



Should Citizens Have a Say about Emerging Technologies?

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Nanotechnologies, bioengineering, robotics, artificial intelligence – in just one human generation such innovations have made the previously unimaginable possible, or even routine. More than three-fifths of the foods on U.S. supermarket shelves are made from genetically engineered plant ingredients. People can now choose the gender of their next child. Robots are performing some surgeries, and will soon do many more kinds of operations. What is coming down the pipeline will be even more startling to many Americans. Self-driving cars have been tested and may soon be commonplace on the roads. Gene therapy and nano-particles may be targeted to brain tissues to suppress unwanted behavior or emotions or induce desirable ones. Half a century ago, even several decades ago, this all would have sounded like science fiction.

American taxpayers are paying for many of these extraordinary advancements, yet citizens have very little say in the purposes new technologies will serve. U.S. government agencies fund not only basic and applied research but also industrial development. Over half of government funding for research and development goes directly to the private sector; and universities and government labs aim to transfer innovations quickly into private production. Few taxpayer-subsidized inventions return money to the public. Even more worrisome, citizens are usually left in the dark about the impact and purposes of new technologies.

Experts and Citizens

Scholars like me who study science and technology policy are asking pointed questions about who has voice and choice. We have discovered a striking imbalance. Right now, ordinary citizens cannot track what is happening and make assessments. Yet people want to learn about new technologies and how they might be used for good or ill. Two obstacles are apparent: lack of access to timely information and elite prejudices about “non-experts.”

- Media outlets often cannot properly inform the public. Journalists as well as scholars must do extensive detective work to discover breakthroughs nearing the market, because most are kept secret. Despite public funding for new technologies, the private sector often classifies them as confidential business secrets or obscures information in patent applications. Regulatory agencies are required to protect proprietary information about technological applications.
- Many natural scientists, engineers, and regulatory and political decision-makers assume that the general public cannot understand emerging technologies. Experts often assert that regular people, if asked to choose, would make foolish decisions or over-react to potential risks.

People Can Clarify Choices and Highlight Values

Scholars who look closely disagree with the conventional wisdom that ordinary people think foolishly. For

example, in our focus group research on food nanotechnology, regular people made sophisticated comments and arrived at nuanced decisions about desirable products and important safety issues. People did not overreact or reject all nanotechnological breakthroughs. Most participants in group discussions offered nuanced views and were willing to accept innovations to improve nutrition and increase food safety to benefit children and the poor.

Many of the values people wanted to see served are not central to companies that foster commercial applications. Most nanotechnology products on the market are applied to sporting equipment, cosmetics, dietary supplements, and personal electronics. Consumers are left with decisions whether to buy the products on the market, and they do not always know about or want what is offered. For example, consumers are calling for labeling of foods made from genetically modified crops, and people often purchase organics instead.

A Need for Citizen Input

Could public funding and regulatory agencies serve as another route for citizens to weigh in – even before commercial interests market products? In principle, yes. But as things work now, regulatory agencies often serve primarily as partners with industry to speed-up product approvals. Congress pushes agencies to decrease the “regulatory burden,” which may lead to hasty decisions by a few experts who invoke “sound science” as the sole justification. Too often, the scientific experts do not have all of the requisite knowledge to make sound technical decisions, let alone appropriate value judgments.

Value judgments are disguised as purely technical assessments. For example, when the Food and Drug Administration decided to allow cloned meat in the food supply, it declared that it was “not charged with addressing non-science based concerns such as the moral, religious, or ethical issues associated with animal cloning for agricultural purposes, the economic impact of products being released in commerce, or other social issues unrelated to FDA’s public health mission.” But how can social or value issues be entirely avoided? Definitions of public health require judgments about socially valuable outcomes. Even what counts as “safe” depends on how we weigh different kinds of human wellbeing. Ordinary people can talk realistically about the key values and social considerations that experts and regulators should keep in mind. They can also share important everyday knowledge to improve decisions.

With technological changes accelerating, opening decisions to a wider range of voices is crucial to reap benefits for the many, not just for a few insiders. Stakeholders and publics should be encouraged to express various values and points of view. To make this possible, we need better ways to include citizens in deliberations about technological breakthroughs and the purposes they should serve. Decisions should not be monopolized in secret by experts and commercial interests. Information about what is possible must be widely shared, and many views and voices heard as new technologies are brought to market or deployed in society.

Draws from current scholarship, including Jennifer Kuzma and Jonathan Brown, “Hungry for Information: Public Attitudes toward Food Nanotechnology and Labeling,” *Review of Policy Research* (2013); and Jennifer Kuzma and Zahra Meghani, “The ‘Revolving Door’ between Regulatory Agencies and Industry: A Problem that Requires Reconceptualizing Objectivity,” *Journal of Agricultural and Environmental Ethics* 24, no. 6 (2011): 575-599.