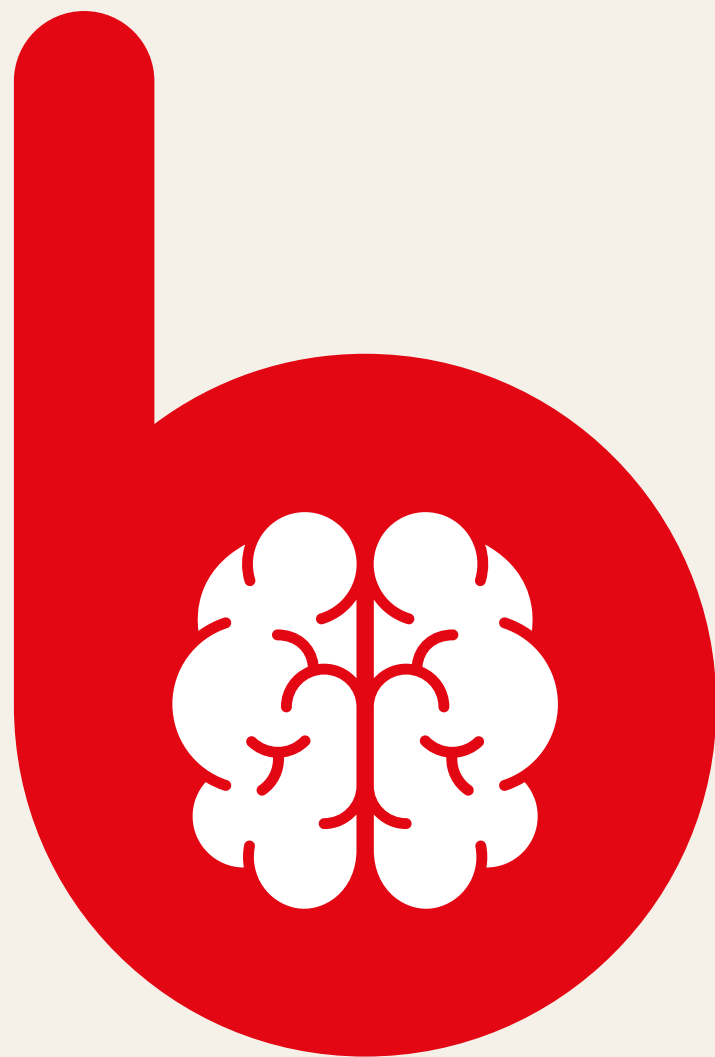




universcience present

THE BAROMETER OF CRITICAL THINKING

2024

#BaromètreEspritCritique
3rd edition on universcience.fr

WHAT SORT OF RELATIONSHIP DO OUR FELLOW CITIZENS HAVE WITH SCIENCE, THE MEDIA AND THE EXCHANGE OF IDEAS? DO THEY HAVE FOND MEMORIES OF MATHS AT SCHOOL, DO THEY PUT THEIR TRUST IN SCIENTISTS OR IN YOUTUBERS, DO THEY THINK THAT HOMEOPATHY IS A SCIENCE? DO THEY PREFER TO RELY ON THE RADIO OR ON SOCIAL NETWORKS FOR INFORMATION? ARE THEY ABLE TO CHANGE THEIR MINDS BY DEBATING WITH PEOPLE WHO THINK DIFFERENTLY?

For the 3rd consecutive year, Universcience – the public institution consisting of the Palais de la Découverte (Palace of Discovery) and the Cité des Sciences et de l'Industrie – carried out a survey amongst the French people, on all these and many other issues, in order to better understand their relationship to critical thinking. For this 2024 edition, the Barometer started by questioning their perception and understanding of Artificial Intelligence. Which sectors will it change, is it reliable and neutral, and could it ever win a Nobel Prize?

SCIENTIFIC COMMITTEE

The survey was conducted by *Opinion Way* on 2,000 individuals aged 18+, a representative sample of the French population.

It was monitored by a scientific committee composed of:

Michel Dubois, Director of Research at the Centre National de la Recherche Scientifique (National Centre for Scientific Research, CNRS)

Emiliano Grossman, Associate Professor at Sciences Po, Affiliate of the Centre d'Études Européennes et de Politique Comparée (Centre for European Studies and Comparative Politics) and Director of the Centre de Données Socio-politiques (Centre for Socio-Political Data, CDSP)

Elena Pasquinelli, Head of Research and Evaluation, La Main à la Pâte Foundation, Associate of the Institut Jean-Nicod, and member of the Conseil Scientifique de l'Éducation Nationale (Scientific Council of National Education)

Magda Tomasini, Director of the Ministry of National Education's Direction de l'Évaluation, de la Prospective et de la Performance (Directorate of Evaluation, Foresight and Performance)

Michel Wieviorka, Director of Studies at the École des Hautes Études en Sciences Sociales (School of Advanced Studies in the Social Sciences, EHESS)

ACKNOWLEDGEMENTS

Special thanks for proofreading the section of the barometer questionnaire relating to AI to:

Jean-Gabriel Ganascia, Professor at Sorbonne Université, researcher at the LIP6 laboratory (Laboratoire d'Informatique de Paris VI)

Lionel Obadia, Professor of Anthropology at the University of Lyon 2 / LARHRA (UMR5190), currently researching IA and robotics.

THE FRENCH AND ARTIFICIAL INTELLIGENCE

THEY ARE INTERESTED IN IT,
BUT ARE NOT READY
TO LET IT FLY A PLANE
OR PRESCRIBE MEDICINES



HOW DO THE FRENCH PERCEIVE THE SUBJECT OF AI – THE FOCUS OF THE 2024 CRITICAL THINKING BAROMETER – AND IN PARTICULAR THAT OF GENERATIVE AI APPLICATIONS, OMNIPRESENT IN THE NEWS SINCE THE EMERGENCE OF CHATGPT?

Although **61%** of respondents see it as a **major technological revolution**, as significant as the invention of the printing press (over 70% of those under 34), a greater percentage – **85%** and **77%** respectively – think that it requires regulation and claim that it raises **new ethical and legal issues**. Concerning the potential of such technology, 68% say that **AI applications cannot make autonomous decisions**, 59% that they are **neither creative nor innovative** (since they collate pre-existing content) and only **19%** believe them to be **perfectly reliable** (the great majority – 69% – state the opposite). As to whether they are “more neutral than humans”, **the sample group is more divided**: 42% say they are, 38% say they are not, a significant proportion (20%) do not express an opinion.

→ When questioned on **THE IMPACT OF THE DEVELOPMENT OF AI ON VARIOUS SECTORS**, the respondents’ perceptions are nuanced, with the answer “as many risks as benefits” being the almost consistent response.

However, the **perception of risk is predominant within the domain of human relations** (37%, against 31% who see “as many risks as benefits” and 10% who see “mainly benefits”); this is equally clear as regards **information** (33%) and **employment** (31%), even though 34% of respondents also see “as many risks as benefits” as regards both these domains. Conversely, it is in the areas of **health** (29%), **research and science** (28%) and **transport** (26%) that the proportion of respondents who see mainly **benefits** is highest – even though on all these subjects, **a nuanced view still predominates** («as many risks as benefits» at 35%, 36% and 33% respectively). In general, **there**

are more people from higher socio-professional groups (CSP+) than from lower socio-professional groups (CSP-) who mainly see the benefits of these AI applications. Moreover, the survey highlights the **specificity of those aged 18-24**, for whom, unlike the general population, **a perception of the benefits of AI is clearly predominant**. For example, concerning transport and mobility, 40% of those aged 18-24 consider that the development of AI mainly presents benefits, 20% that it involves as many risks as benefits, and 19% that it mainly involves risks.

→ When questioned about **THE TYPES OF TASKS THAT AI CAN HANDLE**: the respondents mostly rely on it to detect errors (75%), analyse large quantities of data (73%), locate information (70%) or even write a text (64%). **However, mistrust predominates once questions of responsibility are involved**, whether this consists of court rulings (25 % trust), **piloting a plane** (28%) or **driving a car** (34%), or even **prescribing medicines** (33%) or making medical diagnoses (41% trust).

→ **WHO CAN BE TRUSTED to evaluate the risks and benefits of this new technology?**

In keeping with similar questions posed in previous years (in 2023 on climate change, and in 2022 on Covid-19), scientists (68%), museums and centres for scientific culture (59%), and science journalists (56%) are the sample group’s first choice. By contrast, **the respondents are predominantly mistrustful of companies – particularly digital GAFAM-type companies** (34 and 29% trust) – and of elected officials and political representatives (22%).

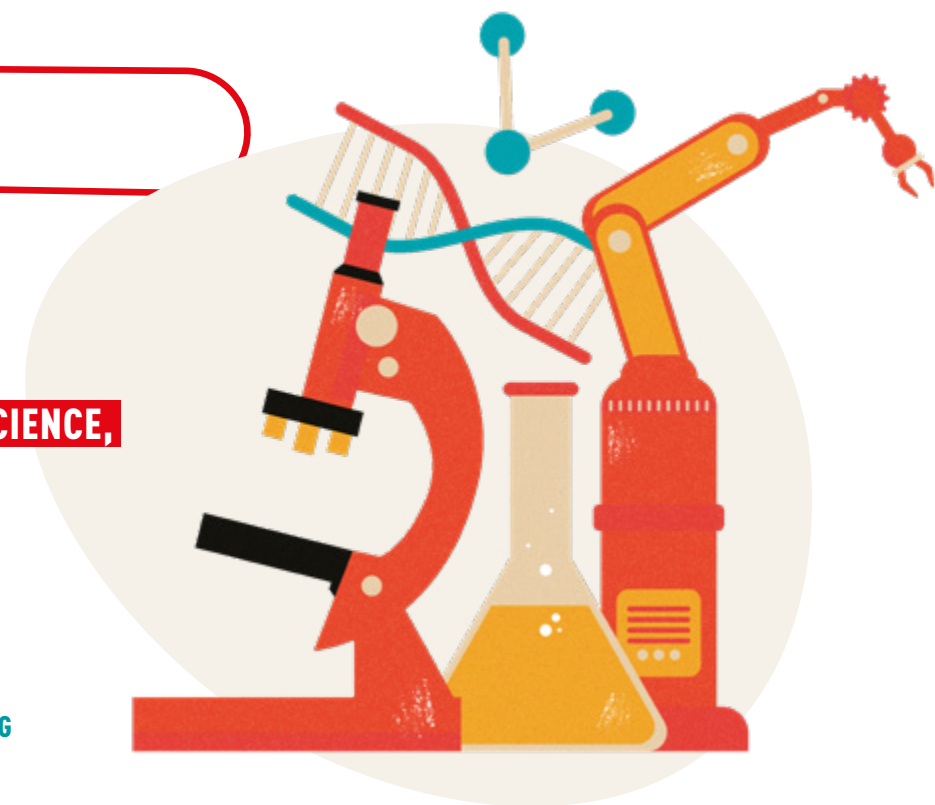
→ **The 2024 Barometer’s respondents were also questioned about GENERATIVE AI (ChatGPT and Midjourney-type).**

65% of the sample group have heard of it, but only **23%** have used it; **34%** do not know what it is. There is also a **divide based around gender, socio-professional category and age**, the level of knowledge being inversely proportional to age (the proportion of usage is significantly greater amongst those aged under 24 – 46%), whilst a greater number of men (70%) and people from higher socio-professional groups (CSP+) (77%) have heard of these technologies and use them. Users of generative AI applications predominantly use it for **informational purposes** (68%), **translation** (61 %) and **creating text** (59%). And although 87% of users are impressed by the speed (87%) and quality (74%) of such AI’s output, a

roughly equivalent proportion of respondents (8 out of 10) stated that they question its reliability (**78%**) and compare the results obtained with those from other sources (80%). There are, however, some variations in the use of such critical thinking with regard to AI output: it is more significant amongst men than amongst women. Moreover, the practice of cross-referencing results obtained from several sources of information steadily increases with age: 74% of those aged 18-24 and 94% of those aged 65+ and over. However, “the uberisation” of “genius” does not appear to be on the agenda: **74% of respondents do not think that AI could ever receive a Nobel Prize**; however, this proportion drops to **59%** amongst those aged 25-34 – another sign of the greater appropriation of such technology by the younger generations.

THE FRENCH AND SCIENCE

A CONFIRMED INTEREST IN SCIENCE,
BUT ETHICAL QUESTIONS
AND GENDER, ECONOMIC
AND TERRITORIAL
DISPARITIES



THE 2024 BAROMETER OF CRITICAL THINKING CONFIRMS THE TWO PREVIOUS EDITIONS’ KEY FINDINGS ON THE FRENCH PEOPLE’S RELATIONSHIP TO SCIENCE.

→ When questioned about **THE TOPICS THAT INTEREST THE FRENCH in the news**: scientific topics, such as those relating to **new technology**, are of interest to **69%** of the respondents – more than **sport** (48%) or even **politics** (61%). 61% of respondents state that they pursue scientific activities at least once a month (up 6 points compared to 2023), with documentaries (42%), websites (37%) and online videos (32%) coming top of the list. Similarly, 41% of respondents pursue **scientific activities for recreational purposes**, visits to exhibitions coming top of the list (27%). When asked more specifically about the areas of science and technology that interest them: the leading topics are **health** (41%) as well as the **climate and ecology** (31%) – ecology being most frequently cited by left-wing respondents. However, significant gender disparities appear for example, only 16% of women state that they regularly seek information on digital technology and AI, compared to 36% of men; the same is true for energy and nuclear power, which is of interest to 36% of the men, but 15% of the women questioned.

→ **Where a relationship to scientific practices is concerned, FOUR DISTINCT GROUPS were observed within the population questioned, in stable proportions when compared to past editions:**

• on the one hand **the “remote” (8%)** and **the “irregular” (42%)**, who tend to be female (and aged 50 to 64 for the remote), from working class

backgrounds, with few or no qualifications, and living in small municipalities;

• and on the other, **the “interested” (36%)**, who tend to be male, elderly, graduates and from higher socio-professional groups (CSP+) who regularly inform themselves about science), and **the “enthusiasts” (14%)**, who tend to be younger, graduates, from higher socio-professional groups (CSP+) living in large cities, parents of young children, who inform themselves about science and visit more science sites).

→ **What is the respondents’ IMAGE OF THE SCIENCES?**

The great majority – **8 to 9 respondents out of 10** – of those **surveyed judge science and its contributions to be positive: in their opinion, it not only provides us with a better understanding of who we are (85%) and the world in which we live (88%), but also improves our living conditions (86%)**, notably through new technology that is of benefit to everyone (88%). However, such positive attitudes run counter to more reserved judgements concerning **science’s ability “to improve humankind”** (65%) and scientists being best placed “to know what is best for citizens”. A suggestion that only convinces just over one in two respondents (55%), with a notable age variation: younger respondents are more inclined to defer to scientists than their elders. The great majority of respondents agree that the knowledge acquired by scientists gives them power which could prove dangerous (72%). This judgement

varies very little in terms of the sociodemographic variables. On another level, although 80% of respondents think that a scientifically validated statement is of greater value, only 48% think that science is the only reliable source of knowledge about the world, 42% disagreeing and 10% are not expressing an opinion. Finally, from the point of view of professional ethics, 60% of respondents think that scientists follow strict ethical rules (a proportion that rises to 69% amongst respondents claiming to be left-wing), but only 51% say that the **scientific community independently validates its results**.

→ **Finally, a new question in the 2024 edition: respondents were invited to EVALUATE THE SCIENTIFIC NATURE of a number of disciplines.**

Although – unsurprisingly – **chemistry, medicine and biology are easily distinguishable** (77 / 76% say “it’s a science”), responses concerning the human sciences (archaeology: 49% and sociology: 32%) are less clear-cut. **Economics came bottom of the list**: 26% of respondents view it as a science (31% “it depends” and 33% “no”), which puts it below homeopathy (27 / 30 / 32) and osteopathy (33 / 34 / 23). 2024’s edition also highlights **a specificity concerning those aged 18-24 who are readier than the general population to grant the status of science to all the domains represented**, including domains that are not recognised as scientific, such as homeopathy (+9 points) and astrology (+13 points).

THE FRENCH AND CRITICAL THINKING

A NUANCED APPROACH

ARE THE FRENCH CRITICAL THINKERS?

ALTHOUGH THE MAJORITY OF RESPONDENTS DESCRIBE THEMSELVES AS CRITICAL THINKERS (75%), A QUARTER OF THEM REPLY IN THE NEGATIVE OR DO NOT EXPRESS AN OPINION.

→ When asked to **DEFINE CRITICAL THINKING**: logical and rational reasoning (44%), seeking information before taking up a position (42%) and the capacity to engage in discussions with individuals with differing opinions (41%) coming out on top. As in previous years, the capacity to distrust one's own intuitions – essential when attempting to break free of cognitive bias – is much less prominent (14%), along with challenging the words of the authorities (16%). A clear majority consider themselves capable of changing their opinions on the basis of convincing reasons (82%), state that they compare different points of view before forming their opinions (78%), and think that it is important to challenge traditional beliefs using logical and rational evidence (77%). However, 46% prefer to engage in discussions with individuals who share their opinions – as against 45% who responded to the contrary. These debates take place mainly during discussions amongst friends (63%) or family meals (59%) and, to a lesser extent, during discussions in the workplace (41%). Social networks appear to be used a lot less for this purpose by the whole sample group (22%), even though the proportion increased significantly amongst young people (34% of those aged 18-24 and even 44% of those aged 25-34 report a regular or episodic use of social networks to engage in debate).

→ When questioned about the **LESSONS THAT ENABLED THEM TO DEVELOP CRITICAL THINKING SKILLS during their schooling**: the majority of respondents cited **French and literature** – mathematics is quoted half as often. **Parents** (75%), tea-

chers (78%), friends (73%) and, to a lesser extent, authors read (68%) stand out as contributing the most to the development of critical thinking.

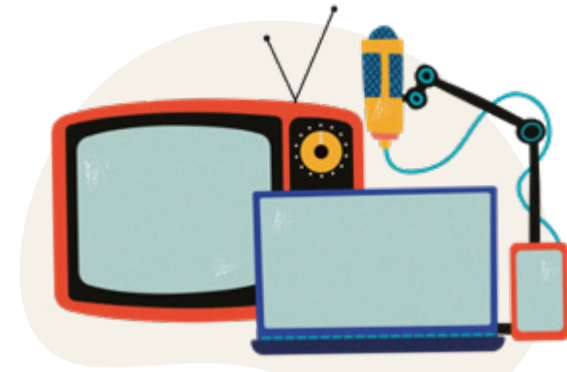
→ This survey on critical thinking **ALLOWED FOUR OTHER GROUPS TO BE DISTINGUISHED amongst the respondents.**

• Firstly, **43% are "analysts"**, older members of the population who describe themselves as tending to the left politically, consumers of traditional media, attentive to the quality of information, convinced of the value of science and valuing critical thinking.

• **30% are "confident"**, tended to be male, younger, describe themselves as politically more right-wing than average, claim to be highly curious, regard consider themselves as science-minded, have greater-than-average confidence in the media and science, and associate themselves with critical thinking and trust the media and science more than the average and associate themselves more with critical thinking.

• **15% are "alienated"**, tended to be from working-class backgrounds, less qualified, tended to obtain their information from fewer sources, are alienated from science and less concerned with critical thinking.

• Lastly, **12% are "distrustful"**, also less qualified, distrustful of science and its results, and show a different relationship with critical thinking (they think they are less critical than other people, and tend to associate critical thinking with the capacity to make the right decision, rather than with the sciences). The "alienated" and the "distrustful" tend to reside in small municipalities.



THE FRENCH AND SOURCES OF INFORMATION

GENERATIONAL, POLITICAL AND GENDER-BASED DIFFERENCES

Respondents' practices as regards following the news have not changed much since last year: Internet (**excluding social networks, 71%**) and **television (67%)** remain their two main sources of information, **with major generational differences** (see the focus on those aged 18-24 below). **Although radio listening has decreased slightly, it continues to be the media that garners the most confidence (55%).**

When seeking information on the Internet, the respondents use a variety of strategies to evaluate the reliability of information. Their main criteria remain the same as in the previous edition and are associated with the **media from which it originates (39%), content and reasoning (37%), and references to other sources (35%).** The media's independence increases (29%, +7 points). The fact that a researcher or expert shares information is a criterion for only 11% of the sample group.

In detail, however, **disparities appear**. Respondents who position themselves to the left of the political spectrum credit the media that disseminates an item of information with greater reliability (49% as against 39% of right-wing respondents); this also applies to content and reasoning (47% as against 36%), references to other sources (43% as against 34%) and the media's independence (38% as against 28%). **The independence of the media consulted also tends to be frequently cited as a criterion of reliability** by men (36% as against 24% of women) and respondents aged 65+ (41% as against 19% of those aged under 25).



THOSE AGED 18-24

THEY ARE MORE INTERESTED IN THE SCIENCES, MORE CONNECTED AND OPEN TO AI THAN THE SAMPLE GROUP AVERAGE

→ **2024's Barometer confirms a number of SPECIFICITIES AMONGST MEMBERS OF THE POPULATION AGED 18-24.** Contrary to certain ambient rhetoric, they are distinguishable by their greater than average pursuit of scientific practices, whether this concerns the regular gathering of information on a topic (79% as against 62% for the sample group – a figure that is up from 2023), outings to science venues (63% as against 40%) or the practice of scientific activities (60% as against 41%).

→ As regards **INFORMATIONAL PRACTICES**, the primacy of the Internet (**72%, up by 5 points compared to 2023**) and **social networks (63%, up by 9 points)** as principal sources of information – all topics combined – stands, whilst television (40%) and Internet (in a smaller proportion than for young people, 49%) predominates amongst the whole sample group. **There is also a significant decline in the use of newspapers** (22%, - 8 points). Nevertheless, **such practices are not associated with an equal amount of trust**: confidence in the Internet (40%) and social networks (30%) has fallen sharply (- 12 points) compared to 2023 (at 54%, i.e. +5 points, radio predominates on this front amongst young people).

→ As for **DEBATES WITH THEIR ENTOURAGE on social or scientific topics**, this section of the population's preference for engaging in discussions with individuals who share their opinions is growing (64% – up by 7 points – as against 46% for the whole of the sample group).

→ **Those aged 18-24 HAVE MORE CONFIDENCE IN AI** (as regards all its application types) than the sample group average, a difference observable in their knowledge and use of generative AI (**46%** of the young people questioned have already used a generative AI application, i.e. twice the sample group average of **23%**).



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