Science dialogues: Talking about science

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To promote greater social discussion of science, bringing together scientists and members of the public in face-to-face dialogue might seem like an obvious idea. However, for many people science is a complicated subject that they do not necessarily feel able to talk about, and scientists are not always good at talking about what they do. Researchers from the Department of Management Communication at Waikato Management School are looking for ways to enhance public involvement in science issues and to get scientists to share their specialist knowledge more widely in a 'user-friendly' way.

The MoRST-funded research project entitled *The Communicative Properties of Science and Technology** explored how different dialogue formats could contribute to enhancing the quality of public discussion about controversial science in New Zealand, and in particular human biotechnology (HBT).

HBT is a contentious subject, which often brings associations with Frankensteinian science fiction scenarios. It is also an area of research that is very hard to precisely define. We took the very broad perspective that HBT could be seen as including reference to direct modification of human genes; modification of food for human consumption; and the genetic modification of organisms for the development of pharmaceuticals for treatment of human diseases.

We had three objectives in mind when we started the project: to pilot, analyse, refine and encourage alternative methods of dialogue for use in discussion of HBT issues; to build dialogue expertise and two-way communication skills generally; and to identify pathways towards applying those dialogue methods in order to raise the quality of public discussion on important issues.

The research included two major stages: preparation for dialogue, and then dialogue meetings. During the preparation, we conducted an extensive literature review on dialogue theory and methods of practice, consulted scientists involved in human biotechnology research, and then consulted the public by way of eight focus groups. These interviews and focus groups enabled us to refine our understanding of how scientists and the public felt about human biotechnology, and what their concerns were about the way this technology was communicated. This information helped us prepare for dialogue meetings.

*Further information on this project is available at http://wms-soros.mngt.waikato.ac.nz/NR/exeres/B8F819FA-9DE2-4120-AAB5-5939C2A50AD9.htm

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The scientists' view

The scientists that we interviewed came from universities, the National Institute of Water & Atmospheric Research Ltd (NIWA), AgResearch, Dexcel Ltd, and the Environmental Risk Management Authority (ERMA). These scientists outlined key areas of HBT research being undertaken in New Zealand and the issues linked to it that might form the basis of dialogue pilot studies. These included: defining the science of HBT; the imperatives and constraints on communication; the role of scientists in public communication; the nature of the relationship between journalists and scientists; and issues around existing education for science communicators. We attempted to talk to as many scientists as possible, but recruiting them to participate in group and public dialogues was not so easy, due to time constraints, limitations in the scope of the project, and, for some, lack of interest in the project.

Scientists struggled to define the field of human biotechnology, but collectively suggested that it should include genetic research that had an impact on humans, including cloning, genetically modified food for human consumption, pharmaceuticals made from genetically modified organisms for treatment of human diseases, and human genetic research such as embryology.

Some scientists felt there was ignorance and hostility towards science in New Zealand. Another view was, as one scientist said: 'The public impression of scientists is that they "tinker" just for the sake of it'. Some considered that trust in scientists was diminished because of the perception that there is a connection between science and commercial interests.

In part, the scientists blamed the media for the public's distrust of them: 'Scientists are asked for guarantees…and the public doesn't understand that their [scientists'] work is with probabilities rather than certainties.' They also said a lot of media representatives lacked scientific understanding. Misrepresentation by the media was a key issue for them. The media usually only reported sensational science, they said. One scientist said that both the media and the public need to talk to scientists more. As this study showed, that particular scientist was 'spot-on'.

What the focus groups said

We wanted a cross-section of people to discuss their attitudes and understandings of HBT. The focus groups for the pre-dialogue study comprised mothers, tertiary arts students, farmers, business people and Māori. These groups had been identified in earlier research to have mixed views – but generally not extreme views – on HBT. In other words, they were reasonably likely to be open to dialogue.

Before meetings, all participants were given newspaper articles about HBT and an information sheet about the research project. When each group came together, we asked them to discuss their thoughts and concerns about HBT. They discussed issues such as HBT and religion, cloning, limits and monitoring, future implications, morals/ethics, and funding. A general trend that we noticed was that the more they talked, the more negative they became. Then they were asked for their attitudes towards scientists and the media's role in imparting HBT information. Again, the responses were largely negative.

Focus group participants admitted most of their information about HBT came through the media – newspapers, television, and talkback radio. Movies that dealt with cloning, such as *Gattica* and *The Matrix,* and science fiction books had influenced perceptions and opinions, too.

When asked if they would like to discuss HBT with scientists, the groups were unsure. Students, mothers and business people all expressed reservations about the usefulness of doing that. They felt scientists would not be able to speak in non-technical terms so they would not be able to understand them. Some thought they would be intimidated by scientists, while a group of students said scientists were terrible communicators. A mothers' group said scientists should use professional communicators rather than speak for themselves.

During these discussions, participants actively engaged with each other and with issues surrounding HBT, and in doing so shifted some attitudes and increased their communicative self-efficacy. Pre- and post-discussion surveys suggested that they became more confident about discussing HBT, their concerns were heightened, and their attitudes towards HBT scientists became more negative.

Bringing scientists and focus groups together

The next phase of the project was to bring the scientists and focus groups together for dialogue. That proved to be a challenge. We had to get the balance of participants right, and the venue and timing right, and we had to set up the dialogues so that everybody felt comfortable participating.

We experimented with several dialogue formats: small group dialogues; a 'citizens' dialogue' that involved opinion leaders or key influencers in the Waikato; a public dialogue event; and an on-line dialogue involving scientists and farmers.

The citizens' dialogue brought together 12 people – a mix of race, age, gender, and occupation. They were joined by four science representatives and, like the smaller dialogues, the event was facilitated by a professional facilitator. However, by far the biggest dialogue was the public one. It had to be handled carefully to avoid it being hijacked by partisan interest groups. For that reason, advertising was subtle rather than widespread, using direct mail (hard copy and electronic) and sent to people the researchers thought might be interested in the event. We expected participants in the public dialogues to have an interest in the subject and knowledge of it. The invitations went to secondary and tertiary institutions, science organisations, local media, community groups, MPs, and city councillors. Participants in the earlier focus groups also received invitations to come along.

It was important to get the scientist mix right as well. They were hand-picked. An Auckland University senior geneticist working in obstetrics and gynaecology; an AgResearch scientist working in immunology; an Auckland University senior academic who was also a member of ERMA, with expertise and experience in molecular biology, genetechnology and decision making. A Hamilton-based member of GE-Free New Zealand was also invited.

That collection was guaranteed to bring a wide range of views to the dialogue. It was scientists in previous dialogues

who said that it was important to have an anti-GE voice to encourage articulation of anti-GM views. The scientists were given a training session before the public forum – a briefing on its aims, the importance of listening, seeking clarification of understanding, and acknowledging when they were expressing an opinion or personal view as opposed to fact.

They were also given examples of how earlier dialogues had evolved – examples of successful and not so successful interactions – and shown how to avoid positions of antagonism.

To assess the effects of dialogue participation, we tracked what was said in each dialogue and, just as we had in the focus groups, we got participants in the dialogues to fill out surveys before and after each session. A strikingly consistent pattern of findings emerged from our analysis. Remember, members of the public who participated in focus groups became more negative towards scientists and more concerned about HBT – plus, they became more confident in discussing their views. However, when we brought people together with scientists, their attitudes became more positive towards scientists and HBT. As in the focus groups, they became more confident in discussing their views.

The most negative comments in the whole study came from the computer-mediated dialogues – the only dialogues that did not bring people together face-to-face. Comments made by some participants were more extreme or less tempered. However, like the other formats, the on-line dialogue led participants to have more positive attitudes toward HBT and scientists.

Overall, the results of the research were encouraging and bode well for the use of dialogue to create a more positive climate for public discussion about controversial science. Specifically, participating in dialogue with scientists led to more positive attitudes to HBT and HBT scientists, more empathy towards scientists, fewer concerns about HBT, and increased confidence and motivation to discuss HBT in a public forum. One comment was: 'One thing that's really worked is the face to face, the personal touch…just being able to talk with people, look them in the eye, and it's very much not that "us and them" forum. And food and socialising over food, just having conversations with each other has been helpful.'

True, the dialogues were geared for positive interaction, but people went away with a more positive view of scientists, the science of HBT and feeling more confident to talk about it.

So what happens next?

For a start, scientists need to become better communicators; they need to build communication into their role particularly if the science is potentially controversial. During the dialogues, scientists said they were often asked to be things they were not trained to be: communicators, educators, marketers, managers, business developers, and administrators. This research shows how important the communicator role is, and we suggest that science managers within science organisations should be the ones addressing the issue by creating opportunities for dialogue between scientists and the public.

There still needs to be more research to find which particular factors have the greatest impact on public attitude. We cannot yet say with certainty which features of the dialogues were most influential nor whether different forms of communication, such as lectures or public relations strategies, would have had the same impact.

It is fair to say that if the science is potentially controversial, it is likely to require public engagement. Clearly not all dialogue formats are appropriate under all circumstances, and whether to engage the public or not would have to be assessed on a case-by-case basis. So scientists need to start learning how to recognise when to engage, and how to develop appropriate dialogue formats. This will be looked at more in the second stage of the research when we will work with a crown research institute to help scientists learn to identify and engage with their relevant stakeholders.

And while giving the public more scientific information has shown to improve people's confidence to participate more in discussion, methods to improve the willingness of the public to participate more in scientific matters need to be expanded.

Ideally, if scientists are more willing to engage in public dialogue and they provide more opportunities to do so, and if the public feels more confident about participating, over time these science dialogues could become the norm when controversial science hits the headlines.