

Science in court – experts and advisers as post-academic science communicators

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Scientific communication in court is particularly important for the understanding of the process of post-academic science communication.

The purpose of this study, carried out through a qualitative approach, is:

- verify whether and how the dynamics of an expert's science communication in court can be traced back to the problem of public science communication
- underline specific characteristics of science communication in court.
- propose a sample of a 'general table on science communication', in order to be able to analyse every possible communication between the different parties of a legal proceeding.

Twelve narrative interviews have been collected, divided in two groups: experts and non-experts (such as lawyers, judges, journalists and others).

The analysis of the interviews has revealed an analogy between the public communication of science in court and the proposal of the 'Venice model', based on the assumption that in the post-academic era the public communication of science follows more than one direction to reach different audiences in different ways, not necessarily bound to the scientific community. Experts communicate science in different ways and with different interlocutors. But they are not the only ones speaking of science in court: judges, lawyers, speak of science among

themselves with different expectations and results, not depending on the expert's mediation. This analogy allowed the creation of a general table that can identify every possible `bridge` of scientific communication in court.

The narrations have allowed the identification of some peculiarities of scientific communication in the legal context. First of all, the conflict of experts' and jurists' expectations in the legal proceeding. While the expert's priority is the correct understanding and use of the scientific truth, the other legal parties have another starting point: the acceptance of a scientific truth, or its refusal, in order to reconstruct that truth that in the legal context is the highest, that is the legal truth.

In the modern era, when techno-scientific ideas and products are increasingly present in everyone's life, conflicts originating in the intersection between science, technology and the law are one of the main fields of redefinition for modern societies (Tallachini, 2001). Indeed, disputes about science seem to be the very basis on which societies build their ideas of legitimate knowledge and through which they identify those who have the right to speak for nature (Josanoff, 1995). The truth of science and the truth of the law are actually being increasingly brought together and asked to find effective solutions in legal proceedings.

This research starts from the idea that in a multiple-centred system of science communication (Greco, 2002) scientific communication in court is particularly important for the understanding of the process of post-academic science communication (Ziman, 1998; Greco, 2002).

The problem of science communication in court is analogous to that of public science communication in general. Communicating science in court is often necessary for the carrying out of several legal proceedings, and sometimes also for their solution. This kind of communication, though, has to cope with particular problems due to the cultural, linguistic, methodological and epistemic difference between the legal and scientific parties of the proceeding. The court is thus a post-academic context of science communication, with special characteristics that can influence society and that make a specific study of this context necessary.

This research intends to:

verify whether and how the dynamics of an expert's communication in court can be traced back to the problem of science communication in general and of public science communication in particular;
underline specific characteristics of science communication in court, where particular legal problems have to be taken into account;
propose a sample of a "general table on science communication", in order to be able to analyse every possible

communication between the different parties of a legal proceeding.

Many questions have to be answered during this research: who are those who communicate science in legal proceedings? To whom do they address their speech? Which kind of scientific information enters the court and how is it communicated to the judge, to the public and to the social parties? What do the scientific and the legal parties expect from the communication of science, and what are its real results? How and how much is scientific truth negotiated and transformed into the normal procedure of science communication in court?

A first attempt at finding an answer to these questions has been the field investigation. An ethnographic research on communication (Matera, 2000) has been made to enter the context in which science and the law cooperate; different experts, judges and lawyers have been interviewed, in an attempt to know the opinion of the main characters of this context of cultural production, who witness the continuously changing relationship between science and society.

The "expert" communicating with "non-experts", that is judges, lawyers and other parties interested in the legal proceedings, has been taken particularly into account. He plays a key role in the process of science communication: he is in the middle of different communication flows and has to follow different communication models, modifying not only his language, but also his interaction with his different interlocutors, each of whom is looking for a different truth.

Materials and method

Twelve narrative interviews (Atkinson, 1998) have been collected in this research; they have been divided in two groups: experts and non-experts (such as lawyers, judges, journalists, scientists and others). The interviews have been recorded on audio-cassettes and then integrally transcribed.

The narrative method (Atkinson, 1998) used in the research is based on "open" interviews that differ from others in their being non-structured, that is with no specific questions to be answered by the interviewed person. The result of this kind of "open" interview is not a series of specific answers to a series of questions, but a sort of "story"

leading the interviewer towards the "other" world, the one in which science and the law meet, focussing on the people (experts, judges, lawyers) and on their modes of communicating (Matera, 2002).

The communicative events (Duranti, 1999) between the researcher and the interviewed people have been of paramount importance to approach experiences and cultural contexts whose understanding would have otherwise been very difficult. This approach does not intend to substitute a quantitative analysis, but to complement and integrate it. The result of the combination of the two methods could be a sort of bridge between the macroscopic analysis of events and the personal experiences of experts, judges and lawyers in particular contexts of space, time and culture.

The narrative approach can bring to the attention of the interviewer new readings and new details that s/he had not met in his/her experiences and that quantitative analyses, based on previously known concepts, would not have underlined. Narratives mainly present personal experiences that no data, no questionnaire, no news could express (Bruner, 1990).

Analysis of the interviews

The analysis of the interviews has brought out new considerations on the particularity of science communication in court and has led to the identification of new ways of bringing together social research on science communication and the complex and ever-changing reality of the court.

The following points have emerged from the analysis of the interviews:

- 1) There are many people communicating and even more communicative flows. Experts speak of science in different ways and with different legal parties. The different legal parties speak of science in different ways both among themselves and with the experts. The analogy between the public communication of science in court and the so-called "Venice model" (Greco, 2002) is evident. The "Venice model" is based on the assumption that in the post-academic era the public communication of science follows more than one direction to reach different audiences in different ways, not necessarily bound to the scientific community.

The followings are examples taken from the interviews:

Sometimes the judge has to coordinate a discussion on scientific matters. He can have some difficulties, and so can the state prosecutor and the defence counsel. The cross-examinations are technical and the discussion is between expert and advisors; after it has been placed in the minutes I can ask the expert for further explanations if there is still something unclear (from the interview to a judge)

Communicating with a vast audience is nowadays a must. But our relationship with the media is particularly complex. I have spoken with them, I still speak with them, I have been interviewed, and I think this kind of relationship is necessary. I believe in information. But nowadays lawsuits are being carried out on papers and this situation needs to be controlled in some way. Italy has been having a morbid tendency for anticipating, these past few years. And this kind of communication can have important influences on lawsuits. After all, judges are human and can be influenced by the media (from the interview to a member of the Ris – scientific investigation group)

The hearings in which advisors discuss among themselves are the longest and most difficult ones, because of the complexity of their communication methods. Everyone does his/her best, lawyers, judge, state prosecutor, advisors, experts (from the interview to a defence counsel)

As a defence counsel I tell my technical advisor what my necessities are, what I need the expert's report to say. He then tells me to what extent scientific truth meets my reconstruction. So we exchange opinions and needs. I am in fact a means between the advisor and the judge, though my reconstruction is not authentic, it is partial, and the judge avails himself of the court-appointed advisor (from the interview to a defence counsel).

It is difficult to get information from an expert, particularly during legal proceedings and before their reports have been deposited. But during the investigation we have many other ways of obtaining information on the expert's report. We won't have his/her direct statement, but it is our job to be able and make others say the things we need to reconstruct the news. But it is a delicate matter, more at risk of legal action than others. We have to be careful (from the interview to a crime news correspondent)

2) The different communication flows are full of expectations. Every communication act has a more or less explicit and recognisable aim. Expectations depend on a number of variables that are mainly to be linked to the professional, anthropological and psychological profile of the communicator. For example, if a psychiatrist on the one hand is interested in defining the psychological profile of the defendant and has difficulties in answering the questions of the penal code, the judge on the other hand wants an irrefutable answer to his question regarding the defendant being of sound mind.

The followings are examples taken from the interviews:

The language of the psychiatrist, the theoretical basis of psychiatry and that of the law

are completely different: the law sees only black or white, psychiatry sees all the nuances of greys. And this difference is a problem for the law and for the experts that are forced to give irrefutable answers. The best example is that on a person's sound mind: the needs of psychiatry and those of the law are not the same (from the interview to a psychiatry consultant)

Communication depends on who the interlocutors are: if the judge is there to listen to the expert, then the expert can communicate in popular terms; if the opposing party is present and wants to answer back, then the expert will use academic and technical terms. This is strategy, and all the interlocutors in a legal proceeding have to be aware of the different aspects of communication depending on who is talking and who is listening (from the interview to the editor in chief of the Master in legal sciences, Parma)

At the Master in legal sciences I understood what a law graduate does not know. I understood that there is a different world. If the professor talked of the energy formula, the scientist wrote " $E=ma$ ", the judge "energy equals mass times acceleration". But the same thing is valid in the opposite sense. Then we started to understand each other. And I realised that if they did not understand me it was I who was communicating in the wrong way (from the interview to a physics consultant, Ris external adviser)

Scientific communication in court is poor, and the reason of this is the conflict between legal and scientific culture. Jurists have a classical education and are proud of it, scientists have a techno-scientific education and are proud of it too (from the interview to the editor in chief of the Master in legal sciences, Parma)

Judges rely too often on their experts (from the interview to a toxicology consultant)

The court asks me to work as court expert because they know me as an expert in specific subjects. The fact that the judge calls people he knows usually works, because he recognises your expertise. It can sometimes happen that the judge calls people he does not know well and that are not expert in a specific field. And then a number of problems arise, ranging from harsh challenges in court to later petitions and legal overcharge (from the interview to a court appointed expert in civil proceedings)

The name of the expert is often important. For example the name of the professor, bound to other similar cases that have aroused great interest (from the interview to the director of the C.I.S.M., Italian centre for mass spectrometry, Florence)

Technical language is not criticised by the judges but by the advisors, and the judges assist to the discussion among experts that understand each other (from the interview to a toxicology consultant)

3) Technical communication in court has many different parties, but it is possible to identify one group (the experts') with strong internal cohesion, surely stronger than that with the other parties.

The followings are examples taken from the interviews:

It is our job to identify the scientific truth and to make the other parties in the proceeding

understand it correctly (this observation recurs in almost every interview)

We always have the same approach at the matter: a strong objectivity during the research phase and the compilation of our report (from the interview to a Ris member)

Globally speaking I would say that scientific evidence has greatly improved certain proceedings; ten years ago they would have been dismissed or would have remained unsolved, because they did not have the kind of scientific information we have today (from the interview to a Ris member)

The expert in legal sciences is of paramount importance today. I have seen famous University professors being appointed for expertise, thought they were not expert in legal sciences (from the interview to a physics consultant, Ris external advisor)

4) A particular feature is common among experts and not among the other interviewed people: frustration about the result of communication. The problem of science communication in court is not only a language problem, then, but a more complex one. It is a conflict between bearers of different truths. While the expert's problem is that of being understood, the other parties' problem is a different one: whether or not to accept a particular scientific truth in identifying the legal truth. Scientific communication in court is not only a language problem or a problem of scientific education, but the "dynamic result of an epistemic conflict about whether objective truth can be negotiated" (Greco). Three different truths meet and sometimes clash in court: the truth of common sense, the scientific truth and the legal truth. The scientific truth meets the common sense one and sometimes clashes with it in general, making it difficult for scientists and non-experts to communicate. The court context is even more peculiar, because there is a third truth competing with the others. And communication is in this way even more difficult. Moreover, this is not everything: out of these three truths, one is in itself superior (that is it prevails on the others): the legal truth. The interviews show that one truth is "truer" than the others, in court, and it is not the scientific truth, but the legal truth identified by the legal and scientific parties together. It seems, then, that the analogy with the general problem of science communication, identified by the ICS (innovation in scientific communication) group, is not perfect and that science communication in court has important peculiarities of its own.

The followings are examples taken from the interviews:

a) experts' frustration:

The judge takes his decisions by interpreting scientific investigations that he often does not understand (from the interview to a Ris member)

We avail ourselves of a technology that is more up to date than the legal parties' scientific education (from the interview to a Ris colonel)

The fact is that experts and legal parties speak two different languages (from the interview to a psychiatry consultant)

As far as scientific communication in court is concerned, I can say that the difficulty is conveying a correct message, in the sense that it is correctly understood (from the interview to the director of the C.I.S.M.)

The main problem in every expertise and consultancy is language (from the interview to a toxicology consultant)

In a way scientific truth is objective, but in the legal context there is a legal truth (from the interview to a Ris colonel)

b) non-expert's opinion of the experts' job:

We ought not to forget that the consultancy is an evaluation: it has its starting point in objective facts, but also the expert is evaluating. The judge follows the expert's opinion if he thinks it is sound, otherwise he refuses it. Because he is the "perito peritorum", in the sense that he decides which opinion to follow when experts and advisors disagree (from the interview to a judge)

The judge's job is to reconstruct the event in legal language starting from the reports of experts and advisors. Their consultancy is one of the elements in the reconstruction of a story that needs many other factors to combine (from the interview to a judge)

The judge has not a direct contact with the scientific truth. And when I say scientific truth I refer to a technical opinion based on very sound facts and careful technical investigations and evaluations. But each expertise is different. The psychiatric one for example is the less certain. For the judge the scientific truth is an incontrovertible truth and it is as valid as other non technical, human truths, such as the reasons for a crime (from the interview to a judge)

The problem of a person's sound mind has nothing to do with the judge's understanding of the psychiatric language. The judge is obliged by the penal code to ask this question. The question must be that of the 85th section, that makes sound mind a requirement to establish criminal liability (from the interview to a defence counsel)

5) One of the results of the research is a clear indication for the improvement of methodology.

Towards a general table for the analysis of scientific communication flows

The field research and the analysis of the interviews have underlined the occurrence of several variables in common with the general problem of science communication that can be investigated also in other research contexts, in other communication situations.

The common points are the following:

Who is the communicator?

The interpretation of meaning cannot overlook the professional, anthropological and psychological features of the interviewed people.

Who does s/he communicate with?

The scientific information entering the court can have different forms, depending on whether the interlocutor is another expert, a judge, a lawyer or a social party.

What does s/he communicate?

Science communication can be formal, informal and public.

How does s/he communicate?

The communication modes between two speakers of science in legal proceedings are nine:

- Oral formal communication
- Written formal communication
- Electronic formal communication
- Oral informal communication
- Written informal communication
- Electronic informal communication
- Oral public communication
- Written public communication
- Electronic public communication

Where does s/he communicate?

The communication mode also depends on the place in which the communication takes

place.

In which context does s/he communicate?

The situational context (Matera, 2002) of a communication event can be formal, informal and public, and it influences the possible communication flows.

What are his/her expectations and results?

Depending on the form of science communication in court the interlocutors have particular expectations and obtain particular results. Quite often the experts' expectations and results differ from those of the other legal parties, since they communicate to establish and reconstruct different truths.

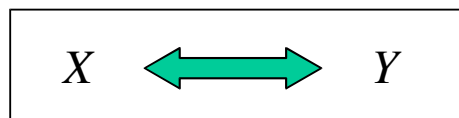
The aim of this research on science communication in court was the identification of the communication "bridges" connecting the different interacting social parties (or groups of social parties). A sample general table that could be used in other researches and could underline every possibility of communication seems useful.

The starting point could be the following statement, referred to a single communication "bridge" and based on the information collected with the interviews:

"X communicates with Y through nine communication possibilities, in particular social places and contexts. On these possibilities X has precise expectations and obtains precise results".

The same thing is valid in the opposite direction:

"Y communicates with X through nine communication possibilities, in particular social places and contexts. On these possibilities Y has precise expectations and obtains precise results".



Finally, a table could be created for each place of science communication, with information on X and his different scientific "habitus" (Bourdieu, 2003). Through this table an analysis of which of the nine communication possibilities has actually occurred for each of the interlocutors (Y, Z, W) should be possible.

The speaker: X
Institutional profile
Techno-scientific profile
Anthropological profile
Psychological profile

This table has obviously to be compared with the one resulting from the analysis of Y's communication with X, mainly to be able to see whether expectations and results are similar or not.

This could be a way of identifying the most usual forms of scientific communication in a particular context (Greco, 2002) and the opinions of the interlocutors on their functioning.

Who does he communicate with?	What does he communicate?	How?	Where?	In which context?	With what expectations	With what results?
Y	Formal communication	Oral				
		Written				
		Electronic				
	Informal communication	Oral				
		Written				
		Electronic				
	Public communication	Oral				
		Written				
		Electronic				

Conclusions

The analysis of the interviews has revealed a clear analogy between the public communication of science in court and the proposal of the "Venice model". Experts communicate science in different ways and with different interlocutors. But they are not the only ones speaking of science in court: judges, lawyers and others speak of science among themselves with different expectations and results, not depending on the expert's mediation. This analogy allowed the creation of a general table on communication that can identify every possible "bridge" of scientific communication in court.

The narrations have nonetheless allowed the identification of some peculiarities of scientific communication in the legal context, that distinguish it from the general pattern. First of all, the problem regarding the conflict of experts' and jurists' expectations in the legal proceeding. While the expert's priority is the correct understanding and use of the scientific truth, the other legal parties have another starting point: the acceptance of a scientific truth, or its refusal, in order to reconstruct that truth that in the legal context is the highest, that is the legal truth.

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