

Public Praises Science; Scientists Fault Public, Media

*Scientific Achievements Less
Prominent Than a Decade Ago*

Overview

Public Has High Regard for Science and Scientists..	
<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
Scientists	70
Medical doctors	69
Engineers	64
Clergy	40
Journalists	38
Artists	31
Lawyers	23
Business executives	21
 But Public Is Less Positive than Scientists about U.S. Science	
<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. 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, ten years ago, 18% cited space exploration and the moon landing as

<i>Public's views of greatest achievement of last 50 years...</i>	May 1999*	May 2009
	%	%
Science/medicine/technology	47	27
Civil rights/Equal rights	5	17
War and peace	7	7
Economy	5	3
Other	13	17
Nothing/Don't know	24	33

Multiple responses accepted.
 * May 1999 question asked about "America's greatest achievement during the 20th century."
 Figures read down.

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

<i>Scientists' views of problems for science...</i>	Major problem %	Minor/ Not a Problem %
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.

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

<i>Impediments to high-quality research...</i>	Very serious %	Serious %	Not too/Not at all serious %
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.

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.

I feel that science education in this country is in a terrible state, particularly post-elementary education. Something is happening between grade school and junior high school, where our kids are losing interest in science, or their teachers are not inspiring them. We also need some kind of continuing science education, or public outreach program, to adults who are out of school. The pace of our scientific advances has become quite swift the last 50 years, but most U.S. adults have been left behind.
Microbiologist, 37.

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.

Government Is Top Source of Research Funding, Say Scientists	
<i>Most important source in your specialty*...</i>	<u>Scientists</u> %
Government (net)	84
Nat'l Inst. Health	49
Nat'l Science Foundation	47
Dep't of Defense	14
Dep't of Energy	13
Non-government funding (net)	50
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> %
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.	

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.

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% increase 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

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.

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 also are more critical of business; they are roughly half as likely as the public to say that “business corporations generally strike a fair balance between making profits and serving the public interest” (20% of scientists vs. 37% of public).

	Public %	Scientists %
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

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.

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.

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.

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

*How much do scientists contribute
to the well-being of society?*

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

Figures read across.

There also are only modest differences in views of scientists 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).

Good Times for Science

	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

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.

% who are...	Public*	Scientists
	%	%
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.
Figures read down.

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.

The state of science is vastly improved since President Obama's election. He understands the importance of science and speaks forcefully for it. The stimulus money should help us climb out of this recession as well as improve the state of funding for scientific research. Mathematician, 64

Science Knowledge

Public's Science Knowledge	
<i>Contemporary questions</i>	Percent correct
<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
Stem cells <i>can develop into many different types of cells</i>	52
<i>"Textbook" questions</i>	
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

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.

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. And 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 30 get higher scores on the knowledge test than do those 65 and older. Still, the best-informed people about science, according to the results of this quiz, are those 30 to 49.