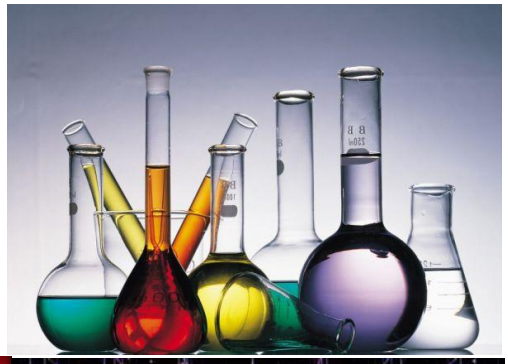
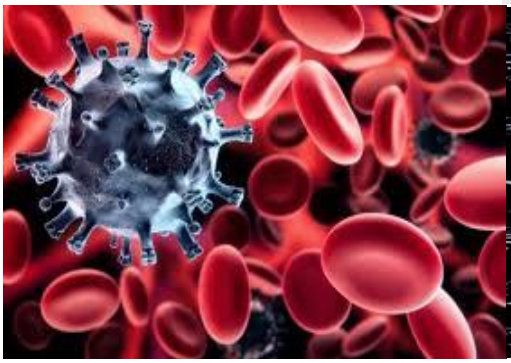
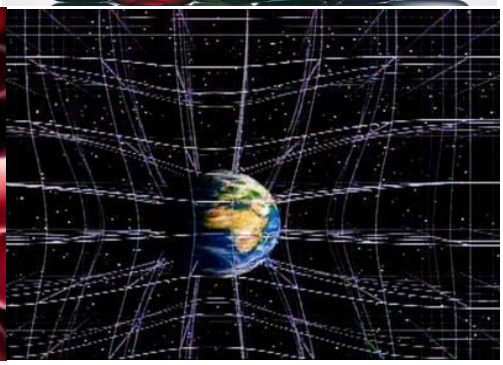
University College Maastricht
Course HUM3049
2017/2018

Science, Power and The Construction of Facts







CONTENTS

1. COURSE INFORMATION

1.1 Course Content

Science is the system of knowledge production through which truths are constructed in much of Western societies, and as a consequence is an incredibly powerful institution that requires critical examination. At the same point in time, significant contemporary movements of "alternative facts" (Conway 2017) and "post-truth politics" are underway (Roberts, 2010). What is the relationship between these two phenomena, and how is power enacted through the establishment of "facts"?

In order to understand the power science enacts in its production of "facts" this course looks to the social, cultural, historical, political, and economic contexts through which science is practiced and scientific knowledge is circulated through society. In doing so we will take a closer look at the production and dissemination of technoscience outputs, and will study science in action in its immediate environment as well as in its role and position in society. To do so we consider science and its scientists as 'a tribe'. To take this idea seriously we need to critically analyze notions of objectivity, expertise, commercialisation, integrity, and credibility that are central to scientific knowledge production. This perspective will help us to understand how science operates in today's complex world.

To gain insight in science we zoom in on the organization of knowledge production and its collaborative character. We also study processes in which credible facts are established and published. Furthermore, this course also pays attention to the integrity of science and in particular its grey areas. Beside the immediate context in which scientific facts are established (i.e. the lab), the course also takes into account the wider socio-economic context in which science operates. This involves not only the commercialization of science, but also the way its promises and expectations are related to our hopes and fears. Finally, you will gain insights into the way the cultural-historical contexts affect the interpretation of facts. It is along these lines that we enter the world of the scientists.

Based on discussions and analyses of these topics the course aims to make you reflect critically on 'common sense' views of the making and use of scientific claims. Besides tutorial meetings, the course also involves lectures, discussion meetings, video analysis, and a visit to a scientific lab for an interview.

1.2 Course Objectives

This course aims at giving you a precise idea of the complexities involved in the processes of building up scientific facts. You will be introduced to the way experimental research programs are set up and how they involve negotiations, translations of interests, and have political as well as cultural relevance.

By the end of this course students should be able to:

- describe the contemporary challenges and dynamics of knowledge production in the sciences.
- identify the complexities of how scientific knowledge is distributed and communicated in society.
- critically analyze 'common sense' views of the making and use of scientific claims.

1.3 Instructional Format

The course aims to introduce you to central conceptualizations of the relationship between science and society and the dynamics of modern scientific practice. To achieve these aims the core teaching of the course is done in five types of activities: perspective lectures, interactive seminar sessions, interview of scientist(s), writing a report of the interview, and a final exam in the form of a paper

Lectures*:* The lectures provide essential background information on the topics discussed during the seminars. You are encouraged to participate actively by asking questions. Important: lectures are considered as an essential part of the course and therefore attendance is required.

Seminars: During the seminars (tutorial meetings) we will discuss the key questions as formulated in the course book and related to the compulsory readings of the seminar. These are not conventional PBL sessions, but are chaired by students and follow a similar format to HUM2046 Living in a Technological Culture (i.e. the prerequisite for this course). Besides the compulsory readings, the course book also provides additional readings that can be helpful for further research into the topic.

Note: you have to prepare summary and critical questions for discussions of all the compulsory literature for every seminar. The tutor will invite you to present your summary during the seminar. There is no specific schedule for these presentations.

Interview*:* As part of Seminar 8 you will interview one of the scientists working in a Maastricht University laboratory in order to analyze how he or she attempts to generate credible knowledge. The preparation of the interview will depend on the size of the class, and the number of interviewees we are able to arrange (and therefore could be done in teams, or by the entire class group). The final report of the interview will be an individual assignment as part of Seminar 10.

1.4 Readings

The readings can be found in a collection of four places: 1) Student Portal in the 'course materials → readings' folder; 2) through links provided in the course manual; 3) the study landscape for Arts and Culture in the Inner City library; and 4) in Maastricht University On-line Library in the form of e-journals and e-books available through their website**.**

1.5 Course coordinator and tutor

Dr. Conor Douglas
Faculty of Arts and Social Sciences
Department of Technology and Society Studies
Email: c.douglas@maastrichtuniversity.nl

2. ASSESSMENTS

This course will be evaluated on basis of three parts:

1. Your participation in the seminars will be valued at 25%
2. Your the interview report, and your presentation on it is valued at 20%
3. The mark of your final exam is valued at 55%

2.1 Participation and Attendance (valued at 25%)

2.1.1. General principles of class participation and attendance

Social knowledge differs from technical knowledge in that it requires active engagement and participation. Class participation is an important component of your grade. Attendance in class does not constitute class participation. Emphasis will be placed on your individual contribution to the quality of class discussion in lectures and tutorials, and your contributions to other aspects of the course.

2.1.2 Assessment criteria and rules considering participation in this course

You are expected to be well prepared (meaning: read all the compulsory readings and prepare all assignments) and contribute actively to the discussions in the seminar in a relevant way. If your participation is above or below this standard it will be clearly reflected in the grading. The tutor will mark your participation after every seminar.

Participation will be based on the following criteria:

- Professional and respectful modes of communication;
- Vocal contributions, comments and questions from the learner;
- The learner's ability to link their comments to the assignments / questions specified for that meeting;
- The learner's ability to draw on course readings in their comments;
- The learner's ability to connect current discussions to material and concepts covered in previous seminars meetings;
- The learner's ability to construct coherent and reasoned comments and questions;
- The learner's ability to respond to previous comments from other learners, include others, and not dominate discussion.

2.1.3 Rules considering attendance in this course

As a matter of policy, attendance is required in all seminars and lectures. UCM has a compulsory attendance requirement for all courses, skills and projects. The minimum attendance requirement is 85%. Therefore, the tutor has to register your attendance in tutorial groups.

Beware: in this course there is also an attendance requirement for lectures.

Exams have a 100% attendance requirement. It is essential that you do not disturb the seminars and lectures by coming in late. This course will strictly adhere to the attendance requirement. If you misses more than 30% of the group meetings (i.e. **more than** 2 meetings), you will automatically fail the course.

2.1.4 Additional assignment

If you do not meet the attendance requirement, but have not missed more than 30% of the meetings, you will be given a provisional overall grade, but will not receive credits for the course until you have successfully completed an additional assignment.

To qualify for an additional assignment you may not have missed more than 30% of the meetings and must submit a completed request form 'additional assignment because of insufficient attendance' to the Office of Student Affairs, within 10 working days after completion of the course. After collecting and checking all the forms, the Office of Student Affairs will send the request forms to the coordinator of this course. It is up to the coordinator to decide if any absence is justified by the reason given. If the coordinator decides that you have a valid reason for not meeting the attendance requirement, you will be given an additional assignment.

The nature and volume of the additional assignment will be proportional to the number of meetings missed. You must complete and submit the assignment within 20 working days. If you receive a pass for the additional assignment it will be regarded as having met the attendance requirement and your provisional final grade will be declared valid. If the coordinator decides that the reasons for absence were not valid, and/or if additional meetings have been missed, no additional assignment will be given and the provisional grade given for the course will be annulled, which will result in a fail for the course. The coordinator will inform the Examination Committee about your successful completion of the extra assignment or your failure to successfully complete the extra assignment.

2.1.5 Sickness or Absence

According to the UCM rules you are required to inform the Office of Student Affairs via e-mail in cases of sickness or absence lasting longer than 8 consecutive days. See for details: UCM student Handbook.

2.2 Interview Report and Presentation (valued at 20%)

2.2.1 Organization, details, and deadlines of interviews and reports

In Week 5 you will conduct an interview with a scientific researcher at Maastricht University. Details of the interview task are provided in the description of Seminar 8 below, and details concerning the interview presentation are provided in Seminar 10.

We will endeavour to arrange for the interview to take place during Seminar 8 (Week 5), but we may need to be flexible based on our interviewee(s). Interviews themselves will either take place in teams, or depending on the number of students as an entire group. The interview report, **and the interview presentation, will be composed, conducted, and submitted individually**.

The deadline for the interview report is Monday December 4th before midnight

The interview presentations will take place at Seminar 10

2.2.2 Requirements and assessment criteria for interview report and interview presentation

The interview **report** deadline is Monday December 5th before midnight, and will be assessed on the following criteria:

Language and Word Count

- The extent to which the report conforms to the page/word requirements of 1,300 to 1,500 words line spacing 1,5 (**excluding** title page, bibliography, and annex of interview questions)
- Level of English spelling and grammar

Structure and Academic Style

- The paper has an identifiable structure that includes an introduction, body, and conclusion.
- Inclusion of a title page formatted according to APA guidelines or UCM title page template
- Conformity to the APA guidelines for in-text citation, quotations, and bibliography;

Content and Argumentation

- Clear formulation of central research question, and specific individual interview questions (to be included in an appendix of your paper)
- Clarity and completeness of the short description of the content of the research project of the researcher.
- Ability to link interview material to concepts and processes relating to credibility and the construction of credible science.
- Ability to link interview findings to course readings.
- Ability to construct clear, concise and convincing argument making use of course concepts and readings in answering your research question.

The interview **presentation** will take place at Seminar 10, and will be assessed on the following criteria:

- The extent to which the presentation conforms to the time page requirements of 10 minutes.
- The ability of the presenter to convincingly answer questions posed after the presentation (from other students and the course instructor)
- Level of spoke English is clear and coherent
- The ability of the presenter to make eye contact, and not only read from prepared notes.
- The presentation has an identifiable structure that includes an introduction, body, and conclusion.
- The clear communication of the research topic and research question, along with the relevance of both to the social studies of scientific knowledge production.
- Clarity and completeness of the short description of the content of the research project of the researcher.
- Ability to present linkages between interview material and concepts and processes relating to credibility and the construction of credible science.
- Ability to present linkages to interview findings to course readings.
- Ability to construct clear, concise and convincing argument making use of course concepts and readings in answering your research question.

2.3 Final Exam / Paper (valued at 55%)

You have to submit a paper of 3000 words (excluding literature list and footnotes; line spacing 1, 5). You use the interview report as point of departure and elaborate its content. The topic of your final paper is for you to choose, but it must relate to the social studies of scientific knowledge production, and be able to be linked to some component of the interview. The final paper goes beyond an elaborated version of the interview report; ***your paper will integrate at least two other topics that have been a focus of attention in other seminars***. This paper should clearly reflect an understanding to the issues that are discussed in class and firmly intertwined with the theoretical concepts that are dealt with in the seminars.

Your paper must be in English, typed, line-spaced 1.5, and 3000 words (with a 10% margin) in length (including footnotes and excluding bibliography) and handed in through Student Portal – Safe Assignment.

The final paper is due on Friday December 15th and will be assessed on the following criteria:

Language and Word Count

- The extent to which the paper conforms to the page/word requirements 3000 words (with a +/- 10% difference allowable) in length (including footnotes and excluding bibliography)
- The extent to which the paper is written in proper English with proper spelling and grammar.

Structure and Academic Style

- The paper has an identifiable structure that includes an introduction, body, and conclusion.
- Inclusion of a title page formatted according to APA guidelines or UCM title page template.
- Conformity to the APA guidelines for in-text citation, quotations, and bibliography.

Content and Argumentation

- Clear formulation of central thesis statement / research question.
- Ability to link paper to a component of the interview.
- Ability to clearly and concisely elaborate ***at least two concepts*** and/or ***processes*** addressed in the course (***not*** **relating to credibility and the construction of credible science**)
- Ability to link at least two course concepts and/or processes to the central thesis statement / research question.
- Ability to construct clear, concise and convincing argument making use of course concepts and readings in answering your thesis statement / research question.

DEADLINE is Friday the 15th of December 2017 before midnight

The 'inspection hour' for those interested to discuss their assessment of the final exam/ paper will take place on Wednesday January 10th, 2018. Date and time will be announced in at Seminar 11.

2.3.1 Re-sit exam

In order to be eligible for a re-sit examination, you must have met the attendance requirement for this course or be allowed to make up for it by means of an additional assignment. You must also have made a fair attempt to do all the parts of the assessment for the course, unless there are pressing reasons that prevented you from doing so and you have notified the course coordinator and Examinations Committee beforehand.

If you pass the course you are not allowed to take a re-sit in order to improve your grade.

Re-sit deadline: Friday February 2nd, 2018 before midnight

2.4 Plagiarism

The UCM Student Handbook provides detailed rules on plagiarism. Plagiarism is defined as fraud (Article 5.7 of chapter 4.1). Article 11 provides a Directive on Fraud (contained in chapter 4.2 of the UCM Student Handbook). In case it is suspected that you have committed plagiarism, the course coordinator will inform the Examination Committee. It is up to the Examination Committee to decide whether you have indeed plagiarized, in which case there will be consequences for you (See Academic Rules and Regulations, Chapter 4.2, Section 5 of the UCM Student Handbook). See for further details: the Student Handbook on plagiarism.

3. COURSE SCHEDULE

3.1 Course Structure

The course will be made-up primarily of seminars that take place twice a week, and **in Weeks 1 & 2 there will also be introductory lectures** (see section 1.3. Instructional Format). Those seminars and lectures are outlined below, and overviewed in a week-to-week schedule in the following section 3.2.

Lecture 1: Introduction to science, power and the construction of facts – Dr. Conor Douglas
Lecture 2: Social studies of scientific knowledge production – Dr. Conor Douglas

Seminar 1: The organization of knowledge production
Seminar 2: Norms and counter norms in science
Seminar 3: Scientific controversies
Seminar 4: Contextualization of knowledge production
Seminar 5: Standardization and objectivity
Seminar 6: Integrity in scientific research
Seminar 7: Credibility in the making
Seminar 8: The interview: Science studies students in action
Seminar 9: The commercialization of science
Seminar 10: Interview presentations: Reflection on credible science in action
Seminar 11: Collaborative knowledge production knowledge

3.2 Week-to-Week Schedule

Week	Type of meeting	Topic / objective	Assignments / Lecturer
Week 1 Oct 30- Nov 3	Lecture #1 1 seminar meeting	- Introduction to to science, power and the construction of facts - The organization of knowledge production: Asthmas & Ebola	C. Douglas Seminar 1
Week 2 Nov 6- Nov 10	***Attention! 3 meetings in Week 2*** Lecture #2 2 seminar meetings	- Social studies of scientific knowledge production -Norms and counter norms in science -Scientific controversies	C. Douglas Seminar 2 Seminar 3
Week 3 Nov 13- Nov 17	2 seminar meetings	-Contextualization of knowledge production -Standardization and objectivity	Seminar 4 Seminar 5
Week 4 Nov 21- Nov 24	2 seminar meeting	-Integrity in scientific research -Credibility in the making	Seminar 6 Seminar 7
Week 5 Nov 27- Dec 1	2 seminar meeting	-The interview: Science studies students in action -The commercialization of science	Seminar 8 Seminar 9
Week 6 Dec 4- Dec 8	2 seminar meetings	***Interview reports due Dec 4th*** -Presentations of interview reports -Collaborative knowledge production	 Seminar 10 Seminar 11
Week 7 Dec 11- Dec 15	-No seminars -One-to-one meetings are available upon request.	***Final paper exam due Dec 15***	Final exam /paper
Week 8	Reflection week	-No meetings	

4. SEMINAR DESCRIPTION

SEMINAR 1: THE ORGANIZATION OF KNOWLEDGE PRODUCTION: ASTHMAS & EBOLA

The central issue in this meeting is the question *in what way the organisation of science and its production of knowledge did change over the last 50 years*. In order to answer this question we will take the notion of 'transdisciplinarity', i.e. the idea that most knowlede production today happens in a context of multi-disciplinarity, as point of departure. Today's science has a strong focus on application and many different kind of stakeholders are actively involved in its knowledge production. This requires the acknowledgement of the need for a different notion of the locus of knowledge production and the involved actors. Therefore we aim to provide you at the beginning of this course with an historical background to understand the upcoming discussions and analyses of the complexities involved in the position, production and dissimination of (scientific knowledge). One of the central notions to understand the changes is the shift from a so-called 'Mode 1' form of knowledge production to a 'Mode 2' form. The concept of 'Mode 2' is coined by Michael Gibbons and further developed by him and Helga Nowotny in their book 'The New Production of Knowledge'. Our empirical domain to study these concepts will be health care and Asthma and Ebola in particular.

Assignment

1. Read the text of Hessels and van Lente (*be aware: only page 740-742*) and explain the notions 'Mode 1' and 'Mode 2'.
2. The first case study we will discuss has its focus on a common health problem: asthma. The Asthma Files (http://theasthmafiles.org) emphasize both the complexity and the transdisciplinarity of studying this disease. Spend some time exploring this website and read a chapter about asthma that is written for a medical book (Fortun *et al*). The asthma case emphasizes *complexity* and *transdisciplinarity* and the issue of *equality* and *social justice*. Define and explain these terms. How –for instance- is *transdisciplinarity* different from *multi* or *interdisciplinarity*? Then, it explains why asthma is also a *cultural* problem, and why *collaboration* between the natural and social sciences, among others, is essential. Explain the argumentation of Fortun et al. in detail!
4. The second case study is the Ebola crisis. Apply the argument of Fortun et al. (transdisciplinarity) on the Ebola case. Two texts (a Diary piece of Paul Farmer and a comment in Economist on Ebola (Oct 18th, 2014) are already provided. Find other information on Ebola yourself as well.

Readings

Farmer, P. (2014). Diary. *London Review of Books*, *36*(20), 38-39. Retrieved from http://www.lrb.co.uk/v36/n20/paul-farmer/diary.
(Web link: http://www.lrb.co.uk/v36/n20/paul-farmer/diary)

Abramowitz, S. (2014). Ten things that anthropologists can do to fight the West African Ebola epidemic. Science, Medicine and Anthropology-Ebola Series, Sept, 26.
(**Web link:** http://somatosphere.net/?p=9182)

The war on Ebola, *The Economist*, Oct 18th 2014: 11.
(**Web link:** http://www.economist.com/news/leaders/21625781-win-it-requires-much-larger-effort-west-africa-outside-world-has-so-far)

Fortun, M., et al. (unpublished manuscript)
Asthma, Culture, and Cultural Analysis: Continuing Challenges.
(**Student Portal**: **Course Materials → Readings folder**)

Hessels, L. & van Lente, H. (2008)
Re-thinking new knowledge production: A literature review and a research agenda. *Research Policy*, 37, 740-760. (Beware: only page 740-742)
(**Maastricht University On-line Library**)

The Asthma Files
(Web link: http://theasthmafiles.org)

Additional reading

Biruk, C. (2014) Ebola and emergency anthropology: The view from the "global health slot" *Somatosphere***.**
(**Web link:** http://somatosphere.net/2014/10/ebola-and-emergency-anthropology-the-view-from-the-global-health-slot.html)

Nowotny, H., Scott, P., Gibbons, M., (2013). The transformation of society. In H. Nowotny, P.B. Scott, & M.T. Gibbons, *Re-thinking science: Knowledge and the public in an age of uncertainty (*Pp. 1-20*)*. John Wiley & Sons.
(**Maastricht University On-line Library**)

SEMINAR 2: NORMS AND COUNTER NORMS IN SCIENCE

Robert Merton

> 'The ethos of science is that affectively toned complex of values and norms which is held to be binding on the man of science. The norms are expressed in the form of prescriptions, proscriptions, preferences, and permissions. They are legitimatized in terms of institutional values. These imperatives, transmitted by precept and example and reinforced by sanctions are in varying degrees internalized by the scientist, thus fashioning his scientific conscience or, if one prefers the latter-day phrase, his superego. Although the ethos of science has not been codified, it can be inferred from the moral consensus of scientists as expressed in use and wont, in countless writings on the scientific spirit and in moral indignation directed toward contraventions of the ethos.

(Merton, R.K. (1979) *The Sociology of Science: Theoretical and Empirical Investigations* .University of Chicago Press: 268-9.)

The norms Merton has in mind are statements of what scientists believe they *ought* to do, and what they believe they are *allowed* to do, and what it would be *good* for them to do. In other words, by "norms" we're not identifying whatever it is scientists normally do; sometimes what scientists normally do falls short of what they know they *should* do.

Scientists aren't handed a rulebook that includes the norms Merton is about to describe. Rather, they figure them out by paying attention to other scientists in their community to see what behaviors they reward and what behaviors they punish.

Members of the scientific community do spend some time talking about the norms — or at least, gnashing their teeth at what they view as egregious violations of the norms. Mostly though scientists talk about the norms either when a scientist violates them or when someone outside the community of science attacks that community's reputation. When scientists are more or less living by the norms, scientists tend not to talk about them.

The distance between what we think we ought to do and what we end up actually doing is so much a part of the furniture of our lives (both as members of the tribe of science and as human beings) that I'd like to hold off on objections to the norms in terms of real behavior of scientists for now. I will be writing a follow-up post on scientific anti-norms — sort of the evil twins to Merton's scientific norms — at which point comments about the values that seem actually to be guiding scientists' behavior will be welcome.

As a sociologist, Merton was interested in understanding science as a social group. He wasn't primarily concerned with providing some independent justification for how scientists

conduct their research. It's worth noting, though, that he seemed to think the norms of science were good ones to have if you're interested in building good knowledge about the world:

> 'The institutional goal of science is the extension of certified knowledge. The technical methods employed toward this end provide the relevant definition of knowledge: empirically confirmed and logically consistent statements of regularities (which are, in effect, predictions). The institutional imperatives (mores) derive from the goals and the methods. The entire structure of technical and moral norms implements the final objective. The technical norm or empirical evidence, adequate and reliable, is a prerequisite for sustained true prediction; the technical norm of logical consistency, a prerequisite for systematic and valid prediction. The mores of science possess a methodological rationale but they are binding, not only because they are procedurally efficient, but because they are believed right and good. They are moral as well as technical prescriptions.' (Merton 1979: 270)

If the tribe of science is a community defined by a common project — building a body of reliable knowledge about the world and how it works — the norms Merton identifies are something like the shared values of that community, values that are taken to be essential to the project of the community.
Source: http://scienceblogs.com/ethicsandscience/2008/01/29/basic-concepts-the-norms-of-sc/

Assignment

1. Complete the assigned reading by Vinck.
2. Watch the movie on 'Einstein and Eddington' (https://www.youtube.com/watch?v=EnYrgzP5WrY)
3. Explain the 4 norms of Merton in detail.
4. Explain the counter-norms as proposed by Mitroff.
5. Find examples of norms and counter norms in the movie 'Einstein and Eddington'.
6. What can be the function of the normative structure of science in the construction of facts?
7. Explain Merton's discussion on scientists' ambivalence.

Readings

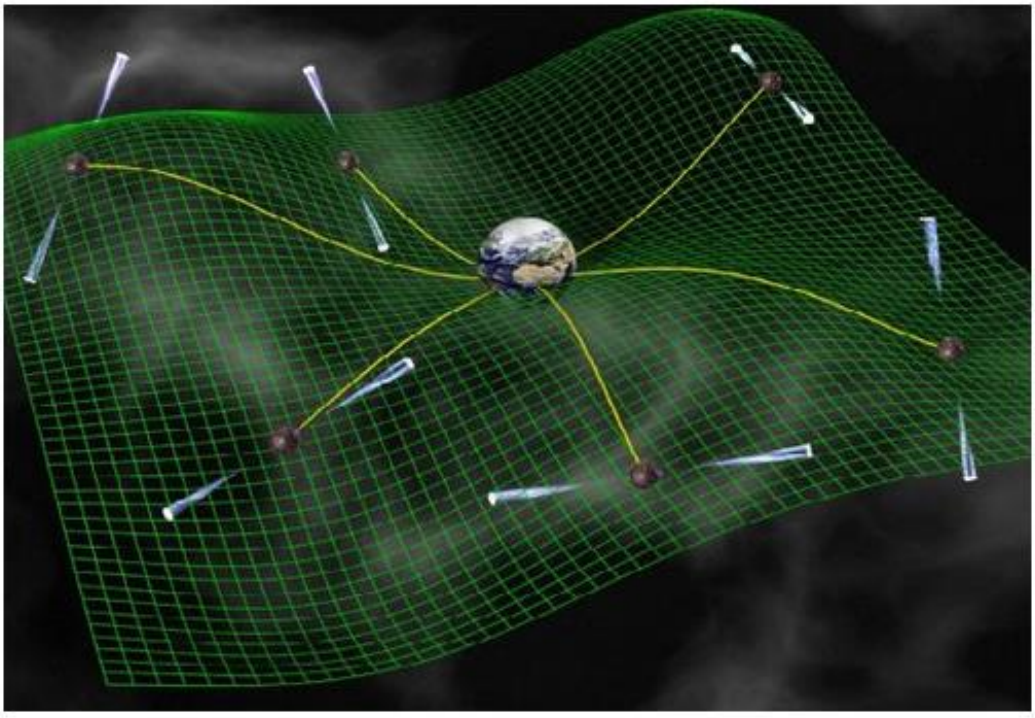
Vinck, D. (2010) The institution of science. In: *The sociology of scientific work* (pp. 30-56). Cheltenham: Edward Elgar.
(**Maastricht University On-line Library**)

Additional Reading

Anderson, M. et.al. (2010) Extending the Mertonian Norms: Scientists' Subscription to Norms of Research. *Journal of Higher Education*. May 1; 81(3): 366-393.
(**Student Portal**: **Course Materials → Readings folder**)

Sismondo, Sergio (2010). Questioning functionalism in the Sociology of Science. In: *An Introduction in Science and Technology Studies (*pp. 23-35). Oxford: Blackwell Publishing.
(**Maastricht University On-line Library**)

SEMINAR 3: SCIENTIFIC CONTROVERSIES



Using an array of millisecond pulsars, astronomers can detect tiny changes in the pulse arrival times in order to detect the influence of gravitational waves.
Source: http://www.sott.net/article/240868-Students-Discover-Millisecond-Pulsar-Help-in-the-Search-for-Gravitational-Waves

What happens when forms of scientific knowledge don't match-up, or when there are arguments within scientific communities? STS has been studying scientific controversies for some time now, and in particular one approach - the sociology of scientific knowledge (SSK). How can scientific controversies be studied, and what is to be gained? SSK gives prominence to the understanding of some of the general characteristics of scientific research, and of the knowledge it produces. But here it seems that we are immediately confronted by an insuperable difficulty. There are innumerable conflicting descriptions of scientific research and scientific knowledge. Nearly all these accounts of science are very heavily idealized, and represent the various utopias of our philosophers rather than what actually goes on in those places which we customarily call science laboratories. In contrast, there is a need for a general description which treats the beliefs and practices of scientists in a completely down-to-earth, matter-of-fact way, simple as a set of visible phenomena. The real difficulty SSK face is the daunting extent of our ignorance of the basic features of scientific activity and scientific inference, but in truth this is no greater than that routinely faced by sociologists and anthropologists when they study other forms of culture.

One example of SSK is the work of Harry Collins. He challenges the way of understanding convention. Collins identifies a group of physicists in agreement on conventional wisdom in their field, who nonetheless disagree upon its implications. In the course of attempt to replicate an experiment which had allegedly detected gravity waves, they offered diverse specifications for a gravity wave detector and diverse standards for evaluating one detector against another. They based their specifications and standards upon existing physical knowledge, but achieved a consensus upon neither. Accordingly, they were unable to agree upon what counted as a replication of the initial experiment, and unable to settle upon a single account of the phenomenon of gravitational radiation.
(Source: Barnes & Edge (ed.) *Science in Context*, 1982)

Guiding Questions

1. What is the essential argument of the chapter on Joseph Weber?
2. Collins refers to the concept of 'experimenters' regress'. What does he mean by this?
3. Provide a list of factors that contribute to closure of a scientific debate as explained in the chapter on the Weber case.
4. What tools do the stakeholders use to strengthen their position in a debate?
5. Explain the five types of activities that contribute to the closer of a controversy outlined in Sismondo. Provide examples of these in the case of gravitational waves or another scientific controversy.
6. Conduct your own self-study research, and report back on the recent developments in the area of gravitational waves. What have we learned about the construction of facts from this case?

Readings

Sismondo, Sergio (2010) Controversies. In: *An Introduction in Science and Technology Studies (*p121-135). Oxford: Blackwell Publishing:
(**Maastricht University On-line Library**)

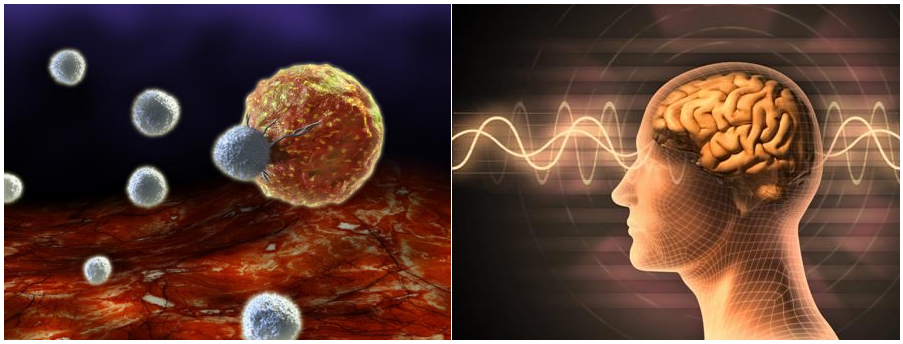
Collins, Harry, and Pinch, Trevor (1993) A new window on the universe: the non-detection of gravitational radiation. In *The golem. What everyone should know about science* (pp. 91-107). Cambridge: Cambridge University Press.
(**Inner City Library Fasos - learning and resource centre (reference only) SW Q 125**)

Additional readings:

Collins, H. Harry Collin's gravitational wave project:
http://www.cf.ac.uk/socsi/gravwave/personal.html

Sismondo, Sergio (2010) The Strong Programme and the Sociology of Knowledge. In: *An Introduction in Science and Technology Studies (*pp 47-56*)*. Oxford: Blackwell Publishing.
(**Maastricht University On-line Library**)

SEMINAR 4: CONTEXTUALIZATION OF KNOWLEDGE PRODUCTION



> The anthropological study of science and technology is an old and vast tradition, or a new and small one, depending how one looks at it. From one perspective, almost the entire field of archaeology, as well as ethnographically based studies of 'material culture," might be considered part of the anthropology of science and technology. Likewise, a number of anthropologists have also examined technology in the context of culture contact, colonialism, and 'development." In this sense, anthropologists began studying "science and technology" (or perhaps better, "knowledge and artefacts") long before STS emerged as an interdisciplinary field of inquiry.
>
> In another sense, however, cultural anthropology has been a relative late-comer to the field of science and technology studies. STS emerged out of the sociology, history and philosophy of science, as well as studies by scientists concerned with the ethical and social implications of science and technology.
>
> In the last decades, a number of factors have contributed to a new anthropological focus on science and technology. In the 1980s a number of cultural anthropologists who had previously conducted what is now thought of as "classical" anthropological field research (studying local communities in China, France and Morocco), turned their attention to the cultural dimension of "techno science" in Europe and the United States. (Hess & Layne, 1992)

The focus of this seminar is on this cultural construction of scientific knowledge. In other words: What is the role of the socio-cultural context in which scientific knowledge is produced?

On basis of anthropological work in science studies, you will get insights in the social construction and the cultural construction of scientific facts and artefacts. Here, we will take the notion of 'construction' explicitly beyond the idea of 'making-up' and show how the establishment of scientific facts cannot erase social influences like professional hierarchies and cultures as well as societal differences in gender, race and culture.

Assignment

You have the read the case study of Emily Martin on the immune system. On basis of the reading you write a two-page text in which you explain the main argument of Emily Martin. Explain the ways medical science and society are related. Send your paper to me by email before 5PM the day before our meeting. Be prepared to explain her argument to your fellow students during the seminar.

Readings

Martin, Emily (1990). Towards an anthropology of immunology: The Body as Nation State. *Medical Anthropology Quarterly*, 4 (4): 410-426.
(**Student Portal**: **Course Materials → Readings folder**)

Additional readings

Hess, David (1995) Introduction. In: *Science and Technology in a Multicultural World. The cultural politics of facts and artefacts (*pp. 1-17*)*. New York: Columbia University Press.
(**Maastricht University On-line Library**)

Hess, D.J. (1995) The Cultural Construction of Science and Technology. In: *Science and Technology in a Multicultural World. The cultural politics of facts and artifacts (*pp.18-53*)*. New York: Columbia University Press.
(**Maastricht University On-line Library**)

Hess, David (2001).Ethnography and the Development of Science and Technology Studies. In Paul Atkinson et al. Eds *Handbook of Ethnography (*pp234-246). London: Sage Publications
(**Maastricht University On-line Library**)

Martin, E. (1993). Histories of immune systems. *Culture, Medicine and Psychiatry*, 17: 67-76.
(**Maastricht University On-line Library**)

Martin, E. (1998) Anthropology and the Cultural Study of Science. In: *Science, Technology & Human Values*, 23(1): 24-44.
(**Maastricht University On-line Library**)

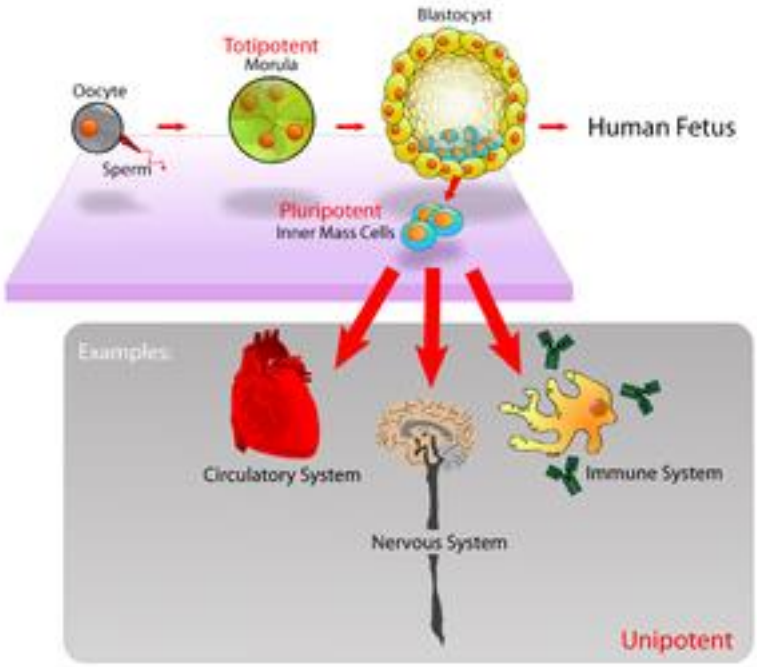
Martin, Emily (2000). Mind Body Problems. *American Ethnologist*, 27 (3): 569-590.
(**Maastricht University On-line Library**)

Traweek, S. (1996) Unity, Dyads, Triads, Quads, and Complexity: Cultural Choreographies of Science. *Social Text*, No. 46/47: 129-139
(**Maastricht University On-line Library**)

Vinck, D. (2010). Society's influence on knowledge content. In: *The sociology of scientific work*. Cheltenham: Edward Elgar (pp. 165 -194)
(**Maastricht University On-line Library**)

Zhan, M. (2012) Worlding Oneness: Daoism, Heidegger, and Possibilities for Treating the Human. *Social Text*, 29(4): 107-128.
(**Maastricht University On-line Library**)

SEMINAR 5: STANDARDIZATION AND OBJECTIVITY



Precisely how technologies are put together is not preordained. Not only do the outcomes depend on the goals set by management or the regulations established by government, they also depend on how well individuals are able to communicate and argue for their particular priorities. This can lead to considerable levels of complexities faced by a single actor making decisions about one very small part of a technology, and it increases exponentially when we add other stages and other actors to the picture (Johnson & Wetmore 2009)

The difficulties in research are not only related to the social complexities, as additional uncertainty reigns as well. Research in the natural sciences has to come up with credible facts. Credibility allows not much space for uncertainty. In order to deal with this standardization and formal objectivity belong to the core business of science. In his introduction into STS (2010), Sergio Sismondo describes the different forms of objectivity, and how the role that standardization plays in getting research done.

One area of the life-sciences that has been very unstable is the field of human embryonic stem cell research. Not only are there considerable ethical issues present in this field, but there are also significant issues of scientific practice that have required settlement and standardization so that scientific work (and subsequent 'facts') can have a chance to move forward. Here we look in detail about how technosciences are (or can be) put together, and how the kinds of standardization and objectivity needed for scientific research can be achieved.

Assignment

1. Read the chapter from Sismondo first, and then the article from Eriksson and Webster.
2. Explain the idea of standardized package of theory and technologies, as developed by Joan Fujimura.
3. Explain the idea of the cycle of credibility.
4. What is the difference between absolute objectivity and formal (mechanical) objectivity?
5. Explain the idea of interpretative flexibility and the difference between the formal mode and the humanist mode.
6. What kind of standardizing work is described by Eriksson and Webster? How is this similar or different from that which is described in the Sismondo chapter?
7. Overall, explain the relevancy of standardization and objectivity for scientific research and construction of facts.

Readings

Sismondo, Sergio. (2010) Standardization and Objectivity. In: *An Introduction to Science and Technology Studies* (pp.136-147). Oxford: Blackwell Publishing.
(**Maastricht University On-line Library**)

Eriksson, Lena & Webster, Andrew. (2015) Standardizing work as a recursive process: shaping the embryonic stem cell field. *New Genetics and Society*, 34:1, 72-88, DOI: 10.1080/14636778.2014.998818
(**Maastricht University On-line Library**)

Additional Readings

<u>On standardization</u>
Fujimura, J. (1987) Constructing 'Do-Able' Problems in Cancer Research: Articulating Alignment. *Social Studies of Science* 17: 257–293.
(**Maastricht University On-line Library**)

<u>On standardizing stem cell research</u>
Eriksson, L., and Webster. A. (2008) Standardizing the Unknown: Practicable Pluripotency as Doable Futures. *Science as Culture* 17 (1): 57–69.
(**Maastricht University On-line Library**)

<u>On complexity and standardization</u>
Vinck, D. & Blanco, E. (2003) Sociotechnical Complexity: Redesigning a Shielding Wall. In: *Everyday Engineering: An ethnography in design and innovation (*pp 13-27*)*. Cambridge MA: The MIT Press
(**Student Portal**: **Course Materials → Readings folder**)

Johnson, D. G., & Wetmore, J. M. (2009). *Technology and society building our sociotechnical future.* Cambridge, Massachusetts: MIT Press
(**Maastricht University On-line Library**)

SEMINAR 6: INTEGRITY IN SCIENTIFIC RESEARCH

source: http://www.files.chem.vt.edu/chem-ed/ethics/index.html

The Union of Concerned Scientists (UCS) puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with citizens across the country, they combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

What began as a collaboration between students and faculty members at the Massachusetts Institute of Technology in 1969 is now an alliance of more than 400,000 citizens and scientists. UCS members are people from all walks of life: parents and businesspeople, biologists and physicists, teachers and students. Their members argue that scientific analysis—not political calculations or corporate hype—should guide our efforts to secure responsible changes in government policy, corporate practices, and consumer choices.

On their website they are very clear that…"science can only thrive when it's independent. When commercial or ideological interests pressure scientists to distort or suppress their findings, science is weakened, and we all lose. Our scientific integrity work began in 2004 in response to a growing problem of political interference in government science. Our advocacy on this issue helped win a promise from the incoming Obama administration to pursue scientific integrity reform. Now, science-based safeguards that have long protected us are under attack in Congress. And the powerful interests that stand to gain by weakening these protections are doing their best to discredit the science that supports them. UCS is fighting back—helping scientists respond to political attacks, working to preserve science-based safeguards, and keeping the pressure on for federal scientific integrity reform."
(Source: http://www.ucsusa.org)

The pursuit and production of knowledge through scientific research is an undertaking that offers enormous intellectual rewards for researchers while also performing an important social function. In the public mind, scientists have a unique and critical mission to discover and explain and to contribute to human welfare. In securing knowledge about the world and beyond, scientists rely on the veracity, competency, and credibility of other researchers. Furthermore, society's confidence in -and support for- science rests on public trust in the integrity and objectivity of individual researchers and their supporting institutions. To ensure scientific progress and to sustain public support for research, it is incumbent upon scientists and their institutions to maintain the quality and integrity of scientific research.

Challenges to the quality and integrity of scientific research have become increasingly apparent in recent years with public revelations that some scientists have been guilty of fabricating data, falsifying results, and stealing the ideas and words of others. While few

would contend that such egregious conduct is widespread, most scientists acknowledge that it warrants a serious and effective response. But while there is a consensus that fabrication, falsification, and plagiarism are clearly unacceptable behaviours, other types of conduct fall into a "grey area," where reasonable people may disagree over the proper course of action. These include, for example, practices related to selecting, sharing, and reporting data and research results, allocating credit, the role of mentors, publication practices, peer review, whistle-blower rights and responsibilities, and the treatment of intellectual property.

Whatever one's views about behaviours falling within this grey area, research practices that damage the integrity of science; whether occurring in academic, governmental, or commercial settings, are unacceptable, not only because of their immediate, detrimental effects on on-going scientific investigations, but also because they betray the personal trust of colleagues as well as the more general public trust; waste scarce resources; and can lead to inappropriate, and possibly harmful treatment or policy decisions when they impinge on health- related or political matters.

What contributes to questionable or unacceptable conduct by scientists? There is no single factor, but rather a complex set of intersecting influences that have combined to create a very stressful environment for researchers. Science is not done in isolation; it is an intensely human and social endeavour. Like anyone else, scientists will at times act on the basis of inadequate training and information or exercise poor judgment. And a rapidly changing environment exacerbates the risks associated with such personal shortcomings where the ground rules are in flux, the ethical imperatives are unclear, and the competitive pressures are increasing.

A sizeable portion of the discretionary part of the government budget currently is allocated to the support of research, and its increasing social importance and public visibility have led to greater demands for mechanisms to hold the scientific enterprise accountable for its use of public funds. At the same time, scientific research has become an increasingly large and competitive undertaking, and scientists are under enormous pressures to produce. And this can sometimes impair professional judgment, whether out of a desire to be first with some new discovery, to enhance a publication record, or to achieve substantial economic rewards.

The complexity of scientific problems and advances in technology has also led to greater emphasis on large-scale collaborative research projects. It is not unusual for several laboratories, perhaps located in different countries, to collaborate on particular studies. But the sheer magnitude of such collaborative studies can make it more difficult to guard against sloppy work and easier for less scrupulous researchers to contribute fudged data to the project. The desire to strengthen the competitive position of the United States in world markets has encouraged universities and government laboratories to join forces with industry in order to produce innovations of commercial value. Such partnerships bring benefits to all parties as well as to the nation's economic position in world markets. Yet, commercial relationships may pose potential conflicts with some of the traditional values of science, such as openness and prompt publication. These changes in the complexity, size, and range of stakeholders that now characterize scientific research have placed demands on scientists that have outpaced the evolution of research standards that researchers rely on as guideposts through rough ethical terrain. This has prompted the scientific community and others to reassess the usefulness of old standards and consider where new guidelines may be needed.

Among those responding to the concerns about scientific misconduct, agencies, like the Federal Agency in the U.S., have issued regulations requiring institutions that receive research funds to establish policies and procedures for investigating and judging allegations of misconduct in science (U.S. National Science Foundation 1991; U.S.

Department of Health and Human Services 1989). Research institutions have responded by putting such mechanisms in place and by seeking training in how to design and implement effective monitoring, investigation, and adjudication procedures that protect the rights of all involved parties (Steneck 1993). Scientific societies have issued standards of research ethics for their members (Frankel 1993), and scientific journals have adopted requirements for authorship and developed guidelines for proper conduct in peer review (Bailar, et al. 1990). Although all of these activities are welcome responses to a serious problem, there is general agreement that they will not be sufficient in the long run without complementary educational efforts. (Source: American Association for the Advancement of Science. 1996)

The issue of research involving human subjects will be exemplified by the current work of irregular migrations research. The issue of academic norms will be based on the daily practices of a life science lab as depicted in the video vignettes developed by the American Academy of Science as well as the use of retouched images for fraudulent purposes in scientific articles

Assignment Steps

In the inner city library you will find five videos (SW V4097 – SW V4101) on 'Integrity of Scientific Research: Only a Bridge'; 'Noah's dilemma'; 'Of Mice and Medoza'; 'Where Credit is Due'. Each video is a short dramatizations aimed at provoking discussion of a series of ethical issues confronting various participants in the research process. Set in a wet-lab environment, the scenarios depict situations concerning topics such as "authorship", intellectual property" and "reporting violations of research protocol" etc, which provide a basis for discussion. Each episode is less than 10 minutes.

1. Do all of the readings listed below.

2. Watch all these five 'trigger' videos'. **Beware: you cannot take them home and have to watch them in the library.** Also: although you might find them on the Internet; however, these versions only provide you with the first five minutes or so, while the dilemma is situated at the end. So, **do not use the Internet.**

3. With the help of the readings, provide a **situational analysis** (see below) of the main issue of the video: integrity in scientific research.

4. Be prepared to explain her argument to your fellow students during the seminar.

A situational analysis uses the following steps:

Provocation: What we can learn on basis of these video's is that integrity is a difficult issue and that it is much harder to draw the line between what counts as correct and incorrect research behaviour; and that is too easy to point solely in the direction of the individual researcher and leave the culture of science outside the 'scope of accusation'.

1. *Translate:* What issues can you identify in the video in relation to the integrity of scientific research on basis of the literature?
2. *Intervention*: How do researchers deal with the problems you have identified in the previous step? Formulate their strategies and add a set of potential strategies.
3. *Integration*: Reflect on what you have done so far: identifying the issue, formulated research questions and their interventions. What is still missing? What other kind of questions can you ask about their particular problems? What might be a possible potential counter effect of *their* intervention as well of your ideas about how to tackle the problem?

4. *Discuss* these steps with your fellow learners (this will be done in the tutorial) and prepare a report that will help you to present your findings (**this should be done before the tutorial**). You should be able to embed your thoughts into the concepts/ideas as explained in the texts.

Readings

Franzen, M, Rödder, S. & Weingart, P. (2007) Fraud: causes and culprits as perceived by science and the media. *European Molecular Biology Organization*, 8(1), 3-7.
(Web link:
http://www.ncbi.nlm.nih.gov.ezproxy.ub.unimaas.nl/pmc/articles/PMC1796756/)

Goodstein, D. (1995). Conduct and misconduct in science. *Annals of the New York Academy of Sciences 775,* 31-38.
(Web link: http://onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.1996.tb23124.x/pdf)

Martin, B.(2006). Stamping out dissent: too often, unconventional or unpopular scientific views are simply suppressed. *New Concepts of Global Tectonics Newsletter*, 38: 19-21.
(Web link: http://www.bmartin.cc/pubs/93nw.html)

Martinson, B. Anderson, M. & DeVries, R. (2005) Scientists behaving badly. *Nature* Vol. 435, 9 June, 737- 738.
(**Maastricht University On-line Library**)

Smith, R. (1996). Time to face up to research misconduct. *British Medical Journal, 312.*
(Web link: http://www.bmj.com.ezproxy.ub.unimaas.nl/content/312/7034/789.full)

SEMINAR 7: CREDIBILITY IN THE MAKING

How do you know something? How do you know for certain? The people of the seventeenth century went in search of a proper foundation for science. There was growing dissatisfaction with the existing foundations (the philosophy of Aristotle and other writings of antiquity) and hence a search for new routes to the acquisition of knowledge. Several different methods were proposed: Descartes had his rationalist method (doubt, and follow your reason), and Bacon his empirical method (start from sensory observations) which became particularly popular.

Such methods were primarily important as *ideals*. When it came to practical implementation, all kinds of problems were encountered. For instance, how can I, as a Baconian, know that the city of Moscow exists, when I have never seen it with my own eyes? How can I persuade people without a telescope or a microscope that Jupiter has four moons, or that a raindrop is full of tiny creatures? Such practical problems asked for practical solutions. The naming of reliable witnesses to an observation might for example help to make the observation more credible. Presenting claims with a degree of modesty might also help to make the reliability of the claim seem a little greater. What was important was to create *credibility*: giving other people convincing reasons to trust in your reports. The converse is also true, people need criteria to estimate the reliability of assertions made by others.

In this seminar we will examine how modern scientists attempt to create credibility - how they make their claims as convincing as possible and how, conversely, they evaluate the reliability of their fellow scientists. In a sense, nothing has changed since the seventeenth century. It is still vital for scientists (and indeed for all of us) to be able to estimate the credibility of others, and to be regarded as credible themselves. Scientific researchers still have no simple cut-and-dried procedure which would deliver indisputable results, and even if they did they would still need to persuade others that the method is sound and that they have followed it correctly. Convincing others is difficult, particularly when it comes to critical colleagues or an outside world with great expectations of scientific findings. Scientists must therefore use every means at their disposal to resist all possible criticisms – you might even say they have a full time job doing this. Furthermore, to convince is a human activity. Logical reasoning is not enough, one needs to take account of the sensitivities of the public, the conventions current in our culture, and the signs that are associated with reliability. Credibility is made of with cultural ingredients.

Now the culture in which credibility is created today is of course not the same as that of the seventeenth century. The approval of the Grand Duke of Tuscany is not likely to impress a

scientist's colleagues today, but a claim will certainly be more convincing if it can withstand the *peer review* of a Nobel Prize winner. Similarly, a woodcut of an air pump will not make one's findings more convincing, but a statement of the type of electron microscope used might. Perhaps the greatest difference in comparison with earlier times is that today's scientists work in a highly specialized world, where only a select community of experts is in a position to assess one another's work. This has also meant that the criteria used are far more technical. Convincing others is still a matter of culture, but the subculture in which a modern biophysicist works is rather less accessible to outsiders than the Royal Society was to the people of the seventeenth century.

However, as the text of Vick will show you, doing science involves much more than 'just' convincing your peers. In order to turn 'a good idea' into an 'objective scientific fact' is a long and painstaking project of hard work. The chapter of Dominique Vick describes the in situ practice of science-in-the-making.

Assignment

Using the chapter of Vinck in this seminar as resource allows you to prepare yourselves further for your actual investigation: an interview of a Maastricht scientist. The researcher will discuss his/her methods, results and instruments. Beware: the results of this interview are an important foundation for your final exam. In order to prepare the interview you need:

1. Read the Vinck chapter in close detail.
2. Select a particular focus from that chapter about scientific practices involved with the creation of credible claims/ knowledge.
3. To formulate a research question (RQ) with sub questions related to this topic.
4. To design an interview guide with questions that will help you to answer your research question (about 5 questions, but have some extra on hand).
5. To bring the results of 1-3 to the tutorial meeting.
6. At the tutorial meeting you will present your RQ with the group and discuss your respective interview questions in preparation for the interview.

Readings

Vinck, Dominique (2010) Scientific practices. In: *The sociology of scientific work* (pp.194-232). Cheltenham: Edward Elgar
(**Maastricht University On-line Library**)

Additional Readings

Bucchi, Massimiano. (2002). Inside the Laboratory. In: *Science in Society. An introduction to social studies of science*. New York: Routledge. pp. 61-66.
(**Maastricht University On-line Library**)

Sismondo, Sergio (2010) Standardization and Objectivity. In: *An Introduction in Science and Technology Studies*. Oxford: Blackwell Publishing.
(**Maastricht University On-line Library**)

Sismondo, Sergio (2010) The unnaturalness of science and technology. In: *An Introduction in Science and Technology Studies*. Oxford: Blackwell Publishing.
(**Maastricht University On-line Library**)

SEMINAR 8: THE INTERVIEW: SCIENCE STUDIES STUDENTS-IN-ACTION

Today you will have an group interview with a scientist. More detailed information on the time and location of the researcher will be provided during the course.

Assignment

Hand in report on basis of interview (individually: 2-3 pages of text) before midnight on Monday December 4th. Make sure that your report also includes a short description of the content of the research project of the researcher. Pay attention not only to the research project, but to his/her perceptions about the public, colleagues or other interested parties who they are attempting to convince. What qualifies as convincing for them, and how does our researcher attempt to relate to this?

SEMINAR 9: THE COMMERCIALIZATION OF SCIENCE

Source: http://www.fnal.gov/pub/science/benefits/sciences.html

Because of a growing emphasis on the commercialization of public sector research and development public universities are being encouraged to enter into cooperative agreements with the private sector to develop and transfer technology with national and international commercial potential. There are several concerns that have been voiced about this trend by scientists conducting research in public universities. The role of the state and commercial interests in setting science policy has always been a concern of scientists, even though they often benefit from national policy objectives and technology transfer to the commercial sector. This has lead to an ongoing debate between state policy and scientific autonomy.

Besides government there is also an exploitation of science and technology by the industry. The private sector invests large amounts of money and personnel to both "pure" and "applied" science. Private sector research labs have grown out of a need for focused research and proprietary research findings. Also, private firms competing in a global marketplace must keep abreast of technological advances to stay in business. This growing reliance of private firms on R&D has stimulated much interest in academia on the impact of technological advancement on firm competitiveness. We can regard this impact as 'potential revolutions' that might result from applications of, for instance, biotechnology. First, biotechnology might create a revolution of thought regarding the ownership of genetically engineered products. Second, advances in biotechnology might create increased emphasis on multidisciplinary collaboration among natural scientists. Third, the products of biotechnology might create a new 'industrial revolution' of consumer products. Fourth, the most important potential revolution resulting from advances in biotechnology: a greater integration of societal values and morals with scientific discovery and technological development.

In this seminar you will study the relationship between science and industry and its potential effects on the production of knowledge. The fact that most knowledge production today happens in corporate labs brings in issues of ownership (IPR and patenting). In this seminar, you will also discuss other consequences of enterpreneurial science such as the issue of funding, evaluation, and 'publish or perish and 'project or perish'.

The pharmaceutic industry will act as an example of the relation between science and industry. In the shocking and sometimes hilarious documentary *Orgasm Inc* filmmaker Liz Canner takes a job editing erotic videos for a drug trial for a pharmaceutical company. Her

employer is developing what they hope will be the first Viagra drug for women that wins the approval of the US Food and Drugs Administration (FDA) to treat a new disease: Female Sexual Dysfunction (FSD). Liz Canner gains permission to film the company for her own documentary. Initially, she plans to create a movie about science and pleasure but she soon begins to suspect that her employer, along with a cadre of other medical companies, might be trying to take advantage of women (and potentially endanger their health) in pursuit of billion dollar profits. This documentary is a powerful look inside the medical industry and the marketing campaigns that are literally and figuratively reshaping our everyday lives around health, illness, desire, and that ultimate moment: orgasm.

Assignment

1. What the below listed film *Orgasm Inc.* as your *Provocation* for a situational analysis. The video is an example of the challenges brought forth by the shifting nature of scientific research: from independent research based in scientific labs to one increasingly driven by commercial interests.
2. Conduct the below readings related to the pharmaceutical industry:
3. *Translate* the overall issues of commercialization into concrete research problems.
4. *Intervention*: How can we deal with the problems you have identified in the previous step? Formulate a set of strategies that are discussed in the documentary if any. Also formulate your own ideas about how to deal with market dynamics in science.
5. *Integration*: Reflect on what you have done so far: identifying the issue, formulated research questions and your interventions. What is still missing? What other kind of questions can you ask about your particular problem? What might be a possible potential counter effect of your intervention.
6. Come prepare to share your situational analysis with the rest of the group.

Readings

Related to the pharmaceutical industry:

Moynihan, R., Heath, I. and Henry, D. (2002) Selling sickness: the pharmaceutical industry and disease mongering. *BMJ* 324: 886-91.
(**Student Portal**: **Course Materials → Readings folder**)

Basson, R.& Leiblum, S. (2003) The making of a disease: female sexual dysfunction. *BMJ* 326: 658.
(**Student Portal**: **Course Materials → Readings folder**)

Moynihan, R. (2005) The marketing of a disease: female sexual dysfunction. *BMJ* 330: 192-194.
(**Student Portal**: **Course Materials → Readings folder**)

Busfield, J. (2010) A pill for every ill: Explaining the expansion in medicine use. *Social Science & Medicine* 70: 934–941
(**Student Portal**: **Course Materials → Readings folder**)

Tiefer, L (2006) Female sexual dysfunction: a case study of disease mongering and activist resistance. *PlosMedicine*, 3(4): e178
(**Student Portal**: **Course Materials → Readings folder**)

Video

'*OrgasmInc*'
Inner city Library: SW V4139 (1 hour 23 mins)
Also available on YouTube: https://www.youtube.com/watch?v=yRdn8A1L1e0

Additional readings

Moynihan, R and Cassels, A. (2005). Prologue. In: *Selling Sickness: how the world's biggest pharmaceutical companies are turning us all into patients (pp.* ix-xviii). New York: Nation Books.

Related to science – industry relation

Kleinman, D.L (2003) Preface. In: *Impure Cultures: university Biology and the world of commerce.* Madison.Wisc: University of Wisconsin Press.
(**Student Portal**: **Course Materials → Readings folder**)

Kleinman, D.L (2003) Unintended Consequences. In: *Impure Cultures: university Biology and the world of commerce.* Madison, Wisconsin: University of Wisconsin Press. Pp90-113.
(**Student Portal**: **Course Materials → Readings folder**)

Kleinman, D.L (2003) Owning Science. In: *Impure Cultures: university Biology and the world of commerce.* Madison, Wisconsin: University of Wisconsin Press.pp.114 – 137.
(**Student Portal**: **Course Materials → Readings folder**)

Bucchi, M. (2003) A new Science. In: *Science in Society: an introduction to social studies of science*. Routledge. pp.125-141
(**Student Portal**: **Course Materials → Readings folder**)

SEMINAR 10: PRESENTATIONS OF INTERVIEW REPORTS: REFLECTING ON SCIENCE IN ACTION

How can we, as outsiders, investigate how contemporary scientists attempt to convince one another, when their work is so specialized? Or in other words: how do we make the question of credibility researchable? How does industry or funding influences research strategies? How do researchers establish credible scientific facts within their own discipline? Which role can we as 'public' play in knowledge production and by what means? How do these means affect the knowledge process? In what way does the wider society plays a role and its specific cultural historical context in particular?

These and many more are questions we have discussed in this course. Now at the end you will reflect on what you have learned and compare your current understanding what science is and how it works with your ideas about this when you entered this course.

Assignment

Prepare individually a presentation of the findings of the interview in a way that you can summarize at least three different topics/ processes that were discussed in the interview. What was the most striking issue that came out of the interview? Your interview report can act as a guiding text. No PowerPoint presentation is needed.

SEMINAR 11: COLLABORATIVE KNOWLEDGE PRODUCTION

Google or Wikipedia? Those of us who search online - and who doesn't? - are getting referred more and more to Wikipedia. For the past few years, this free online *encyclopedia of the people* has been topping the lists of the world's most popular websites, but do we really know what we're using? Backlight plunges into the story behind Wikipedia and explores the wonderful world of Web 2.0. Is it a revolution, or pure hype? Director IJsbrand van Veelen goes looking for the truth behind Wikipedia. Only five people are employed by the company, and all its activities are financed by donations and subsidies. The online encyclopedia that everyone can contribute to and revise is now even bigger than the illustrious Encyclopedia Britannica.
Does this spell the end for traditional institutions of knowledge such as Britannica? And should we applaud this development as progress or mourn it as a loss? How reliable is Wikipedia? Do *the people* really hold the lease on wisdom? And since when do we believe that information should be free for all? In this film, "Wikipedians," the folks who spend their days writing and editing articles, explain how the online encyclopedia works. In addition, the parties involved discuss Wikipedia's ethics and quality of content. It quickly becomes clear that there are camps of both believers and critics:

> "Wikipedia is quite useful in all case when used correctly. If you want to go there and get a recipe for baking advanced organic molecules perhaps you are the one that is error. If you want to get a good overview of an area Wikipedia is the place."
>
> "For being so intelligent they're missing the whole point of the Internet when it comes to blogs, media, and other forms or social networks. Many are relying on the internet as an unbiased place of information because our current traditional "news outlets" are corrupt controlling propaganda machines, owned by the 1% that are manipulating our opinions of events by showing us the information they want us to know or focus on."

(Source: topdocumentaryfilms.com)

Wikipedia is often considered as an example of 'collaborative knowledge'. Researchers have contested the value of Wikipedia content on various accounts. Some have disputed the ability of anonymous amateurs to produce quality information, while others have contested Wikipedia's claim to accuracy and neutrality. In the documentary '*Trust in Numbers: everything, according to Wikipedia'*, Scott Glosserman and Nic Hill explore the history and cultural implications of Wikipedia. A whole range of opinion is expressed about the impact of Wikipedia on the archiving of learning, from interviews with founder Jimmy Wales to commentators suspicious of the site's supposed neutrality. The documentary delves into the EssJay controversy in which a Wikipedian made false claims about his academic credentials and the battle over journalist John Seigenthaler's inaccurate entry. Evenhandedly weaving multiple perspectives about the impact of Wikipedia, the film provokes a deeper conversation on how knowledge is formed and what future generations will learn about history and the world.

Besides Wikipedia, also Google Scholar plays an important role in the participatory knowledge production. As Wyatt et al. argue, this represents a major transformation:

> In recent years, the role of social media (also referred to as Web 2.0, user-generated content, participation, and crowd sourcing) in nearly all aspects of daily life has hardly been out of the news, and it has also become a fashionable topic amongst scholars from many disciplines. Social media can be defined as web- based applications, which facilitate the exchange of ideas and information through their 'architecture of participation' (O'Reilly 2005). Popular and scholarly accounts of the participatory potential of new digital technologies are usually enthusiastic. Twitter, blogs, YouTube, Facebook, and Wikipedia are all lauded for their capacity to harness people's creativity and knowledge, and for their potential to challenge traditional hierarchies in politics, science, and the media. It is claimed these web-based applications have facilitated political uprisings, the solution of scientific problems, and the emergence of hitherto undiscovered talents in music and the arts. Others question the validity of such claims, pointing to the dangers of hoax, misinformation, narcissism, and loss of privacy. Sometimes, the stories are very serious, such as the controversy about the YouTube video about Joseph Kony and child soldiers that 'went viral' in March 2012. Sometimes, they provide voyeuristic entertainment, as in the case of the bigamist and his two families who found out about each other via Facebook photographs and connections. Social media are used in areas where citizens and fans have long participated such as politics and popular culture, and in domains where the boundary between expert and amateur is more tightly guarded such as medicine, science, and scholarship. The decentralized architecture of social media and the internet more generally challenges traditional knowledge authorities and hierarchies. Questions subsequently arise about whether lay inclusion helps to 'democratize' knowledge formation or if existing hierarchies are re-enacted online. The resulting fascination with new forms of knowledge production may signal a desire for change in those traditionally hierarchical and increasingly commercialized institutions that produce and distribute knowledge. (…)
>
> In the first article, Rene König focuses on Wikipedia, one of the most celebrated successes of participation and the wisdom of crowds, in which people work together to produce entries on a variety of topics. Drawing on insights from the sociology of knowledge, König examines the German-language Wikipedia entry for the 11 September 2001 attacks and the related talk pages. Alternative accounts emerged that contradicted the account presented by established authorities? (Wyatt et al, 2013:153-4)

Even if these concerns about Wikipedia as well Google Scholar as an encyclopaedic genre are relevant, they misguidedly focus on human agents only. Wikipedia's advance is not only enabled by its human resources, but is equally defined by the technological tools and managerial dynamics that structure and maintain its content. This article analyses the sociotechnical system – the intricate collaboration between human users and automated content agents – that defines Wikipedia as a knowledge instrument (van Dijck, 2010).

Assignment

1. Watch In the documentary *'Trust in Numbers: everything, according to Wikipedia' (2010)* and the short documentary explanation of *'Open access explained'*.
2) Summarize the argument of van Dijck about the role of Google Scholar.
3) Reflect on these two forms of knowledge production (Wikipedia and Google Scholar) in relation to your own way of knowledge production. What have you learned from this seminar in regard to your own knowledge production?

Readings

Van Dijck, J. (2010) Search engines and the production of academic knowledge. *International Journal of Cultural Studies* 13 (6): 574-592.
(**Student Portal**: **Course Materials → Readings folder**)

König, R. (2013) Wikipedia: between lay participation and elite knowledge representation. Information, *Communication & Society*, 16 (2): 160-177.
(**Student Portal**: **Course Materials → Readings folder**)

Videos

Glosserman, Scott & Hill, Nic (2010) *Truth in Numbers: everything, according to Wikipedia.*
(Inner City Library FASoS learning and resource centre - SW V4147 - reference only, you can't take this out/home with you)

Cham, Jorge (2012): *Open access explained,* Accessed 13 October 2016.
https://www.youtube.com/watch?v=L5rVH1KGBCY

Additional Readings

Bucchi, Massimiano (2008). Of deficits, deviations and dialogues: theories of public communication of science. In M. Bucchi B. Trench (Eds) *Handbook of Public Communication of Science and Technology* (pp. 57-76). New York, NY: Routledge.
(Inner City Library FL - learning and resource centre SW Q 223 - reference only)

Kelty, Christopher (2010) Outlaw, Hackers, Victorian Amateurs: Diagnosing Public Participation in the Life Sciences Today. *Journal of Science Communication* 9(1): C03
(**Web link:**
http://jcom.sissa.it/archive/09/01/Jcom0901(2010)C01/Jcom0901(2010)C03/Jcom0901(2010)C03.pdf)

Kelty, Christopher; Fischer, Michael; Golub, Alex; Jackson, Jason; Christen, Kimberly; et al (2008) Anthropology of/in Circulation: The Future of Open Access and Scholarly Societies. *Cultural Anthropology* 23(2): 559-588.
(**Web link:** https://scholarworks.iu.edu/dspace/handle/2022/3167)

Kelty, Christopher (2008). *Two Bits: The Cultural Significance of Free Software*. Durham, NC: Duke University Press.
(**Web link:** http://twobits.net/read/)

Lessig, Lawrence (2007) Laws that choke creativity. Ted Talks.
(**Web link:** https://www.youtube.com/watch?v=7Q25-S7jzgs)

Niederer, S. & Dijck van, J. (2010) Wisdom on the crowd or technicity of content? Wikipedia as a socio-technical system. *New Media & Society* 12 (8): 1368-1387.
(**Maastricht University On-line Library**)

Wyatt, S. et al (2013) Participatory Knowledge Production 2.0: Critical views and experiences. *Information, Communication & Society* 16 (2): 153–159.
(**Maastricht University On-line Library**)