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What science stories do:

Rethinking the multiple consequences of intensified science communication

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In most industrialized countries, science communication activities are seen as essential for improving science–society relations. Telling stories about science and being a scientist has become a central activity for communicators, but increasingly also for researchers. In this paper, we ask: What do science stories and specific kinds of storytelling do? What repercussions do the widely produced and distributed public images, the multiple stories about science, doing science and being a scientist have? We trace the effects of dominant forms of storytelling about science, particularly on scientists and their ways of living and working in science, but also on society. In conclusion, we call for a ‘storytelling ethics’, which stresses that communicating science is also about choice, about what stories are being told and which ones are left out, and in that sense also about which kind of science we frame for which kind of society.¹

More science communication

Recent decades have seen an intensification of science communication activities in most industrialized countries, although to different extents that relate to different traditions and following different modalities of implementation and support. There is a flourishing business circulating communication models and best practice exercises. Despite all national and local differences, and whether they are labelled science communication, mediation, engagement, brokering or something else, these activities have one thing in common: they are all seen as essential for improving the relation of science and society, and thus remain largely unquestioned. For institutions of research and higher education, to take but one example, investing in telling stories about science and technology seems to have become a *must* when it comes to claiming their position in the public space. Research needs to be valorized through offering a web presence attractive to ‘the public’, press releases on the latest research results have to be sent out, and the doors must be opened for some outreach activities.

Forms and formats of communication have also been continuously redefined and diversified: science weeks and festivals, children’s universities, public labs, science blogs, science slams—and the list could be continued. While these activities focus mainly on communication, we also encounter—even though to a lesser extent—formats fostering public participation and engagement in actively shaping the relation of science and society, such as citizen conferences.

¹ This paper builds on a presentation by U. Felt delivered at the 2012 International Conference on Science Communication. For further reading on the impact of science communication on science, see also Felt & Fochler (2012).

Medialization of research

What we observe could be labelled a medialization of research—to use Peter Weingart's (1998) notion in a slightly extended manner. Our use of this term does not focus only on classical mass media, but embraces the whole spectrum of different forms of public communication and representation of science. Medialization thus on the one hand means an ever-increasing coverage of science in the media, as well as a multiplication of contexts in which scientists themselves present and re-present their work to different audiences. On the other hand, as we show in this paper, it also means that specific forms, formats and guiding values typical of classical media communication now become central in core areas of scientific practice, such as in funding processes, assessment exercises or self-presentations.

Medialization is fostered by policymakers, who not only financially support science communication efforts as stand-alone activities, but also formally define communication activities as among the aims and outputs of funded research projects. Also, researchers are increasingly asked to become active and participate in communication work, to become active storytellers of science. This can be seen in growing offers to train young researchers in communication skills in order to better represent 'their research' in the public arena, and placing them under an obligation to do so. This is expected to add some authenticity to the stories developed about science.

Driving forces and expectations

What is the motivation behind these activities, and why such an intensification? Different lines need to be distinguished here.

One major strand of efforts is devoted to making science appear more attractive, in particular to the younger generation. Staging contemporary societies as dependent on technoscientific developments, the concern is that not enough young people decide to make science and engineering their career choice, particularly in fields that are regarded as key for future developments. From the youngest age, children are to be attracted to science through colourful presentations and by having fun when they play 'doing science'. Second, these activities are also meant to counterbalance the alleged mistrust of 'the public' towards science and thus to ultimately lead to more enthusiastic support for new developments. But they are also geared to 'develop' or to educate the 'scientific citizen' (Irwin 2001), who can and is ready to participate and engage with research and research-related issues in a 'rational' manner, thus contributing to the creation of an innovation-friendly climate. Together, this is aimed at supporting a steady flow of innovations, which is expected to foster future societal development and welfare, at least in the currently dominant 'Innovation Union'² discourse on the European level.

To meet these aims, should we simply call for doing more and better science communication? Should we simply stress the need for more funds and more stable support, pretending that once these claims are fulfilled everything will be fine for science in contemporary societies?

² http://ec.europa.eu/research/innovation-union/index_en.cfm.

In what follows, we argue that this would not only be a considerable oversimplification, but could prove counterproductive. We much more want to ask: What do science stories and specific kinds of storytelling do? What repercussions do the widely produced and distributed public images and sociotechnical imaginaries (Jasanoff & Kim 2009), the multiple stories about science, doing science and being a scientist have? We trace the effects of dominant forms of storytelling about science, particularly on scientists and their ways of living and working in science, but also on the public. The guiding question will thus be: How does this intensified and diversified storytelling about science tacitly govern (Felt & Fochler 2012) research and create a specific imaginary of science in broader societal arenas?

Storytelling

Looking into science communication as a storytelling activity builds on a long-standing tradition in the social sciences, in particular after the 'narrative turn'. We are interested in stories researchers narrate about the multiple relations of science and society and the kinds of ordering and positioning work that go into them (Czarniawska 2004). Interviews with researchers but also the many other kinds of formal and informal discussions we had with them are settings in which researchers are explicitly invited to engage as storytellers (Denzin 2001). Yet these are also moments when the dominantly circulating, quasi-institutionalized stories are assessed and counterstories of resistance narrated (de Certeau 1984). They are spaces where stories are 'produced (concocted, fabricated), sold (told, circulated), and consumed (listened to, read, interpreted)—often all in the same performance' (Czarniawska 2004:45). Looking at researchers' narratives through the lens of storytelling thus allows us to draw attention to a specific, culturally rooted way to organize information, to the rules that govern this kind of storytelling, to how stories unfold their emotional power, and how this is a means to perform the building of community. It means devoting attention to the way science and its relation to society gets narrated, and how different threads gain importance in this and form the fabric that science gets wrapped into.

The following reflections thus try to offer selective insights into what science stories do, drawing attention not only to how they are told, but to how specific ways of dominant storytelling act on researchers and their self-understanding. They build on more than 60 interviews as well as group discussions from two major research projects the authors have been involved in over the past six years, studying the way researchers live and work in contemporary science in Austria.³

³ The project 'Knowing—Knowledge, Institutions and Gender. An East–West Comparative Study' (FP6) compared the research cultures in molecular biology and sociology in five European countries. For this paper, we are referring to interviews and focus groups conducted with molecular biologists in Austria. The project 'Living Changes in the Life Sciences. Tracing the Ethical and Social within Scientific Practice and Work Culture' (BMWf; ELSA/GEN-AU) explored how life scientists narrate the relationships between biographical, epistemic, institutional and broader societal rationales. The authors would like to thank all colleagues who have contributed to the field work in both projects. See <http://sciencestudies.univie.ac.at/en/research/completed-projects/>.

Stories told about science

'If you think about your generation and earlier ones, what's the difference for you in terms of the skills one needs to be a scientist?' was a crucial question we asked young scientists in the Austrian life sciences. We also asked their senior colleagues an adapted form of the question. As answers, one could expect a range of arguments: the ability to master new methods and technologies, the literacy to deal with the enormous amount of published information available electronically, or the skill to navigate an increasingly internationalized science system. While all these issues did come up, there was another maybe less expected skill many of our interlocutors referred to: to tell one's own research as a convincing story. Consider the following statement by a female PhD student:

We are [perceived] a lot [through] what we published, we are also [perceived] a lot [through] the way we present ourselves ... I know a lot of good professors with extremely good work, but who stand in front of an audience and start k-k-k—nothing comes out. And when that happens you lose ... The fact that now we have ... powerpoint presentations, movies and all these things makes communication easier, but it also is a challenge.

Our interviewees mentioned a range of different contexts for this kind of presentation work, from conference presentations to job interviews, blogs and interviews in classical mass media. Of course they would stress that different arenas call for different forms of stories to be told. However, the basic narrative form of these stories seems similar across contexts: stories need to be brief and speak to a particular audience in an entertaining manner, while simultaneously and convincingly conveying relevance. This is what is seen as making the difference in a dense economy of attention structuring science news or the blogosphere, and now increasingly also the scientific conference hall. Hence, it seems that elements of mass media communication logic have become quite pervasive in areas of intrascientific communication. That is why we call scientists' practice of talking about their research in these narrative conventions 'press-packaging science' (Felt & Fochler 2012).

It is important to note that these forms and conventions of telling stories about science are not imposed in direct media interaction. Rather, they are trained and rehearsed within science, particularly in the socialization of young researchers. Our interviewees would tell us about media training or science slams, where they learned to entertainingly sketch their work in three minutes for a general audience, and about pre-conference meetings in their groups in which presentations were rehearsed again and again until they were 'spot on'. In 1914, one of the sons of Charles Darwin, Sir Francis Darwin, wrote 'In science credit goes to the man who convinces the world, not to the man to whom the idea first occurs' (Darwin 1914:9). Nearly a century later, one would hardly be surprised to find this quote in a training manual for science communication.

However, convincing the world today takes more than a 'spot on' presentation. This quickly becomes apparent in another domain in which both senior and junior scientists would describe press-packaging practices as central: science funding. Here, building linkages to grand societal narratives—as is the 'Innovation Europe' narrative

at the time this article is written—is seen as equally crucial. Witness the following comment by a senior professor:

Everybody writes, and so do I, as first sentence in the [grant application]: ‘metabolic diseases are a major burden on humanity’. As if, with my grant, if I manage to get it through, I would solve that problem. [laughs] But of course it’s actually not like that.

As this quote alludes to, it is not enough for a story about science to be brief and entertaining if its aim is to win research money or sustained public attention for the storyteller(s). It needs a more heroic plot, in which science contributes to shaping societal futures, to realizing societal values and to solving societal problems. In the light of the contemporary discourses around science and innovation, positioning the eternal quest for new knowledge and the insatiable curiosity of the scientist as selling arguments in the first paragraph of a grant proposal or in the press release announcing a new project no longer seemed an adequate narrative choice to many of our interlocutors. Rather, the take-home message should always be what this particular research effort will do for wider society. This ties the stories told into broader accounts about progress and innovation, about how more knowledge will necessarily lead to better lives.

In doing so, these promissory stories implicitly stage a particular relation between science and society. The ironic tone in which our interlocutor stages his experience directs our attention to this. He mockingly comments on the specific temporal causality inherent in his own narrative, and the linear relation that is established between proposed research and the solution of future societal problems. This linearity leaves little room for any uncertainties, complexities or alternative ways of problem solving—all of which this quite successful grant-story teller would see as mattering. Things are ‘actually not like that’, he would be keen to add.

Hence, the narrative form in which these stories about science are told both buys into and reproduces a grossly simplified picture of the way the sciences contribute to shaping societal futures. This is even more important to consider, as the logic of staging one’s work as providing future solutions to contemporary societal problems is not confined to the genre of the research grant. The ‘economy of promises’ (Felt & Wynne 2007), in which the promise of future contributions to societal issues becomes a central medium for attaining reputation and resources within science, is equally observable in many other instances where stories about science are told.

Stories not told about science

What do the particular ways of telling stories about science sketched above do? How do they tacitly govern science, and how it relates to society? To grasp these issues, it is useful to look at which stories are not or can no longer be told in these narrative frameworks (Coyaud 2007).

In the context of the Austrian life sciences, it is not very hard to find researchers who are quite frustrated about the ubiquity and importance of the practices of storytelling we have described. This frustration is not linked to their lacking potential ability to tell of their research in a convincing or entertaining manner, but rather to a societal context in which not every form of new knowledge is seen as equally promising. For

example, agricultural biotechnology has been deeply controversial in Austria over the past decades. In the 1990s, the first field experiments testing transgenic crops were protested against, and in 1997, in one of the most successful public petitions to parliament, more than 1.2 million Austrians signed slogans such as 'No food from the gene laboratory' or 'No field trials involving genetically modified organisms'. Now, 15 years later, public resistance against agricultural biotechnology has become a deeply rooted element of Austrian technopolitical culture and identity (Felt 2013), and has also spawned a quite restrictive legal and administrative regime for agricultural biotechnology.

In our field work, more senior researchers working in molecular plant biology, in particular, were quite concerned about how negative public opinion affected their work even in basic research. In this, the impossibility of telling stories that work in the current economy of promises in the Austrian context was of central importance, as the following statement by a senior group leader shows:

I simply can't argue on the basis of the potential applications of these things, because there is no political support for these applications here. That means we can't do what the basic researchers in the medical field do, which is claim that they have a therapy for XY in five years time.

For her, as for others in related areas, this has quite direct consequences for her work. On the one hand, access to the most prestigious forms of research funding seems hardly possible because the right kind of story cannot be told, and hence cannot be converted into other forms of capital in the economy of promises. On the other hand, other important aspects of this scientific field are also affected, such as its reproduction. Because of the lack of a positive storyline, students' interest in choosing this field for their PhDs and their future scientific careers is more limited than in neighbouring fields. Molecular plant biology in Austria is seen as a quite risky career choice.

As we can see from the case of agricultural biotechnology, the ability of a field to tell the right kind of stories has quite manifest governing effects. While this case is certainly the most extreme in the Austrian context, other sciences also face similar issues. The social sciences and humanities, for example, have been and are struggling hard to tie their work into these promissory forms of storytelling, with its emphasis on the direct usefulness of the knowledge produced for addressing societal problems.

Struggling with stories about being a scientist

Besides stories about science, stories about scientists and what living and working in research means are a second important type of narrative relevant to our argument in this paper. There are two contexts in which these stories are enacted. First, there is a growing range of communicative contexts in which scientists are asked to talk about who they are and what motivates them to do research. Among those contexts, communication directed at young people has become particularly central over recent years. Scientists go to schools to talk about themselves and their work, or they invite pupils to 'open labs' to show them what doing science is like. Second, particularly but not only in the mass media, iconic figures such as Craig Venter or other 'science celebrities', often circulating in more national and local circuits of communication, are

staged as representing science in its most cutting-edge form, very often strongly relating to the promissory discourses we have described above.

In our own field work, it has been interesting to observe how many researchers in the life sciences struggle to make sense of the relation of their own experiences and biographies to these public stories about being a scientist. Not surprisingly, the public stories almost uniformly stage a particular kind of success. On the one hand, they do so in relation to the people portrayed, who are sketched as those who 'have made it', as elite scientists who deliver both scientific excellence and societal relevance. Failure is virtually only talked about in the context of reporting about fraud cases, where the scientists involved are staged as culprits and as a few black sheep violating the scientific ethos.

On the other hand, also in 'open labs' and other contexts where scientific practice is presented, epistemic failure or other exigencies of everyday scientific practice are hardly an issue. The experiments shown and conducted there are not experiments in the actual sense of a setting designed to find something new. Rather, they are demonstrations that doing science is fun and that results are always clear-cut. Time frames of experiments are reasonably short, and scientific work is portrayed as continuously exciting. In the daily lives of the researchers we talked to in our field work it often is not, as experimental practice is also full of routine work and setbacks and is connected to being notoriously behind schedule, and as moments of frustration are more common than the rare occasions of thrill and delight when things do work out. The scientists we talked to would repeatedly complain that these issues and experiences are mostly absent from public stories about science and scientists. To also show these aspects, one interviewee ironically suggested that a TV reality show reporting on science would be needed, because in his view 'only then we would have time for the stories which currently are not told'.

But why are researchers struggling with the fact that their lives and practices are portrayed more positively than they perceive them? After all, it does not seem such a bad thing to look good in the news or in any other presentation to the public. There are two sets of reasons why our interlocutors were often quite ambivalent about this.

The first is that representing scientific practice as continuously exciting and successful again implies a certain linearity in which science will be able to address and solve societal issues and problems. This creates societal expectations, which researchers see as based on a false representation of scientific practice, and hence as providing a skewed picture of the time frames in which research may contribute to meeting societal challenges. Simultaneously, as discussed above, researchers are using the linear arguments about science's future contribution to solving societal problems as argumentative resources in different contexts, and hence contributing to the (re)production of the very same genre of stories they criticize. This points to an essential tension scientists are currently facing, as under the conditions of an increased medialization of science they are both producers and subjects of stories about science.

Second, our interviewees were concerned about the picture of scientific practice and scientific careers conveyed to the young generation. For example, they would refer to the quite unrealistic picture of working in science they had as they started their careers, and say that they might have made different career choices if they had

had a more realistic assessment. At this point, it again seems useful to ask which stories about being a scientist are not or only very rarely told in the public realm. In this, current developments around scientific careers are a particular case in point. In our interviews, young life scientists described their experience of pursuing a scientific career as structured by strongly temporalized and uncertain employment conditions on the one hand, and as guided by an intense competition for the few positions that offer a more long-term perspective on the other (Felt et al. 2012). Also, the normative lines along which academic careers develop are seen as rapidly changing, which means that the experiences and models of prior generations—often presented in media narratives—can give only very little orientation and guidance for young researchers today. A senior scientist reflected on the change of public images of scientists and the role models they offer for the young generation:

Now there are glossy brochures in which scientists are portrayed. And they are portrayed in a completely different way, they are like pop stars partially, so they have a completely different character than the role models I saw in my youth.

The stories about success in science told in these glossy brochures partly become role models for the younger generation, or maybe more precisely they become yardsticks against which one's own scientific biography gets measured. However, the stories about scientists portrayed in the media are first and foremost a set of quite narrow success stories, and they follow rather homogeneous patterns, also often omitting the contingencies and not so successful sides of the particular biographies. Hence, when compared to these stories, the individual lives of young scientists are deficient nearly by default. Some of the normative requirements of the 'excellence career' are always missing, be they research stays in prestigious institutions, too few high-level publications or media presence. This has considerable tacit governing effects on how young researchers think about themselves and plan their careers. The homogeneity they are confronted with reinforces young scientists' orientation on one particular career trajectory, which—as they are quite aware—will only be available for very few. At the same time, the lack of a repertoire of alternative stories curtails their thinking and creativity in developing alternative career models and in experimenting with different ways of living in research.

Concluding remarks

What can we learn from these examples and observations?

We want to start our concluding remarks by joining Nowotny, Scott and Gibbons (2001:260) in stressing: *Mind the gap*—'the gap between images of science and the actual practices', which runs the danger of 'becoming too wide'. 'In an age of intense contextualisation', an age where science and its representations have come to play a crucial cultural role in ordering modern societies, 'images of science need to have a strong "reality content", that is, be closer to actual practices and their rapid changes than the traditional and timeless images' (Nowotny et al. 2001:259). In what we have shown above, we clearly see the consequences of the stories and work realities drifting apart.

From our perspective, it is essential to understand that telling stories about science in the public realm has an important impact on society, but also on science and in particular on the next generation of scientists. The medialization we have sketched also defines how researchers contextualize and value their own work and what kinds of promises will frame and possibly guide it. Finding a place and being successful in an economy of promise is not only to be understood as a game which is played outside science to assure support, authority and admiration. It also affects how researchers perceive their own role and their work in science. The stories we have analysed in this paper give shape to a specific temporal imagination of research, stress the idea of immediate innovation and direct usefulness as central values for making choices in science, and in the long run nourish the belief in a future that can be shaped and controlled. At the same time, they create a normative imaginary of the successful researcher and how s/he should be and act.

We thus argue that stories told about research and being a researcher have a tacit long-term impact on scientists' epistemic pursuits as well as on the skills and virtues expected from the scientist as a person. Nor do they leave society untouched: they are important parts of the broader societal imaginaries of research in contemporary societies.

The arguments we have made in this paper suggest that storytelling about science participates in the creation of a rather specific and often quite narrow imaginary of research, one of a fast and successful enterprise, where science is in control and provides solutions to clearly defined societal problems. Other possible storylines that would instead address the uncertainties and contingencies of current scientific practice and its relation to society are hardly present. In diagnosing this, we would like to refer back to de Certeau's (1984) writings, in which he reminds us that stories could be important spaces of resistance to dominant narratives of institutionalized power structures. Not giving place to alternative stories and rehearsing only specific narratives thus matters for the relation of science and society.

In conclusion, we thus do not want to simply buy into the logics of the frenzied business of selling science better and increasing its public presence at any price, but call for a 'storytelling ethics' in a world where science and technology have become so powerful. Telling stories about science means much more than simply giving a correct account or an attractive presentation to convince members of the public. It is about choice, about what stories are being told and which ones are left out, and in that sense also about which kind of science we frame for which kind of society.

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