

Chapter 7. Science and Technology: Public Attitudes and Understanding

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Information Sources, Interest, and Involvement

Television and the Internet are Americans' primary sources of science and technology (S&T) information.

- More Americans select television as their primary source of S&T information than any other medium.
- The Internet ranks second among sources of S&T information, and its margin over other sources is large and growing.
- To learn about specific scientific issues, more than half of Americans choose the Internet as their main information source.
- Internet users do not always assume that online S&T information is accurate. About four of five surveyed said they had checked on the reliability of information at least once.

Surveys have long shown that most Americans express substantial interest in S&T. However, other indicators suggest a lower level of interest.

- In surveys conducted annually from 2001 to 2006, between 83% and 87% of Americans said they had "a lot" or "some" interest in new scientific discoveries.
- Survey data indicate that, relative to other topics, interest in S&T is not particularly high. However, some topics that rank higher than S&T, such as new medical discoveries, include extensive S&T content.
- As with many news topics, the percentage of Americans who say they follow S&T news closely has declined over the past 10 years, but S&T's decline has been more pronounced.
- Recent surveys indicate that elsewhere in the world, including Japan and Europe, public interest in S&T is lower than in the United States. China is a notable exception.
- In 2006, about three of five Americans said they had visited an informal science institution, such as a zoo or museum, in the past

year. This proportion is generally consistent with results from surveys conducted since 1979.

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Public Knowledge About S&T

Many Americans do not give correct answers to basic factual questions about science and questions about the scientific inquiry process.

- Americans' factual knowledge about science has not changed much over time. Factual knowledge is positively related to level of formal schooling, income level, and number of science and math courses taken.
- People who score well on long-standing survey questions that test for information typically learned in school also appear to know more about nanotechnology and the Earth's polar regions, topics that historically have not been central to the standardized content of American science education.
- Levels of factual knowledge of science in the United States are comparable with those in Europe and appear to be better than those in Japan, China, or Russia.
- Americans' understanding of the scientific process appears to have improved slightly in recent years. Their level of understanding is strongly associated with factual knowledge of science and with level of education.

U.S. scores on questions about the theory of evolution and the "big bang" are lower than those in other countries, and many Americans are receptive to including nonscientific views in science classrooms.

- Many Americans appear skeptical of established scientific ideas in these areas, even when they have some basic familiarity with them.
- Americans' responses to questions about evolution have remained virtually unchanged over the past 25 years.
- More Americans approved than disapproved of instruction about three explanations of the origins of life (evolution, intelligent design, and creationism) in public school science classes. However, many were unsure.

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Public Attitudes About S&T in General

Americans consistently and by large margins endorse the past achievements and future promise of S&T. This support has been evident in surveys conducted since 1979.

- In 2006, more than half of Americans said that the benefits of scientific research have strongly outweighed the harmful results, and only 6% said the harms slightly or strongly outweighed the benefits. Other indicators yield similar results.
- Americans' positive attitudes about S&T cross demographic boundaries: men and women, college graduates and high school dropouts, and blacks and whites all express support.
- Americans also express some reservations about S&T. A majority agree that "scientific research these days doesn't pay enough attention to the moral values of society," although the proportion agreeing dropped substantially in annual surveys between 2001 and 2006. Nearly half believe that science makes life change too fast.
- Attitudes about the benefits of S&T are somewhat more favorable in the United States than in Europe, Russia, and Japan. Attitudes in China and South Korea, however, are comparable with and perhaps even more favorable than those in the United States.

Support for government funding of scientific research is strong and growing.

- In 2006, 87% of Americans expressed support for government funding of basic research, up from levels around 80% in past surveys dating back to 1979.
- The percentage of Americans who said that the government spends too little on scientific research grew from 34% to 41% between 2002 and 2006.
- Other kinds of federal spending, however, generate even stronger public support.

The public consistently expresses confidence in science leaders.

- In 2006, more Americans expressed a great deal of confidence in leaders of the scientific community than in the leaders of any other institution except the military. Despite a general decline in confidence in institutional leaders since the early 1970s, confidence in science leaders has remained relatively consistent.

- On science-related public policy issues (including global climate change, stem cell research, and genetically modified foods), Americans believe that science leaders, compared with leaders in other sectors, are relatively knowledgeable and impartial and should be relatively influential. However, they also perceive a significant lack of consensus among scientists on these issues.

In deciding whether a study is scientific, most Americans rely on criteria related to the research process: whether results are evidence based, carefully interpreted, and replicated.

- Research process characteristics are especially important among more highly educated Americans, who are less likely than others to rely on other criteria such as researchers' credentials, institutional settings, and consistency with common sense or with religious beliefs.
- Americans and Europeans both see medicine as more scientific than other fields, with physics and biology following close behind it.

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Public Attitudes About Specific S&T Issues

Americans have recently become more concerned about environmental quality.

- In 2007, 43% of Americans expressed strong concern about the environment, up from 35% in 2005. However, concern about the environment ranks somewhere in the middle among 12 issues.
- Global warming has recently become more prominent among environmental issues of concern to the public, although it still ranks 8th among 10 issues.

Many Americans are unfamiliar with emerging technologies and research topics, and many have significant misconceptions about them.

- Few Americans (about 1 in 10) consider themselves "very familiar" with biotechnology.
- Most Americans (60%) believe they have not eaten genetically modified foods, although in fact processed foods commonly contain genetically modified ingredients.
- More than half of Americans (54%) have heard "nothing at all" about nanotechnology.

- Most Americans say they are "not very clear" (35%) or "not clear at all" (35%) about the distinction between reproductive and therapeutic cloning.

A majority of Americans support medical research that uses stem cells from human embryos. However, Americans are wary of innovations using cloning technology, and they overwhelmingly oppose reproductive cloning.

- In three surveys conducted between 2004 and 2006, a majority agreed with the statement that it was more important to continue with stem cell research than to avoid destroying human embryos used in the research.
- About half of Americans oppose using human cloning technology even if it is limited to helping medical research develop new treatments for disease.
- Four of five Americans oppose using "cloning technology to produce a child."

Americans, Europeans, and Canadians share similarly favorable attitudes about biotechnology and nanotechnology.

- In 2005, 71% of Americans and 67% of Canadians expressed support for products and processes involving biotechnology. Almost two-thirds of Europeans said they expected biotechnology to positively affect their way of life in the next 20 years.
- When told about nanotechnology, about half of Americans surveyed in 2005 foresaw substantial or some benefit from it, and 14% expected substantial or some risk. Canadian response to the same question was similar. Among Europeans, 48% expected positive effects from nanotechnology, whereas only 8% expected negative effects.