SCIENTIFIC MISINFORMATION IN SPAIN

Report

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1. Introduction

Misinformation has emerged as a major concern worldwide due to its detrimental effects on societies and democratic institutions (Allcott et al., 2019). During the onset of the COVID-19 pandemic, there was a widespread circulation of information related to the virus, much of which was inaccurate or misleading. This resulted in behaviours that endangered public health. The World Health Organization (WHO) even went so far as to declare infodemics to be as dangerous as the virus itself, given the magnitude of the problem.

The spread of misinformation has become a significant problem, due to a combination of different processes. On the one hand, there has been an increase in socio-political phenomena such as economic inequality, political polarization, and declining trust in science (Lewandowsky et al., 2017). On the other hand, the media ecosystem has undergone changes, including the emergence of digital journalism and the growth of unreliable news publishers, making it difficult for the public to discern the reliability of the information they they have access to (Tandoc et al., 2018). Additionally, technological advancements on various media platforms have transformed the role of the audience from passive readers to active editors and disseminators, further exacerbating the problem (Lewis & Westlund, 2014).

Initially, the decentralisation of information was viewed as a positive aspect of the internet, as it could amplify marginalized voices that were previously overlooked by mainstream media. However, the ability to discern between informative and opinionated news items has not been universally adopted. Consequently, Scheufele (2013) argues that misinformation regarding scientific issues is mainly due to inadequate coverage of scientific news by specialized journalists. This has resulted in a practice known as "false balance," where scientifically proven facts are presented alongside claims from non-scientific interest groups (Boykoff & Boykoff, 2004).

Misinformation about scientific content is abundant (León et al., 2022) and was so prior to the pandemic. Some of the most prevalent topics include climate change, consumer products that may involve risks, vaccines or diseases (Suarez-Lledo & Alvarez-Galvez, 2021). To address these concerns, some authors have called for increased media literacy (Dib et al., 2022; Guess & Munger, 2022); and improved competency in understanding how science works or certain skills in understanding health-related news (Dib et al., 2022).

Numerous initiatives have been launched to combat misinformation. One of the most important is the European Digital Media Observatory[1], which brings together research groups, communication platforms, verifying organisations, journalists, and media literacy professionals. The observatory includes the IBERIFIER[2] project, the digital media observatory in Spain and Portugal, whose main objective is to analyse the digital media ecosystem and address the problem of misinformation.

Fundación Española para la Ciencia y la Tecnología (FECYT), as an interface organisation between science and society, plays an important role in improving scientific culture and communication. In this role, it has become involved in the IBERIFIER observatory, in which it contributes to, among other things, understanding the factors underlying scientific misinformation in Spain.

[1] https://edmo.eu
[2] https://iberifier.eu/observatorio/

The objectives of this study are:

- To estimate the perceived level of credibility of misinformation on scientific issues circulating in Spain.
    - To estimate the credibility assigned to misinformation messages.
    - To estimate the ability to discern between false and true messages.
    - To explore the factors related to the ability to discern misinformation.
- To explore individual strategies for detecting misinformation.
- To explore people's attitudes towards misinformation.
- To estimate the propensity of individuals to spread misinformation about scientific topics.
    - To explore factors related to the propensity to spread misinformation.

Details of the data production work are presented below, followed by the main results.

2. Fact Sheet and Variables

Universe: individuals aged 15 and over and residing in Spain. In the case of foreigners, residents are considered to be those who have been residing in Spain for 5 years or more.

Sample size: 2100 interviews.

Sampling: The selection of the sample, stratified by Autonomous Community and habitat size, was carried out in two stages. In the first stage, landline and mobile phone numbers were randomly generated to select households. In the second stage, the interviewee was selected using sex and age quotas.

Method of data collection: computer-assisted telephone interview (CATI) using a structured and pre-coded questionnaire. The interviews were carried out in 70% of the cases through the interviewees' landline telephones and in the remaining 30% through mobile phones.

Date of fieldwork: from 22 June to 15 July 2022. Conducted by Sigma Dos.

The questionnaire is composed of seven blocks specified in Table 1 below. The questionnaire can be found in Annex II.

Table 1. Content of the study questionnaire.

Block	Content
1	Science information consumption habits
2	Credibility and the spread of misinformation
3	Factors related to perceived credibility and propensity to misinformation
4	Perceptions of misinformation
5	Attitudes towards misinformation and science
6	Interpersonal and institutional trust
7	Demographics

- Scale construction and exploratory analysis

In the first phase of the analysis, the survey variables were studied individually. This analysis was used to construct the scales used in the models, based on theoretical criteria. The table contains the scales and variables of interest included in the models presented in the report.

Table 2. Variables of interest in the analysis.

Variable	Description
Sharing false information: Gluten-free foods are healthier, and can also help you lose weight (Scale: 1-7)	Measured directly in the survey (Q6.2). Could you tell me to what extent you would share this information with the people around you, using a scale from 1 to 7, where 1 means that you would not share it at all and 7 means that you would definitely share it?
Sharing misinformation: Without wind and sun, renewable energy cannot be produced (Scale: 1-7)	Measured directly in the survey (Q6.3). Could you tell me to what extent you would share this information with the people around you, using a scale from 1 to 7, where 1 means you would not share it at all and 7 means you would share it for sure?
Sharing false information: HIV can be transmitted through intense kissing (Scale: 1-7)	Measured directly in the survey (Q6.5) Could you tell me to what extent you would share this information with the people around you, using a scale from 1 to 7, where 1 means you would not share it at all and 7 means you would share it for sure?
Sharing false information: Climate change is mainly due to natural causes (Scale: 1-7)	Measured directly in the survey (Q6.8). Could you tell me to what extent you would share this information with the people around you, using a scale from 1 to 7, where 1 means you would not share it at all and 7 means you would share it for sure?
Ability to discern true and false information (Scale: 1-7)	Mean of items Q7.1 to Q7.8 where 7 means that you are very discerning, so you answered with 7 when assessing true news and 1 when assessing false news.
Perception of the effects of misinformation (Scale: 1-7)	Mean of the items in question P16 (α = ,69). P16.1 “The circulation of misinformation or hoaxes can have detrimental effects on the health of the population”, P16.2 “Misinformation and hoaxes have the capacity to manipulate people's beliefs”, P16.3 “Misinformation and hoaxes cause citizens to mistrust institutions”, P16.4 “The circulation of hoaxes among the population about COVID-19 has had a detrimental effect on the credibility of scientists and experts”.
Agreement with conspiracy theories (Scale: 1-7)	Mean of three items about conspiracy theories (Q8.1-P8.3) (α = ,66). P8.1 “There are many important things going on in the world that the public is never informed about”, P8.2 “Politicians often lie to us about the real reasons for their decisions”, P8.3 “There are secret organizations that have a lot of influence on political decisions”.

Variable	Description
Scientific knowledge (Scale: 0-3)	Number of correct answers to Q9.1 “The sun revolves around the earth”/“The earth revolves around the sun”, Q9.2 “Antibiotics cure infections caused by both viruses and bacteria”/“Antibiotics cure infections caused by both bacteria”, Q9.3 “Current climate change is a consequence of the hole in the ozone layer”/“Current climate change is mainly due to the accumulation of greenhouse gases”.
Media literacy (Scale: 0-3)	Number of correct answers to the items in question P10. Q10.1 “Spanish Radio and Television (RTVE) relies on advertisements as its main source of funding”, Q10.2 “The news and content a person views on Facebook are randomly selected”, Q10.3 “Most of the media that exist in Spain belong to private companies”.
Trust in institutions (Scale: 1-4)	Mean of items P21.1 “The Government of Spain”, P21.2 “The Government of your Autonomous Community”, P21.4 “The United Nations/The World Health Organization”, P21.5 “The European Union”. Items were reversed before calculating the mean.
Trust in people (Scale: 1 = “Never cautious enough” to 7 = “Most people can be trusted”).	Measured directly in the survey Q20 “Would you say that, in general, you are never cautious enough in your dealings with others, or can you trust most people? Please place yourself on a scale of 1 to 7, with 1 meaning that you are never cautious enough and 7 meaning that you can trust most people.”
Balance on science (Categorical: 1 = “Benefits outweigh harms”, 2 = “Benefits and harms are balanced”, 3 = “Harms outweigh benefits”).	Measured directly in the survey in question Q19: “If you had to make an overall assessment of science and technology taking into account all positive and negative aspects, which of the following options would best reflect your opinion?”
Receiving misinformation through direct contact (Categorical: 0 = “No”, 1 = “Yes”).	Measured directly in the survey in items Q12.1 and Q12.2.
Receiving misinformation through social networks (Categorical: 0 = “No”, 1 = “Yes”).	Measured directly in the survey in Q12.3.
Receiving misinformation through television (Categorical: 0 = “No”, 1 = “Yes”).	Measured directly in survey Q12.6.
Gender (Categorical: 1 = “Male”, 2 = “Female”).	Measured directly in survey D1.
Age	Measured directly in survey D2.

Variable	Description
Educational level (Ordinal: 1 = “Less than primary”, 2 = “Primary”, 3 = “Secondary, first cycle”, 4 = “Secondary, second cycle”, 5 = "Short cycle university", 6 = "University"). **Ideology** (Scale: 1 = “Far left” to 7 = “Far right”).	Measured directly in survey D7. Measured directly in survey D11.

Source: FECYT. Own elaboration

3. Main results

- Most people show interest in scientific topics: Medicine and health (68%), Food and physical well-being.
- The Internet and social networks are the preferred means of obtaining information about science and technology (82.1%), the environment and ecology (76.6%) and food and physical well-being (72.9%).
- When it comes to health-related topics, three out of four people (73.9%) prefer to turn to health professionals.
- Social networks are the most widely used of the internet-based media for consultations on all the topics proposed. The most searched content on these networks is related to Food and physical wellbeing (44.5%) and the least searched content is related to Medicine and health (33.2%).
- One in four people have received false information on scientific topics in the last week (27.6%). The number of people who believe they have received false information on some topics is even higher: the COVID-19 pandemic and the vaccine (37.5%), climate change (32.7%) or nutrition and wellbeing (30.5%).
- Most people (61.7%) who have received dubious information in the last week point to social media as the main source.
- The media with which the least misinformation is associated are the printed press (21.9%) and radio (20.8%).
- Radio is the most trusted source (58.2%), followed closely by friends and family (56.9%) and television (52.1%).
- One in ten people are not at all confident that the information they receive is accurate (10.5%). This percentage almost doubles when it comes to people with primary education or less (17.8%).
- Most citizens believe that misinformation has negative effects on the population. 7 out of 10 people (71.5%) strongly agree that “Misinformation and hoaxes have the capacity to manipulate people's beliefs” (Table 6). 6 out of 10 completely agree with “The circulation of misinformation or hoaxes can have detrimental effects on people's health” (63.2%) and with “Misinformation and hoaxes cause citizens to mistrust institutions” (63.3%). Slightly more than half (53.6%) strongly agree that “The circulation of hoaxes among the population about COVID-19 has had a detrimental effect on the credibility of scientists and experts”.
- **The main factors associated with concerns about misinformation** are having a conspiracy mentality, level of knowledge about science and trust in institutions. Also, people who believe they have received hoaxes via social media have a higher level of concern about the circulation of misinformation. People who are critical of the results of science, i.e., those who believe that the benefits of science are similar to its harms, are less concerned about information clutter.
- In general, citizens are able to discern between false and true information. False information is shared less than true information, but there is a significant percentage of people who share hoaxes.
- The **main factors associated with the ability to discern the veracity** of scientific topics, which were asked about in the study, are the level of media literacy and trust in institutions. On the other hand, the more ambivalent and negative attitudes towards

science (it has the same harms as benefits and has more harms than benefits) have a significant negative effect compared to the more optimistic attitudes (it has more benefits than harms). In terms of demographic characteristics, being young and female are associated with a greater ability to differentiate true headlines from hoaxes. People with ideological positions further to the right found it more difficult to differentiate between information and misinformation.

- The **main factors associated with the propensity to spread misinformation** on scientific topics vary according to the topic. In principle, media literacy is a protective factor, as is the ability to discern the veracity of news. When it comes to topics susceptible to ideological positioning, ideology becomes a significant factor.

3.1. Scientific information consumption habits

There is no consensus on the definition of misinformation. On the one hand, misinformation can refer to information that is inaccurate (Lewandowsky *et al.,* 2020) or information that is contrary to the consensus in the scientific community about a phenomenon (Swire-Thompson & Lazer, 2020). On the other hand, it's important to note that the distinction between misinformation and disinformation is relevant in understanding the intention behind the spread of inaccurate information. However, for the purposes of this study, the term misinformation is used generically to encompass both unintentional and intentional spread of false or inaccurate information.

The study aimed to investigate the habits of the Spanish population in consuming scientific information. This was done by asking participants about their frequency of seeking information on specific topics and the means by which they actively seek this information. The study also explored the extent to which scientific content is received through messaging applications, private groups, or direct messages, given the potential for these channels to spread misinformation, as highlighted by Brennen *et al*. (2020) in the context of COVID-19.

As can be seen from the results, the topic on which information is most commonly sought on a daily basis is Politics (29.1%). This is followed at some distance by Economy and business (18.7%), Food and welfare (17%), Medicine and health (15.2%), Science and technology (14.4%) and Environment and ecology (10.4%).

If we group all the searches carried out without considering whether the frequency is daily, weekly or several times a month, the results change. The topics that attract the most interest are precisely scientific topics: Medicine and health (68%), Food and fitness (68%) and Science and technology (60.7%).

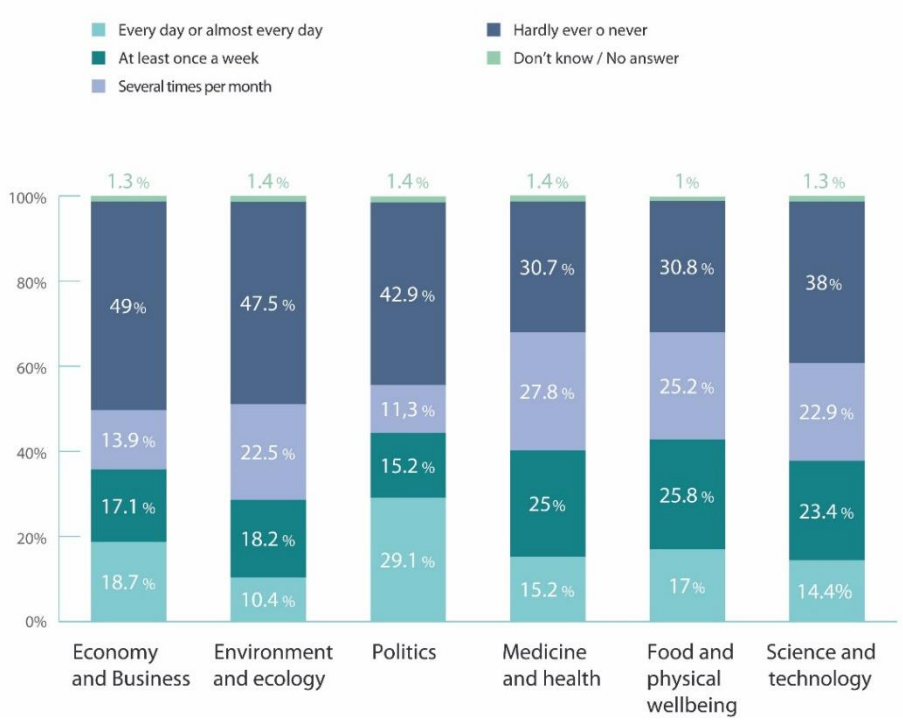
The fact that Politics and Economy and business are more frequently searched on a daily basis could be linked to the fast-paced and ever-changing nature of these topics. On the other hand, the higher proportion of people who are not interested in these topics or who search for them rarely suggests that they may be perceived as less relevant or engaging to a significant part of the population (49%, 42.9% and 47.5%, respectively).

The largest gender differences in daily access to information is found in the topics of Politics, Economics and business, and Science and technology. Almost 40% of men carry out daily searches on Politics (38.2%), while only 20.6% of women do so. In the cases of Economics

and Science the differences are also very large (26% and 11.9% for the former; 20% and 9% for the latter).

Chart 1. *Frequency of searching for information about different topics (Percentage).*

In general, how often do you seek or consult information about...?



Source: FECYT. Own elaboration

The information channels used, as shown in Chart 2, vary according to the different topics, although the majority of people used the **Internet or social networks**. These are the preferred media for information on Science and technology (82.1%), Environment and ecology (76.6%) and Food and fitness (72.9%).

When it comes to medicine and health, citizens prefer to turn to **health personnel** (73.9%). This group also accounts for more than half of those interested in food-related issues (52.7%). A third source, for just over 45% of those informed on these two issues, is direct contacts: **Family, friends, or acquaintances** who, although to a lesser extent also represent an important source in the remaining subjects (29.7% Science and technology; 26.8% Environment and ecology).

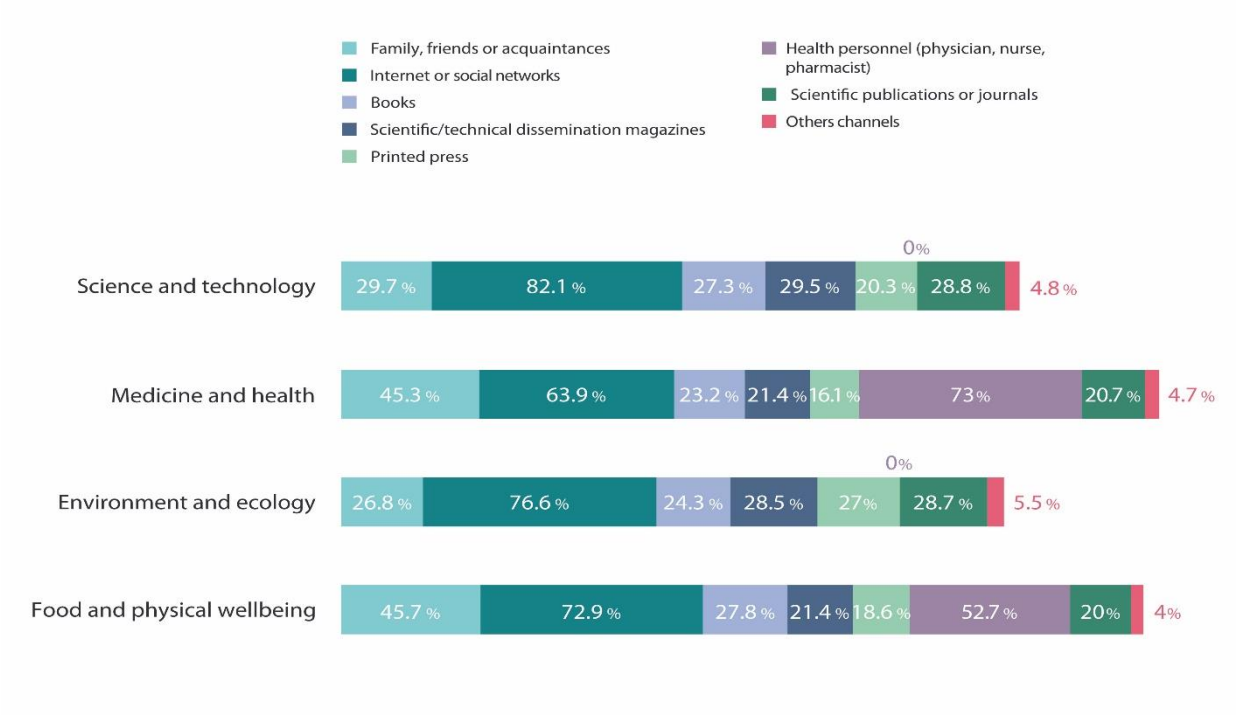
Books remain a relevant source of information for some topics, such as Food (27.8%) and Medicine (23.2%). It is worth noting that **almost a third of those who read about science and technology (29.5%) and the environment (28.5%) use popular science magazines**. Scientific journals are also used by a significant percentage of people seeking information on Medicine (20.7%) and Food (20.4%), despite being less accessible to the general public. Something similar, but with less follow-up, is the case with the **printed press**, used by 27% of those seeking information on the environment.

When analysing the differences by gender, the largest differences we found in the way of finding information about science, more women (34.2%) prefer to use family and friends (34.2%) than men (26.2%). The opposite is true for searches on the internet or social networks

(84.1% of men and 79.5% of women). In the case of Medicine and health, women turn more to books (25.3% and 20.9%) and to health personnel (76.4% and 69.3%). On issues related to the environment, men are more likely to get information from the written press (29.9% and 23.9%) and scientific publications (31% and 26.4%). When it comes to food, women are more likely to consult books (30.4% and 24.9%) and health personnel (56.3% and 48.5%). Men, on the other hand, opt more for the written press (22.3% and 15.3%).

***Chart 2**. Means or contact to get information about the proposed topics (Percentage).*

Thinking about the last time you looked for or asked for information on (topic), who or what did you turn to?



Source: FECYT. Own elaboration

Given that the Internet is the most widely used medium in general, the sources of information used on the network were investigated. Among the sources proposed, a distinction can be made between two main groups: sources which, due to their structure, in principle provide a greater guarantee of veracity, due to the existence of controls on the information, and those which lack them. The former include generalist digital newspapers, Wikipedia or the institutional websites of organisations such as universities or regional councils. The latter include social networks (Facebook, Twitter, Instagram...); YouTube videos, blogs or forums, instant messaging (WhatsApp or Telegram) and podcasts or Internet radio.

What the results show is that people who use the Internet to inform themselves about the proposed topics use both the media with the most veracity controls and those that do not. **Social networks** are the most widely used source of information for all topics with food and physical well-being being the content most frequently searched for on these platforms (44.5%). In contrast, medicine and health are the least frequently searched for topics on social networks (33.2%).

Just over a third of people use **digital newspapers** to find out about the environment and ecology (36.6%) and science and technology (34%). The proportions are somewhat lower for

Medicine and health (30.1%) and Food and fitness (27.8%). Almost another third use **YouTube videos** for information on science and technology (31.6%) and food (30.4%). Smaller proportions use the channel for Environmental (26.7%) and Medical (24.5%) content. Around one in four people use **blogs or forums, Wikipedia, and institutional websites** for all topics. To a lesser extent, Instant Messaging (between 11% for Environment and 15.5% for Food) and **Podcasts** (between 9.1% for Medicine and 13.7% for Environment) are used.

Table 3. *Media consulted on the internet (%).*

	Science and Technology	Medicine and Health	Environment and Ecology	Food and physical wellbeing
Social networks (Facebook, Instagram, Twitter…)	38%	33.2%	40.2%	44.5%
Generalist digital press (El País, El Mundo…)	34%	30.1%	36.6%	27.8%
YouTube videos	31.6%	24.5%	26.7%	30.4%
Blogs or forums	29.1%	25.9%	22.8%	27.8%
Wikipedia	28.1%	27%	26.1%	21.2%
Institutional websites (universities, regional ministries…)	26%	28.7%	29.3%	22.2%
Instant messaging (WhatsApp or Telegram)	12.2%	13.9%	11%	15.5%
Podcasts or internet radio	13.3%	9.1%	13.7%	10.6%
Other channels	13.6%	18.8%	13.9%	15.8%
Don't know/No answer	2.5%	1.6%	0.8%	1.6%
Total	**228.4**	**212.7**	**221**	**217.3**

*Those media marked in colour refer to those that have some type of filter or verification system.

Source: FECYT. Own elaboration

As can be seen in Table 4, more than a quarter of respondents say that they have received information related to one of the topics in the last week. Nearly half of them received content on Food and Fitness (42.2%) and 37% on Medicine. In the case of Science and technology and Environment, 29.9% and 25.6%, respectively.

Table 4. *Receipt of information on topics related to the topics consulted.*

Thinking about the last 7 days, have you received through your social networks, instant messaging applications or in conversations with other people information about...?

	Science and Technology	Medicine and Health	Environment and Ecology	Food and physical wellbeing
Yes	29.9%	37%	25.6%	42.2%
No	64.9%	58.7%	69.5%	53.8%
Don't know	4.7%	3.8%	4.4%	3.7%
No answer	0.4%	0.4%	0.5%	0.4%

Source: FECYT. Own elaboration

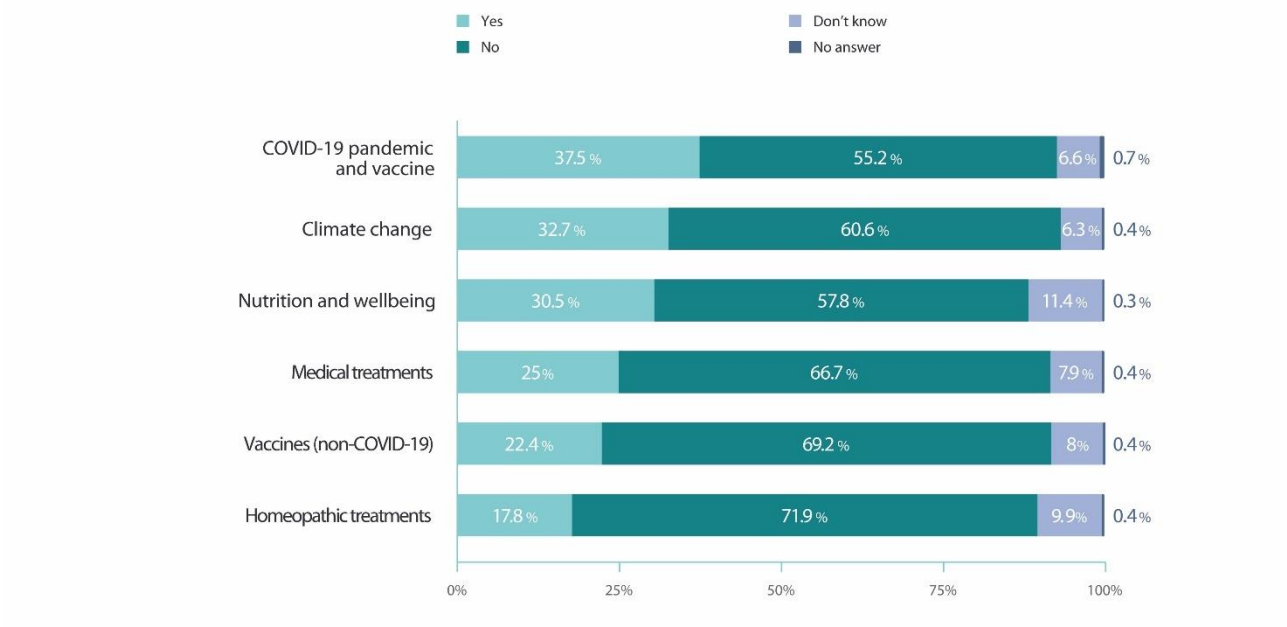
3.2. Credibility and misinformation on scientific issues

One in four people perceive that they have received false information on scientific topics in the last week. The proportion increases when it comes to content related to the Pandemic and the COVID-19 vaccine (37.5%), Climate change (32.7%) or Nutrition and wellness (30.5%). 25% of people believe they received incorrect information on medical treatments and slightly less on Homeopathic treatments (17.8%). It is also interesting to note that between 6.3% and 11.4% are not sure whether the information related to the various topics proposed is false.

False information was received mainly via social networks, with 61.7% of people who reported having received dubious information in the last week indicating social networks as the main source. Equally high proportions reported receiving it via **messaging apps** (43.8%) and **TV** (40.6%). One in three people say that this information came from **digital press** (34.2%) and **Other digital media** (33.8%). Slightly fewer believe that the information came from **personal conversations** (28.6%). The sources with the lowest levels of misinformation received are the **printed press** (21.9%) and **radio** (20.8%).

Chart 3. *Reception of false information.*

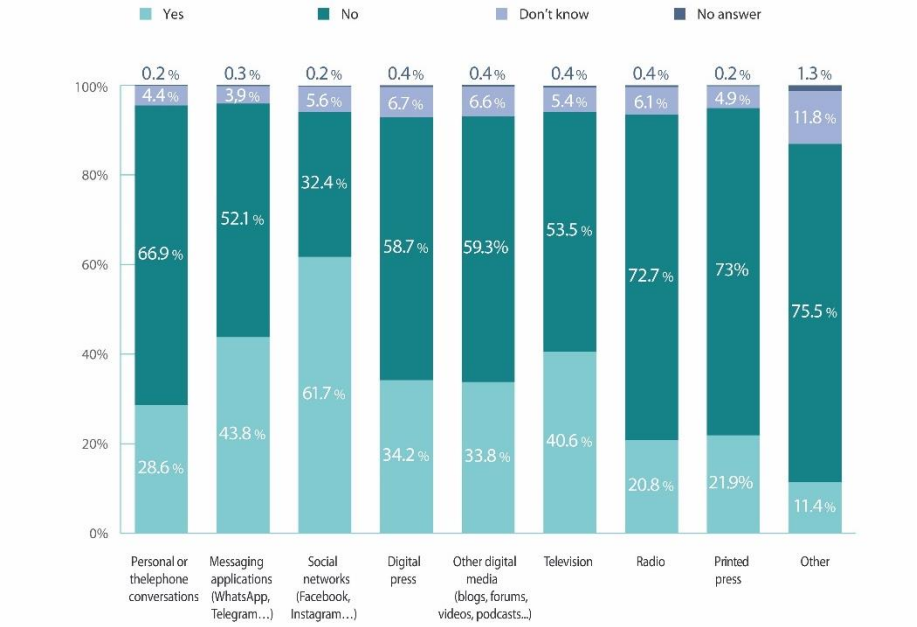
Thinking about the last 7 days, have you received any information or news that you think may be false about...?



Source: FECYT. Own elaboration

Chart 4. *Means of receiving information perceived as false.*

And that information you received that you think may be false, did you receive it through...?



Source: FECYT. Own elaboration

3.2.1. Trust in communication channels

Table 5 shows that people's trust in news accessed through different channels varies greatly. In general, the proportion of people who place a great deal of trust in any of the channels is low. **Friends and family** are the most trusted channels (15.5%). Adding together the two most trusted categories (much and quite), more than half of the people trust **Radio** first (58.2%), closely followed by **Friends and family** (56.9%) and **Television** (52.1%). Slightly less than half trust the **printed press** a great deal or a lot (48.8%).

A large majority of people do not trust news accessed via **social networks** and **messaging applications** (69.7%) and **video websites** (66.4%). The online press, albeit lagging somewhat behind, is also seen as an unreliable channel (51.4% have little or no trust in it).

Overall, it can be observed that channels that are assumed to have some form of verification or control over the accuracy of the information are generally considered more trustworthy, in addition to personal networks such as family and friends. There is a strong correlation between trust in a particular channel and the perception of having received false or misleading information through it, as shown in the previous section. However, although these differences are present, we do observe a crisis of trust in journalism, as announced by Nielsen (2016).

Table 5. *Trust in news and information depending on the channel.*

To what extent do you trust or not trust the news and information you access through (media)?

	Printed press	Online press	Social networks and messaging applications	Television	Radio	Video websites	friends and family
Much	9.8	5.9	5	11.2	13.2	3.3	15.5
Quite	39	31.8	14.6	40.9	45	14.2	42.4
Little	31.9	38	45.2	34.1	22.4	40.5	31.6
Not at all	13.5	13.4	24.5	11.6	9.6	25.9	6.6
Don’t know	4.3	7.9	7.1	1.7	6.9	11.9	2.9
No answer	1.4	3	3.6	0.6	2.9	4.2	1
Total	**2100**	**2100**	**2100**	**2100**	**2100**	**2100**	**2100**

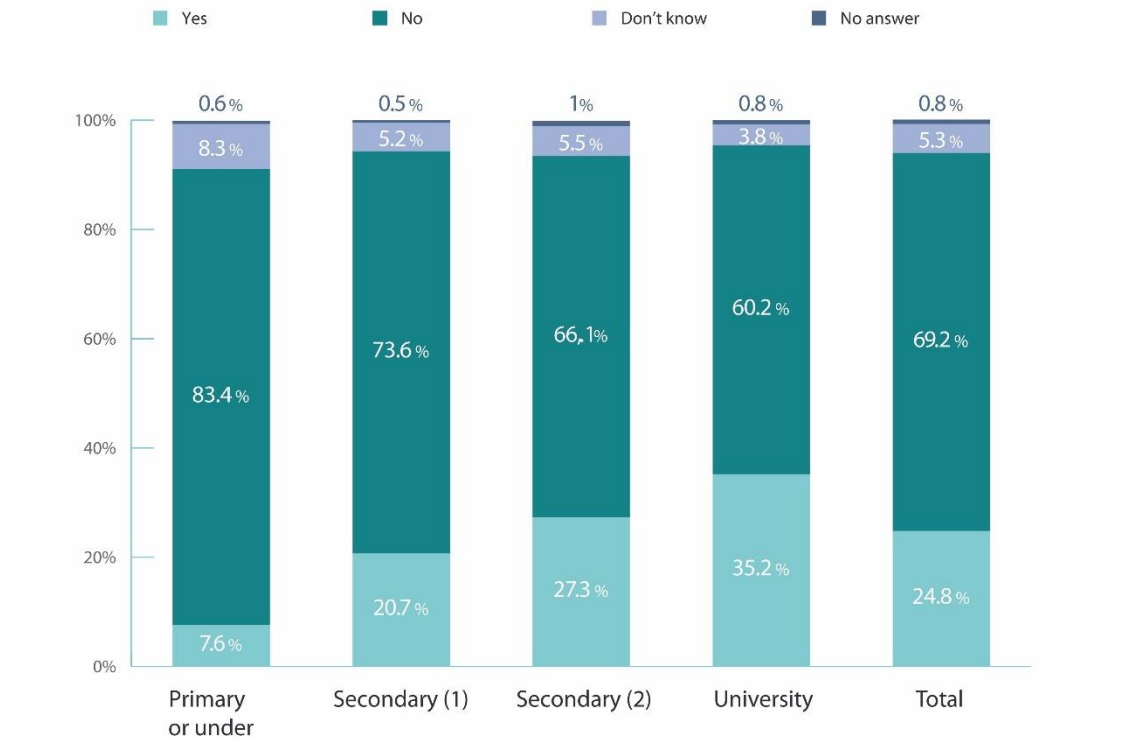
Source: FECYT. Own elaboration

3.2.2. Use of verifiers

In recent years, various fact-checking services have emerged with the aim to provide evidence of certain information disseminated through the media. **One in four people (24.8%) have at some time consulted a means of verification.** The proportion of people who consult these media increases according to the level of studies completed; as shown in Chart 5, 35.2% of people with university studies say that they have used it, while only 7.6% of those with primary studies have done so. A higher percentage of men (29.5%) than women (20.4%) use it.

Chart 5. *Consultation with verifiers.*

Have you ever consulted any media dedicated to the verification of information such as Maldita, Newtral, EFE Verifica or Verificat?



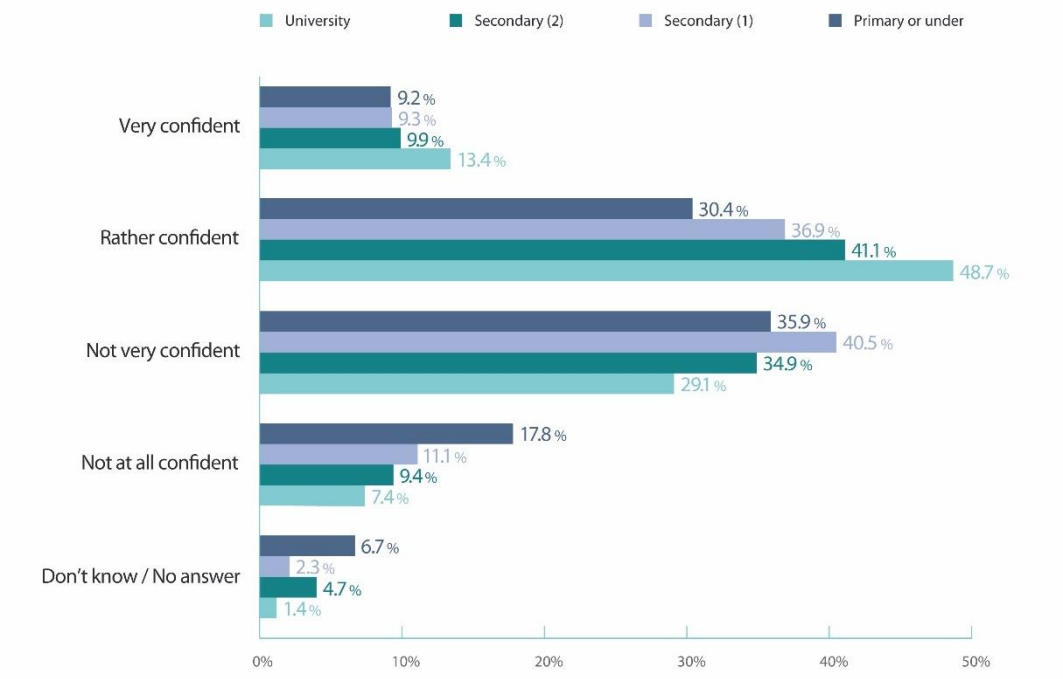
Source: FECYT. Own elaboration

3.2.3. Identification of false information

Only 11% of the population say they are very confident in identifying misinformation. Men feel this way to a greater extent than women (13.4% and 8.2%, respectively). More than half of the population feels confident in identifying misinformation (51.4% feel very confident or rather confident). This feeling of security increases as the level of education increases, with a majority among university students (62.1%), as shown in Chart 6. On the other hand, it should be noted that one in ten people do not feel at all confident in identifying whether the information is true or not (10.5%). This proportion almost doubles among people with primary education or less (17.8%).

Chart 6. *Identification of false information.*

To what extent are you confident or not confident that you can identify information that is false or distorts reality?



Source: FECYT. Own elaboration

3.2.4. Attitudes towards misinformation

As we said at the beginning of this paper, concern about misinformation has grown among different governments and civil society groups, but also among citizens (Newman *et al.,* 2019). In the case of Spanish citizens, it can be observed that they are also concerned about its effects. Most of them maintain that misinformation has negative effects on the population. 7 out of 10 people **(71.5%) strongly agree** that **"Misinformation and hoaxes have the capacity to manipulate people's beliefs" (Table 6).** 6 out of 10 also strongly agree that "**The circulation of misinformation or hoaxes can have detrimental effects on people's health" (63.2%)** and that **"Misinformation and hoaxes cause citizens to mistrust institutions" (63.3%)**. Slightly more than half **(53.6%) strongly agree that "The circulation of hoaxes among the population about COVID-19 has had a detrimental effect on the credibility of scientists and experts**".

While there is a majority feeling among the public that the dissemination of misinformation has negative effects, the percentage of people who believe that "**The government should take measures to restrict false online information" is less than half (49.3%) (Table 7).** As can be seen, women are proportionally more supportive of such measures than men (52.7% and 45.7%, respectively). This is in line with the work of Rodríguez-Virgili *et al*. (2021), in which they conclude that there are significant differences in terms of the actions to be taken to protect oneself from misinformation. Although in that study they talked about individual actions and here they look at governmental actions, the differences remain. It is worth noting that slightly more than 10% do not know how to position themselves or prefer not to do so.

Table 6. *Level of agreement with statements about the effects of misinformation or hoaxes (percentages).*

To what extent do you agree with the following statements?

	The circulation of misinformation or hoaxes can have detrimental effects on the health of the population	Misinformation and hoaxes have the capacity to manipulate people's beliefs	Misinformation and hoaxes cause citizens to mistrust institutions	The circulation of hoaxes among the population about COVID-19 has had a detrimental effect on the credibility of scientists and experts
Fully dissagrees	5%	1.9%	2.6%	6%
2	0.6%	0.3%	0.8%	1%
3	2.5%	1%	1.6%	2.6%
4	5.5%	4%	5.3%	7.5%
5	9.5%	8.2%	11%	12.1%
6	10.4%	10.6%	12.4%	11.9%
Fully agrees	63.2%	71.5%	63.3%	53.6%
Don’t know/No answer	3.3%	2.5%	3.1%	5.3%

Source: FECYT. Own elaboration

Table 7 *Level of agreement with statements about measures against misinformation (percentages).*

I would like you to indicate which of the two statements you agree with the most:

	Men	Women	Total
The government should take measures to restrict false online information, even if this limits press freedom.	45.7	52.7	49.3
Press freedom must be protected, even if this means publishing false information.	46.7	34.3	40.3
Don’t know	5.6	9.6	7.7
No answer	2.0	3.4	2.7
Total	**975**	**1,125**	**2,100**

Source: FECYT. Own elaboration

3.2.5. Factors associated with increased concern about misinformation

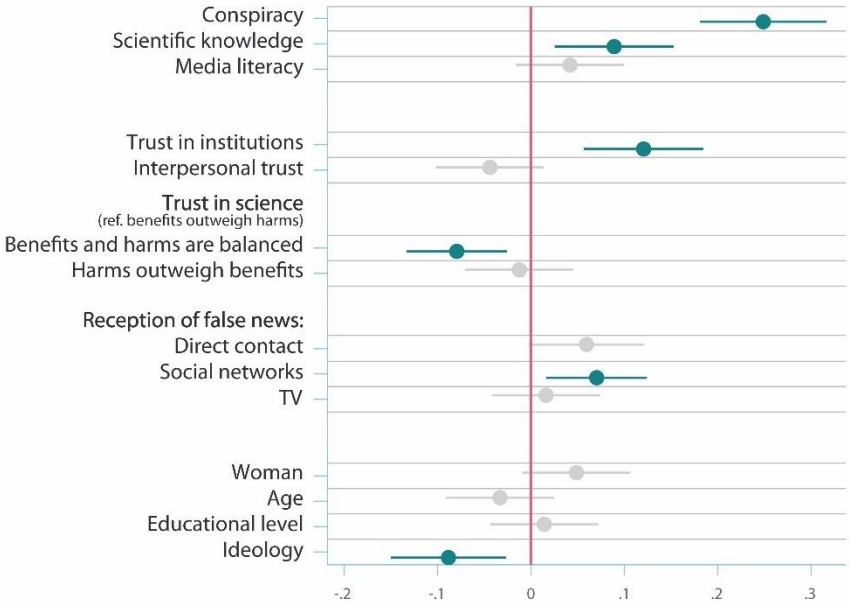
One of the issues on which there is not much information is on the factors affecting concern about information clutter (Neyazi *et al.,* 2021).

Chart 7 shows the significant effect of **conspiracy mentality,** as well as **trust in institutions**, **knowledge about how science works** and **balance about science outcomes**. The level of concern about misinformation is influenced by various factors, including support for conspiracy theories, trust in institutions, scientific knowledge, and views on the contributions of science. Those who hold conspiracy theories about the world tend to be more concerned about misinformation. In contrast, individuals who trust institutions and

have a higher level of scientific knowledge are also more concerned about the effects of misinformation. Conversely, those who believe that the benefits of science outweigh its harms are more concerned about the effects of misinformation than those who hold an ambivalent view. These apparently contradictory results may be attributed to differences in how different groups interpret the concept of misinformation and why its dissemination is concerning.

On the other hand, the positive effect of **having received misinformation through social media** is observed. This finding is in line with Neyazi *et al.,* (2021) who observe the relationship between the use of some social networks and concern about misinformation. What the authors note is that the most significant relationship is the use of WhatsApp, probably because it has taken less action against misinformation, compared to Twitter and Facebook. In the case of ideology, a negative effect is observed, **indicating that left-wing ideological positions are the most concerned about misinformation**. This is also in line with the work of Rodríguez-Virgili *et al.* (2021).

Chart 7. *Factors explaining concern about misinformation (standardised coefficients)*.*



*Standardised coefficients significant at the 95% confidence level are highlighted.

Source: FECYT. Own elaboration

3.3. Discerning and sharing information on scientific issues

The main objectives of this work include understanding the factors associated with both discernment and the propensity to disseminate scientific misinformation. The ability to accurately discern credible information from unreliable information is important, as information can shape attitudes and guide particular behaviours (Metzger *et al.,* 2003). A related question that we are also interested in exploring is whether there is a relationship between the ability to discern in the reception and dissemination of science news. In order to study these objectives, we have adapted the procedure followed by Pennycook *et al.* In their work, the authors analyse people's ability to discern between different headlines related to COVID-19. They found that participants in their study showed a greater ability to discern the veracity of news stories when they were asked to pay attention to the accuracy of the news than when they were asked to choose which headlines to share on social media.

To do this, we chose eight science news headlines related to health, the environment and food, with the aim of covering topics about which false information has been spread. Half of them were true and half were false. The four true headlines were taken from the science sections of generalist media such as El País and the four false headlines were chosen from the news verification platform Maldita[3]. Respondents were asked to say, on the one hand, to what extent they believed the headlines to be true or false. A scale of 1 to 7 was used, with 1 indicating "Sure it is false" and 7 indicating "Sure it is true". A further question asked them to indicate the extent to which they would share the news, again on a scale of 1 "Would not share it at all" to 7 "Would share it for sure". The results of the following analyses of citizens' discernment and propensity to share misinformation should be interpreted in terms of the headlines used **(Table 8).** The analysis of these questions shows that, especially when it comes to information sharing, explanatory factors vary significantly according to the topic and focus of the headlines, which means that an alternative selection of headlines could result in different conclusions.

As can be seen in **Table 8,** in general, citizens are able to discern between false and true information. The average score above 3.5 for true headlines indicates the ability to discern their veracity. In the case of false headlines, this is reflected in scores below 3.5. However, there are two news items that show problematic results: "A glass of wine a day is NOT recommended for general health" and "Without wind and sun, renewable energies cannot be produced".

A second point to note is that false information is shared less than true information. This indicates that there is some containment of misinformation and most people do not share hoaxes. Finally, on a less optimistic note, there is a significant percentage of people sharing false information. This reflects the fact that if the information seems credible, it is more likely to be spread by being shared on social networks (Bryanov & Vziatysheva, 2021). This is why it is particularly interesting to understand the factors that underlie the credibility of news.

[3] https://maldita.es

Table 8. *Level of discernment of science headlines and propensity to share those headlines (averages).*

Items		Share (Q6) [1]		Discern (Q7) [2]	
		M (Standard Error)	N (Not weighted)	M (Standard Error)	N (Not weighted)
Inf	Accurate information				
A glass of wine a day is NOT recommended for general health		3,1 (0,09)	1026	3,2 (0,10)	909
The cost of energy generated from renewable sources is the cheapest of all energy sources		4,5 (0,09)	956	4,9 (0,09)	899
COVID-19 vaccines have been shown to be effective against mortality		5,4 (0,09)	1020	5,7 (0,08)	1024
HIV transmission can be prevented with appropriate treatment		4,7 (0,10)	966	4,9 (0,10)	933
	False information				
Gluten-free foods are healthier and can also help you lose weight		2,8 (0,09)	994	3,0 (0,10)	943
Without wind and sun, renewable energies cannot be produced		4,0 (0,10)	993	4,3 (0,10)	989
HIV can be transmitted through intense kissing		2,6 (0,10)	985	2,3 (0,09)	979
Climate change is primarily due to natural causes		3,1 (0,10)	995	2,7 (0,10)	932

[1]Scale from 1 to 7 where 1 represents those who would not share it at all and 7 those who would share it for sure.

[2]Scale from 1 to 7 where 1 represents that the information is definitely false and 7 that the information is true.

Source: FECYT. Own elaboration

3.3.1. Factors associated with the ability to make judgements about the veracity of scientific issues

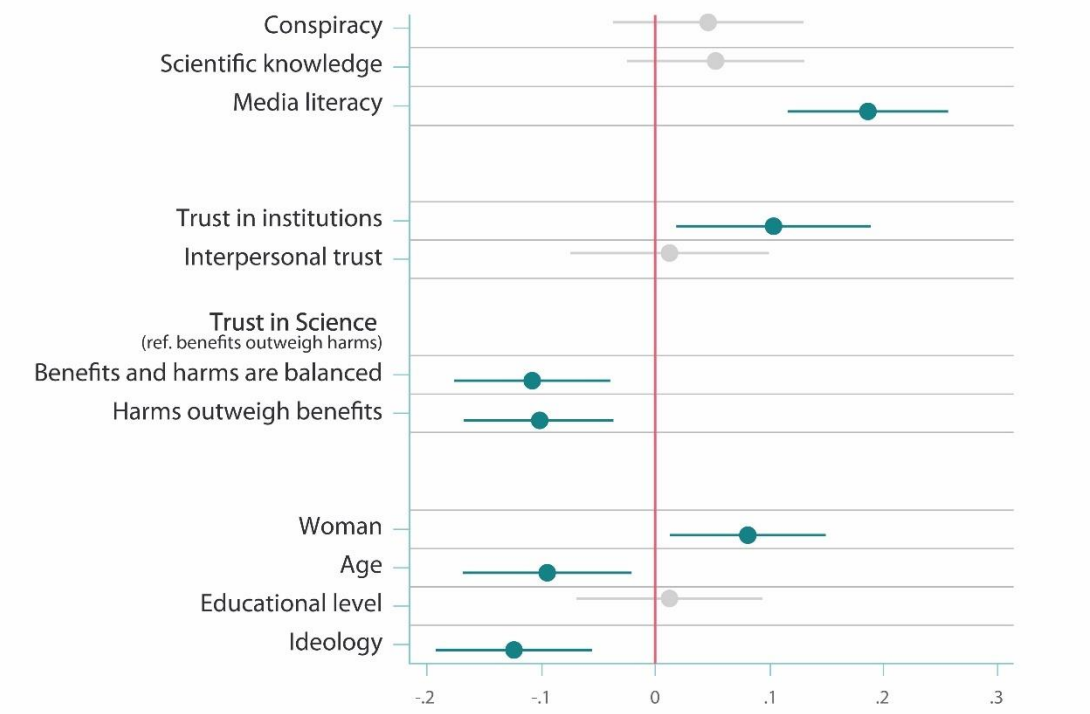
To analyse the factors associated with the ability to discern, the dependent variable “ability to discern” was developed based on the evaluation of the truthfulness or falsity of the different true and false headlines shown to the participants. The mean of all of them was calculated, meaning that a 7 indicates that they distinguished perfectly between true and false headlines and a 1 indicates that they distinguished incorrectly in all of them.

In the existing literature there are a number of factors that are associated with the ability to discern the veracity of news stories. Based on a classification of the literature on misinformation, Tandoc *et al*. (2018) distinguishes three areas: trust and credibility, knowledge about the production of published information, and information consumption in social media. Inspired by this classification, we have introduced a number of independent variables. Related to trust, we introduced two variables related to social cohesion: trust in institutions and interpersonal trust. In addition, trust in science, measured on the basis of the perception of the benefits and harms derived from it. Regarding knowledge about the production of information, some authors have claimed the importance of knowledge about the functioning of the media, or media literacy (Dib *et al*., 2022; Guess & Munger, 2022; Lazer *et al*., 2018). Also, especially in the type of misinformation that concerns us, we have considered knowledge about how

science works. We have also considered factors such as conspiracy mentality and ideology, which, in principle, imply exposure to different messages, which are more or less prone to veracity. Finally, three socio-demographic variables have been added, such as gender, age, and level of education.

In **Chart 8** we show the significant effect of **media literacy** on the ability to discern the veracity of scientific headlines included in the survey question. Citizens who are more knowledgeable about how the media works are better able to identify true information. Moreover, those who give an **ambivalent** ("It has the same harms as benefits") or **negative** ("It has more harms than benefits") **assessment** of the contributions of science tend to be less able to discern between true and false information than those who give a positive assessment of the **impact of science** ("It has more harms than benefits"). **Trust in institutions** is positively related to the ability to discern. Positions further to the right of the **ideological scale** show a lower ability to identify true and false information. In terms of demographic characteristics, **women** and **younger people** are more skilled at identifying true information.

Chart 8. *Factors explaining the ability to discern the veracity of scientific topics (standardised coefficients).*



*Standardized coefficients significant at the 95% level of trust are highlighted.

Source: FECYT. Own elaboration

3.3.2. Factors related to the propensity to spread misinformation about scientific issues

Given the heterogeneity of the nature of the information presented by the different headlines on which to decide whether or not to share information, the profile of those who choose to share varies. To capture these nuances, rather than using a summary measure of the likelihood of sharing, we have decided to present the four models. The first model deals with the probability of spreading the following false headline: "Gluten-free foods are healthier and

can also help you lose weight". The second: "Without wind and sun, renewable energies cannot be produced". The third: "HIV can be transmitted through intense kissing". The fourth: "Climate change is mainly due to natural causes".

As shown in **Chart 9**, the factor that has a significant effect on the propensity to spread false information about gluten-free food is primarily trust in institutions. The ability to discern between false and true information has a negative effect on the propensity to share this news. In the case of false information about renewable energy production, we can see that among the factors that show an effect on the propensity to disseminate it, trust in institutions again stands out. Conspiracy mentality and age are also found. Media literacy has a negative effect here.

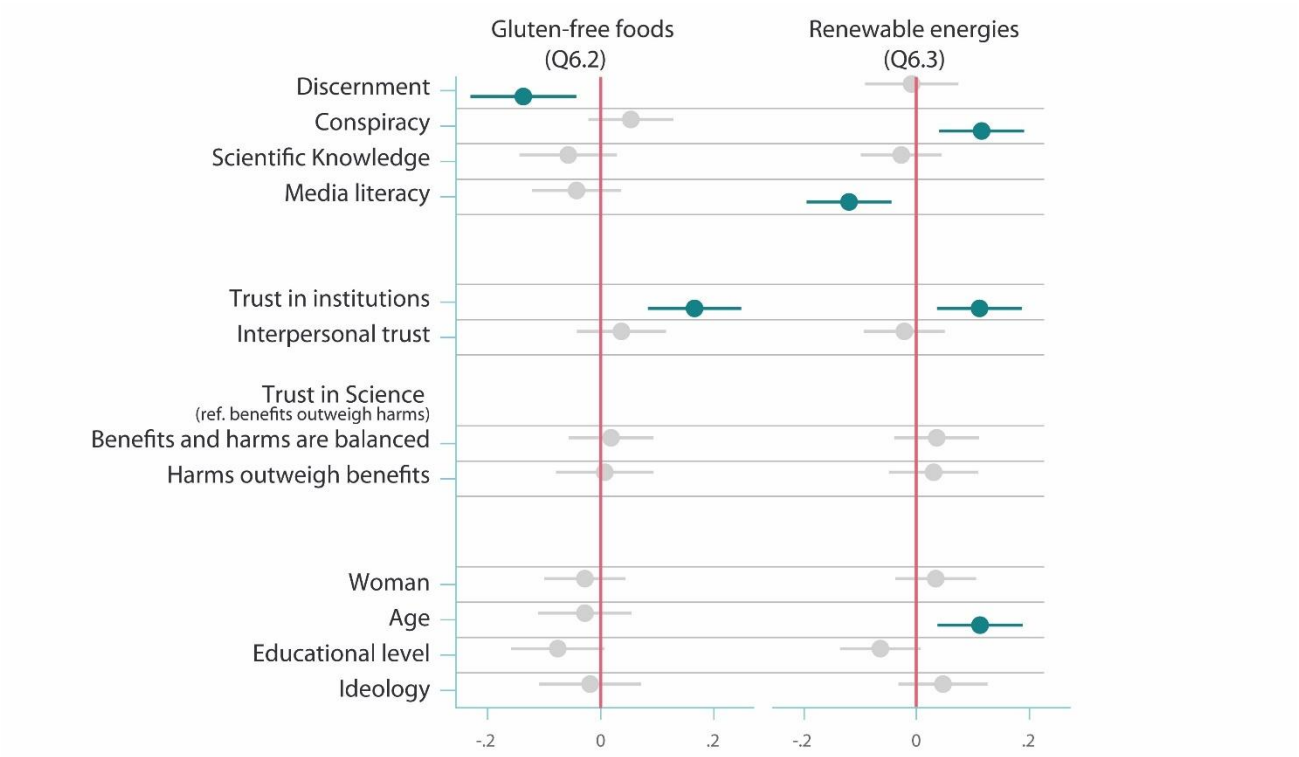
Chart 10 first shows the model based on the propensity to disseminate fake news related to HIV infection. It shows the negative effects of judgement, media literacy and educational level. Finally, the factors that have a significant effect on the dissemination of fake news on climate change are ideology. Those who are more ideologically right-wing are more likely to spread such news. On the other hand, the ability to discern and media literacy also have a negative effect here.

As we anticipated, **regarding the factors influencing the propensity to disseminate false scientific information**, **we found that there are different profiles depending on the nature of the news.** Discernment and media literacy have a negative effect in almost all models. That is, people with a lower ability to discern the veracity of science news, as well as those with lower media literacy, are more likely to disseminate false information. This supports work highlighting the value of media literacy (e.g. Dib e*t al.*, 2022; Lazer *et al.,* 2018).

The model that reflects a false headline on the most politically controversial issue currently presented, the origin of climate change, is precisely the one that reflects the effect of ideology, following in line with the observation of other authors that partisanship leads to greater sharing of information that is consistent with the beliefs of the group (Shin & Thorson, 2017).

One striking element is that trust in institutions has a significant effect in two of the models. This contradicts existing literature, where institutional trust is found to be a protective factor against misinformation (e.g. Vinck *et al.,* 2019). After the analysis, it was found that there is an interaction with the ability to be discerning, so that for those who are able to identify the veracity of information, trust in institutions is not relevant. However, for those who are unsure whether information is true or false, trust in institutions plays an important role in deciding whether to share information. Thus, it can be said that institutional trust functions as a cognitive shortcut in the decision to share news.

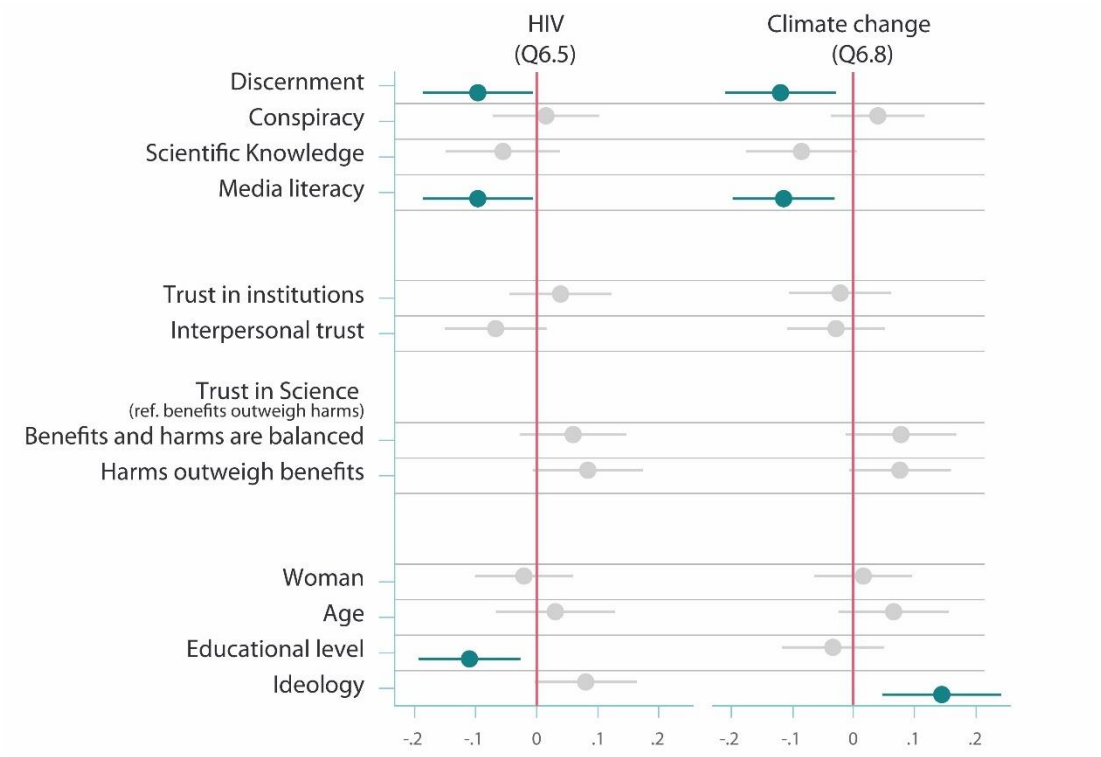
Chart 9. *Factors that explain the propensity to spread misinformation on scientific topics (standardized coefficients) (I).*



*Standardised coefficients significant at the 95% confidence level are highlighted.

Source: FECYT. Own elaboration

Chart 10. *Factors explaining the propensity to spread scientific misinformation (standardised coefficients) (II).*



*Standardised coefficients significant at the 95% confidence level are highlighted.

Source: FECYT. Own elaboration

4. Implications

The results of this report provide some conclusions for science news management:

- Citizens are interested in scientific topics, especially those related to medicine and health. In general, these are highly specialised subjects and the channels most commonly used to seek information on them, in most cases, do not go through verification processes.
- Consulting health personnel is the preferred means of finding information on health-related topics. This is positive in principle, but authority bias is often at work and the public is unable to distinguish whether a health professional is competent in a particular specialisation. For these reasons, these professionals can often spread misinformation about important issues such as vaccines (Verger *et al.,* 2015) or COVID-19 (Ecker *et al.,* 2022).
- Media literacy has been shown to be a fairly robust protective factor against misinformation. This ability is especially important given the great complexity in the media ecosystem generated by the technological possibilities of digital media and, especially, social networks.
- The channels perceived as most trustworthy are those that are presumed to guarantee checks on the veracity of the information broadcast, in addition to family and friends. However, trust in the different media is quite low and seems to be related to the fact that many people perceive that they have received misinformation from many of them.
- Although social networks are untrusted by most of the population, and are identified as the main channel of misinformation, they are widely used. This means that, beyond so-called echo chambers, which can confirm prior beliefs (Ecker *et al.,* 2022), there is selective exposure. Thus, even if there is a sceptical stance towards specific information, there is an increased distrust of the media and institutions.
- Misinformation is a widespread concern. A large part of the public believes that its impacts include the manipulation of people's beliefs, which can increase mistrust or damage health.
- Ideological positions on the right show a lower capacity to discern the veracity of the scientific headlines included in the study. This can be explained by the avoidance of cognitive dissonance (Festinger, 1975) that can occur when confronting some information with held beliefs.
- Trust in institutions functions as a cognitive framework (Lewicki and Brinsfield, 2011) that guides many people's information processing, especially when they lack the capacity to discern the veracity of a news item.
- Motivated reasoning (Kunda, 1990) plays an important role in the dissemination of climate change misinformation, as in this case political ideology influences the propensity to share misinformation.
- Institutions guide many people's information processing, especially when they lack the capacity to discern the veracity of a news item.

The following **recommendations** can be drawn from these conclusions:

R1. Promoting media literacy among the entire population

Given their important role in the ability to discern the veracity of scientific issues and limit the spread of misinformation, there is a need to enhance competences that enable people to engage critically and effectively with information, with other forms of content, with different sources and their ability to verify information, and with different types of dissemination modalities.

R2. Increasing knowledge of how science works.

The public must be able to understand the provisional nature of science, so that a new discovery can discard previous knowledge. This, far from being a problem of mistrust in science, should reinforce that trust as an activity subject to constant judgement.

R3. To promote knowledge about the social practices that the scientific community uses to produce reliable knowledge and the criteria for scientific expertise.

Scientific knowledge is highly specialised and, due to the limits of our knowledge and time, we often rely on the expertise of others, so people may use their trust in experts or institutions as a shortcut. In this sense, it is necessary to promote a) knowledge about the social practices that the scientific community uses to produce reliable knowledge, such as the importance of consensus or peer review, and b) the ability to question the reliability of a source and its specialised scientific expertise in the area in question (Osborne, J. & Pimentel, D., 2022).

In relation to the previous point, misinformation disseminated by scientists and health professionals in different media, especially in social networks, should be avoided (Ferrer, 2022). This happens when different science and health professionals broadcast news in which they have no expertise or capacity to discern its veracity. Reception occurs with an authority bias, as the public is often unable to assess their ability to do so. Sometimes this misinformation has no false basis, nor is it opinionated, but it is inadequately communicated and loses accuracy.

R4. Promoting the skills to exercise “healthy” scepticism.

Trust in institutions, greater confidence in science and greater knowledge about how science works, and conspiratorial mindsets are associated with concerns about misinformation, which could help alert people to the risks of misinformation. In this sense, it is important to promote the skills to exercise ‘healthy’ scepticism - the ability to accept evidence - as opposed to the absolute suspicion of anything related to the official narrative and immune to evidence that is characteristic of conspiratorial thinking (Le Morvan, 2011; Vraga & Tully 2021).

R5. Avoiding the politicization of scientific facts.

Ideology can play a role in discerning and disseminating scientific misinformation, which shows the importance of avoiding “politicising” scientific findings and differentiating these from political measures or decisions, in which other social, economic, ethical, etc. factors also play a role.

R6. Promoting responsible and quality scientific communication.

Although social media play an important role in the dissemination of scientific misinformation, people tend to attribute less credibility to these channels. In this sense, it is **essential to promote the quality of scientific communication** by media and institutions, both to avoid misinformation and to build public trust in these organisations.

R7. Promoting specialized science journalism.

Professional and specialised science journalism should be promoted so that, without losing its independence and critical capacity, it allows scientific findings to be contextualised, conveys the provisional nature of science as a strength and avoids "false balance" in the media, presenting an issue as more balanced between two opposing views than what is supported by the evidence. This is not to say that the public cannot have a say in the effects that scientific findings, or their applications, may have, but it is important that they be distinguished from the facts. In this respect, initiatives that provide resources to the media to cover scientific news, such as *the Science Media Centre or the European Science-Media Hub*, are useful.

R8. Promoting specialized structures, means and resources dedicated to science communication.

For their part, scientific institutions themselves play an important role, so it is necessary to promote specialised structures, media and resources dedicated to science communication that involve the public and can provide effective and responsible information, avoiding exaggeration of scientific findings, communicating uncertainty and promoting knowledge about how science works.

R9. Incorporating measures to limit the spread of misinformation promoted by algorithms.

It is important to work with search engine and social media algorithms to penalise misinformation. Existing algorithm biases (such as interaction bias[4]) often increase the spread of hoaxes. In addition, competition for attention and the use of tactics favoured by these algorithms can encourage scientists and institutions to contribute to information noise and misinformation.

[4] See, for example: https://eticasfoundation.org/why-and-how-media-curation-by-algorithm-contributes-to-disseminate-misinformation

5. Authors' Brief Note

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Annex I. Methodological report

This annex to the report aims to provide a detailed description of the methodology used in the data collection and subsequent data analysis.

Study design: sample and fieldwork

The target population of the survey included adults aged 15 years and over residing in Spain and was administered by telephone to a final sample of 2,100 respondents. The sample of telephone numbers, totalling 109,207, consisted of landlines (70%) and mobiles (30%). The fieldwork was carried out by Sigma Dos between 22 June and 15 July 2022. During this period, each telephone number received, on average, 3.3 calls and the average interview duration was 18 minutes.

The selection of the sample, stratified by autonomous community and habitat size, was carried out in two stages. In the first stage, landline and mobile phone numbers were randomly generated; in the case of landlines, they were stratified by region and municipality size. In the second stage, once contact had been established with a landline number corresponding to a household, the respondent was selected using sex and age quotas. In the case of calls to mobile phones, the person was selected using sex and age quotas.

Once the fieldwork was completed, an analysis of the representativeness of the final sample was carried out. For this purpose, the results obtained in the survey were compared with those of the Labour Force Survey (INE, 2022) for a series of variables. This analysis showed an over-representation of people with tertiary education compared to those with primary education or lower. Given that the educational attainment variable may be related, in addition to the probability of responding, to other target variables, the sample was rebalanced.

The sample was calibrated in order to generate a weight to be used in the data analysis. Calibration consists of generating a weight that forces the sample profile to match the population with respect to a number of auxiliary variables available from the LFS and survey data (Kott, 2006). The variables used in the calibration were a combination of the variables sex, age (six groups: 15-24, 25-34, 35-44, 45-54, 55-64, 65+) and educational level (four groups: primary or less, lower secondary, upper secondary, tertiary) and, on the other hand, autonomous community. The population totals were taken from the LFS, a survey which, due to its design and sample size, can act as a reference for the FECYT scientific misinformation survey. The Table 9 contains the distribution of the variables used in the calibration. To avoid the negative impact on the variance of the estimates of the weights with more extreme values, weights were trimmed at the 99.5th percentile.

Table 9. *Distribution of unweighted and weighted sample profile compared to LFS 2022 data.*

Variable	EPA (%)	Misinformation survey	
		Not weighted (%)	Weighted (%)
Autonomous community (Region)			
Andalusia	18.2	17.6	18.2
Aragón	2.8	2.7	2.8
Asturias, Principality of	2.2	2.2	2.2
Balearic, Islands	2.6	1.7	2.6
Canary Islands	4.9	4.3	4.9
Cantabria	1.3	1.2	1.3
Castile and León	5.1	5.2	5.1
Castile - La Mancha	4.3	3,9	4.3
Catalonia	16,0	16.5	16.0
Valencian Community	10.7	11.1	10.7
Extremadura	2.2	2.3	2.2
Galicia	5.9	5.2	5.9
Madrid, Community of	14.2	16.1	14.2
Murcia, Region of	3.2	3.3	3.2
Navarre, Chartered Community	1.4	1.5	1.4
Basque Country	4.6	4.3	4.6
Rioja, La	0.7	0.7	0.7
Gender			
Men	48.6	46.4	48.6
Women	51.4	53.6	51.4
Age			
15-24	12.1	9.1	12.1
25-29	12.8	13.3	12.8
35-39	16.7	17.6	16.7
45-49	19.1	19.4	19.1
55-59	16.4	17.0	16.4
65-69	22.9	23.6	22.9
Academic background			
Primary education or less	16.0	9.9	16.0
Secondary – 1st cycle	29.3	15.1	29.3
Secondary -2nd cycle and VE	22.6	32.9	22.6
Higher education	32.1	42.1	32.1

Source: FECYT. Own elaboration

Questionnaire

The questionnaire is made up of seven blocks, which are specified in Table 1. The questionnaire can be found in Annex II. Questionnaire

Table 10. *Content of the survey questionnaire.*

Block	Content
1	Science information consumption habits
2	Credibility and the spread of misinformation
3	Factors related to perceived credibility and propensity to misinformation
4	Perceptions of misinformation
5	Attitudes towards misinformation and science
6	Interpersonal and institutional trust
7	Demographics

Two of the questions included in the analysis refer to the propensity to share true and false information (Q6), and the identification of that information as true or false (Q7). The information used in the questionnaire corresponds to true and false headlines. The false information came from Maldito Bulo, an organisation dedicated to verifying information, while the true headlines were taken from the science sections of generalist media such as El País. The headlines selected were intended to cover the topics about which false information has been spread.

Using the same informant to determine the likelihood of information sharing (P6) and to assess the veracity of the information (P7) poses a drawback: the answer to the question about the propensity to spread the information (P6) may influence the assessment of the veracity of the information (P7). To mitigate this problem, we implemented a design in which the same respondent would evaluate different items in questions Q6 and Q7. In this design, the sample was divided into two random groups: the first subsample was asked about the propensity to share two true and two false pieces of information (Q6) while assessing the truthfulness of four other items (Q7), two true and two false. The second subsample was asked about the likelihood of sharing the four pieces of information (P6) that had been presented to the first subsample in question P7. Similarly, in the question about the truthfulness of the items (Q7), they examined the items that the first subsample had evaluated in question Q6.

Data analysis

The data analysis was carried out in three phases. First, the scales and variables used in the analysis were defined, as described in the body of the report (Table 2). Second, a multiple imputation model was developed to deal with missing cases of the variables included in the regression analyses. Finally, a series of linear regression models were fitted to investigate factors associated with the propensity to share misinformation, the ability to discern between true and false information, and perceptions of the seriousness of misinformation. Data analysis was conducted using Stata 17 software (StataCorp, 2021).

Treatment of missing cases in models: multiple imputation

Before fitting the statistical models, an analysis of the impact of missingness on the estimates was carried out. Missing values may pose a risk to the quality of the estimates if those who choose to answer one or more questions are different from respondents who responded to all questions. To assess the impact of missing cases, we first quantified the observations without valid information for each variable. Table 11 presents a summary of the level of missing cases for some relevant variables of the study.

Table 11. *Missing values in a selection of variables in the analysis.*

Variable	Percentage of missing values
Sharing news: Gluten-free foods are healthier, and can also help you lose weight	6.0
Sharing news: Without wind and sun you can't produce renewable energies	6.1
Sharing news: HIV can be transmitted through intense kissing	5.6
Sharing news: Climate change is mainly due to natural causes	4.6
Ability to discern true and false information	19.2
Perception of the effects of misinformation	6.8
Agreement with conspiracy theories	7.2
Trust in institutions	6.2
Trust in people	1.2
Overall assessment of science	8.1
Age	0.2
Educational level	0.7
Ideology	11.4

Source: FECYT. Own elaboration.

A multiple imputation model was used to mitigate the possible effect of missing values on the coefficient estimates. This technique consists of producing an *m* number of complete datasets, each consisting of a number of plausible values to replace the missing ones. Models, such as the regressions in this report, are then run on each of the full datasets and combined to provide a final estimate. This technique is efficient by mitigating the risk of working with a single imputation that may have outliers. Furthermore, the variability between the coefficients of each model is a measure of the uncertainty introduced by the imputation of the values (Carpenter & Kenward, 2012).

To make the estimates, a chained equation model was used, with missing values being iteratively imputed taking into account the values assigned by the model in previous iterations (Rivero Rodríguez, 2011). With this technique, each variable is imputed from a different type of model according to its nature. Dichotomous variables are imputed with logistic regression models, while categorical variables are based on multinomial logistic regression models. Scale variables, which are the majority in this study, were imputed using a predictive mean matching technique, which is developed in four steps. First, a linear regression model is fitted using the cases with valid observations. Second, the model is used to predict the value of the variable to be imputed for all cases. In the next step, for each case with the missing value of the variable,

a set of observations, usually between 3 and 10, is selected that satisfy two conditions: the values predicted in the previous step must be similar and the original values cannot be missing. Finally, one of the selected cases is randomly chosen and donates its original value to the case with the missing value.

For the imputation model to be effective in reducing the bias of the estimates, the variables must be able to explain the response mechanism of the survey questions (Little & Rubin, 1987). To this end, a preliminary analysis was carried out in order to identify the variables that were related to the response mechanism. Thus, the final specification of the imputation model (Table 2) had three types of variables: the dependent variables of the analysis, the independent variables and those capable of contributing to explaining the mechanism underlying the missing cases.

Table 12. *Specification of the multiple imputation model by chained equations.*

Variables to be allocated		
Variable(s)	**Label**	**Method**
Q6.1-Q6.8	Sharing information	Predictive mean adjustment
Q7.1-Q7.8	Ability to discern true and false information.	Predictive mean adjustment
Q16.1-Q16.4	Perception of the effects of misinformation	Predictive mean adjustment
Q8.1-Q8.3	Agreement with conspiracy theories	Predictive mean adjustment
Q21.1, Q21.2, Q21.4, Q21.5	Trust in institutions.	Predictive mean adjustment
Q20	Trust in people	Predictive mean adjustment
Q19	Overall assessment of science.	Predictive mean adjustment
D2	Age	Predictive mean adjustment
D7	Educational level	Predictive mean adjustment
D11	Ideology	Predictive mean adjustment
Variables in the imputation model that are not allocated		
Variable(s)	**Label**	
Q9.1-Q9.3	Scientific knowledge.	
Q10.1-Q10.3	Media literacy	
Q12.1-Q12.3, Q12.6	Receiving misinformation by different means.	
D1	Gender	
Strata	Strata of the sample	
Weighting	Weighting coefficient (in quintiles).	

Source: FECYT. Own elaboration

The imputation model generated ten complete data sets. The regression models were fitted ten times, once on each complete data set. Finally, the ten models were combined following Rubin's rule for calculating the coefficients and variance of the estimators (Little & Rubin, 1987). To calculate the coefficients:

$$\hat{\beta} = \frac{1}{M}\sum_{m=1}^{M}\hat{\beta}_m$$

(1)

where βˆrepresents the coefficient of the final model, M the total number of complete data sets and βˆ_m is the coefficient of the regression model computed on the complete data set m. The variance of the coefficients was calculated according to the following formula:

$$Var(\hat{\beta}) = W + \left(1 + \frac{1}{M}\right) B$$

(2)

where W corresponds to the average of the variances of the coefficients of each model $W = \frac{1}{M} \sum_{m=1}^{M} Var(\hat{\beta}_m)$ and B is the variance between the coefficients of the generated models $B = \frac{1}{M-1} \sum_{m=1}^{M} (\hat{\beta}_m - \hat{\beta})^2$.

Regression models

Then, three sets of linear regression models were fitted. These three sets correspond to the dependent variables: 1) probability of sharing false information (Q6), 2) probability of discerning between true and false information (Q7) and 3) level of concern about the effects of the spread of misinformation (Q16). Descriptive statistics for the variables included in the model are presented in Table 3.

Table 13. *Descriptive statistics of the variables included in the analysis.*

Variable	N	Mean	Typ. dev.	Min.	Max.
Sharing false information: gluten-free food	994	2.7	2.2	1	7
Sharing false information: renewable energies	993	4.0	2.5	1	7
Sharing false information: HIV	985	2.5	2.3	1	7
Sharing false information: climate change	995	3.0	2.4	1	7
Discerning	2083	4.8	1.4	1	7
Conspiracy	2085	5.9	1.3	1	7
Science knowledge	2100	2.2	0.9	0	3
Media literacy	2100	2.1	0.9	0	3
Trust in institutions	2073	2.3	0.7	1	4
Inter-personal trust	2075	3.8	1.9	1	7
Trust in science: more benefits than harms	1929	0.6	0.5	0	1
Trust in science: same benefits than harms	1929	0.2	0.4	0	1
Trust in science: more harms tan benefits	1929	0.1	0.3	0	1
Receives misinformation: direct contact	2100	0.3	0.5	0	1
Receives misinformation: social media	2100	0.4	0.5	0	1
Receives misinformation: television	2100	0.2	0.4	0	1
Woman	2100	0.5	0.5	0	1
Age	2095	49.6	17.2	15	94
Educational level	2085	4.3	1.4	1	6
Ideology	1861	3.8	1.4	1	7

Source: FECYT. Own elaboration

There are several considerations to take into account when interpreting the models. First, the decision to present the models exploring the probability of sharing false information separately rather than using a summary measure has to do with the heterogeneity of these models: depending on the nature of the information, the profile of those who choose to share it varies. To capture these nuances, instead of using a summary measure of the probability of sharing, we have decided to present the four models, thus acknowledging one of the limitations of this study. Second, the set of models exploring the probability of sharing false information has been estimated on half of the sample that was asked about the probability of disseminating such information. Finally, and with reference to all the models in the report, standardised coefficients are presented to facilitate comparison of the magnitude of the relationship of each factor with the dependent variable.

Annex II. Questionnaire

The research questionnaire is reproduced below.

Block 0. Paradata and population selection

Good morning/afternoon. I am an interviewer for ....., a company dedicated to opinion and communication work, and we are carrying out research on current affairs. We have chosen your telephone number at random to conduct an interview. We ask for your cooperation and we guarantee the complete anonymity of your opinions.

Q0.1. Are you of Spanish nationality?

[1] Yes[**GO TO** Q0.3.]

[2] No

Q0.2. How long have you been residing in Spain?

[1] 5 years or more

[2] Less than 5 years **[END OF THE INTERVIEW**]

Q0.3. Are you registered in this municipality?

[1] Yes

[2] No **[END OF THE INTERVIEW]**

Block 1. Science information consumption habits

Q1.1 To start with, could you tell me on average, how often have you used the internet in the last 3 months? By this we mean accessing the internet from anywhere and with any type of device (PC or laptop, tablet or mobile phone).

[1] Several times a day or continuously

[2] Daily or almost daily, at least 5 days a week

[3] Every week, but not daily

[4] Less than once a week

[5] Never

[888] Don’t know

[999] No answer

Q1.2 **SHOW IF** [1] Several times a day or continuously **A** [4] Less than once a week **IN** Q1.1.

And in the last 30 days, can you tell me whether or not you have used each of the following social networking or messaging applications?

Q1.2.1 Generalist social networks (Facebook, Instagram, Twitter…)

[1] Yes [2] No/does not have an account [888] Don't know [999] No answer

Q1.2.2 Messaging applications (WhatsApp, Telegram, etc.)

[1] Yes [2] No/ does not have an account [888] Don't know [999] No answer

Q2. To what extent do you trust or not trust the news and information you access through ….

Q2.1 … printed newspapers and news magazines?

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q2.2. … online newspapers and news magazines?

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q2.3. … social networks and instant messaging apps?

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q2.4. …television?

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q2.5. …radio?

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q2.6. … video web platforms (YouTube, Twitch…)?

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q2.7. …friends and family

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q3. In general, how often do you **seek or look up** information about...

Q3.1. Economics and business

[1] Every day or almost every day [2] At least once a week [3] Several times per month [4] Hardly ever or never [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q3.2. Environment and ecology

[1] Every day or almost every day [2] At least once a week [3] Several times per month [4] Hardly ever or never [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q3.3. Politics

[1] Every day or almost every day [2] At least once a week [3] Several times per month [4] Hardly ever or never [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q3.4. Medicine and health

[1] Every day or almost every day [2] At least once a week [3] Several times per month [4] Hardly ever or never [Every day or almost every day [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q3.5. Food and physical well-being

[1] Every day or almost every day [2] At least once a week [3] Several times per month [4] Hardly ever or never [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q3.6. Science and Technology

[1] Every day or almost every day [2] At least once a week [3] Several times per month [4] Hardly ever or never [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

LOOP of Q4.1 to Q4.2 for each $topic: [1] Science and Technology [2] Medicine and health [3] Environment and ecology [4] Food and physical well-being

Q4.1 **SHOW IF** [1] Every day or almost every day **A** [3] Several times per month **IN** Q3*.

Thinking about the last time you searched for or requested information about **$topic**, to whom or what did you turn?

Q4.1.1 Family, friends or acquaintances

[1] Yes [2] No

Q4.1.2 Internet or social media

[1] Yes [2] No

Q4.1.3 Books

[1] Yes [2] No

Q4.1.4 Science or technical journals

[1] Yes [2] No

Q4.1.5 Printed press

[1] Yes [2] No

Q4.1.6 Health personnel (doctor, nurse, pharmacist) **[SHOW IF $topic is [2] Medicine and health OR [4] Food and fitness] [SHOW IF $topic is [2] Medicine and health OR [4] Food and fitness].**

[1] Yes [2] No

Q4.1.7 Scientific publications or journals

[1] Yes [2] No

Q4.1.8 Other. Which?

[1] Yes [2] No

Q4.2 **SHOW IF** [1] **Yes IN** Q4.1.2

And when you searched for information about these issues on the internet or social media, which media did you use?

MULTI-RESPONSE. READ ONE AT A TIME.

[1] Social networks (Facebook, Twitter, Instagram)

[2] Messaging apps (WhatsApp or Telegram)

[3] Generalist digital newspapers (El País, El Mundo...)

[4] Blogs or forums

[5] Podcasts or internet radio

[6] YouTube videos

[7] Wikipedia

[8] Institutional websites (universities, departments, ministries)

[9] Others (please note)

[888] Don't know (DO NOT READ)

[999] No answer (DO NOT READ)

Q5. Thinking back over the last 7 days, **<u>have you received</u>** through your social networks, messaging applications or in conversations with other people information about...

Q5.1 … Environment and ecology?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q5.2 …Medicine and health?

[1] Yes [2] No [888] Don't know (DO NOT READ)) [999] No answer (DO NOT READ)

Q5.3 … Food and physical wellbeing?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q5.4 …Science and technology?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Block 2. Credibility and the spread of misinformation

Q6. I am going to read you a series of news headlines. Could you tell me **to what extent you would share this information with the people around you**, using a scale from 1 to 7, where 1 means that you would not share it at all and 7 means that you would share it for sure.

SHOW TO sub-sample A [Random50%]

Q6.1. A glass of wine a day is **NOT** recommended for general health.

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q6.2. Gluten-free foods are healthier and can also help you lose weight.

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q6.3. Without wind and sun, renewable energies cannot be produced.

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q6.4. The cost of energy generated from renewable sources is the cheapest of all energy sources

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

SHOW TO sub-sample B [Random 50%]

Q6.5. HIV can be transmitted through intense kissing.

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [I would not share it at all 999] No answer (DO NOT READ)

Q6.6. COVID-19 vaccines have been shown to be effective against mortality.

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q6.7. HIV transmission can be prevented with appropriate treatment.

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q6.8. Climate change is primarily due to natural causes.

[1] I would not share it at all [2] [3] [4] [5] [6] [7] I would share it for sure [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q7. For the following group of statements about news or other information, I would like you to tell me to what extent you think they are true or false, using a scale from 1 to 7, where 1 means that you are sure that the statement is false and 7 means that you are sure that the information is true.

SHOW TO sub-sample A

Items Q6.5 to Q6.8

> [1] Sure to be a fake. [2] [3] [4] [5] [6] [7] Sure to be true. [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

SHOW TO sub-sample B

Items Q6.1 to Q6.4

> [1] Sure to be a fake. [2] [3] [4] [5] [6] [7] Sure to be true [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Block 3. Factors related to perceived credibility and propensity to misinformation.

Q8. Could you tell me to what extent you agree or disagree with each of the following statements using a scale from 1 to 7, with 1 representing fully disagree and 7 representing fully agree.

Q8.1 There are many important things happening in the world that are never reported to the public.

> [1] I fully disagree [2] [3] [4] [5] [6] [7] I fully agree [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q8.2 Politicians often lie to us about the real reasons for their decisions.

> [1] I fully disagree [2] [3] [4] [5] [6] [7] I fully agree [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q8.3 There are secret organizations that influence political decisions very much.

> [1] I fully disagree [2] [3] [4] [5] [6] [7] I fully agree [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q9. A Next, I am going to read you several pairs of statements. Please tell me which statement from each pair is correct. Try to answer from your own knowledge.

Q9.1

> [1] The Sun revolves around the Earth.
>
> [2] The Earth revolves around the Sun.

Q9.2

> [1] Antibiotics cure infections caused by both viruses and bacteria.
>
> [2] Antibiotics cure infections caused by bacteria.

Q9.3

> [1] Current climate change is a consequence of the ozone hole.

[2] Current climate change is mainly due to the accumulation of greenhouse gases.

Q10. I am going to read you a series of statements, could you tell me, from your knowledge, if they are true or false?

Q10.1 Spanish Radio and Television (RTVE) relies on advertisements as its main source of funding.

[1] True [2] False [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q10.2 The news and content that a person views on Facebook are randomly selected.

[1] True [2] False [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q10.3 Most of the media in Spain are owned by private companies.

[1] True [2] False [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Block 4. Perception about misinformation (in general)

Q11. Thinking back over the last 7 days, have you ***received*** any information or news that you think might be false about……

Q11.1 …Nutrition and wellbeing?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q11.2 …Vaccines (not including the COVID-19 vaccine)?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q11.3 …The COVID-19 pandemic and the vaccine?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q11.4 …Climate change?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q11.5 …Homeopathic treatments?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q11.6 …Medical treatments?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q12. SHOW IF [1] Yes **IN ANY QUESTION FROM** Q11.1 **TO** Q11.6

And did you receive the information you believe may be false via…

Q12.1 …Personal or telephone conversations?

[1] Yes [2] No

Q12.2 …Instant messaging applications (WhatsApp, Telegram...)?

[1] Yes [2] No

Q12.3 …Social networks (Facebook, Instagram…)?

[1] Yes [2] No

Q12.4 …Digital newspapers?

[1] Yes [2] No

Q12.5 …Other digital media (blogs, forums, videos, podcasts…)?

[1] Yes [2] No

Q12.6 …Television?

[1] Yes [2] No

Q12.7 …Radio?

[1] Yes [2] No

Q12.8 …Printed press?

[1] Yes [2] No

Q12.9 …Other channels?

[1] Yes [2] No

[888] Don't know (DO NOT READ)

[999] No answer (DO NOT READ)

Q13. Over the last 7 days, have you **shared** any information or news which you believe may be false at…

Q13.1 **SHOW IF** [1] Yes **IN ANY QUESTION FROM** Q1.2.1 **TO** Q1.2.2.

…your social networks or messaging applications?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q13.2

…face-to-face or telephone conversations with other people?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q14. To what extent are you confident or not confident that you can identify information that is false or distorts reality: very confident, rather confident, not very confident, not at all confident?

[1] Very confident [2] Rather confident [3] Not very confident [4] Not at all confident
[888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q15. In recent years, organizations and media dedicated to verifying hoaxes or information suspected of being false have appeared. Have you ever consulted any media dedicated to verifying information, such as *Maldita, Newtral, EFE Verifica* o *Verificat*?

[1] Yes [2] No [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Block 5. Attitudes towards misinformation and science

Q16. To what extent do you agree or disagree with the following statements? Answer on a scale from 1 to 7, with 1 meaning "Fully disagrees" and 7 "Fully agrees".

Q16.1 The circulation of misinformation or hoaxes can have detrimental effects on people's health.

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q16.2 Misinformation and hoaxes have the capacity to manipulate people's beliefs.

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q16.3 Misinformation and hoaxes cause citizens to mistrust institutions.

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q16.4 The circulation of hoaxes among the population about COVID-19 has had a detrimental effect on the credibility of scientists and experts.

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q17. Please indicate which of the following two statements you agree with more:

[1] The government should take measures to restrict false online information, even if this limits press freedom.

[2] Press freedom must be protected, even if this means publishing false information

[888] Don't know (DO NOT READ)

[999] No answer (DO NOT READ)

Q18. Please tell me to what extent you agree with each one of the following statements. Use the scale from 1 "Fully disagree" to 7 "Fully agree".

Q18.1 Those who pay for research may influence scientists into arriving at the conclusions they find most convenient.

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q18.2 Scientific knowledge constitutes the best basis for making laws and regulations.

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q18.3 The written press, television and digital media act freely and without threats or repercussions.

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don’t know (DO NOT READ) [999] No answer (DO NOT READ)

Q18.4. The government interferes too much in our daily lives

[1] Fully disagrees [2] [3] [4] [5] [6] [7] Fully agrees [888] Don’t know (DO NOT READ) [999] No answer (DO NOT READ)

Block 6. Trust

Q19. If you had to make an overall assessment of science and technology taking into account all positive and negative aspects, which of the following options would best reflect your opinion?"

[1] Benefits outweigh harms

[2] Benefits and harms are balanced

[3] Harms outweigh benefits

[888] Don't know (DO NOT READ)

[999] No answer (DO NOT READ)

Q20. Would you say that, in general, you are never cautious enough in your dealings with others, or can you trust most people? Please place yourself on a scale of 1 to 7, with 1 meaning that you are never cautious enough and 7 meaning that you can trust most people

[1] You are never cautious enough [2] [3] [4] [5] [6] [7] Most people can be trusted [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q21. To what extent do you trust the following institutions or groups to address problems related **to health or the environment**: much, quite, little or not at all?

Q21.1. The Government of Spain

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q21.2. The Government of (NAME: your autonomous community)

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q21.3. Politicians

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q21.4. The United Nations/World Health Organisation

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q21.5. The European Union

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q21.6. Journalists

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Q21.7. Scientists

[1] A lot [2] Quite [3] Little [4] Not at all [888] Don't know (DO NOT READ) [999] No answer (DO NOT READ)

Block 7. Demographics

D1. Would you describe yourself as a man, a woman or in some other way?

[1] Man

[2] Woman

[3] In some other way

D2. AGE. *(INTERVIEWER MUST TAKE DOWN THE AGE AND CODIFY).*

Age: _____

[1] 15 - 24

[2] 25 - 34

[3] 35 - 44

[4] 45 - 54

[5] 55 - 64

[6] 65 or older

[999] No answer

D3. Province of residence

D4. Community of residence

D5. Size of community by population

[1] Population of less than 10,000

[2] Population of 10,001 – 20,000

[3] Population of 20,001 – 50,000

[4] Population of 50,001 – 100,000

[5] Population of 100,001 – 500,000

[6] Population of over 500,000

D6. How many persons, yourself included, live permanently in your household?

TAKE DOWN

D7. What are the highest-level official studies that you have completed (obtaining the corresponding official degree)?

OPEN QUESTION. CODIFY.

[1] Cannot read (illiterate).

[2] No education, but can read.

[3] Incomplete Primary Studies (Preschool).

[4] Primary Education (1st stage General Basic Education, Entrance, etc.) (Studied until the age of 10).

[4] Secondary/First Cycle Education (2nd stage Basic General Education, 4th year of Baccalaureate, School Graduate, Administrative Assistant, General Culture, etc.) (Studied until the age of 14).

[5] Secondary/Second Cycle Education (BUP, COU, FP1, FP2, PREU, Higher Bachelor, University Access, Language School, etc.).

[6] First cycle university education, 3-year courses (University Degree, Technical Engineering/ Surveying, Diplomas, Registered Nurse, Teaching, three-year degree, etc.).

[7] Second cycle university education, courses lasting 4 to 6 years and doctorate (Master's, Bachelor's degrees, Higher Engineering, Medicine, etc.)

[999] No answer

D8. What would you say is your status as regards religion?

[1] Practising Catholic.

[2] Non-practising Catholic.

[3] A believer of another religion.

[4] Indifferent or agnostic.

[5] Atheist.

[999] No answer

D9. Taking into account that the net family income is of around 1,100 euros per month, is the family income of your household...?

[1] A lot higher (more than twice as much).

[2] Higher.

[3] Around that figure.

[4] Lower.

[5] Rather lower (less than half).

[888] Don't know **(DO NOT READ)**

[999] No answer **(DO NOT READ)**

D10. Which of these is your current situation?

[1] Working for somebody else.

[2] Self-employed.

[3] Retired, pensioner.

[4] Unemployed, having previously worked.

[5] Unemployed, looking for a first job.

[6] Househusband or housewife.

[7] Student.

[999] No answer

D11. When talking about politics, the expressions left and right are normally used. On a scale of 1 to 7, where 1 means 'far left' and 7 'far right'', where would you place yourself? Scale from 1 to 7. INTERVIEWER: This question is important; please insist.

D12.1. Please tell me whether, at the last general elections, held in November 2019, you…

[1] Went to vote and voted

[2] Went to vote, but could not vote

[3] Did not go to vote

[4] Were not old enough/could not vote

D12.2. And what party or coalition did you vote for on that occasion?

[1] PSOE/PSC/PSPV/PSG/PSE

[2] PP

[3] Unidas Podemos/En Comú Podem/En Común-Unidas Podemos

[4] ERC

[5] Ciudadanos

[6] Junts per Cat

[7] EAJ-PNV

[8] EH Bildu

[9] Más País/Más Madrid

[10] CUP

[11] CCa-NC

[12] Na+

[13] Més Compromís

[14] BNG

[15] PRC

[16] Teruel Existe

[17] PACMA

[18] Vox

IBERIFIER – Iberia Media Research & Fact-Checking

IBERIFIER is a digital media observatory in Spain and Portugal funded by the European Commission, linked to the European Digital Media Observatory (EDMO). It is made up of thirteen universities, five fact-checking organizations and news agencies, and five multidisciplinary research centers.

Its main mission is to analyze the Iberian digital media ecosystem and tackle the problem of misinformation. To do this, it focuses its research on five lines of work:

1. Research on the characteristics and trends of the Iberian digital media ecosystem.

2. Development of computational technologies for the early detection of misinformation.

3. Fact-checking of misinformation in the Iberian territory.

4. Strategic reports on threats of disinformation, both for public knowledge and for the authorities of Spain and Portugal.

5. Promotion of media literacy initiatives, aimed at journalists and informants, young people and society as a whole.

For more information look for the project website iberifier.eu and the Twitter account @iberifier.

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