



# Reframing Science Communication Culture, Identity and Organisations

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Culture, Identity, and Organisations

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## Introduction (1)

Science communication is an important phenomenon in modern knowledge societies. These days, most societies expect scientific knowledge and technological development to be at the core of economic growth and welfare. They also hope that science will find solutions to challenges like climate change, diseases and scarcity of energy, food and water. Such expectations imply that science communication is significant in at least three ways.

First of all, science communication is important for the welfare of individuals, organisations and nations. Many countries invest a large part of their GDP in finding solutions to problems in society, and science does indeed often deliver crucial new knowledge and technologies that change our life for the better. Such knowledge has to be communicated to its potential users in order to take effect. Knowledge about disease prevention, water resources, or energy efficient technologies will only improve the life of citizens if it is communicated to relevant people who can put it to good use - for instance by developing new products or changing behaviour. Knowledge about galaxies far away, or the intricacies of metabolic pathways, might not have immediate uses in the same way, but such basic scientific knowledge still needs to be communicated if it is to have effects on the way we understand our lives and our situation on earth.

Secondly, science communication is important for democracy. How can people contribute to decision-making in a knowledge society if they do not have a solid connection with the basis for many decisions — scientific knowledge itself? Such a connection is not just about understanding, or the ability to correctly explain scientific facts. Rather it implies that citizens should know about how scientific knowledge is produced as well as about its limitations and consequences. This is not a small demand. But nowadays science is one of the most important productive forces in society, so citizens have to be familiar with the way it works. If we do not succeed in making science a general topic for democratic discussion, then we risk creating societies, which are more and more polarised between those who understand, use, and make decisions about science, and those who do not.

Finally, science communication is important because it relates to culture and identity. Much of everyday life is dependent on technoscience. Sometimes the scientific content of our life is invisible, while at other times it is painfully explicit - such as when we need to talk to medical professionals about the best treatment for a particular cancer diagnosis. Most of the time, however, science is somewhere in the background. It is part of how we understand ourselves, an integral aspect of the cultural fabric we exist in. For some people it is central — being knowledgeable about science can be a crucial identity marker — whereas for others

it is blended in with other values and ways of knowing. At its core, science communication is an activity that allows us to make sense of science, ourselves and the societies we live in.

It is this idea of science as central to the culture of contemporary knowledge societies that is the starting point for this talk. Science communication is not just about making difficult things more simple so that lay people can understand it, or about moving scientific knowledge from those who know to those who don't know. It is an integral part of society, which has huge impacts on welfare, democracy and culture. Today I will focus particularly on the latter of these issues. There has previously been a lot of interest in the effective translation of scientific knowledge into useful solutions – what I have here called the issue of welfare. We have also generated quite a substantial amount of scholarship on the relationship between science communication and democracy. But I believe that we need to pay more attention to the general relationship between science communication and culture.

### **What is science communication?**

I want to use the example of the Euroscience Open Forum held in Copenhagen 2014 to elaborate this kind of thinking. The EuroScience Open Forum – or ESOF - is an event which was started by the European Commission in 2004 in order to strengthen the idea of a European Research Area. It takes place every second year in a major European city, and as it happens we will see the next iteration in Manchester in July 2016. The ESOF event combines a science policy convention with about 5000 delegates with a large public festival, called Science in the City. In 2014 in Copenhagen the festival included a long list of activities, from more traditional lectures to hands-on experiments and discussions about science in society. Some 40,000 people visited Science in the City during its six days, making the entire ESOF event a mix of academics, journalists, families, school groups, policy makers, activists, artists, politicians, and PR teams.



Depending on where you were at any particular moment, ESOF could be experienced as

- a science show aimed at kids with exploding cola-bottles and balloons
- a professional mix of network-building and receptions,
- a traditional lecture by an eminent scientists
- a booth about the scientific collaboration between EU and South Africa
- the Ignobel prize show
- a researcher explaining her soil research among lots of other displays in a tent
- and lots of other activities



I was also there with an installation about the social responsibility of science that I had made with a group of colleagues and students. It was based on some of our research, which concluded that although everyone agrees that science should be socially responsible, there are incommensurable differences between what various actors mean by this. There is more information about this installation, including a short video that explains it at [www.breaking-entering.dk](http://www.breaking-entering.dk).



In total, ESOF involved many activities that we can think of as science communication. However, this term does not just cover exhibitions aimed at the general public in the festival, such as my own installation. Instead I would argue, that all the activities, which took place as part of ESOF – that is the policy convention as well as the science festival – were communicating about science.



When the Danish research council for independent research is promoting their work and arguing that it allows 'curiosity to bring change' they are simultaneously telling stories about how science works and what it is all about.



Similarly, when the Danish universities are trying to recruit bright young scientists to come to Denmark, they are narrating a story about what science and scientists are and what a job in science is.

We should therefore not *a priori* distinguish between the activities that took place in the convention hall for ESOF delegates and the Science in the City displays and engagement activities. All of the audiences present at ESOF, whether schoolchildren, policy makers, or scientists themselves, were important recipients of the messages about science put forward at the event. The point here is that science communication happens in many different contexts and is designed, consciously and unconsciously, for many different types of audiences. It also communicates diverse messages, and has many different effects. At a gathering such as ESOF, participants do not just learn about specific scientific endeavours and facts, but engage in communication about the meaning of the word science, the role of a scientists and the identities of themselves and other actors.

In collaboration with Sarah Davies and Alan Irwin I have defined science communication as



“organised actions aiming to communicate scientific knowledge, methodology, processes or practices in settings where non-scientists are a recognised part of the audience” (but not necessarily all of the audience) (2). This is a broad definition. It includes mass media presentations of science; information materials; science in museums and festivals; public lectures and debates; science online and in social media; political debates about science; and university branding, just to name a few examples.

To broaden this even further, I should say that I use the term ‘science’, but I really mean ‘research’. However, science communication is an established term in a way that research communication is not, and I therefore continue to use it for the time being. Research, however, suggests a broader set of practices than science and I believe we should be more sensitive to this in the future. Similarly, I use ‘science’ as a shorthand for ‘technoscience’. Modern science is completely interwoven with technology, and science communication often relates at least as much to technology and technical development as to science. However, ‘technoscientific research communication’ is not a very handy title, and therefore we tend to stick with the familiar shorthand.

### **Science communication as culture**

So far I have argued that an event like ESOF draws together many different kinds of knowledge, many different people, and many different formats. None of these forms of science communication can be understood outside of the cultures, organisations and groups they are situated in. The key argument of this talk, is that there is always more to science communication than the transfer of knowledge. It is part of it, certainly, but not the whole story. Events like ESOF are also used to construct particular identities, solidify social relations, shore up organisational cultures, or engage in political debate. In what remains of this talk I want to focus on such issues by framing science communication as a cultural phenomenon.

The concept of culture is almost too familiar. It is used widely within the social sciences and humanities, as well as within popular discourse. I will draw on one particular take, which was developed within the British tradition of cultural studies and specifically in the work of Stuart Hall and colleagues. Culture, Hall explains, is:

not so much a set of things — novels and paintings or TV programmes and comics — as a process, a set of practices. Primarily, culture is concerned with the production

and the exchange of meanings — the ‘giving and taking of meaning’ — between the members of a society or group. To say that two people belong to the same culture is to say that they interpret the world in roughly the same ways and can express themselves, their thoughts and feelings about the world, in ways which will be understood by each other. (3)

This resonates very well with the way I am talking about science communication. It is about meaning-making in society – particularly in our advanced technoscientific knowledge economies. But it is also true in a more general sense: When actors in society communicate about science, they narrate stories about the world and about their own, as well as other people’s, places in it. By understanding science communication as a cultural phenomenon it becomes possible to view it as integrated into the lives of many different people, and into the construction of many different kinds of identities, rather than simply seeing it as the transfer of knowledge.

Hall also makes it clear that culture is something that is multiple. ESOF, for instance, hosted a wide variety of science communication practices. Overall, however, these practices might be seen as representing a culture that values science as an important part of society. But not all Copenhagen citizens will have found it relevant or meaningful to engage with this: their understanding of their culture, in other words, might be different to that assumed by organisers of Science in the City. This is an important point for Hall, who notes that a focus on shared meaning sometimes leads to the misconception that culture is unitary. But in any culture, he says, “there is always a great diversity of meanings about any topic, and more than one way of interpreting or representing it”. (4)

Seeing science communication as a cultural practice therefore leads us to expect multiplicity in interpretation, whether that is of the nature of a particular communication event or the role of science in society more generally. This version of cultural theory also helps us to be aware of the contexts of science communication, and the fact that it is always articulated and interpreted at specific moments. Cultures vary, after all. To say that people belong to the same culture, writes Hall, “is to say that they interpret the world in roughly the same ways” — and that other people, from other cultures and sub-cultures, may do so differently. (5)

Working with a group of colleagues from the UK’s Open University, Hall’s thinking on culture was summed up in a model called the ‘Circuit of Culture’. It is a circular model with arrows between five different moments of articulation: Representation, Identity, Production, Consumption, Regulation. (6) They were building on Marxist analyses of the ‘regularities of cul-

tural processes' put forward in the 1980s. Hall and colleagues, however, broke with the idea that a study of cultural artefacts can focus solely on the production process - as if that is the only thing that determines their meaning. Instead the group argued that meanings of cultural products — focusing on the Sony Walkman as a key example — are not set in stone by their producers, but are subject to interpretation at multiple moments. As Paul du Gay writes:

Meaning is not simply sent from one autonomous sphere — production say — and received in another autonomous sphere — consumption. Meaning-making functions less in terms of a “transmission” flow model, and more like the model of a dialogue. It is an ongoing process. It rarely ends at a preordained place. (7)

The circuit of culture is a useful starting point for a renewed understanding of science communication. It is not a model that can be applied in an instrumental way. Rather, it provides a framework for analysis that seeks to take into account the richness of any instance of science communication. In what follows I will give you some examples of how this could be done. I will discuss each of the five moments of articulation separately, but it should be stressed that the segregation of the five processes into separate sections is artificial. As it will be apparent, the discussion continuously overflows these categories.

## **Identity in Science Communication**

Let us begin with the question of identity. ESOF took place in an area of Copenhagen known as Carlsberg City. This is the former site of the Carlsberg brewery – a large industrial complex with related research facilities. In 2014, Carlsberg City was undergoing large scale redevelopment, with many of the vacant buildings used as makeshift arenas and event spaces. To Danes, Carlsberg has strong connotations of a proud and influential scientific history. The Carlsberg Brewery was founded in 1847 by J.C. Jakobsen, who had visited Pasteur in Paris and was the first to adopt scientific technologies to improve the quality of beer brewing. He is known as an enthusiastic supporter of science: in 1875 he founded the Carlsberg Laboratory, which continues to exist as an exemplary industrial lab which also produces excellent basic science. The Carlsberg Foundation is one of the largest private scientific funders in Denmark, and there are close links between the Carlsberg Foundation and the Danish Royal Academy.

Placing ESOF in this area of the city therefore highlighted important cultural and historical trajectories and values. Carlsberg signifies the importance of science for modern Danish industrialisation, as well as the link between scientific excellence and industrial research. The national identity as scientifically excellent and world-leading is furthermore boosted by the very fact of ESOF's presence. Its organisation requires significant financial and administrative resources - so the fact that ESOF chose and was successfully run in Denmark is prestigious. The importance of the ESOF conference was signalled by the fact that the opening session featured both the Danish Queen Margrethe II and the chairman of the European Commission, Manuel Barroso.

Identity should be a key concern for future efforts to understand science communication. Processes of national identity formation — for instance presenting Denmark as a scientifically advanced, technologically world-leading nation — were particularly apparent at ESOF, but we should also be concerned with other ways that science communication relates to the shaping and management of identities. When scientists communicate, they are not just presenting facts or information, but making sense of what science is and should be, as well as managing their own professional and personal identities. Throughout the ESOF event it was possible to meet scientists who presented themselves in different ways: some came across as playful and down to earth, while others were more aloof or serious. These performances were not only about who they were, but implied different versions of what science is. To some it is an endeavour full of hard-core facts and certainty, while others introduced ambiguity and uncertainty into their stories. Some scientists were clear that they were primarily speaking as individuals, while others saw themselves as representatives of something bigger than themselves — their university or a scientific discipline, for instance.

Science communication can also be more or less important for the way in which citizens see themselves and their communities. At an event like ESOF it is not unusual to meet people who think it is a citizenly duty to 'keep up' with science and who talk worriedly about a wider public who don't pay enough attention to it. Going to a science festival can be a status marker, or a sign that one is a good citizen. On the other hand, some people may define themselves through being someone who doesn't understand or care about science.

Science communication therefore relates to identity construction in a number of different ways. Cultural theory tells us that the constitution of identity is not something that happens once and for all, but is an ongoing process; often, "identity is most clearly defined by difference, that is by what it is not". (8) Culture is the overall pool of shared meanings which we draw upon when we do this identity work. But this continuous identity work also contributes

to our shared pool of meanings. Culture and identity are therefore in continual interaction with each other. Science communication may help shape cultural resources for identity formation, but it will also, of necessity, draw upon existing understandings of science, scientists, and public audiences.

## **Production of Science Communication**

According to cultural theory, the study of production processes covers all aspects of how meaning is encoded into messages, artefacts and other representations. Studies of production therefore involve analysis of the structures, which shape the making of particular cultural artifacts, as well as the cultures that imbue those representations with particular meanings. What is in focus here are the practices that make up any production process - from taken-for-granted assumptions and worldviews to organisational visions and heroic stories as well as ordinary habits and routines.

ESOF was a massive undertaking, and many different organisations and individuals were involved in its development. The science communication were produced by universities and academic departments, independent research institutes, news media and journalists, companies and industrial organizations, NGOs, hackers, artists, and designers. While all these actors might share an overall goal about communication about science, they also have different ways of doing so, based on different sets of values.

For instance, many of the universities and research organisations present at ESOF used it as a site for PR and showcasing positive stories. Science communication was part of a general effort to achieve good branding. Groundbreaking scientific results are valuable not just in and of themselves, but because they can be used to make salient external communication. However, branding is not simply something the universities do. Hacker-spaces and NGO's for instance, would also like to raise their public profiles in order to improve their possibilities of acting in the world... And so do researchers, by the way.



Here is an image of myself with the vice-chancellor of the University of Copenhagen. I was in the installation one day at ESOF, when I was told that he would come round with his entire entourage to visit the University of Copenhagen tent, and could I please prepare a 5 min presentation of the installation. Of course, I wanted to explain the point of the installation to him and the group and

get them to reflect on their own taken-for-granted assumptions about science. However, I also experienced in myself, a very strong wish to make sure that they understood that this was great and that I and my team were doing something quite unique. Simultaneously, I made sure that one of the students took photos of this. One never knows when it is useful to have a picture of the vice-chancellor in your installation. Along these lines, I would argue that most of the actors in ESOF were somehow also guided by wishes to put forward a positive image of themselves in their efforts at ESOF. Hence, branding is not something the others do, and something that lies outside science communication.

I want to touch upon a different aspect of production, namely that of the idea of planning. Although many of us know that the world is not a rational, ordered place, it is very hard to remember when we only see the outcome of chaotic production processes – the final science communication product. This is the third installation I have made with the particular designer, and every time I have been surprised at how many decisions we make based on happenstance or without really having time to think them through. I don't mean to say we don't think hard about what we do, but there are just so many more things to consider, which means that the actual outcome, the installation, always overflows the original ideas.

Why, for instance, do I wear a lab-coat in the picture above. As I recall it, we did not talk about it very much. The designer needed to make the students employed in the installation visible and she wanted the clothing white because it would go with the colour scheme – and at some point we had talked about getting the synthetic biology scientist to man the installation. So I think she just thought that this was a simple choice. And I didn't really have time to pay attention to that detail and then it was lab-coats.

As an STS scholar I might actually like to question whether that was a good choice. And as it happened, some of my science colleagues even commented ironically on it at the time – Maja, you don't have to wear a lab-coat to be a scientist, don't you know that? Of course, if

we are historical materialists – possibly in the line of Haldane - and we believe that the productive forces determine the meaning of things, we might see this choice of lab-coat as a clear sign of the hegemony of natural sciences. However, I guess I am more in line with Stuart Hall and colleagues – I think it was just one of those things that happened. And this is my point here: we need to study the production processes themselves in order to investigate such things. We cannot deduce how production took place from seeing the final product.

And yet again, there are other aspects of production processes in science communication, which suggest the opposite – namely the professionalization of the field. While I and my colleagues are the typical amateurs, many other people at ESOF did this kind of thing for a living. I believe we should also pay more attention to these processes of professionalization. What are the emerging norms guiding the profession? How do they interact with scientists and all the other new interface-specialists, which get employed in universities? What kinds of training and education systems do we organize within science communication?

In the context of science communication, a focus on production processes points to a number of different things: questions of branding, certainly, but also the emerging professional values and practices in the making of science communication products. Science communication is no longer simply done by individual scientists as an add-on to their normal job. Rather it is rapidly becoming big business and in some sense, it is also becoming a precondition for the actual production of science itself. In order to be able to generate necessary resources and legitimacy, scientists need to be able to communicate convincingly about their visions and ideas. Studies of production therefore open many questions about how science communication is organised and carried out, as well as the values attached to it.

## **Representations in Science Communication**

Representation is about the way in which signs – such as words, images, body language, or symbols – are used to ‘stand for’ or signify objects in a meaningful way. Such representations are always subject to multiple interpretations. “It is by our use of things, and what we say, think and feel about them”, writes Hall, “that we *give them a meaning*”. (9) The processes of representation therefore include all the ways in which we use signs to create and communicate meaning about phenomena. Just as ‘encoding’ covers the processes by which meaning is imbued into cultural artifacts through their production, Hall speaks of ‘decoding’ as the interpretative process by which people make sense of representations. (10) Representations are always open to multiple forms of decoding, and producers therefore cannot control the process of decoding – even though they might try to make some

forms of interpretation more obvious than others.

This part of the circuit of culture is probably where we find the most previous scholarship and I will therefore not spend too much time on this. We know quite a bit about how metaphors, icons or imagery is used to promote certain imaginations of science, just as there is a large body of literature on representations and framings of science – particularly controversial aspects of technoscience. It is important not just to understand these representations in terms of how accurately they represent the scientific knowledge that they are signifying. The representations found in science communication are never just about their scientific content: in addition, they also represent ways of understanding science as a social activity and part of society. One simple issue, for instance, is that of gender. If most representations of scientists are of white men, then what does this mean for how science is decoded by audiences? (11)



We actually thought a lot about how to represent scientists in our installation. At each entrance to the tower of science, we wanted a scientist to give his particular views on science and his own responsibility as a scientist. At first, we wanted to make interviews with real scientists representing the particular view of that entrance. This turned out to be very difficult in practice. So then

we thought about actors – but we needed four – should it be two males and two females? – and what other kinds of differences should we try to include? In the end we did the opposite – we just chose one actor who did all four. This is Jacob and he was on our team because he designed the digital part of the installation. He was also the only one of us who had any training in drama. So therefore we settled on him. But he does undeniably look like a white man and hereby we do undeniably contribute to the representations of the white male as the normal scientist.



## Consumption of Science Communication

Consumption, within cultural theory, is used to refer to all the various processes in which representations are decoded and put to use. As Paul du Gay writes, “Processes of production only provide a series of possibilities that have to be realized in and through consumption”. (12) So consumption is active. Consumers of cultural products are not just passively fulfilling a determining script put forward by producers, but decoding messages according to their values, preferences, and interests. This is a very familiar line of reasoning for people within STS who have been arguing for decades that people make sense of science in ways that suit them, their values and their current circumstances. However, while the seminal book on “Misunderstanding Science?” by Irwin and Wynne actually focused on the way people make sense of scientific information related to their everyday life, most STS researchers have since moved away from such general and mundane settings in order to focus on governance implications of public engagement or more specialized consumptions – for instance patients using medial science. When it comes to more general or mainstream science communication, such as ESOF, STS scholars seem to have left the fields to other disciplines, who are mostly interested in issues of education, learning and scientific literacy. I think this is a shame, as there are a lot of interesting aspects of consumption related to a phenomenon like ESOF and similar mainstream science communication.



For a start, it was clear that people at ESOF found multiple ways of relating to the Festival and its exhibits. Some people attended because their son was a PhD student at the University of Copenhagen and they wanted to see what he is doing in his festival tent. Others commuted through the area on their way home from work, and stopped to see what the fuss was about. Schools used it as

a free and entertaining afternoon out for students. Overseas visitors saw it as part of a cultural itinerary in the larger project of visiting Copenhagen. Activists and other politically engaged people used it as a platform for discussing issues they cared about. No matter what their interest was, however, visitors were not just being informed about science, but actively taking part in a cultural reproduction of science as an important and multifaceted part of society.

Similarly with our installation, where we experienced many different ways of engagement or

consumption – only some of which we had foreseen. Some people followed the intended route: started at the desk, got their iPad, saw the first film and picked up the route into the installation to engage with the dilemmas. Others got stuck at the desk talking to the students manning the installation. Others yet again went in from the back, as if they wanted to see what it was without losing the ability to get out fast again. When we talked to them and offered an iPad some got very interested, while others shyed away. It often made us feel like we were kind of intruding on them. Clearly not everyone wants to get engaged with an installation but prefer to keep a role as spectator. They were curious, but they liked to keep their distance and just watch and try to suss out what the installation was. As a contrast to this, some children were interested in the iPads and used them on a kind of treasure hunt to see if they could find all the scanning symbols. Similarly some of the teenagers were mostly interested in the iPads and a few even managed to hack them in order to change the content. Actually, however, many of the teenagers were some of the visitors that engaged for the longest with the installation. They really got into the different stations and would stand and discuss with each other for a long time.

And many of the visitors wanted to discuss with me and my team. They wanted to talk about the content of the installation, for sure, but also more broadly science policy and the role of science in society. A lot of them clearly had their own particular issues that they cared about and they used this as an opportunity to talk about it: Sustainability, CERN creating black holes, commercialization of science, government funding of research, child education, and alternative medicine are just some of the issues that people brought up in discussions with us. In this way the installation clearly demonstrates how people consume science communication as part of their entire life. It is not a separate issue, but something that gets entangled with all the other things they care about and try to achieve.

## **Regulation of science communication**

We finally come to the last aspect of the circuit - that of regulation. Within cultural theory, processes of regulation are understood in a broad way. On the one hand, there is explicit and direct regulation of production and consumption: the ways in which we organise, govern, and control the production and use of cultural products. This aspect highlights legislation and other formal means of controlling production. But there are also other and more diffuse means of regulation, in which cultural meanings “organize and regulate social practices, influence our conduct and consequently have real, practical effects” (13), as Hall puts it. Studies of cultural production therefore pay attention to how cultural norms and conven-

tions structure how artifacts are used, circulated, and understood.

In the context of science communication, regulation therefore concerns both formal legislation and the unstated norms and conventions that govern practice. This might involve official rules about obligations to disseminate research, but also the informal cultures around whether these activities are actually desired, merely accepted, or somehow discouraged.

ESOF is a good example of the commitment to science communication, which can be found generally in the European Commission. And ESOF is demonstrating a general norm of understanding science as important, powerful, useful and universal. However, we can also identify certain differences between the way science and scientific organizations are presented in the ESOF policy convention compared to the Science in the city festival. In the exhibition hall of the policy convention, stories are focused on scientific progress, excellence, competition and investment in science. They are also explicitly related to stories of national prosperity and growth in modern knowledge societies. In contrast, exhibits in the public festival was focused on representations of science as playful, spectacular, directly useful to everyday life, entertaining, wonderful and engaging.

This is one of the ways in which basic norms guide how we produce and experience science communication. Expectations towards audiences shape particular ways in which we talk about science. But we could unfold this argument and consider the interplay – but also possible conflicts – between the focus on the competitiveness of the European knowledge societies and the move towards dialogue and democracy, which was visible in many displays. This is what I have elsewhere referred to as the tensions between the innovation and the deliberation agenda. (14) And this could be a focus for an entire talk in itself. However, before I end, I want to give you just one last example of how norms and values regulate science communication, but also how consumption might overflow such norms.

Our installation was clearly addressing its visitors as citizens of a democratic state. I am saying this very matter-of-factly, but in my work with previous installations, this is something I have been thinking about quite a lot. (15) In many ways, this installation is a variation of the famous participatory consensus conferences run by the Danish Board of Technology. It invites ordinary citizens into a space of deliberation – it gives them some information and ask what they think about it. The installation does not ask for a consensus statement, but it does ask for people's opinions in lots of different ways.



In this image, for example, visitors are asked to write their suggestions for which social problems they want science to find solutions to. They should write on the coloured notes and then 'post' them through the tubes. On the inside they are subsequently asked to decide which of the many problems they think should be prioritized highest and how resources should be distributed.

What I want to show you are the responses that we received to such a question, and I have here compiled the first 12 responses, which were in English. There were many more, but these are just a random selection:

I wish that we were able to travel to other stars

Climate change!

Research on why people have knowledge (eg about health or climate change) but don't act on their knowledge.

Too much inconsideredness – about the environment

I'd like to see an end to socialism!

I would like to find out how we build the hospitals of the future, so they match the future challenges

I want a fucking unicorn

The Riemann conjecture

World will survive

There won't be any illnesses

I still love her

Cancer

I am endlessly interested by such a list. First of all because it gives me a lot to think about. How, for instance, should we interpret the wish for a unicorn? The installation does actually use synthetic biology as the example, so is this a real wish, is it fun, or is it ironic? Secondly, such a list suggests that people do not simply do what they are asked, but actually answer questions based on their own life situation. They are not simply letting themselves be interpellated as citizens, but also include their own life situation – here this is most visible in ‘I still love her’ (whatever that means), but generally we get a lot of such comments. For instance, we also found ‘I want to meet Justin Bieber and marry him’ and ‘I love my best friends forever’ in other places in the installation. In this way, communicators like myself are reminded that we cannot simply expect people to fall neatly into the categories that we impose on them. Who says that my best friends, or the undying love for ones girlfriend isn’t at least as important as science policy? While we might want to create instantiations of a Habermasian public sphere in our science communication, people might have other imaginations of what the public space should be used for.

## **Conclusion**

In conclusion, I want to stress that the circuit of culture is not a tool that gives immediate answers. Rather, its value is that it opens up questions, allowing us to notice different aspects of science communication in different kinds of ways. I have used it here as a framework for navigating science communication, but of course other theories and models could be used. The important point is to stress the heterogeneity and richness of science communication, when we consider it a cultural phenomenon.

As a final remark, I want to suggest that we think of science communication as an eco-system in order to capture its heterogeneity and multiplicity. What we see at a place like ESOF can be thought of as a diverse landscape with many different forms of being and communicating. The term eco-system is not meant to suggest a stable structure in which everything has a particular place and is connected in very specific ways, but to a heterogeneous space teeming with various life-forms, all relating to each other in different ways. If science communication is an ecosystem, it has many niches, in which different practices of communication sustain themselves and others in a complex web of interdependence and autonomy. To me, this eco-system is endlessly interesting and I hope that more STS people would want to take on the task of exploring it in the future.

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(1) This talk is partly based on arguments made in Sarah R. Davies & Maja Horst (forthcoming), *Science Communication: Culture, Identity and Citizenship*. London: Palgrave.

(2) Maja Horst, Sarah R Davies & Alan Irwin (forthcoming), 'Reframing Science Communication', in Ulrike Felt et al (eds.), *Handbook of Science and Technology Studies*, Cambridge, MA: MIT Press.

(3) Stuart Hall (1997), *Representation: Cultural Representations and Signifying Practices*. London: SAGE Publications, p. 2.

(4) Hall, *Representation*, op. cit., p. 2

(5) Hall, *Representation*, op. cit., p. 18.

(6) Hall, *Representation*, op. cit., p. 1.

(7) Paul du Gay (1997), *Production of Culture/Cultures of Production*. London: SAGE Publications, p. 10.

(8) Kathryn Woodward (1997), *Identity and Difference*. SAGE Publications, p. 1-2

(9) Hall, *Representation*, op. cit., p. 3.

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(11) M. Chimba M and J. Kitzinger J (2010), 'Bimbo or boffin? Women in science: an analysis of media representations and how female scientists negotiate cultural contradictions', *Public Understanding of Science* 19(5), pp. 609–624.

(12) du Gay, op. cit., p. 59.

(13) Hall, *Representation*, op. cit., p. 3.

(14) Maja Horst and Alan Irwin (2010), 'Nations at ease with radical knowledge', *Social Studies of Science* 40, pp. 105–126.

(15) Maja Horst (2011), 'Taking our own medicine: on an experiment in science communication', *Science and Engineering Ethics* 17(3), pp. 801-815.



## STS Occasional Papers

1 **Joe Cain** No Ordinary Space: A Brief History of the Grant Museum's New Home at University College London. 2011.

2 **Simon Schaffer** Mutability, Mobility and Meteorites: on Some Material Culture of the Sciences. 2014.

3 **Hsiang-Fu Huang** Ouranologia: an Annotated Edition of a Lenten Lecture on Astronomy with Critical Introduction. 2015.

4 **Helen Longino** Underdetermination: a Dirty Little Secret? 2016.

5 **Maja Horst** Reframing Science Communication: Culture, Identity and Organisations. 2016





