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Survey Finds Emotional Reactions to Nanotechnology

U.S. Attitudes Could Divide Like Those on Nuclear Power and Global Warming

Washington, DC—"The U.S. public's perception of nanotechnology is up for grabs. It could divide along the lines of nuclear power, global warming and other contentious environmental issues absent a major public education and engagement effort by industry, government, civic groups and scientists. People who know little or nothing about 'nanotechnology' instantly react in an emotionally charged way to the concept, and their opinions divide along cultural lines as they learn more about it," according to Dan M. Kahan, the Elizabeth K. Dollard Professor at Yale Law School.

His conclusions are based on the findings of a new web-based public opinion survey of U.S. public perceptions of nanotechnology. "Essentially, when asked what they think about this new technology, Americans go with their gut instinct—which usually reflects their views toward other issues like climate change and nuclear power. When they learn more, they tend to adopt a stance about nanotechnology that fits their political and cultural predispositions," said Kahan, one of the principal investigators in the study.

"Nothing in our findings suggests that public polarization over nanotechnology is inevitable," noted Don Braman, a professor at The George Washington University. "Our results indicate that another outcome is possible but unlikely unless government, business, and educators take a more proactive approach to nanotechnology public engagement and communication."

The results from this study of 1,800 persons who were recruited to participate in an online survey experiment were released today by the Project on Emerging Nanotechnologies at the Woodrow Wilson International Center for Scholars. The research was conducted by The Cultural Cognition Project—an interdisciplinary team of top experts from Yale University, the University of Washington, The George Washington University, and Decision Research.

The study produced two major findings. The first is that "affect," or emotion, plays a major role in people's perceptions toward nanotechnology. The second major finding of the study is that individuals' values determine their reaction to information about nanotechnology. "We exposed one group of subjects to information about the benefits and risks of nanotechnology, and we compared their views to those subjects who did not receive such information," explained Kahan.

"We found that when people who hold largely 'individualistic' values—and who tend to dismiss claims that commerce and industry are dangerous and need regulation—receive information about nanotechnology, they tend to focus on the benefits. When those who hold 'egalitarian' and 'communitarian' values—and who are relatively more community-oriented

and sensitive to environmental and technological risks—get the same information, they focus on the risks." "Social psychologists call this a polarization effect," Kahan said.

"Based on our results, it is fair to anticipate that as nanotechnology assumes a higher profile in the media and public imagination, people's attitudes may divide along the same lines that nuclear power or climate change have," said John Gastil, professor at the University of Washington.

The study also confirmed a major finding of an earlier poll conducted by Hart Research that Americans remain largely unaware of nanotechnology—despite government and industry investments of $10 billion annually in nanotechnology research and development. The new survey found that over 80 percent of U.S. respondents had heard "little" or "nothing at all" about nanotechnology.

"When it comes to nanotechnology, the American public is probably like people from Missouri—the 'Show Me' State," according to David Rejeski, director of the Project on Emerging Nanotechnologies. "They have to be convinced that the benefits of this new technology—with its valuable applications in medicine, the environment, and energy production—will outweigh its risks. This survey indicates that just providing the public with factual scientific information about nanotechnology will not guarantee popular acceptance and support. The window of opportunity for reaching out to the public about nanotechnology—before polarization occurs—is closing fast. The current government strategy for educating and engaging the public is weak, and industry strategies are almost nonexistent," said Rejeski.

This study was supported by the National Science Foundation, the Oscar M. Ruebhausen Fund at Yale Law School, and the Project on Emerging Nanotechnologies.

About Nanotechnology

Nanotechnology is the ability to measure, see, manipulate and manufacture things usually between 1 and 100 nanometers. A nanometer is one billionth of a meter; a human hair is roughly 100,000 nanometers wide. More than $30 billion in products incorporating nanotechnology were sold globally in 2005. By 2014, Lux Research estimates this figure will grow to $2.6 trillion.

The **Project on Emerging Nanotechnologies** is an initiative launched by the Woodrow Wilson International Center for Scholars and The Pew Charitable Trusts in 2005. It is dedicated to helping business, government and the public anticipate and manage possible health and environmental implications of nanotechnology. For more information about the project, log on to www.nanotechproject.org.

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