

Social collaboration and the communication of scientific knowledge: Scientists and non-scientists in the lab



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Although public interest in science has remained strong since 2006 when the Royal Society published their latest [report on science communication](#), poor communication of scientific research to the public is still a concern. Despite the plethora of social communication technologies that pertain to help scientists and researchers reach out to new public audiences, and the increasing interest of scientists in social media as shown in the 2007 [Bioinformatics report](#), dissemination of scientific knowledge remains a challenge.

In a [recent study](#) on how scientific knowledge is disseminated in contemporary society we identified a number of historical factors relating to science, the media, and academia that seem to have contributed to this state of affairs over the last twenty years, and that do not seem to have been broken-down with the advent of the above mentioned social platforms.

Factors relating to science: The traditional approach to communicating with the public followed by science since the 1980s has considered the general public as needing to be educated in science matters (Gregory & Miller, 1998; Meyer, 2016). Also known as the 'Deficit Model', this approach assumes that people need to be educated and that their lack of interest in science is caused by insufficient knowledge and poor understanding of the basic principles of science.

This way of conceptualising the general public creates a dichotomous, rather than a collaborative, relationship between scientists and non-scientists. This can be seen in the language many scientists have used to

relate with different publics in their efforts to communicate the results of scientific research.

Factors relating to the media: This dichotomy is something that is maintained through mainstream, and has failed to improve the poor quality of communication between scientists and the general public. In examining how scientific discoveries are reported in the press, for example, our research has revealed that scientific knowledge is transformed, and sometimes even distorted, potentially misinforming readers. An experiment on the malleability of sensory processing in adult rats which were implanted with a panoramic infrared sensory system, originally published in *Journal of Neuroscience* (Hartmann et al., 2016), for instance, can be reported to the readers of a British online tabloid as the chance for humans to have superhero night vision in the future (Gray, 2016). Similarly, a study of pre-Columbian monkey tools that addresses primate technological evolution and barely mentions humans, initially published in *Current Biology* (Haslam et al., 2016), can reach the readers of a free British tabloid as the origins of the human ability to crack cashew nuts (Tamplin, 2016).

Factors relating to academia: A number of trends in academia also seem to have contributed to a missed opportunity to engage with the public in a meaningful and effective way. The overemphasis on disseminating scientific discoveries almost exclusively to the scientific community as a way of increasing the value and impact of research- perhaps as a consequence of assessment exercises such as the RAE and the REF- is just one example. This almost obsessive attention to the impact of scientific papers within the scientific community has resulted, among other things, in missed opportunities for many scientists to develop communication skills for engaging with other audiences.

Similarly, the marked tendency- possibly as a residual effect of the deficit model- to tell end users, i.e. the publics, about the benefits of scientific research instead of engaging them as participants as early as possible, something that REF has been trying to correct, may have been rather short-sighted and not part of a coherent long term strategy.

The poor communication strategies put in place so far, such as the assumption that open access makes research accessible in the fullest sense of the word, coupled with distortions resulting from the trajectories of scientific knowledge may have engendered a degree of mistrust in the general public. While the [2014 Public Attitudes to Science](#) study shows that the public are as enthusiastic about science as ever, a third think that scientists adjust their findings to get the answers they want, and 3 in 10 think that scientists never or rarely have their research checked by other scientists before publication.

[Our research](#) has shown that public trust is likely to be closely connected to, if not resulting from, how scientists communicate with the general

public. This is supported by the Public Attitudes to Science study. Public trust would be enhanced if the public felt listened to and involved in before rather than after science happens. According to the study 7 in 10 think that 'scientists should listen more to what ordinary people think'. As our research shows, public trust in science is paramount for keeping science motivated as a profession, avoiding government cuts to funding, and attracting overseas investment, especially in post-Brexit times.

Social collaboration

One way forward may be 'social collaboration' in scientific research and communication ([Gimenez, Waddell & Specht, 2017](#)), which could help to increase public interest and trust in science. Like previous calls for engaging laypeople in governing science and technology (e.g. Bakuwa, 2014), we would argue that *social collaboration* would encourage a more inclusive approach to science engagement and trust, by which scientists, academics, the media and the general public could work more closely together. Social collaboration could create a number of opportunities for people with an interest in science to be actively involved beyond providing data for scientific research. They could also play a more active role within laboratory experiments, clinical trials, and so on.

Such opportunities would provide scientists with a chance to explain what they are doing as they go along, engage their audiences, and enhance public trust in science and scientists. The laypeople, on the other hand, would be able to ask questions, seek clarification, and enhance their understanding of science. Thus scientists would develop the skills needed for communicating scientific knowledge to non-specialist audiences, and the interested public would have a presence within the processes of science itself.

Increasing the interest in, engagement with, and trust in science by different publics should not be the responsibility of scientists alone, and relying on the media, Open Access or sharing through social media does not take this endeavour far enough, especially in the uncertain post-Brexit scenario. It is rather a social endeavour that requires scientists, academics, the media as well as the general public to work collaboratively if science is to become, as the British Science Association hopes, "a fundamental part of culture and society at large".

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