

European Values Study

Europe's citizens trust science and technology, while supporting nature conservation

- **Consensus reigns** on the role of science in the improvement of human health and in reducing the superstitions and fears of the past. Scientific research is seen as the most reliable way to understand the world
- **The Spanish are the most upbeat** on science and technology. They concur with the citizens of other countries that religion should not impose limits on scientific advances, but differ in their belief that nor should ethical considerations
- **Expectations are emphatically favorable** for the diverse technologies and applications of science, notably solar energy and new technologies (computers, Internet, mobile phones). The sole exception is nuclear power, which a relative majority believe will make our lives worse
- **Doctors and scientists** are the professional groups accorded most trust, with widespread agreement in all survey countries that they are made up of competent professionals who act in an ethical manner
- **In the five countries analyzed**, a positive predisposition to science and technology coincides with appreciative and protective feelings towards nature, perceived as a beautiful thing whose balance can be easily altered by human activity
- **European citizens are wary** of biotechnological applications that genetically modify living beings, with rejection more intense in the case of humans and animals than that of plants

The BBVA Foundation has presented the third module of its European Values Survey 2019-2020, examining values and attitudes in five European countries (Germany, the United Kingdom, France, Italy and Spain). Following a first module devoted to the public sphere (politics, economics, the media, trust), and a second focusing on issues in the private domain

(religion, ethics, practices subject to moral controversy), this third installment explores values and attitudes towards science, technology and nature.

The aim of the study is to capture a broad set of preferences, values and beliefs that inform individual conduct in multiple facets of public and private life, and to examine how these conducts interrelate in the two domains. Values and intangibles in both spheres operate as a kind of “cognitive, normative and emotional GPS” that helps individuals navigate their way around complex issues and situations on which they have limited information, aiding them in their decision-making. They help identify what is “good” (valuable) and “right” (which sort of individual and institutional behaviors are obligatory or permitted/forbidden). The resulting map of cultural “intangibles” – values and attitudes – of the adult population is fairly stable in its main contours, but may be affected or modified as a result of exceptional events (crises) or the emergence of new information of singular importance, visibility and reach.

The comparative analysis of values and attitudes conducted in the study identifies commonalities and differences both across and within the five societies by reference to sociodemographic and cultural factors: age, sex, educational level and declared political orientation.

Strong interest in health and the environment

Citizens in the five European countries express most interest in health and environmental issues, followed by technology and science. The Spanish report interest in these issues exceeding the average of the other four countries: 8.1 for health (on a scale where 0 means no interest at all and 10 means a great deal of interest) and 7.5 for the environment, against 7.2 and 7.1 respectively.

While Spaniards’ interest in medical and environmental issues cuts across all population segments, interest in science and technology is greater among younger adults, those with more years of study, those on the political left and those in the low religiosity bracket. Also men express more interest than women in technological issues.

Importance of new technologies

The mobile phone stands out as the single most important means of communication for citizens in all five countries (averages exceeding 7 points on an importance scale from 0 to 10), ahead of television and the Internet. The radio, the press and the personal computer, though seen as important, come further down the list.

Eighty percent or more of citizens in the five survey countries declare themselves Internet users, with penetration highest in the United Kingdom and France. However frequency of use (“I am connected almost all day”) is greatest in Spain (26%), followed by the United Kingdom and Italy (24% in both cases).

Mobile phones are the most common means of Internet access, particularly in Spain (80%) and Italy (77%). Next come laptop computers, a strong second choice in Germany and France, and desktop computers, also popular in France. In last place comes the tablet or iPad, with most adepts in the UK.

Internet is very much a space for information search: almost all users (94% in Spain and the other four countries on average) report using online search engines. Though this universal search function dominates, it is also a space for keeping up with the news: nearly half of all users read newspapers online, with incidence highest in France (55%) and Spain (54%), and Germany in the rear (38%).

Internet is additionally a space for interpersonal communication via e-mail and social networks. E-mail is used extensively in all societies (81% in Spain and an average 89% across the other four countries).

Social networks are also in very wide use, notably in Italy (74%), Spain (73%) and the United Kingdom (73%), with Germany (68%) and France (65%) some way behind. Social network activity is rather more intense among women than men, and increases sharply as we move down the age groups, producing a significant breach between young citizens and the over 45s. Use is also higher among those of medium to high educational level.

For many users, especially in Spain (65%) and France (60%) the Internet is also a space for entertainment, where they can download or stream music and videos. A majority of those surveyed had also used the Internet in the past month for banking transactions (59% in Spain vs. a 61% average in other countries) and online shopping (49% in Spain vs. a 65% average in other countries).

A positive view of science and technology, with some reservations

In all countries, we find a broad consensus on science’s role in improving human health (average 8.0 in Spain vs. 7.7 in other countries, on a scale where 0 means “completely disagree” and 10 “completely agree”), and in reducing the fears and superstitions of the past (6.8 in Spain vs. 6.4 in other countries). It is also agreed to be the most reliable way to understand the world (6.6 in Spain vs. 6.4 in other countries).

Opinions are more divided as to whether “science has an answer for all the major problems,” with the Spanish (5.7), Italians (5.3) and Germans (5.3) supporting this view and the French (4.1) and British (4.1) rather more skeptical.

Although the conviction that science has reduced the fears and superstitions of the past cuts across all segments, it tends to increase further with educational level. In Spain, it also stands higher among young people, those identifying as on the left and those expressing a low level of religiosity.

At the same time, agreement prevails as to the negative impact of science and technology in increasing unemployment and the threat of war. Although with opinions more divided, the idea that the advance of science has created a world full of risks also exceeds the agreement threshold (except in the United Kingdom), as does the belief that science makes everything more complex and harder to understand (except in Italy).

These reservations do not mean citizens think “we would be better off if we lived our lives without so much science and technology,” a view rejected in every country with the exception of Italy. Nor do they believe that science destroys people’s religious beliefs and/or moral values (with Italy again the exception).

In effect, if we pan out from the study of specific facets to an aggregated view based on a scale of positive assessments (“promises”) and another of negative perceptions (“reservations”), we see that in all countries the promises side wins out clearly over reservations.

Expectations tilted in favor of technology

Citizens in every country express upbeat expectations for a range of technologies and applications, foremost among them solar energy (89% of Spaniards and 86% elsewhere believe it will make our lives better) and new technologies (computers, Internet, mobile phones). The sole exception is nuclear power, which a relative majority believe will make our lives worse.

The Spanish stand apart from the average of the other four countries in being more favorably disposed to all applications, especially genetic engineering, space exploration and artificial intelligence.

Education is the variable that best discriminates for expectations towards science and technology, which diminish sharply among the population with fewest years of study. They are also lower among women, the over 65s and those with a higher level of religiosity.

Specific expectations towards the development of machines and systems based on artificial intelligence vary widely both between and within countries. A relative majority of Spanish (49%) and British (46%) believe that the advance of AI will improve society, while a majority of French (52%) and relative majority of Germans (45%) and Italians (44%) believe that it will make things worse. In all countries a large segment declined to issue an opinion on this topic (21% in Spain and 18% on average in other countries).

If we construct a summated scale with the number of technologies or applications that citizens believe will make their lives better, we see significant differences emerge between countries. Spain scores highest of the five by the measure of positive expectations (average of 7.2 applications of the 11 mooted). In second place comes the United Kingdom (6.7) with France at the extreme of lowest expectations (5.8).

Trust in doctors and scientists

Doctors and scientists are the professional groups accorded most trust (averages of 7.9 and 7.3 respectively in Spain, and of 7.5 and 7.0 in other countries, on a scale where 0 means “you do not trust them at all”, and 10 means “you trust them completely”). Next come engineers (6.9 in Spain and 6.8 in other countries) and ecologists (6.1 in Spain and 6.2 in other countries). Here the Spanish average out about the same as the other four countries while being those expressing most trust in doctors.

A key determinant of trust in professional groups is a belief in their ethical behavior. There is a broad consensus in all countries in classing doctors, followed by scientists and engineers, as professional groups that act in an ethical manner.

Another important factor for trust in a professional group is their technical competence or ability to perform their function. Again a majority in all countries concur in seeing doctors, scientists and engineers as competent and capable professional groups.

Science and religion

Citizens are divided over the nature of the coexistence of science and religion. The Germans are the most convinced that the two domains coexist without problems (average of 5.2 on a scale from 0 to 10, where 0 means completely disagree and 10 completely agree), while the French clearly differ (4.3). The Spanish, British and Italians are more accepting of the idea (4.9), albeit without attaining the threshold of agreement.

A majority in all countries feel that religion should not set limits on scientific advances. This view

finds particularly strong support in Spain (82%), France (79%) and the United Kingdom (78%), tailing off in Italy (65%) and Germany (60%).

Ethical limits to scientific advances

When citizens are asked not about religion but ethics as a possible brake on scientific advances, a majority in all countries, with the exception of Spain, say this it should rightly serve this function. The Germans are firmest in their support for this view (68%) followed by the French (57%). In Spaniards' case, only 36% believe that ethics should be able to set limits on science.

However this general perception is qualified when opinions are sought on specific scientific applications impinging on the moral terrain, with citizens in every country, including Spain this time, displaying attitudes of wariness or rejection.

Cloning and genetic modification of living beings

A clear example is the cloning of animals, which meets with strong and widespread rejection in all countries (average scores of three points or lower on an acceptance scale from 0 a 10). The Spanish and British are, relatively speaking, the most accepting of this practice and the French and Germans the most opposed. Cloning of human beings is even more vehemently and universally rejected (averages below two points).

Citizens were also asked about the genetic modification of animals for diverse purposes. Only in Spain does support for this technique reach the threshold of acceptance (average of 5) for the case of drug production, though not so for the production of food. In the other four countries, rejection dominates whatever the goal pursued, with disapproval strongest in France and Germany.

In the case of genetic modification of plants, the purpose of such modification conditions the level of acceptance, with pharmaceutical drug production activating acceptance to a greater extent than the production of food. In Spain and the United Kingdom acceptance wins out in both scenarios, while the Italians and French accept the former use but not the latter. In Germany, finally, opinions fall below the acceptance threshold in both cases.

Research with embryos and gene editing

Research with few-day-old human embryos for medical purposes is considered morally unacceptable in Germany, France and Italy. The extreme of outright rejection (0 to 2) finds most support in Germany (57%), as well as being opted for by a relative majority in the other

two countries (45% in France and 42% in Italy). In Spain and the United Kingdom, there is a more even split between those in favor and those against, with not dissimilar percentages bunched at the extremes of most rejection (0 to 2) – 33% in Spain and 30% in the UK – and maximum acceptance (8 to 10) – 29% in Spain and 26% in the UK.

Opinions vary in all five countries regarding the moral status of the embryo. One part of the population – 36% in Spain and 30% on average in other countries – sees the embryo as a cluster of cells with no moral condition; a second group – 21% in Spain and 24% in other countries – believe it to have a moral condition halfway between a cluster of cells and a human being; others – 15% in Spain and 17% in other countries – say it has a moral condition closer to that of a human being; and, a last group – 21% in Spain, 23% elsewhere – say it has the same moral condition as a human being.

These moral viewpoints exert a clear influence on attitudes towards research with embryos. Hence, while rejection prevails across most segments, it is stronger among those who view the embryo's moral condition as closer to that of a human being and, even more so, among those who say it has the same moral condition. Among those who consider it a cluster of cells, its use in research finds approval in Spain, the United Kingdom and Italy, while among those seeing its moral condition as halfway between a cluster of cells and a human being, acceptance only wins out in the United Kingdom.

Acceptance of the genetic editing of embryos is also contingent on the ends pursued: while widely accepted, except in Germany, to prevent the transmission of hereditary diseases (with support especially strong in Spain and the United Kingdom), there is widespread opposition in all countries to its hypothetical use to increase people's cognitive abilities and, more markedly still, to modify their physical characteristics.

Vision of nature and living beings

There is an ample consensus between and within countries around the ideas that nature is beautiful, inspires feelings of peace and is in a delicate state of balance vulnerable to human activity (averages topping 7 points in all countries on an agreement scale from 0 a 10). And we find even wider agreement in seeing biodiversity as an essential part of a country's wealth, and around the dependence we have on other species (averages of 8.5 in Spain and 8.2 in other countries).

In all countries (most notably Germany and France) the view prevails that nature should be protected because of the respect and consideration due to all forms of life. However, a

significant percentage in all countries believe that nature should be protected for utilitarian reasons, that is, for the practical benefits it brings to humans. This latter position finds most support among the Spanish and least among the Germans.

Citizens in all survey countries concur with the idea that science shows us fascinating things about nature (averages of 7.6 in Spain and 7.7 in other countries). However opinions are more divided within each country as to whether science and technology have the power to solve today's environmental problems, with agreement winning out in most cases (except France), and strongest of all in Spain.

Predominantly favorable views of science's role in the environment coexist with a vision of science as having already disrupted the balance of nature. And there is also broad agreement to the effect that scientists should not alter the workings of nature (averages of 7.0 points in Spain and other countries). A large majority in all countries agree that all living beings have the same right to life and that, in the case of animals, this right to life should be accorded similar recognition to that of human beings. Finally, while the use of animals in research aimed at improving human health finds considerable support in Spain (average of 6.2), this contrasts with the rejection expressed in Italy (4.6), Germany (4.4) and, especially, France (4.1), and the more divided views of Britons (5.0).

Concern over climate change

On the issue of climate change, citizens are united in considering it a grave threat (averages of 8 and more in almost every country). Eighty percent of the population in Spain and more than 60% in the other survey countries rate the problem very serious, with scores in the topmost bracket (8, 9 and 10).

Regarding the future course of climate change, the sentiment is clearly pessimistic. This is especially so in France and Germany, where the process is viewed as irreversible, with a majority convinced that we can only hope to mitigate some of its effects. In Spain a relative majority believe there is still time to rein in climate change.

Conclusions

In the five countries analyzed, keen interest in scientific issues and predominantly favorable attitudes to science and technology coexist with an environmentalist (non-materialist) view of nature that sees it as a beautiful thing whose balance can be easily disrupted by the action of human beings. Hence though aware of the benefits science and technology can bring to the environment, in terms of advancing knowledge and solving problems, citizens oppose the use

of its tools to alter the natural order.

The map of perceptions of science and its applications is a differentiated one, exhibiting a positive valence in the case of techniques that, while intervening in natural processes, do not alter them directly and are aimed clearly at obtaining medical benefits, but a negative valence for practices that modify or genetically alter living beings, with rejection more intense in the case of humans and animals than that of plants.

The Spanish, followed by the British, tend to be the most favorably disposed toward science and technology. They concur with the citizens of the other four countries in saying that religion should not set limits on scientific advances, but differ in their belief that nor should ethical considerations. They are also the most supportive of certain applications and practices subject to moral controversy, standing alone with the British in accepting the genetic modification of plants for both medicine and food production.

Spaniards also express greater acceptance of the use of human embryos in research and their gene editing to prevent the transmission of disease. Finally, they stand apart from their fellow European citizens in expressing greater acceptance of the use of animals in scientific research.

Technical notes:

- Geographical scope of the study: Germany, Spain, France, Italy, and the United Kingdom.
- Universe: in each country, the general population aged 18 and over.
- Method: administered face-to-face interview in the home.
- Sample size and distribution: 1,500 cases in each of the 5 countries. Multistage sample distribution stratified by region (NUTS classification or equivalent)/size of habitat, with primary units selected by lot at municipal level. Individuals randomly selected.
- Sampling error: The estimated sampling error is +/- 2.6% in each country for a confidence level of 95.5% and in the worst-case scenario ($p=q=0.5$).
- Survey period: April to July 2019
- Weighting: Total European results are arrived at by weighting each country's data according to its population weight in the universe of European countries surveyed.
- Fieldwork: coordinated and executed by the IPSOS network.
- Study design and analysis: BBVA Foundation Department of Social Studies and Public Opinion.

17 January, 2020

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