What is a science programme? **16/06/2008**

Science programmes on TV and Radio, created to attract attention of recipients, may stimulate the interest of the audience in science and may promote scientific culture. We share the view that scientific culture cannot be restricted to the deficit model (Miller 1983, 1992). Instead of it we adopt a multidimensional model of scientific culture with three dimensions:

a) cognitive which refers to the knowledge of scientific facts and history of science;
b) social dimension which relates to the knowledge about the social, political and economic aspects of the scientific and technological change; and
c) behaviour dimension which includes the "meaningful appropriation of scientific contents and methods in the …conduct of daily life" (Cerezo and Cámara 2007).

Given that and in line with what has been mentioned while discussing the typology *a science programme is defined as a programme, where contents can be expected, which may contribute to a scientific culture, that means*

a) as a programme where exclusively or mainly research findings or events related to the natural and social sciences, humanities or to applied sciences such as engineering and medicine are broadcasted (Bauer et al. 2006; Bucchi 2003), regardless how new the findings or the events might be ***or***

b) *as a programme where exclusively or mainly societal, political, economical or every day topics are clearly linked with scientific expertise or scientific findings related to the natural and social sciences, humanities, or applied sciences such as engineering and medicine (Hijmans et al. 2003)* ***or.***

c) as a programme made by actors who own an identity as science journalist, environmental journalist, health journalist or technique journalist and/or work within organisational structures specialised on the observation of science in the sense mentioned.

Given that definition, science programmes are regardless their formats (quiz, documentary, magazine, service, news etc.) those with a clear focus on issues related to science (including humanities) and technology. They include significant explicit content, namely a reference or references to scientific findings, scientific research, scientific procedure, science as an intellectual activity or scientists in their professional capacity. The meaning of "scientific" in this context includes humanities.

A science programme in that sense is a programme, where *outcome or/and process of scientific work* is explicitly mentioned as primary source (a) or as secondary source (b) (Dimopoulos et al. 2002: 228; Hijmans et al. 2003: 155). The emphasis of the word outcome and process means that programmes focus primarily on research policy or environmental policy are included, those topics

are clearly linked with the process of scientific work and provides one of the main routes by which scientists enter public arenas, and publics engage with scientists.
The emphasis of the word scientific work means, that programmes focus primarily on educational policy or the educational system are excluded. Those topics are not clearly linked with scientific work.
Included are those programmes where the history of science is broadcasted or every day "topics" or simply "things" (cars, pasta etc.) are *clearly and explicitly* linked with science in the sense outlined above (that means including humanities, medicine, engineering). That includes for instance programmes, where are explained how chocolate is produced industrially, in general, programmes that are classed by practitioners into "knowledge programmes", when the knowledge *is clearly linked* to science and humanities in the sense mentioned above.

This definition is not deductively developed but inductively, taking into account recent trends in science journalism (knowledge programmes) and former tries to limit the research field. It reflects the many different ways society (and broadcast media) talk about science and humanities. It is "content centred" in that sense, that the actual content of programmes serves as the starting point to frame the content we are interested in. Our content centred perspective is supplemented by an actor centred perspective. That means; additional to what has been specified, all programmes will be included in the sample, that are, given the self-presentations of channels, classed into a science programme regardless the fact that they might not contain science in the sense mentioned.

Refinements:
(1) wildlife/nature. According to Göpfert (1996) this type of programmes can be class to science programmes, 'cause such programmes uses the outcome of scientific research mainly implicitly for providing information about the behaviour of animals for instance. It can be expected that they usually do not *mainly and explicitly* refer to the outcome of science. That means that in most of the cases they will be excluded.

(2) Programmes about Computers and Technology: After looking at programme guides there are two main types of programme on this topic. One type is about new developments in technology and technological solutions to problems. The other type is mainly about reviewing new consumer technology products (gadgets). Given our definition, the first type should be in, the second usually not, 'cause it can be expected for sure that the later ones are not primarily dealing with the outcome of engineering or the process of scientific work. For the first mentioned type this

cannot be ruled out. To protect equivalency we agreed upon the inclusion of every computer and technology programme broadcasted due to difficulties in ruling out that programmes do contain contents we are interested in.

(3) Programmes about Medicine / Health. There are several types of programmes about Medicine / Health listed in the programme guides. For example, programmes about illnesses and their treatment, reality TV type programmes about patients or medical staff, radio phone-in programmes to doctors for advice, interviews with doctors/scientists about current medical research. Given our definition all theses programmes are usually included, excluded are only programmes, where the content is mainly or exclusively fictional, that concerns for instance reality-TV-type programmes where patients are not real patients but actors.

(4) Educational programmes. Programmes about the education system (schools, high schools, universities) are excluded, that also means educational programmes about science or better teaching programmes. Very difficult to handle is the case of the BBC or a similar programme in Germany, produced by DLF. The BBC produce a series called Megamaths which comprises educational programmes focusing on mathematics aimed at 7-9 year olds. This type of programme might be in, 'cause it may use mainly and explicitly the outcome of social sciences. The same is true for a programme called Pisaplus, that also comprises teaching programmes in schools by putting together scientific expertise from different disciplines (psychology, social sciences and others).

(5) Environment. Those programmes are included. The inclusion can be legitimated by the fact that environmental journalists are traditionally classed to science journalists and additional by the fact that environmental topics are part of the outcome of traditional science sections in newspapers.

It is not intended to analyse science programmes by content analysis extensively. Therefore in any cases, where we cannot rule out the possibility that the programme is a science programme, the programme shall be included. We can decide upon an exclusion later.

Our main target is the journalistic unit that produces the science programme. The definition leads to two strategic choices, how to identify relevant organisational units or subunits:

a) From programme to the subunits: That means that relevant programmes have to be identified. After that we can start to find out, which organisational background is behind the programme.
b) From subunits to programmes: That means that it has to be clarified which specialised sections within an organisation exist. After that we start to find out the programmes those units produce.

It is intended to follow both lines simultaneously.

Methods/Procedures

After the vague definition of programmes we are interested in, further clarifications are needed, that concerns detailed descriptions of the methods, how to identify relevant programmes respectively specialised units. This clarification has been done using another document (Selection of Science Programmes). It is a combination of key word search and interpretative approach.

A) To start with, the identification of science programmes (strategy a) should follow the outlined way:

1. Search for relevant programme lists that already exist. It can be expected that for instance academics within universities specialised on science journalism or science communication own such lists. Of certain use may be the platform "scirab" www.scienceonair.org, where relevant radio programmes from all over Europe are listed.
2. Search for relevant programmes with the help of programme guides and further clarifications with the help of the internet. We are exclusively interested in programmes that appear regularly. To make sure, that saisonal programmes are in our sample, four issues of programme guides that usually cover one or two weeks of programme, should be sampled by chance. To make sure that every saison is in our sample, each issue has to cover different saisons (spring, summer, fall, winter). We should go from April/May (spring 2008) back to winter 07/08, autumn 07, summer 07. Given the definition, relevant keywords for our search are: science, research, knowledge, health, medicine, technique, technology, space, environment.... . (See for more details the coding scheme). Such a content analysis of programme guides has to be seen obligatory. It can be facilitated by for instance programme lists that already exist, but such a list cannot displace a content analysis of programme guides.

B) Strategy b) may be of special use when a list of programmes is missing. In that case the search for programmes can start with asking programme managers of all channels about science programmes in question. Again, a content analysis of programme guides cannot be displaced by

asking the programme managers, because we cannot count on a shared understanding of what a science programme actually means.

Documentation

The results have to be documented uniformly by all partners. It is suggested to use a table with seven columns: Channel, Distribution (nationwide, regional), Title of the Programme, Programming (when is the programme broadcasted?, for instance saturday 13.20 – 14.00), Description of the programme (short), Format (magazine, documentary, quiz, feature, report, other), WebSite, Contact (this category refers to the person where the questionnaire has to be sent), Reason, why this programme has been selected.

References:

Bauer, Martin W.; Petkova, Kristina; Boyadjieva, Pepka; Gornev, Galin: Long-Term Trends in the Public Representation of Science Across the „Iron Curtain": 1946-1995. In: Social Science Studies, Vol.36, No.1, 2006, 99-131.

Bucchi, Massiamo; Mazzolini, Renato G.: Big science, little news: science coverage in the Italian daily press, 1946 - 1997. In: Public Understanding of Science, Vol. 12, 2003, pp. 7-24.

Dimopoulos, Kostas; Koulaidis, Vasilis: The socio-epistemic constitution of science and technology in the Greek press: an analysis of its presentation. In: Public Understanding of Science, Vol.11, 2002, pp 225-241.

Göpfert, Winfried: Scheduled Science: TV coverage of science, technology, medicine and social science and programming policies in Britain and Germany. In: Public understanding of Science, Vol.5, 1996, pp.361-374.

Hansen, Anders; Dickinson, Roger: Science Coverage in the British Mass Media. Media Output and Source Input. In: Communications, Vol.17, No.3, 1992, pp.365-377.

Hijmans, Ellen et al.: Covering Scientific Research in Dutch Newspapers. In: Science Communication, Vol. 25, 2003: 153-176.

José A. López Cerezo and Montaña Cámara, 2007. Scientific Culture and Social Appropriation of the Science, Social Epistemology, Vol. 21, No. 1, January–March, 69–81.

Miller, J. D., 1983. Scientific Literacy: a conceptual and empirical review. Daedalus, Spring, 29-48.

Miller, J. D., 1992. Towards a Scientific Understanding of the Public Understanding of Science and Technology. Public Understanding of Science 1, 23-30.