

SCIENCE ON TELEVISION: AUDIENCES, MARKETS AND AUTHORITY. SOME CONCLUSIONS

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In May 2013, the “7th European Spring School of History on Science and Popularization” took a closer look at the roles television and science have played, and still play in our daily lives. The aim of the School was to contribute to the analysis of television as a particular space where the complex relationship between science and its publics unfolds. It was an invitation to explore and experience television as a major constituent of the production, circulation and appropriation of scientific, medical and technological knowledge. Notwithstanding the sweeping expansion of the internet in the last two decades, people still build a highly significant part of the symbolic framework of the social, economic, political and cultural fabric around television.

Media and science are two sets of discourses and practices that play key roles in the construction and operation of contemporary societies. Science has been described as a form of communication (Secord, 2004; Topham, 2009), and media as a set of technology-mediated communication practices (Thompson, 1995; Couldry, 2004; Bräuchler & Postill,

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2010). The production and circulation of scientific-technological knowledge greatly depends on media. Correspondingly, media are, first and foremost, technology, an inescapable part of those processes of knowledge management.

We were interested in television communication practices from production and generation processes of formats and content to everyday domestic consumption patterns. As a whole, these practices are part of the way people appropriate technology and services in their everyday life. And they are also part of the way people communicate, eat, work, study, collaborate and solve problems. From this point of view, media practices and communication practices associated with the use and consumption of television can be understood as non-formal, multidimensional learning spaces.

In the conclusion of this dossier we shall try to identify some of the common themes the six articles deal with. We will start by addressing the tension between content and form in science popularization in general and in “Science on Television” in particular. We will then follow up with a joint consideration of audiences, the associated television (and science) practices and discourses, and the contingency of the historical contexts where science television takes (and has taken) place.

Does form beat content?

The question of form and content is as old as science popularization itself. It has been argued that “public science”, i.e. the attempt to address society at large, was born in the early eighteenth century with the lecture courses on Newton’s new physics (Stewart, 1992). Since those days popularisers have been faced with the thorny task to turn a more or less esoteric topic into something that may interest or better even fascinate the general public. Science communicators of all sorts, be they itinerant lecturers of experimental physics or school teachers, curators of museums or authors of popular science books, knew that they had to grasp the attention of their audiences first – through a heavy explosion, a ghost appearing on a screen or simply a gripping story – before they could teach them anything about chemistry, optics or zoology. In historical perspective, appealing to the senses, and particularly the eyes, was a prerequisite of any attempt to popularize (for the eighteenth century: Bensaude-Vincent & Blondel, 2008; for the nineteenth century: Kember, Plunkett & Sullivan, 2012; for the twentieth century: Nikolow & Schirmacher, 2007).

Yet this “solution” brought along a “problem”, that instantly threatened to undo the intended instruction. Numerous critics alleged already back in the eighteenth century that spectators of public demonstrations of natural phenomena will not learn anything. Any kind of information will get lost in the spectacle aimed at the senses of the audience – not at their mind. In short: the form will dispense with the content, or in the rhetoric of the critics, superficial entertainment will triumph over the subtleties of science. A short-hand for this tension is the opposition between the word (the scientific law, the equation, the formula etc.) and the visual (Galison, 2014). In three centuries of science popularization

and the continuous evolution of its media “Science on Television” may seem as the apex of this inherent tension between instruction and mere spectacle. TV is good at moving people, exciting us, making us laugh – in short: to entertain us. Yet due to its character as a visual medium TV maybe the form least suited to communicating science, as in one way or another all three practitioners of the School argued. Simplification, trivialization and worse, distortion are the accusations regularly levied against the attempts to popularize science, especially science on screen. In the words of Marcel LaFollette (2012: 229):

The need to attract the largest possible audience pushed television’s version of science, whether intended as education or fiction, even more toward sensationalism, politics, celebrities, and representation and away from the discussion of ideas, away from the real, away from attention to the thought and reasoning behind scientific conclusions and recommendations.

Yet at this point we have to take a step back and ask for the assumptions that underpin this kind of criticism. This view of science popularization considers communication as a one-way, top-down process. It assumes (and simultaneously legitimates) the authority of a minority of experts and the necessarily passive reception and acceptance of this knowledge by a purportedly ignorant general public. The very concern about strategies to engage audiences hints at an implicit acknowledgement of the agency of nonprofessionals in the construction of scientific knowledge. The underlying debate concerning scientific knowledge circulation and management refers to the (im)balance between information, education and entertainment (see, for instance: Collins, 1987; Shapin, 1992; McQuail, 1994; Irwin & Wynne, 1996; Bucchi, 1998; Rakow, 1999; Seale, 2004; Boon, 2008; Kirby, 2008; Nieto-Galan, 2011; Horst & Michael, 2011).

David Dugan, drawing on his long and successful career as producer and director of science documentaries, points to the variety of reactions of scientists: “Some despair at misconceptions and misinterpretations of data. Others are grateful that there is interest in their research at all and go out of their way to help.” But more importantly Dugan notices a growing understanding on the part of the scientists for

the need to engage the public in an entertaining, informative way [...] To obtain funding, appreciation and sympathy for science, scientists realize they need to engage the public through mass media. In many institutions this is now part of their job description. ... Nowadays, they are much more likely to appreciate the need to get across key messages and their chief concern is the lack of science coverage on television.

This disposition of the scientists to cooperate with the media or even to actively approach them, has been described as the “medialization” of science (Rödder, Franzen &

Weingart, 2012). In times of severe competition for public visibility collaboration with the media is more than an option for scientists, it has become a must.

The practitioner's toolbox

The challenge for the practitioner is to translate a potentially dry or even esoteric topic into entertaining and above all visually alluring narratives. Joan Úbeda puts it in terms of the disparities between distinct logics of communication (scientific versus journalistic/audio-visual). For him, as a director and producer of documentaries, it is very hard to narrate “facts” on TV while the medium is ideal to tell stories and to convey actions and emotions. And worse: “the scientific process is opaque to the camera”. Dugan, also a producer and director of documentaries, speaks for Úbeda and many other practitioners when he proposes the following recipe: “first you tantalize the audience, then you intrigue them as the story evolves, and finally you resolve the story with a dramatic pay-off. This can be summarized in three steps: **tantalize, evolve, resolve**” (emphasis in the original) Ana Montserrat is in charge of a completely different television product, a 30-minute weekly program featuring short reports and news about science. She argues: “a program about science is just, and no less than, a television program, with strategies and rules that are common to other television genres. [...] In the end, content has to be interesting and it has to look alluring.”

Taken together the three contributions of Dugan, Montserrat and Úbeda provide a quite comprehensive “toolbox” of how to turn scientific content into a “televisable” format. To name but a few: a science program needs rhythm, clear explanations based on metaphors, analogies, visuals as well as a gripping narrative. Powerful images, to repeat the obvious, are paramount. The more relevant the topic is to the every-day-life of the audiences, their experiences but also their preoccupations, the better. To portray scientists as human beings, i.e. with passions and even mistakes, helps the viewer to empathize with them. Therefore scientific controversies may also lend themselves as a useful tool to communicate science on TV. From a “theoretical” point of view one might even think that such an approach could help to convey a more realistic image of science and how knowledge is produced. Yet once more form beats content: coverage of scientific controversies on television tends to focus on the personal battles between scientists rather than asking whether uncertainty might be inherent to the process of research. The toolbox seems quite an apt metaphor. Producers of science programs construct and form a very specific image of science according to the requirements of the medium.

(Re)searching the audience

Popular science is not only about instruction and entertainment, it is also a marketplace – and has been since the eighteenth century (Hochadel, 2007; Fyfe & Lightman, 2007). Any science communicator wants to reach a maximum audience. “Science on Television” might be the most blatant example of this need to capture the public. The reason is plain: TV is a

business perhaps more than anything else. This point was made time and again in the School. The viewing figures rule, more than anything else (quality, political relevance or other). Quantity is quality. It is all about market-shares, audience ratings and numbers of viewers. As Ana Montserrat put it: “This is not to say that anything goes in the name of audience ratings, yet the fact is that, without viewers, television does not make any sense.” The acceptance or rejection of a given program, by simply staying or leaving a given channel, shapes decisively the ways science is depicted.

People actively appropriate the content offered to them on television according to their own worldviews, needs, preferences and fears, that is, their everyday-life experiences. People are not empty and passive receptacles to be filled with content. Rather, there is a dynamic relationship in which both, television professionals and their audiences contribute to shape the ways in which science, medicine and technology are presented. We may consider this as ultimately integrated and expanded consumer power around the rules of supply and demand. Its analysis is crucial for the understanding of contemporary processes of construction, circulation and management of techno-scientific knowledge.

Both practitioners and academics are interested in audiences, albeit in different ways. Scholars dealing with science popularization would love to know how the general public appropriates lectures, shows, books, exhibitions and other forms of science communication product in distinct historical contexts. But in most cases, even the mere reception (not to mention consumption patterns or dynamics of re-signification, see, for instance: Taberner *et al.*, 2012, 2013) of audiences is elusive due to the lack of sources. In the case of “Science on Television” there are some indicators, though. An ever-refined system of rating provides data about who watches what kind of program. As it was pointed out at the School this information is only quantitative and rather questionable. Nevertheless the intriguing question remains how much these figures – unreliable as they may be – shape the decisions around the production and broadcasting of science content.

Research on patterns or determinants of production and broadcasting of science content (or even just reporting about science) in the media at large is far from commonplace. Even though interest in audiences’ media content appropriation has a tradition as long as its production (Taberner & Perdiguero, 2015), “the search for, and analysis of, several kinds of distortions in media representations of science have been leading topics of science-in-media research” in the last half century as Markus Lehmkuhl points out. This takes us back to the trivialization argument discussed above. For Lehmkuhl it is essential to stop looking exclusively at production matters. What seems crucial (also in historical perspective provided that primary sources allow for such studies) is to analyse the interplay between supply and demand.

The outcome of the international comparisons of Lehmkuhl and his colleagues seem dismal. It is hardly surprising that science is not a preferred subject for television viewers in general. Yet the reasons behind this may not be related to science itself: Lehmkuhl and his

colleagues “could not identify any motive, need or gratification that can be linked exclusively to science contents. Instead, expected and received gratifications [linked to entertainment, for example] appear to be applied to the medium TV rather than to specific nonfictional TV contents.” In other words: even if we can name “motives of audiences to watch science programmes”, these hardly help us to understand “the interaction between supply and demand of science contents in TV”. In Lehmkuhl’s analysis “edutainment” (as opposed to more traditional ways of popularizing science) has the greatest potential in European television because it may easily be adapted to well-established TV genres “such as the family show, the quiz show and even reality TV”. Form (in this case genre) beats content yet again.

In terms of factual knowledge, viewers – then, now and in the future – may learn little about science if anything at all. Yet this is not the entire story. “Education” may not refer to what people actually learn by watching a news feature or a documentary. Historians of science and scholars of media studies ask what images of science and ideologies are conveyed through these formats (Apple & Apple, 1993; Haynes, 1994; Long & Steinke, 1996; Kirby, 2010; LaFollette, 2012). Science, medicine and technology often emerge as enormously powerful, albeit utterly enigmatic machineries that have the capacity to drastically transform the world and, incidentally, save our lives (science as commodity). Media products, given their production rules and constraints, do generally not question how these machineries actually function (science as process). Yet this does not prevent television to serve – at times – as a powerful tool for socio-cultural criticism, as we shall see.

The construction of authority

Comelles and Brigidi, from an anthropological standpoint, delve into the visual world of health, disease and medical processes offered by popular medical TV dramas. As medical anthropologists they highlight the ethnographic dimensions of series such as *E.R.*, *Grey’s Anatomy*, or *Hospital Central*. In order to maintain the interest of the viewers it is crucial that they recognize themselves on the screen, that is to say “their personal or collective experience of doctors, nurses or hospitals”. “Medical dramas intervene also in the cultural production of *ideal types* of professionals [and], institutions”, according to Comelles and Brigidi. This kind of program may “represent the hegemonic conception of health, illness and care”, but as the authors point out, also serves as criticism of the health system such as in the series *Bodies*.

We have seen the complexity of the processes of production of science content for television. We have also seen that it is not easy to grasp the highly diverse patterns of appropriation of the products as well as their broad socio-cultural impact. These analytical difficulties increase even more when both sides of the communication processes are analysed in isolation. Yes, “Science on Television” is a tough and elusive subject. But once more we would argue that the combination of different approaches we are proposing here is most

promising.² The sociological and the anthropological perspective need to be complemented by the historical one.

The historical perspective helps us to understand both, strategies of production of science programs and the socio-cultural context where patterns of appropriation of such programs were forged. Tim Boon's analysis of early British science television in the 1950s and 1960s brings the problem of how to create confidence and authority to the fore. He shows how the development of specific technologies and of narrative techniques of science television was inseparable from the characteristics of the medium. Although Boon's material and methodology are entirely different his results are very much in sync with the views of our three practitioners and with one of the main conclusions of Lehmkuhl's sociological approach mentioned above. As Boon puts it: "Such narrative demands about what makes 'good television' are clearly to do with conventions rather than with ideal categories."

And finally, he connects these aspects with the need in Cold War Britain (and, by extension, the rest of the Western World), to convey a sense of authority through the communication and portrayal of techno-scientific facts and processes:

Television producers in the 1960s – not just in science television, but across all subject domains – were actively experimenting with these components of their new televisual language [...] As they became fluent, the confidence and authority of television was made concrete. Caught like a fly in amber, particular authoritative articulations of the sciences [...] also became established.

The examination of early television production strategies, such as the use of anchors, when "explored by a consideration of the sources of authority", reveals a fundamental correlation between the processes of construction of authority and the necessary appeal to people's everyday lives: "Science television achieves much of its cultural effect by the authority that the people in front of the camera project."

The dialogue continues

Our School wanted to build bridges between scholars studying communicative processes of "Science on Television" and producers of science content for television. In May 2013 practitioners and academics did meet: not only in a seminar room in Minorca but also in mind.

2. Actually, at the School, participants from different countries fleshed this impression out by sharing the nuances of our subject in their respective socio-cultural contexts. Comparative and *longue-durée* approaches were thus called for. Different case studies add up to an increasingly complex scenario. In this sense, "non-Western" participants contributed very different points of view. For future research, it might be highly revealing to include more than just "the West", and reflect more about Latin America, Asia, and Africa. For example in India, there are 400 TV channels and a high illiteracy rate among the viewers. Here "Science on Television" certainly takes on very different forms as compared to Europe.

All the speakers astutely reflected their own practices, the role they are playing and not least the binds they are in. The School felt like a real rapprochement between theory and practice.

Yet, turning the presentations into papers has led to a certain “de-rapprochement”. Writing down what was said crystallizes positions clearer and brings basic assumptions out in the open. Reading the three papers of the practitioners suggests that the rules of the market entail a top-down view of scientific communication. This is a far cry from the picture drawn by historians of science trying to reconstruct the convoluted and “messy” process of producing knowledge. There are nuances. Dugan for example insists that audiences are far from ignorant and should be taken serious. This chimes with the “academic” claim that the general public is not a passive receiver.

Yet all in all the insights of history of science and of STS have so far not impinged on the views of many practitioners. Are the practitioners not aware of this research? This may not be the right question to ask. It seems that all these frameworks (the deconstruction of the deficit model, the co-production of knowledge, etc.) are not of practical interest for the practitioners. Yet this does by no means imply that practitioners lack theory. The practitioners present at the School and in this dossier theorize their own doing and know their “tool-box” inside out. Their three contributions add up to a “recipe book”, full of examples of how to make science on TV attractive. As Ana Montserrat put it: “to popularize is to seduce”. Practitioners are very apt in telling “good stories”, even when they deal with “theory”, with formulas of how to produce appealing TV content, as is the case in this dossier. We think it is no offence to the academics to state that the articles of the practitioners make for a much better read. Story telling is not our strong suit. It is an important object of study but not an actual practice for most academics. Easier said than done but there is certainly something to be learned from the practitioners, namely how to reach your audience with an engaging narrative.

Theory meets practice might thus mean exactly that: rapprochement and subsequent distancing; understanding and misunderstanding (what do we mean by “theory”?); acknowledging the differences yet learning from each other with respect to the necessity of a good story, the power of visual culture and the crucial role of the public. Dialogue is necessary but hardly ever easy – and never finished. The diversity of experiences and points of view in this dossier bears witness to an actual will of further communication and understanding. We need to think about the narrative strategies of our own craft in order to foster an enriching dialogue with media professionals and their productions – because there is indeed room for engagement.

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