

Does nanotech have a gender?

Gender is less of an issue in nanotechnology than in other areas of science and technology but, as **Chris Toumey** explains, public attitudes to nanotech do depend on gender.

It is widely agreed that the underrepresentation of women in the natural sciences is a problem for two reasons. First, institutional discrimination, whether in mentoring, hiring, promotion or funding, is just plain wrong, even when it is unintentional. Second, the whole scientific enterprise will suffer if institutional obstacles come between itself and half of the population.

More contentious is the suggestion that women might be underrepresented in the natural sciences because they think differently from men — really, truly, seriously differently — and, this line of reasoning continues, the whole scientific enterprise would be enriched if more women became scientists because the way they think about science would act as a counterweight to the prevailing male view of science.

However, irrespective of one's view about this argument (about which I am ambivalent), men and women do seem to gravitate towards different fields of science. In particular, there are more women in disciplines where the scientist observes interactions among living systems, and especially in fields where the scientist interacts with living systems (such as environmental science). The flip side of this is that there are more men in fields in which the scientist attempts to control a phenomenon or a form of matter (such as mechanical engineering)¹.

These gender-related issues are not widely discussed among the nanotechnology community, possibly because nanotechnology comprises a fantastic spectrum of scientific disciplines and sub-disciplines. However, public surveys of attitudes to nanotechnology do reveal that men and women have very different attitudes towards the risks and benefits associated with nanotechnology. Barbara Harthorn (University of California at Santa Barbara) has noted that women are less familiar with nanotech, less enthusiastic about it, and less willing to tolerate nano-related risk². The same is true for public attitudes to science and technology in general: as Joseph Conti (University of Wisconsin-Madison) puts it “politically

conservative, authoritarian, high-income earning, and highly educated white males are very risk tolerant, relative to all others”³.

I have personal experience of this. In 2005 I directed the South Carolina Citizens School of Nanotechnology, and my research assistant counted the kinds of questions and comments that the participants posed to the speakers. Those from the male participants were evenly balanced between technical and ethical topics, but those from the female participants were almost exclusively about ethical topics⁴.

Multiple surveys have found that few people in the public know much about nanotechnology. Gender hardly matters in these circumstances, but if non-scientists start to take a serious interest in nanotechnology, we can predict with reasonable certainty that men and women will react differently. It will be interesting to see whether this affects nanotechnology policy in, for example, decisions about funding or regulation.

Gender differences also become evident when we look at the links between nanotechnology and science fiction, and stories about mad scientists in particular, because mad scientist stories can be templates for thinking about ethics and policy. When European opponents of genetically modified foods referred to those products as “Frankenfoods”, they had a figure of speech that was every bit as scary as they intended it to be. Kasi Jackson (West Virginia University) says that nanotechnology is vulnerable to mad scientist imagery for three reasons⁵. First, the definition of nanotech “is still coalescing”, and members of the public often perceive nanotech in terms of nanobots and tales of grey goo. Second, most government programmes to nurture nanotechnology do not include enough public input, which could cause some people to view policy decisions about nanotechnology with suspicion, especially as it is often said that nanotechnologies could have a large impact on our everyday lives. Third, there are already strong links between science fiction and nanotechnology⁶. However, if public attitudes to nanotechnology turn negative, the links between nanotechnology and

science fiction/mad scientists will make it more difficult to have a rational discussion about the risks and benefits associated with nanotechnology.

But what does this have to do with gender? Mad scientist stories are classic exercises in gender stereotypes. When the mad scientist aspires to the impious “promise of ultimate control over nature”, says Jackson, the scientist is male almost every time. He also possesses a suite of male personality features that does not endear him to others: his inability to empathize, for example, or his unwillingness to ask directions.

And so we have three kinds of phenomena in which gender and nanotech could encounter each other. The first is the claim that women do science differently from men. However, I am not aware of any evidence from nanotechnology that shows that the scientific knowledge produced by women is distinctly different from the knowledge produced by men in the same discipline or sub-discipline. The second kind is more credible and is well documented: among the public, women perceive science and technology differently from men, especially regarding toleration of risk. This phenomenon has appeared in a number of surveys of public attitudes about nanotech, and it will endure. The third concerns mad scientists and nanotechnology: a few mad scientist stories here and there will have little consequence, but it will be highly problematic if mad scientists become strongly associated with nanotechnology in the eyes of the public, not least because it will suggest that nanotechnology is the work of male scientists alone. □

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