

# Public Praises Science; Scientists Fault Public, Media

## Scientific Achievements Less Prominent Than a Decade Ago

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*The following report is based on a survey conducted by the Pew Research Center for the People & the Press in collaboration with the American Association for the Advancement of Science*

| <b>Public Has High Regard for Science and Scientists...</b>           |               |                   |
|---|---------------|-------------------|
| <i>Science's effect on society</i>                                    | <u>Public</u> |                   |
|   | %             |                   |
| Mostly positive   | 84            |                   |
| Mostly negative   | 6             |                   |
| Other/DK  | 10            |                   |
| <i>Contribute "a lot" to society's well-being...</i>                  |               |                   |
| Members of military   | 84            |                   |
| Teachers  | 77            |                   |
| <b>Scientists</b>   | <b>70</b>     |                   |
| Medical doctors   | 69            |                   |
| Engineers   | 64            |                   |
| Clergy  | 40            |                   |
| Journalists   | 38            |                   |
| Artists   | 31            |                   |
| Lawyers   | 23            |                   |
| Business executives   | 21            |                   |
| <b>But Public Is Less Positive than Scientists about U.S. Science</b> |               |                   |
| <i>U.S. scientific achievements...</i>                                | <u>Public</u> | <u>Scientists</u> |
|   | %             | %                 |
| Best in the world   | 17            | 49                |
| Above average   | 47            | 45                |
| Average   | 26            | 5                 |
| Below average   | 5             | 1                 |
| DK/No answer  | 4             | *                 |
| Figures read down.  |               |                   |

Americans like science. Overwhelming majorities say that science has had a positive effect on society and that science has made life easier for most people. Most also say that government investments in science, as well as engineering and technology, pay off in the long run.

And scientists are very highly rated compared with members of other professions: Only members of the military and teachers are more likely to be viewed as contributing a lot to society's well-being.

However, the public has a far less positive view of the global standing of U.S. science than do scientists themselves. Just 17% of the public thinks that U.S. scientific achievements rate as the best in the world.

A survey of more than 2,500 scientists, conducted in collaboration with the [American Association for the Advancement of Science](#) (AAAS), finds that nearly half (49%) rate U.S. scientific achievements as the best in the world.

When asked about their own scientific specialty, about the same share of scientists (45%) rate U.S. scientific achievements the best in the world.

There are indications that the public also is somewhat less confident in America's scientific prowess than it once was.

**Scientists See Lack of Funding, Visa Problems As Obstacles to High-Quality Research**

| <i>Impediments to high-quality research...</i>   | <u>Very serious</u><br>% | <u>Serious</u><br>% | <u>Not too/Not at all serious</u><br>% |
|--|--------------------------|---------------------|--|
| Lack of funding for basic research               | 46                       | 41                  | 12                                     |
| Visa problems for foreign students & scientists  | 17                       | 39                  | 36                                     |
| Regulations on animal research                   | 6                        | 21                  | 59                                     |
| Regulations on use of US technology overseas     | 4                        | 17                  | 48                                     |
| Implementation of human subjects rules           | 4                        | 15                  | 51                                     |
| Conflict of interest rules used by science pubs. | 2                        | 10                  | 73                                     |

Figures read across.

**Problems for Science: Lack of Public Knowledge, Sloppy News Coverage**

| <i>Scientists' views of problems for science...</i>                            | <u>Major problem</u><br>% | <u>Minor/Not a Problem</u><br>% |
|--|---------------------------|---------------------------------|
| Public does not know very much about science                                   | 85                        | 15                              |
| News does not distinguish between well-founded findings and those that are not | 76                        | 24                              |
| News media oversimplify scientific findings                                    | 48                        | 51                              |
| Public expects solutions to problems too quickly                               | 49                        | 51                              |

Figures read across.

Significantly fewer Americans volunteer scientific advances as one of the country's most important achievements than did so a decade ago (27% today, 47% in May 1999). As an example, 10 years ago, 18% cited space exploration and the moon landing as the country's top achievement of the 20th century. Today 12% see it as the greatest achievement of the past 50 years.

While the public holds scientists in high regard, many scientists offer unfavorable, if not critical, assessments of the public's knowledge and expectations. Fully 85% see the public's lack of scientific knowledge as a major problem for science, and nearly half (49%) fault the public for having unrealistic expectations about the speed of scientific achievements.

A substantial percentage of scientists also say that the news media have done a poor job educating the public. About three-quarters (76%) say a major problem for science is that news reports fail to distinguish between findings that are well-founded and those that are not. And 48% say media oversimplification of scientific findings is a major problem.

The scientists are particularly critical of television news coverage of science. Just 15% of scientists

rate TV coverage as excellent or good, while 83% say it is only fair or poor. Newspaper coverage of science is rated somewhat better; still, barely a third (36%) of the scientists say it is excellent or good, while 63% rate it as only fair or poor.

While scientists are generally upbeat about the state of their profession, they do see several obstacles to conducting high-quality basic research. As might be expected, by far the biggest impediment is a lack of funding; more than eight-in-ten say this is a very serious (46%) or a serious (41%) impediment to research. A majority (56%) also says that visa and immigration problems for foreign scientists and students stand in the way of high-quality research. Far smaller percentages say that regulations on animal research (27%) or other factors are serious impediments to scientific research.

### Government Is Top Source of Research Funding, Say Scientists

| <i>Most important source in <b>your</b> specialty*...</i> | <u>Scientists</u><br>% |
|---|------------------------|
| <b>Government (net)</b>                                   | <b>84</b>              |
| Nat'l Inst. Health  | 49                     |
| Nat'l Science Foundation                                  | 47                     |
| Dep't of Defense  | 14                     |
| Dep't of Energy   | 13                     |
| <b>Non-government funding (net)</b>                       | <b>50</b>              |
| Foundations/non-profits                                   | 30                     |
| Industry/business   | 20                     |

### Public Sees Government Funding of Research as "Essential"

| <i>Which comes closer to your view...</i>                         | <u>Public</u><br>% |
|---|--------------------|
| Gov't investment in research is essential for scientific progress | 60                 |
| Private investment ensures enough progress w/out gov't investment | 29                 |
| Don't know  | 11                 |

\* Multiple responses accepted; figures add to more than 100%. Top funding sources listed. Figures read down.

### Points of Agreement

The survey of opinions about the state of science and its impact on society was conducted by the Pew Research Center for the People & the Press in collaboration with the American Association for the Advancement of Science (AAAS), the world's largest general scientific society. The survey of the general public was conducted on landlines and cell phones among 2,001 adults April 28-May 12; the online survey of scientists was conducted among a sample of 2,533 members of the AAAS from May 1-June 14. Science knowledge questions were included in a separate survey of the general public, conducted on landlines and cell phones among 1,005 adults June 18-21.

While scientists express frustration with the public, there are some significant points of agreement between the public and the scientific community. First, majorities of both groups point to advances in medicine and life sciences as important achievements of science. About half of the public (52%) cites medicine -- including health care, vaccines, and medical cures -- when asked to describe ways that science has positively affected society; by comparison, just 7% mention communications and computer technology. Similarly, most scientists (55%) mention a biomedical or health finding when asked about the nation's greatest scientific achievement of the last 20 years.

There also is common ground between the public and scientists regarding the pivotal role of government in funding scientific research. Government institutions and agencies are the dominant funders of research, according to scientists: 84% list a government entity as an important source of funding for their specialty, with nearly half specifically citing the National Institutes of Health (49%) or the National Science Foundation (47%). Half of the scientists (50%) cite non-government funding sources as among the most important in their field.

A majority of the public (60%) says that government investment in research is essential for scientific progress; only about half that percentage (29%) is of the view that private investment will ensure that enough scientific progress is made even without government intervention.

Moreover, large percentages think that government investments in basic scientific research (73%) and engineering and technology (74%) pay off in the long run. Notably, the partisan differences in these views are fairly modest, with 80% of Democrats and 68% of Republicans saying that government investments in basic science pay off in the long run. Comparable percentages of Democrats and Republicans say the same about government investments in engineering and technology.

**Scientists Have More Positive View of Gov't, Less Positive View of Business**

| <i>When something is run by gov't it is usually inefficient and wasteful</i>            | Public | Scientists |
|---|--------|------------|
|   | %      | %          |
| Agree   | 57     | 40         |
| Disagree  | 39     | 58         |
| Don't know/No answer  | 4      | 2          |
| <i>Business corps. generally strike a fair balance bet. profits and public interest</i> |        |            |
| Agree   | 37     | 20         |
| Disagree  | 58     | 77         |
| Don't know/No answer  | 5      | 2          |

Figures read down.

In this regard, public views about whether funding for scientific research should be increased, decreased or kept the same have changed little since the start of the decade. Currently, more than twice as many people say that, if given the task of making up the budget for the federal government, they would increase (39%) rather than decrease (14%) funding for scientific research; 40% say they would keep spending as it is. That is largely unchanged from 2001, when 41% said they would increase funding for scientific research.

As in the past, scientific research rates as a second-tier funding priority, well behind education (67% favor increased funding), veterans' benefits (63%) and health care (61%). But since 2001, support for increasing funding in several areas, including education and health care, has declined. Over the same period, opinions about funding scientific research have remained more stable.

**Opinion Gaps between Scientists, Public**

The public and scientists generally concur about the importance of government funding of scientific research, but there are substantial gaps in the opinions of scientists and the public about various scientific and societal issues. Scientists are far less critical than the general public of government performance. Just 40% of scientists agree that "when something is run by the government, it is usually inefficient and wasteful"; a majority of the public (57%) agrees with this statement.

Scientists are, however, more critical of business; they are roughly half as likely as the public to say that

**Scientists Viewed Positively, Even By Those Skeptical of Scientific Conclusions**

|   | <i>How much do scientists contribute to the well-being of society?</i> |      |         | N    |
|---|--|------|---------|------|
|   | Not much!  |      |         |      |
|   | A lot  | Some | Nothing |      |
|   | %  | %    | %       |      |
| <b>View on origins of life...</b>             |  |      |         |      |
| Believe in evolution due to natural selection | 78   | 19   | 3       | 647  |
| Believe beings were created in present form   | 63   | 27   | 7       | 621  |
| <b>Views on climate change...</b>             |  |      |         |      |
| Earth is getting warmer due to human activity | 74   | 21   | 4       | 965  |
| No solid evidence earth is getting warmer     | 64   | 25   | 7       | 239  |
| <b>Science and your religious beliefs...</b>  |  |      |         |      |
| Science does not conflict w/ my beliefs       | 72   | 21   | 5       | 694  |
| Science conflicts w/ my beliefs               | 67   | 27   | 5       | 1249 |

Figures read across.

"business corporations generally strike a fair balance between making profits and serving the public interest" (20% of scientists vs. 37% of public).

When it comes to contemporary scientific issues, these differences are often even larger. Most notably, 87% of scientists say that humans and other living

things have evolved over time and that evolution is the result of natural processes such as natural selection. Just 32% of the public accepts this as true.

And the near consensus among scientists about global warming is not mirrored in the general public. While 84% of scientists say the earth is getting warmer because of human activity such as burning fossil fuels, just 49% of the public agrees.

| <b>Differences between Public and Scientists<br/>Go Beyond Evolution</b>     |               |                   |
|--|---------------|-------------------|
|  | <u>Public</u> | <u>Scientists</u> |
|  | %             | %                 |
| Think that humans, other living things have evolved due to natural processes | 32            | 87                |
| Think that earth is getting warmer because of human activity                 | 49            | 84                |
| Favor use of animals in scientific research                                  | 52            | 93                |
| Favor federal funding for embryonic stem cell research                       | 58            | 93                |
| Favor building more nuclear power plants                                     | 51            | 70                |
| Say that all parents should be required to vaccinate their children          | 69            | 82                |

More than nine-in-ten scientists (93%) favor the use of animals in scientific research, but only about half of the public (52%) agrees. There also are wide differences in the proportions of scientists (93%) and the public (58%) that favor federal funding for embryonic stem cell research. There is less of a schism over the need for universal vaccinations: 82% of scientists and 69% of the public at large say that all children should be required to be vaccinated. Just 17% of scientists and 28% of the public say

parents should be able to decide not to vaccinate their children.

Despite these differences, science and scientists are viewed positively by those who differ over evolution, global warming and other contentious issues.

| <b>Partisan and Ideological Differences</b>                           |                |                   |
|---|----------------|-------------------|
|   | <u>Public*</u> | <u>Scientists</u> |
| <i>% who are...</i>   | %              | %                 |
| Democrat  | 35             | 55                |
| Republican  | 23             | 6                 |
| Independent   | 34             | 32                |
| <i>Ideological self-rating</i>  |                |                   |
| Liberal   | 20             | 52                |
| Moderate  | 38             | 35                |
| Conservative  | 37             | 9                 |
| * Based on 2009 Pew Research surveys; N=10,630.<br>Figures read down. |                |                   |

On the question of evolution, for instance, 78% of those who say that humans and other living things have evolved over time because of natural selection and other natural processes say that scientists contribute a lot to the well-being of society. Those who say humans and other living things have existed in their present form since the beginning of time express a less positive view of scientists; nonetheless, 63% of them say scientists have contributed a great deal to society.

Views of scientists also differ only modestly between those who say global warming is caused by human activity and those who say there is no solid evidence the earth is warming. In addition, those who say that science sometimes conflicts with their own religious beliefs -- 36% of the public -- are only slightly less likely than those who see no conflict to say that scientists contribute a great deal to society (67%, 72% respectively).

### Scientists Say These Are Good Times

|                        | Good time for... |                |
|------------------------|------------------|----------------|
|                        | Science          | Your specialty |
|                        | %                | %              |
| All scientists         | 76               | 73             |
| <i>Field</i>           |                  |                |
| Biological and Medical | 73               | 73             |
| Chemistry              | 75               | 69             |
| Geosciences            | 83               | 77             |
| Physics and Astronomy  | 79               | 74             |

### Good Times for Science

The poll finds scientists upbeat about the state of their profession. Three-quarters (76%) say this is generally a good time for science and nearly as many (73%) say it is good time for their scientific specialty. Positive views are shared by scientists irrespective of specialty. In addition, despite the bad economy, 67% say it is either a very good time (17%) or a good time (50%) to begin a career in their scientific field.

Politics may play some role in the positive way the scientists surveyed judge the times. More than half of the scientists surveyed (55%) say they are Democrats, compared with 35% of the public. Fully 52% of the scientists call themselves liberals; among the public, just 20% describe themselves as liberals. Many of the scientists surveyed mentioned in their open-ended comments that they were optimistic about the Obama administration's likely impact on science.

For its part, the public does not perceive scientists as a particularly liberal group. When asked whether they think of scientists as liberal, conservative or neither in particular, nearly two-thirds (64%) choose the latter option. Just 20% say they think of scientists as politically liberal. However, a majority of scientists (56%) do see members of their profession as liberal.

Most scientists had heard at least a little about claims that government scientists were not allowed to report research findings that conflicted with the Bush administration's point of view. And the vast majority (77%) says that these claims are true. By contrast, these claims barely registered with the public -- more than half heard nothing at all about this issue. Only about a quarter of the public (28%) said they thought the claims were true.

Both scientists and the public overwhelmingly say it is appropriate for scientists to become active in political debates about such issues as nuclear power or stem cell research. Virtually all scientists (97%) endorse their participation in debates about these issues, while 76% of the public agrees.

**How much science do you know? Click here to take a 12-item quiz, a mix of contemporary knowledge and text-book style questions, to find out. Note: Answers to the quiz questions are revealed below.**

### Science Knowledge

Americans are knowledgeable about basic scientific facts that affect their health and their daily lives. But the public is less able to answer questions about more complex science topics.

### Public's Science Knowledge

| <b>Contemporary questions</b>                                    | <u>Percent correct</u> |
|--|------------------------|
| <i>Aspirin</i> recommended to prevent heart attacks              | 91                     |
| GPS reliant on <i>satellites</i>                                 | 82                     |
| <i>Undersea earthquakes</i> can cause tsunamis                   | 77                     |
| <i>Carbon dioxide</i> is gas linked to rising temperatures       | 65                     |
| <i>Water</i> recently discovered on Mars                         | 61                     |
| <i>Pluto</i> no longer a planet                                  | 60                     |
| <i>Stem cells</i> can develop into many different types of cells | 52                     |
| <b>"Textbook" questions</b>                                      |                        |
| Continents are/have been shifting                                | 76                     |
| Not all radioactivity is man-made                                | 63                     |
| Antibiotics <i>do not</i> kill viruses as well as bacteria       | 54                     |
| Lasers <i>do not</i> work by focusing sound waves                | 47                     |
| Electrons are <i>smaller</i> than atoms                          | 46                     |

The 12-item quiz administered to the public is available online. If you would like to take the quiz before reading this section, [click here](#).

Fully 91% know that aspirin is an over-the-counter drug recommended to prevent heart attacks and 82% know that GPS technology relies on satellites. Topics covered in major news stories also are widely understood; 77% correctly identify earthquakes as a cause of tsunamis and 65% can identify CO2 as a gas linked to rising temperatures.

Slightly more than half (54%) knows that antibiotics do not kill viruses along with bacteria, and about the same percentage (52%) knows that what distinguishes stem cells from other cells is that they can develop into many different kinds of cells. And some high-school science knowledge is elusive for most Americans: Fewer than half (46%) know that electrons are smaller than atoms.

Previous Pew Research Center [knowledge surveys](#) have shown that young people are poorly informed about current events and politics. But this is not the case with science knowledge. In fact, those younger than age 30 get higher scores on the knowledge test than do those ages 65 and older. Still, the best-informed people about science, according to the results of this quiz, are those ages 30 to 49.

[Continue reading the full report at people-press.org](#) including methodology and [topline findings](#).

Also at [people-press.org](#), find a [commentary by Dr. Alan I. Leshner](#), Chief Executive Officer, American Association for the Advancement of Science and executive publisher of *Science*.