

A global survey of the scientifically literate public reveals

a Pacific DIVIDE on key issues in science.



Tomorrow's science buffs at the Popular Science Museum of Meteorology in Guiyang, China.

Science, it is often said, is an international language. But how international are attitudes towards science and scientists? *Nature* and our affiliated publication *Scientific American* set out to learn how the views of the scientifically literate public vary around the world. Our web-based survey of more than 21,000 readers of *Scientific American* and its translated editions in 18 countries revealed that although these science enthusiasts read the same publication and share many attitudes in their perception of science, they seem to diverge on some of the hottest-button issues.

The differences are most striking between east Asia and the rest of the world. For example, a startling 35% of the Japanese and 49% of the Chinese respondents agreed that there is

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“reason for doubt” about evolutionary theory’s ability to explain the variety of species on Earth. In contrast, the numbers for the rest of the world fluctuated around 10%. Japanese and Chinese respondents were also less likely than others to say that they trust scientific explanations of the origins of the Universe. And almost one-third of scientifically literate Chinese people say that scientists should not get involved in politics, compared with around 10% of respondents in most of the rest of the world.

The results are not conclusive. Far from being rigorous, the survey sampled countries unevenly, with thousands of respondents in the United States and several European countries, 1,195 in Japan and just 269 in China. The respondents were self-selected, so some subsets

of readers may simply have bypassed the questionnaire. And cultural differences may have influenced how people from different countries responded to identical questions. Still, the results are sobering for anyone who believes that a public informed about science will necessarily share scientists’ views.

Many of the results match expectations for a scientifically literate group. Worldwide, poll respondents overwhelmingly agreed that scientists are more trustworthy than other public figures, that investment in science is key to future economic growth and that animal research should be permitted. Strikingly, a large fraction of respondents in every country said that in the past year they have grown more confident that human activity is changing the global climate, despite noisy controversies over the United Nations’ climate panel and leaked e-mails by climate researchers. And some of the regional differences were also familiar from earlier reports. Europeans tend to be wary of genetically modified organisms (GMOs), for example, and Germans want to phase out nuclear energy.

But how to explain the scepticism about evolution and the Big Bang in Japan and China? Christian creationism has little traction in these countries, but some scientists, in response to follow-up questions from *Nature*, pointed to Asian philosophical systems such as Shinto or Buddhism, which have their own explanations for the origin of life.

Naruya Saitou, a population geneticist at the National Institute of Genetics in Mishima, Japan, suggests that the apparent doubts stem from a recognition of complexity in nature. This also explains other trends in Japan, he says: systems biology is a relatively unpopular career path for scientists because “life is too complex to be reduced to a formula”, engineering and robotics are popular fields because “you can control almost everything”, and GMOs are shunned because “people are afraid of manipulating the huge complexities in nature”.

The ambivalence could also reflect a greater appreciation among east Asians for the limitations of knowledge, says Kazuto Kato, a specialist in the public perception of science at Kyoto University in Japan. The phrasing of the evolution question, which asked whether there is “any doubt” about the theory’s explanatory power or whether “all the evidence” supports evolution, probably provoked a guarded response, he says. “Many scientifically literate people would say there is room for doubt,” adds Kato. “It doesn’t mean they believe in creationism.”

Wu Yishan, a chief engineer at the Institute of Scientific and Technical Information of China in Beijing, says that the evolution question probably also triggered a natural, and healthy, scepticism in Chinese respondents: “As a scientist you should be able to doubt anything,” he says, noting that even among physicists there is debate over the origins of the

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Universe. “People are often guessing what kind of answers pollsters hope to hear. In this case, if I say I have no doubts, it seems I am not open-minded.”

Western respondents may have been less equivocal in their support for science and scientists because of political debate in their countries, says Dietram Scheufele, a science-communications and public-policy expert at the University of Wisconsin–Madison. “Particularly in the United States, dichotomies dominate political issues, like a sporting event with two sides. Dichotomies are prominent in discussions about climate change, stem cells and so on,” he says. “And they can damage the debate.”

A comparison with previous surveys on attitudes towards evolution highlights one dichotomy in the United States. A typical survey of the public at large shows that a mere 26% of Americans believe that evolution can explain the variety of animal life on Earth, whereas 87% of *Scientific American* readers said in this poll that “all the evidence supports evolution”.

“These are not the people you would tap in a general population survey,” says Scheufele.

Subtleties in language probably also affected the results, says Wu. Chinese respondents said that scientists “should speak freely about science-related policy questions” and “should take part in public debate” in similar ratios to the Western respondents, and they were even more likely to think that “scientists know what is good for the public”. Yet a very high proportion, 29%, felt strongly that “scientists should stay out of politics”. Wu suggests that the negative connotation of ‘politics’ in China, deriving from a ‘politics first’ movement during the communist Cultural Revolution that was used as an excuse for various abuses, might be to blame: it is not that scientists have nothing to contribute, but that politics itself is tainted.

Furthermore, the 269 respondents from China can’t represent the entire country, says Wu. “In a country of 1.3 billion, that is nothing. A change in attitudes of a few people can really shift a result.” The US cohort — 4,779, from a country of 300 million — also had a broad range of ages and specialities, including many social scientists, whereas the median age of the Chinese respondents was a young 35, and the sample was heavily skewed towards natural scientists.

Still, Scheufele says that although the poll is far from scientific, it holds interesting clues — even about the sparsely represented people of China. “We can say there is a group of young and educated people who feel strongly that science needs to have an impact on policy and in daily life. It’s a young group that thinks that science will drive politics instead of what you would expect in China — the other way around.” ■

David Cyranoski is Nature’s Asia-Pacific correspondent. Survey conducted by Sara Grimme and Fiona Watt.

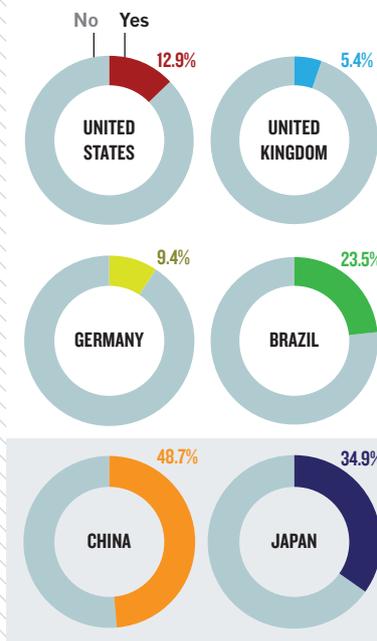
A WORLD OF VIEWS

The survey revealed high levels of trust in science and scientists, but responses to selected questions in China and Japan were strikingly different from elsewhere.

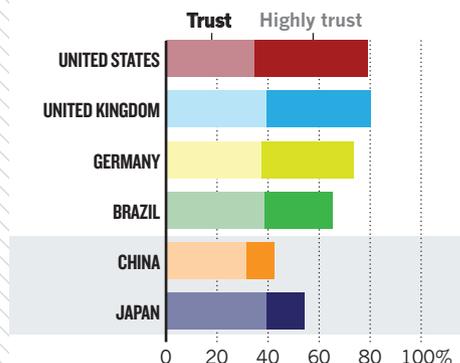
Number of respondents by country



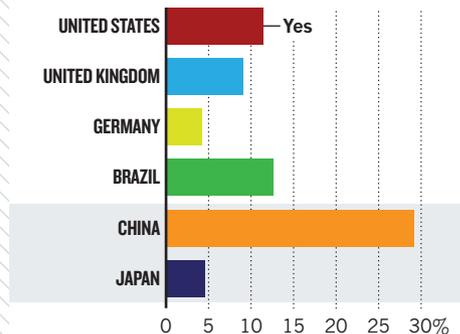
Q Is there any doubt that evolution, including natural selection, can explain the forms and variety of life?



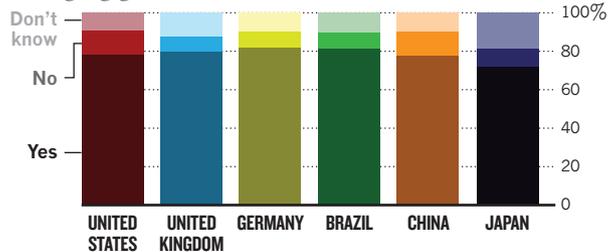
Q Do you trust what scientists say about the origins of the universe?



Q Do you strongly agree that scientists should stay out of politics?

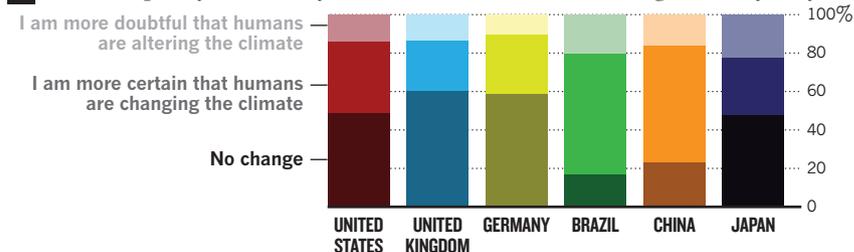


Q Do you think humans are significantly changing global climate?



Respondents around the world generally shared the views of most scientists, even on controversial topics such as climate change.

Q Over the past year, have your views about climate changed in any way?



For more survey graphics, see scientificamerican.com/science-trust-poll