democracies.

Kahan, Dan 2010. Fixing the communications failure.
Source: Nature 463, 296-297 (21 January 2010)

Abstract and annotation: The author argues that people's grasp of scientific debates can improve if communicators build on the fact that cultural values influence what and whom we believe. In a famous 1950s psychology experiment, researchers showed students from two Ivy League colleges a film of an American football game between their schools in which officials made a series of controversial decisions against one side. Asked to make their own assessments, students who attended the offending team's college reported seeing half as many illegal plays as did students from the opposing institution.
Source: Science Communication September 2005 vol. 27 no. 1 64-99

Abstract and annotation: “Stem cell research” has become a subject of political discussion in recent years because of its social and ethical implications. The intellectual research program, however, has a history of several decades. Therapeutic applications and patents on the basis of stem cell research became available during the 1990s. Currently, the main applications of stem cell research are found in marrow transplantation (e.g., for the treatment of leukemia). In this study, the various meanings of the term stem cell are examined in these different contexts of research, applications, and policy debates. Translation mechanisms between contexts are specified, and a quantitative indicator for the degree of codification is proposed.

Source: The Open Information Science Journal, 2008, 1, 10-14

Abstract and annotation: The article considers how discrete disciplines such as documentary research, participatory methodologies and the public communication of science can, if used synergistically, provide the necessary elements for a public debate on a scientific issue of current interest. In this instance, the debate formed part of a CNR-British Council, Rome branch and the Civil Protection Department project for the communication of science to young people, and the theme chosen for discussion was the freshwater crisis. It is important to ensure that schools offer suitable learning environments and provide innovative teaching techniques to encourage students to explore the social dimensions of the scientific issues they are dealing with.

Source: Science Communication December 2005 vol. 27 no. 2 268-291

Abstract and annotation: In this article we argue that nanotechnology represents an extraordinary opportunity to build in a robust role for the social sciences in a technology that remains at an early, and hence undetermined, stage of development. We examine policy dynamics in both the United States and United Kingdom aimed at both opening up, and closing down, the role of the social sciences in nanotechnologies. We then set out a prospective agenda for the social sciences and its potential in the future shaping of nanotechnology research and innovation processes. The emergent, undetermined nature of nanotechnologies calls for an open, experimental, and interdisciplinary model of social science research.
Source: American Journal of Botany 96: 1767-1778 

Abstract and annotation: In this essay, the authors review research from the social sciences on how the public makes sense of and participates in societal decisions about science and technology. We specifically highlight the role of the media and public communication in this process, challenging the still dominant assumption that science literacy is both the problem and the solution to societal conflicts. After reviewing the cases of evolution, climate change, food biotechnology, and nanotechnology, we offer a set of detailed recommendations for improved public engagement efforts on the part of scientists and their organizations. We emphasize the need for science communication initiatives that are guided by careful formative research; that span a diversity of media platforms and audiences; and that facilitate conversations with the public that recognize, respect, and incorporate differences in knowledge, values, perspectives, and goals. 

Pace, Michael L, Stephanie E Hampton, Karin E Limburg, Elena M Bennett, Elizabeth M Cook, Ann E Davis, J Morgan Grove, Kenneth Y Kaneshiro, Shannon L LaDeau, Gene E Likens, Diane M McKnight, David C Richardson, and David L Strayer. 2010. Communicating with the public: opportunities and rewards for individual ecologists. 

Abstract and annotation: Many ecologists are interested in communicating science to the public and addressing societal concerns about environmental issues. Individual ecologists need to consider whether, when, and how this should be done. We propose that public outreach activities can be beneficial for ecologists at all stages of their career. There are diverse opportunities for such involvement, and these can vary enormously in terms of time and expertise required. Trends within the science of ecology, especially research focused on social–ecological systems, are likely to promote increased interactions with stakeholders and policy makers. To be effective in these interactions, ecologists should consider new approaches to communication and be aware of the potential roles scientists can play in public policy debates. Professional ecologists need to engage with non-scientific audiences; a review of such activities should be included in considerations for promotion, recognition, and awards, while also acknowledging variations in the inclinations and abilities of individual scientists. There are, however, few current standards for how much time ecologists should commit to public outreach, how time allocation might change over a career, or how to evaluate the quality of such activities. We ask ecologists to consider ways to evaluate the quality of interactions with the public and how to reward these efforts appropriately.
Priest, Susanna Hornig 1994. Structuring Public Debate on Biotechnology  
Media Frames and Public Response.  
Source: Science Communication December 1994 vol. 16 no. 2 166-179

Abstract and annotation: A study of themes arising within focus group discussions of U.S. lay publics (both student and nonstudent adults) in response to newspaper coverage of biotechnology is consistent with the assertion that media frames and reader schemas interact to produce an understanding of a newly emerging issue. Newspaper coverage heavily dominated by institutional sources and dealing with only a narrow range of issues may be limiting the terms of public debate in an unhealthy way. Readers reason by analogy with related and sometimes unrelated developments in trying to understand biotechnology, based on schemas reflecting their general understanding of science.

Source: Science Communication November 26, 2008

Abstract and annotation: Science communication is said to have changed in the past decades. It is widely assumed that science is no longer merely transported and translated by the mass media to a passive audience, but “medialized”: Many authors believe that scientific issues are discussed extensively in the mass media nowadays, that these discussions are plural in its participants and in the arguments used, and that the issues at stake are evaluated controversially. It is still unclear, however, if this change applies to all science topics or only to some. The article at hand argues that science issues from different epistemic cultures can be expected to be “medialized” to different extents, and analyzes mass media coverage on stem cell research, human genome research, and neutrino research to underline this claim. The findings show that the described change only applies to some issues, and that further differentiation of the concept of “medialization” is necessary.
Abstract
Since the turn of the century, engagement of citizens and societal actors in science and technology has been an issue of rapidly increasing academic and societal importance. Citizen and societal actors engagement comes in many shapes and responds to different objectives, ranging from consultative exercises involving users in local technology development to cross-European or even global deliberative exercises. In addition to institutionalized and invited forms of consultation, participation and engagement of the public in decision making about emerging technologies and their applications, citizens have in the recent past also become part of the innovation and increasingly the research effort itself. Movements such as do it yourself science or concepts such as open innovation or community based-innovation are part of a emerging trend in research and innovation. Engagement of citizens and societal actors can be considered as a means for aligning research and innovation activities with societal needs and demands, and for ensuring an open, reflective, and accessible discussion about desirable futures and how research and innovation contributes to them. Public engagement activities inspire models of how the scientific community can best contribute to productive exchanges with society.
As the Commission’s in-house science service, the Joint Research Centre’s mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new standards, methods and tools, and sharing and transferring its know-how to the Member States and international community.

Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.