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A little knowledge

Communicating the risks and benefits associated with nanotechnology to the general public is proving to be more subtle and complex than researchers might have expected.

Although survey after survey shows that the public has little interest in nanotechnology[1–4], academic interest in the public perception of nanotechnology continues to increase and, from time to time, produces some rather surprising conclusions. One such finding is reported by Dietram Scheufele and co-workers at the University of Wisconsin and Arizona State University (ASU) on page 732 of this issue[5]. Based on surveys of 1,015 US adults and 363 nanoscientists earlier this year, they found that researchers working on nanoscience and nanotechnology were more optimistic than the general public about the potential benefits of research in their field but, unusually for new technologies, they were also more worried about some — but not all — of the risks. For example, almost 45% of the public were worried that nanotechnology would lead to a loss of privacy, compared with around 30% of nanoscientists, but the latter were more worried about it causing pollution and new health problems.

"Our findings," the Wisconsin-ASU team writes, "show a gap in risk perceptions among scientists and the general public that — regardless of its origin — is indicative of serious communication deficit". There is, however, an upside in that other research by the team shows that for information on nanotechnology, the public trusts industry and university scientists more than governmental bodies, regulatory agencies and the media. "Nanotechnology may, therefore, be one of the first emerging technologies where academia and business have the ability to reach out directly to a public who trusts the information they provide." The downside is that scientists may also, for the first time, have to explain to that public why they should be more rather than less concerned about some potential risks. A previous study by Currall *et al.* found that the perceived risks and benefits for nanotechnology were approximately average when compared with those for 43 other technologies, although the interaction between risk and benefit was also more complex than expected[6].

However, nanoscientists and technologists should look to social scientists for more than just data on these questions — help from 'outside' is also needed to communicate effectively with the public. A survey carried out earlier this year by Peter D. Hart Research Associates for the Project on Emerging Nanotechnologies in the US confirms that simply telling people more about nanotechnology is not enough[7]. Of 1,014 adults asked about the risks and benefits of nanotechnology, around half did not answer the question, which is not surprising given that almost three quarters had heard little or nothing about nanotechnology. However, when asked again, after being informed about the risks and benefits, the percentage who thought the benefits were greater than the risks increased from 18% to 30%, whereas those who felt the risks and benefits were similar rose from 25% to 30%. Disturbingly, however, the percentage who believed that the risks outweighed the benefits increased from just 6% to 22%. In other words, the most pronounced effect of telling people in this sample more about nanotechnology was to make them more concerned about it. And to compilcate matters further, there were noticeable differences when the responses were analysed by gender, age, income and other variables. This is backed up by other studies[8].

These and other results emphasize the difficulty of making sure there is not a public backlash against nanotechnology — there is no guarantee that the communication approaches that work for men in the US, for instance, will work for women in the US, let alone for anyone else in the world. One size certainly does not fit all. Given the complexity of this challenge it can be helpful to think in terms of 'frames' or 'perceptual filters' when trying to communicate with the public[9,10]. The basic idea of this approach is that most people are overloaded with information and not that interested in the details of nanotechnology or any other technology, so they use frames or filters — such as their political or religious beliefs — to process all this information and what it means for them.

To an extent, the nanotechnology community is already doing this, selling nanotechnology in terms of its health and environmental benefits, but the message does not appear to be getting through. This would not be a problem if the health and safety issues related to engineered nanomaterials were being addressed, but they are not, which means that a major health scare linked to nanotechnology could still lead to public resistance.

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