Alternative Science, Alternative Experts, Alternative Politics. The Roots of Pseudoscientific Beliefs in Western Europe

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The Roots of Pseudoscientific Beliefs in Western Europe

The Covid-19 pandemic has given further centrality to science within the public debate. But it has also acted as a great multiplier for pseudoscientific (conspiracy) theories. This exploratory study investigates the determinants of pseudoscientific beliefs in five European countries, using data from a survey conducted in May 2021. The concept of pseudoscience is theoretically framed and then operationalised by constructing a Pseudo-scientific Beliefs Index (PBI). Results show that exposure to scientific information does not 'protect' against unsound scientific claims, if not complemented by a correct understanding of the division of scientific labour. Pseudoscientific views are strongly associated with distrust of official science. But, in the context of today's information abundance, even more relevant is the spread of epistemological populism, which fosters reliance on alternative sources and the pseudo-expertise of 'alternative scientific authorities'. The embrace of 'alternative scientific facts' is also associated with electoral support for populist parties.

Keywords: pseudoscience, technical expertise, epistemic authority, populism, Covid-19 pandemic, conspiracy.

Perhaps never in recent history has science been at the centre of public and political debate as in 2020-2021. To scientific development, citizens (and governments) have addressed their expectations regarding the management and possible solution of the global health crisis. At the same time, science has been the target of increasing criticism and suspicion.

The advent of the Covid-19 pandemic has only made the complex relationship between science, communication, and politics more apparent. From global warming to unconventional medicine, from evolutionism to vaccines, science has increasingly become a battleground in public debate and an object of political contention in recent times. The Internet is a breeding ground for pseudoscientific (if not anti-scientific) positions that challenge the acquisitions of 'official' science or contribute to the spread of unproven theories. The same themes, moreover, can be found among the issues that fuel political polarisation. Many observers have stressed the risks associated with the propagation of these beliefs and their consequences on individual behaviour and the formulation of public policies.

Drawing on the growing literature on science-related populism (Mede and Schäfer, 2020; Eberl, Huber and Greussing, 2021; Eslen-ziya and Giorgi 2022), this article investigates the relationship between pseudoscientific beliefs and the spread of epistemological populism (Saurette & Gunster, 2011), contesting the role of traditional epistemic authorities and thus undermining the principle of scientific division of labour (Keren 2018). First, it studies how individual-level pseudoscientific beliefs (and their relationship with exposure to scientific information) are affected by trust in mainstream scientific authorities and what are defined as *alternative scientific authorities*: non-mainstream sources of scientific information combining ordinary people and "authorities" (and celebrities) from other domains, which find growing space in today's hybrid media system (Chadwick 2013). It then focuses on the role of populist political actors as the proponents of a narrative that includes mainstream science among the corrupt elites, assessing the impact of populist electoral orientations on pseudoscientific

beliefs. The analyses rely on individual-level data collected through a CAWI survey conducted by Demos&Pi and Fondazione Unipolis in five European countries, in May 2021.

The article is structured as follows. Section 1 provides a definition of pseudoscience and illustrates its theoretical links with neighbouring concepts and fields of research. Section 2 discusses the theoretical expectations concerning the determinants of pseudoscientific beliefs, focusing on trust in mainstream and alternative scientific authorities. Section 3 outlines the research design and the operationalisation of the main concepts that make up the hypotheses formulated in the previous section. In particular, it introduces a Pseudo-scientific Beliefs Index (PBI) that will be used as the dependent variables in a series of nested OLS regression models presented in section 4. Finally, section 5 summaries the main findings and discusses their implications for the different disciplines that study these phenomena.

1. Pseudoscience and neighbouring concepts

Although pseudoscience is far from being a new phenomenon, the 'demarcation problem' continues to engage the work of philosophers (Pigliucci & Boudry, 2013). In his attempt to draw the boundaries between science, pseudoscience and non-science, Hansson defines a statement as pseudoscientific

if and only if it satisfies the following three criteria: (1) It pertains to an issue within the domains of science in the broad sense (the criterion of scientific domain). (2) It suffers from such a severe lack of reliability that it cannot at all be trusted (the criterion of unreliability). (3) It is part of a doctrine whose major proponents try to create the impression that it

represents the most reliable knowledge on its subject matter (the criterion of deviant doctrine) (Hansson, 2013, pp. 70-71).

The last criterion – identifying the doctrinal component – marks a step forward from the theoretical approaches that define pseudoscience as 'facsimile science' (Oreskes, 2019) or 'cultural mimicry of science' (Blancke et al., 2017). At the same time, it underlines its oppositional character with respect to mainstream science. In another article, Hansson distinguishes two types of pseudoscience. The first, which aims to promote a specific theoretical perspective, has been called *pseudo-theory promotion*. The second type, which challenges a scientific theory or a scientific branch, has been called *science denial(ism)* (Hansson, 2017; 2021).

The proponents of pseudoscientific theories thus challenge or openly attack official science and its authorities, often accusing them of hiding or distorting reality in order to defend vested interests or ideological convictions. In this sense, the field of analysis of pseudoscience intersects with that of conspiracy theories (Pasek, 2019; Lewandowsky et al., 2015). According to Uscinski, the term conspiracy theory refers to 'an explanation of past, ongoing, or future events or circumstances that cites as a main causal factor a small group of powerful persons, the conspirators, acting in secret for their own benefit and against the common good' (Uscinski, 2019, p. 48). Pseudoscientific conspiracy theories have scientists as their main target, but often emphasise their collusion with other institutions and power holders: governments, interest groups, economic actors. Among these, multinational corporations and pharmaceutical companies have a prominent place.

This indicates a further theoretical overlap, as the enemies of pseudoscientific conspiracy theorists largely coincide with the elites and 'dangerous others' seen by populist narratives as 'depriving (or attempting to deprive) the sovereign people of their rights, values, prosperity,

identity and voice' (Albertazzi & McDonnell, 2007, p. 3). There is a growing literature focusing on science-related populism (Giorgi and Eslen-ziya 2022; Eberl, Huber and Greussing, 2021; Mede and Schäfer, 2020). Pseudoscience and conspiracy theories share with populism their dichotomous view of the world (Oliver & Wood, 2014), the dark side of which is often identified with mainstream parties, mainstream experts, and the mainstream media, seen as part of a unified 'system'. In pseudo-scientific narratives, the scientific establishment, in cahoots with Big Pharma, Big Tech and Big Business in general, are seen as part of *that* system.

Populism studies do not provide the only ground on which pseudoscientific theories intersect the most prolific strands of research in political science: another one certainly regards the topic of political polarisation (McCoy et al., 2018). Many scientific issues are now strongly linked to partisanship and are often included among the themes along which contemporary polarisation is determined. For this reason, in the scenario of contemporary polarisation, scientific findings also take on a political colour. Technical-scientific issues such as climate change are transformed into cultural and ideological issues (Safford et al., 2020) – to the point that scholars of American politics speak of 'red facts and blue facts' (Wier, 2017).

Not by chance it was Kellyanne Elizabeth Conway, a Senior Counselor to the then US President Donald Trump, to popularise the concept of 'alternative facts', at the beginning 2017. A few weeks before, the Oxford English Dictionary had chosen *post-truth* as its word of the year. 2016 was the year of the *brexit* referendum and Donald Trump's election to the White House, and both campaigns were suspected of being heavily influenced (if not hijacked) by *fake news*. There is indeed an overt parallel between 'fake science' and fake news when we consider the potential definition of the latter provided by Lazer et al. (2017, p. 4): 'misinformation that has the trappings of traditional news media, with the presumed associated editorial processes'.

The philosophical and sociological debate on post-truth has linked these phenomena to long-term social, cultural and technological transformations, which have eroded trust in traditional epistemic authorities and created a context in which the rational component is overridden by the emotional and affective dimensions. From this angle, post-truth has been seen as a by-product of post-modernity (Lyotard, 1979). This leads to an (apparent) paradox, in which secularisation and the growth in education levels, combined with the availability of increasingly accessible and diverse sources of information, seem to hinder reliance to the body of knowledge provided by the scientific community.

In this context, the emergence of personalised truths and alternative belief systems is also fostered by the configuration of alternative and dispersed, multiple and overlapping knowledge communities. Internet and social networks are seen as major accelerators of these processes. Misleading media coverage has been included among the factors that undermine consensus on established scientific theories or foster the spread of pseudoscientific claims (Lewandowsky et al., 2013; Boykoff, 2007). Social media abound with unorthodox views, alternative experts offering alternative theories that can act as powerful cultural attractors for fragmented individual beliefs. Studies on the spread of pseudoscientific beliefs and conspiracy theories must therefore necessarily be confronted with the broad strand of literature that studies confirmation bias in online communication through the formation of 'echo chambers' and 'filter bubbles' (Sunstein, 2011; Pariser, 2011). A large and growing strand of literature on conspiracy beliefs and disinformation studies their interplay with populism and media use (Enders et al. 2021; Stecula and Pickup 2021a; Stecula and Pickup 2021b).

2. Explaining pseudoscientific beliefs: hypotheses

At the intersection of neighbouring concepts and multiple areas of investigation addressed in the previous section, the contribution of different disciplines – ranging from philosophy to psychology, from political sociology and sociology of communication to political science – suggests a series of theoretical expectations regarding the determinants of pseudoscientific beliefs.

Scientific knowledge, information and trust in official and alternative scientific authorities

In the public debate, the propagation of pseudoscientific ideas is often described as the result of ignorance, scientific illiteracy, and disinformation (or misinformation). Research conducted in the fields of both pseudoscientific beliefs and conspiracy theories have generally confirmed the existence of a relationship, on an individual basis, between these orientations and educational qualifications. These results support the idea that a longer educational path should endow people with a body of knowledge and a predisposition for rational thinking and technical reasoning. Higher levels of scientific understanding would, in turn, inhibit support for such beliefs and offer protection against misleading claims (Wood et al., 2012; Kahan et al., 2012). This theoretical posture is consistent with the idea (inspired by the Enlightenment) which associates modernity with the (linear and inescapable) affirmation of rationality and the scientific method. While recognising the naive and simplistic character of this formulation, we can translate it into the (provisional) basic expectation that support for pseudoscience is negatively associated with scientific knowledge. Scientific knowledge can result from various individual attributes related to educational and professional background, personal interest, and exposure to scientific information. The survey used in this article did not collect 'objective' measures relating to specific scientific notions possessed by the respondents. It does, however, provide information on educational qualification, personal interest in science and exposure to

scientific information. All of these dimensions are expected to inhibit pseudoscientific beliefs and will be used to control del model presented in section 3.

Nevertheless, the theoretical framework outlined in the previous section suggests at least caution in drawing automatic links between levels of scientific knowledge and reliance on pseudoscientific theories. If the latter persist in the post-modern scenario, in which levels of education and available sources of information are incomparably higher than in the past, this relationship must necessarily be more complex. The strengthening of people's autonomy in their approach to science and the emergence of a scientifically sceptical attitude, as well as making people 'less susceptible to arguments that present logical fallacies' (Mancosu et al., 2017, p. 331), can also affect official science, undermining the credibility of scientifically sound claims. The 'deficit model of public understanding of science' has long been disputed (Bucchi & Neresini, 2008). In this respect, Nickels reports that 'studies of the public engagement with science tend to show that the more members of the general public learn about how science is really done, the less confidence they have in it' (Nickles, 2013, p. 115).

Particularly fruitful in the attempt to unravel these theoretical puzzles is the perspective provided by Keren (2018). The philosopher of science suggests that the objective of improving the public understanding of science should be pursued integrating the dominant *Scientific Content (SC)* approach with the *Scientific Division of Labor (SDoL)* approach. The former aims at improving the public understanding of scientific texts and the content of science (concepts, theories, facts, methods), usually by adopting a top-down communicative process. The latter 'emphasises the importance of the division of cognitive labour between expert scientists and laypersons'. This approach should foster the emergence of 'competent outsiders' (Feinstein, 2011), who recognise the authority of experts providing them with 'preemptive reasons' (Zagzebski, 2012) to believe scientific claims. Because – Keren contends – 'a better understanding of scientific contents, unaccompanied by a proper understanding of the division

of cognitive labour might tempt some laypersons to base beliefs about scientific issues on their own weighing of scientific evidence rather than on the authority of experts' (Keren, 2018). It is precisely distrust in (official) scientific authorities and the lack of a proper assessment of the division of scientific labour that, in the present times, seems to undermine scientific claims and foster the spread of pseudoscientific beliefs.

McMyler points out that, while the exercise of practical authority – aiming at obedient action – does not (necessarily) require trust, 'trust seems to play a more central role in the exercise of epistemic authority' – aiming 'at influencing the beliefs of others' (2021, pp. 77-79). If the erosion of trust in traditional authorities is one of the hallmarks of post-modernity, we can expect that pseudoscientific beliefs are fostered by distrust in (official) science and scientists (Oreskes, 2019). Indeed, distrust in (official) scientific authorities is one of the most studied among the factors that boost pseudoscience (Pasek, 2019). In general, we can therefore expect that

H1 (trust in science hypothesis) the lower the trust in science and scientists, the higher the support for pseudoscientific beliefs.

Scientific knowledge is not only the result of rigorous methods and the individual work of scientists. It is a collective, cooperative and interactive product: it entails the existence of scientific institutions and a scientific community – a 'thought collective' in Fleck's words (1935; Oreskes, 2019). But, when the scientific community is perceived as distant and untrustworthy, separate from the rest of the public and carrying special interests, individuals may turn to alternative communities and unofficial sources of scientific knowledge. In other words, if 'official' expertise is perceived as biased, this may favour the emergence of the pseudo-expertise of pseudo-experts.

The post-modern age is the age of contamination between different types of expertise, which finds in the hybrid media system (Chadwick, 2013) the ideal context in which to express itself. Saurette and Gunster have suggested that post-modern media – political talk radio (PTR), in their study – promote what they call *epistemological populism*, which 'employs a variety of populist rhetorical tropes to define certain types of individual experience as the only ground of valid and politically relevant knowledge' (Saurette & Gunster, 2011, p. 196). While undermining traditional well-established epistemic authorities, new media thus promote an alternative epistemology (Giorgi and Eslen-Ziya 2022).

Social media and the so-called Web 2.0 in particular provide the ideal 'place' in which different types of expertise, stemming from different types of authority, and the non-expertise of 'normal' people meet, blend and become indistinguishable (Gemini et al., 2021). According to the ideology of web, every opinion must have the same dignity and weigh as much as the others, beyond any form of mediation and any kind of 'scientific authoritarianism'. On the internet, celebrities from different domains of the star system (from sports to pop music) become experts on a wide range of subjects (including science), while sectoral experts (including scientists) often become celebrities themselves. This explains why the Internet abounds with prophets of deviant doctrines. This picture emerged even more sharply during the Covid-19 'infodemic' (Rothkopf, 2003). Extant research has focused on the relationship between pseudoscientific theories, media diets and trust in different news outlets. The study by Ejaz et al. (2021), for example, showed that beliefs in conspiracy theories related to the Covid-19 pandemic in Pakistan were negatively associated with trust in traditional media and positively associated with trust in social media.

The expectation formulated in this paper is that today's socio-political-media eco-system, besides promoting the exaltation of individual knowledge and inhibiting trust in official scientific authorities, promotes the 'improvised [pseudo]expertise' (Dentith, 2018) of

alternative scientific authorities. The latter combines ordinary people and authorities from other (neighbouring or distant) domains, further undermining the principle of division of scientific labour (SDoL). If this approach is valid, we can expect that

H2a (alternative authorities hypothesis) the higher the trust for alternative scientific authorities, the higher the support for pseudoscientific beliefs.

We can also expect the effect of exposure to scientific information to be mediated by trust in alternative scientific authorities. In particular, we can expect that

H2b ('alternative' effect of information) the negative effect of exposure to scientific information on support for pseudoscience is diminished or even reversed for those who trust alternative scientific authorities.

Alternative political choices

Today's challenges to mainstream science share a common social, cultural, and political milieu with the challenges faced by mainstream politics. Extending the line of reasoning developed so far, it is possible to draw possible theoretical links between unorthodox scientific views and certain emerging political phenomena pertaining to the sphere of democratic malaise and populism.

According to the ideational approach (Mudde 2017), populism can be defined as thin-centred ideology that 'considers society to be ultimately separated into two homogeneous and antagonistic groups, "the pure people" versus "the corrupt elite", and which argues that politics should be an expression of the volonté générale (general will) of the people' (Mudde, 2004).

As anticipated in the previous section, the proponents of pseudoscientific (conspiracy) theories share with populism their dichotomous view of the world. Populist political actors increasingly include scientific elites among their targets. Especially after the outbreak of the Covid-19 pandemic, populist political actors have often show proximity to the promoters of pseudoscientific theories and their ideas, confirming their role as central actors in the ongoing 'war on science' (Thompson & Smulewicz-Zucker 2018; Giorgi and Eslen-Ziya 2022). Populist actors can be seen as part of those alternative scientific authorities that spread or amplify alternative epistemologies related to epistemological populism.

Scholars of conspiracy theories offer interesting perspectives on this relationship. This strand of literature has suggested a link between conspiracy beliefs, distrust of political institutions, extremist (especially right-wing) and populist electoral orientations (Vezzoni et al., 2022; Mancosu et al., 2017; Einstein & Glick, 2015; van Prooijen et al., 2015). Wood and Douglas point out that a significant proportion of extant research has linked these attitudes and perceived *outsiderdom*: a sort of anomie, alienation and separation from mainstream society, 'a feeling that one's own values and beliefs are not represented in broader society' (2019, p. 249). These arguments largely match the interpretations that see voters of populist parties as the 'losers of globalisation' (Kriesi et al., 2006) or angry left-behind, and read their choices as a reaction to the economic, cultural and political consequences of globalisation and its recurrent crises.

Research, however, has shown that populism has several explanations beyond perceived outsiderdom and deprivation – factors linked to ideology, issue salience or populist attitudes – and that populism comes in different varieties (Zulianello 2020; Zulianello and Larsen 2021). In addition, several strategies have been proposed to measure populism and identify populist political parties. Although recognizing the importance of considering populism in terms of degrees (Meijers and Zaslove, 2021; Caiani and Graziano 2019; Gidron and Bonikowski 2013),

this article uses a dichotomous approach, focusing on support for populist and non-populist parties (Rooduijn et al., 2019). We can expect that:

H3 (populist politics hypothesis) the higher the support for populist parties, the higher the support for pseudoscientific beliefs.

3. Measuring pseudoscientific beliefs and their determinants

The hypotheses outlined in the previous session will be tested on data from a CAWI survey carried out by Demos&Pi and Fondazione Unipolis on the voting age population (over 18 years old) of five European countries: France, Germany, Italy, The Netherlands, and the United Kingdom. The survey was carried out in the spring of 2021 (field: 5-14 May) on a total sample of 5,081 cases (about 1000 for each country). Within each country, the cases were selected to reproduce the quotas for the main socio-demographic variables (gender, age group, geographical area). Although the choice of the five countries was made by the research institutes independently of the (specific) objectives of this study, the five countries offer a broad perspective on Western Europe both from a demographic point of view and regarding the substantive issues addressed in the article. The selection offers good coverage on the North-South axis, including the four largest countries in the region. The five countries also provide a good degree of variability in levels of scientific and technological development, when measured in terms of gross domestic spending on R&D (as a percentage of GDP[1]). Moreover,

[1] Considering 2019 OECD data, this index was: Germany 3.190; France 2.196; The Netherlands 2.184; United Kingdom 1.756; Italy 1.466.

the indicators included in the questionnaire cover the main dimensions that shape the theoretical framework of this article.

Constructing the dependent variable: a Pseudoscientific Beliefs Index (PBI)

Following the theoretical breakdown of pseudoscience offered by Hansson (2017), the research included indicators related to both *pseudo-theory promotion* (PTP: 6 items) and *science denial(ism)* (SD: 5 items). Respondents were asked to what extent they considered each of the 11 science-related statements randomly proposed to them to be credible. Table 1 provides the exact wording for the battery and each statement, together with the distribution in the overall sample.

The list includes relevant scientific statements known to have become the object of contestation by specific groups or currents of opinion, such as those concerning evolutionism, anthropogenic global warming, the effectiveness of vaccines or the relationship between smoking and the likelihood of developing certain serious diseases. It also includes the classic (Copernican) scientific acquisition on heliocentrism, doubts about which are often matched by flat earth theories, which are also included in the list of 'unofficial' scientific theories. The latter include 'traditional' pseudoscientific positions, such as those concerning astrology. It also includes medicinal practices with a wide popular following but lacking scientific proofs, as in the case of homeopathy. Finally, the list comprises scientific claims associated with conspiracy theories, such as those concerning moon landing denialism, aircraft chemtrails – described in the item as part of a plot to alter earth's climate – or the Covid-19 pandemic – the questionnaire suggested that the virus was developed and kept in circulation to benefit pharmaceutical companies.

All official scientific theories were considered credible by a large majority of respondents, ranging from 74 to 83 per cent. Only small segments of the sample (openly) contested them, with a maximum of 10 per cent in the case of evolutionism. However, it is important to stress that an additional (significant) proportion of respondents preferred not to answer (or were unable to), bringing for many theories the area of (potential) denialism to around one in four. Broader support was recorded, in general, for claims related to pseudo-theory promotion, ranging from 15% for flat-earthism to 42% for homeopathy.

These preliminary results suggest the importance of using statements with different polarity (including both scientific and pseudoscientific claims) and item randomisation in order to limit the problems of acquiescence and response set. However, they leave open the question of whether there is a single dimension underlying pseudoscientific beliefs that could lead to the construction of a synthetic index. Koertge reports that 'supporters of one kind of pseudoscience are statistically more likely to have unorthodox views on seemingly unrelated subjects' (2013, p. 168). Similarly, research has shown that 'one of the strongest predictors of someone's opinion of a conspiracy theory is their thoughts about other conspiracy theories', even when these views are not directly interlinked or even contradict each other (Wood & Douglas 2019).

The computation of Cronbach's alpha statistic for the scale formed from the 11 items largely confirms these results (Table A.1 in the online appendix). Each item was recoded to have a 5-value score ranging from -2 to +2. For PTP items, the original answers were assigned the following values: -2 'not credible at all'; -1 'not very credible'; 0 'don't know' / no answer; +1 'fairly credible'; +2 'very credible'. The corresponding values for official scientific theories were inverted to translate them into SD indicators. The resulting additive scale appear to be reliable (coefficient: 0.898), even if the homeopathy item does not seem to fit well in the scale:

its item-rest correlation – the correlation between the item and the scale formed by all other items – is lower than those of the other items.

Factor analysis performed using a polychoric correlation matrix – particularly suitable with categorical (ordinal) variables – largely confirms these preliminary findings (Table A.2a in the online appendix). The analysis suggests that two factors, which jointly explain about 64% of the total variability, should be retained. However, the second factor, positively associated with SD items and negatively associated with STP items, seems to signal a possible response set problem that points back to the original scale – before reversing the scores for SD items. On the other hand, the first factor, which explains 43% of the variability, seems to capture the dimension of pseudoscientific beliefs, being positively associated with all the variables. However, the uniqueness of the homeopathy variable for the two-factor solution was 0.51, further suggesting the removal of this indicator. The model without homeopathy (Table A.2b) actually seems to improve, bringing the variance explained by the two-factor solution above 66% and increasing the distance between the first (47%) and second factor (20%).

These results might suggest using the factor scores of Factor 1 as an index of pseudoscientific beliefs, thus depurating it from the response set effect. However, in order to favour the straightforwardness of the subsequent analyses and their replicability in other studies, a simple additive index was preferred, computed as the arithmetic mean of the 10 items (excluding homeopathy). This *Pseudo-scientific Beliefs Index* (PBI), which ranges from -2 to +2, presents a correlation of 0.999 with the factor scores of Factor 1. Its average value is about -0.9, meaning that, on average, respondents from the five countries consider ‘not very credible’ PTP claims and ‘fairly credible’ official scientific claims (thus rejecting SD). The PBI reaches the lowest level in Italy (-1.2) and the highest value in The Netherlands (-0.8).

The PBI will be used as the dependent variable in a series of OLS regression analyses presented in the next section, which follows the sequence of hypotheses formulated in this

article. In the remaining part of this section, the operationalization of the independent variables used in the models will be presented.

The determinants of pseudoscientific beliefs: the independent variables

All models presented in the next section are controlled for two socio-demographic variables.

- *Gender*. This is a dichotomous variable with 'men' as the reference category.

- *Age*. Continuous variable divided by 10.

All models also include variables that can be considered as proxies for scientific knowledge.

- *Education*. Categorical variable on three levels: low (reference category: up to lower secondary education); medium (up to upper secondary education); high (tertiary education).

- *Interest in Science (IN)*. A dummy variable identifying respondents who are "very" or "quite" interested in scientific-technological evolution.

- *Exposure to scientific information Index (EX)*. The index was constructed as an additive scale using a battery of four items measuring individual exposure to sources concerning scientific-technological evolution (Cronbach's alpha: 0.878; see Table A.3 for exact question wording). This solution was also tested through a factor analysis performed using a polychoric correlation matrix, which suggested the existence of a single factor explaining 78% of the variability.

In order to test H1 and H2a-b, the next set of independent variables relates to trust in science and scientific authorities.

- *Trust in science index (TS)*. This is an additive index computed from two items measuring individual trust in science and scientists (Cronbach's alpha: 0.811; see Table A.3 for exact question wording).

- *Trust in mainstream (MA) and alternative scientific authorities (AA)*. The questionnaire contained a 11-item battery measuring the respondent's trust in scientific claims when made

by different subjects (see Table A.3 for exact question wording). In order to identify alternative scientific authorities and construct a corresponding index, this set of variables was first analysed using factor analysis performed on a polychoric correlation matrix, which revealed the existence of two factors explaining almost 66% of the overall variability (Table A.4a-b). The results also suggest that the two factors should be jointly analysed. Factor 1 seems to identify a generic measure of trust, while Factor 2 seems to divide mainstream/official sources of science-related information (scientists working in the public or private sectors, doctors and scientific communicators, journalists that the respondent holds in high esteem) from other sources.

Although the above-mentioned category of journalists should be considered a borderline category – not all journalists covering science issues are (official) science journalists –, the second group includes subjects who belong to domains of social life that are clearly explicitly from official science: a politician from the party the respondent votes for; the star of a show the respondent likes; a sportsperson the respondent is a fan of; a blogger or influencer whom the respondent follows; a religious figure whom the respondent has as a reference; a friend or relative of the respondent. The latter indicator (friends or relatives), however, has a high level of uniqueness (0.498). For this reason, it was excluded in subsequent analyses, which then consider a balanced number of mainstream and alternative scientific authorities (each containing 5 subjects). The sequence of models presented in the next section will include two basic additive indices obtained from the simple count of the number of mainstream authorities and alternative authorities the respondent trusts (‘a lot’ or ‘very much’) – the two final indices will therefore range from 0 to 5.

The final set of independent variables relates to political and electoral attitudes, in order to test the hypothesis related to and populism (H3).

- *Self-placement on the left-right ideological scale*. Although individual ideological position is not involved in the hypotheses tested in this article, its relevance in studies on the relationship between conspiracy beliefs and political attitudes suggested the inclusion at least as an additional control variable (which, however, will be included only after testing hypotheses H1 and H2a-b). The questionnaire included a variable which, introducing the categories of left and right, asked the respondent to take place on five possible levels: left, centre-left, centre, centre-right, right. This variable will be introduced in the models as a categorical variable considering the *outsiders* as a reference category: the *outsiders* include non-respondents and those who 'don't see [themself] in this scheme' (this answer was explicitly foreseen in the questionnaire).
- *party proximity*. The questionnaire included questions about the respondents' proximity to parties estimated by major polls to be over 5% at the beginning of May 2021[2]. Each respondent was asked if she felt 'a lot', 'somewhat', 'a little', 'not at all' close to each party or movement. These variables have been used as continuous variables in the models presented in the next section: this methodological stretch will be compensated by the greater ease of comparison between the parameters of the different predictors; however, robustness checks were made by transforming these variables into dichotomous variables, obtaining similar results. Using the classification provided by PopuList 2.0, 'Populist', parties were identified (Rooduijn et al., 2019): Table 3 also include information about 'Far Left' and 'Far Right' which might be useful in the interpretation.

4. The results

[2] Parties over 5% were selected using the information provided by Politico's «Poll of polls» (www.politico.eu/europe-poll-of-polls/) and the Europe Elects project (https://europeelects.eu/).

Table 2 provides the results of a series of nested OLS regression models using the *Pseudo-scientific Beliefs Index* (PBI) as the dependent variable and sequentially introducing the predictors associated with the set of assumptions outlined in section 2. As already mentioned, the analysis presented in this paper focuses on the five countries jointly and does not explicitly include country differences in its hypotheses. However, each model includes country dummies and has been tested separately in each country to get first clues about the robustness of general results across the five countries (Table A.6-9 in the online appendix). For each model, both regression coefficients and beta coefficients are reported in order to favour comparison on the relative strength of each predictor[3].

Model 1 is a baseline model that includes only demographic variables and indicators of scientific knowledge. The results only partially support the expectations suggested by the literature. Pseudoscientific beliefs are negatively associated with education and interest in science. Medium and especially high levels of education are significantly associated with a reduction in PBI. At the same time, people with higher interest in science (IN) show a lower propensity to embrace pseudoscientific views. However, the results reveal a positive relationship between exposure to scientific information (EX) and pseudoscientific beliefs. Contrary to expectations, higher 'science consumption' seems to produce scientific denialism and pseudo-theory promotion. These results generally hold across the five countries (Table A.6). The model – which explains about 25% of the overall variability – also reveals that pseudoscientific beliefs are relatively more widespread among younger people and women (compared to men) – but the relationship with gender is confirmed only in Italy.

[3] For the same reasons, beta coefficients are also reported for categorical predictors, although standardisation does not permit a substantive interpretation of this parameter.

Model 2 adds the Trust in science index (TS) to Model 1, confirming the expected relationships and bringing the explained variance to 32%. The empirical results support hypothesis H1: pseudoscientific beliefs are significantly more prevalent among people with low levels of trust in science (and scientists). This result is also robust across the five countries (Table A.7). In order to better distinguish trust in mainstream and alternative scientific authorities, the two respective indices (MA and AA) replace general trust in science (TS) in Model 3. Consistently with H2a, the parameters of the two indices show opposite signs, and reliance on alternative scientific authorities significantly contributes to PBI: its beta parameter is (in absolute values) the highest of all predictors in the model. In addition, the explained variance of the model rises to 45%. Additional robustness checks were carried out using the factor scores of the two factors (Table A.4b in the online appendix) isolated from the analyses presented in the previous section (Model 3c: Table A.5b in the online appendix) and by directly introducing the 11 elementary indicators of trust in mainstream and alternative scientific authorities into the model (Model 3d: Table A.5b in the online appendix). These checks confirm the results and support the parsimony of Model 3, as the explained variance is quite similar. Model 3d also makes it possible to identify which of the 11 elementary indicators contribute most to the significance of the two indices. Reliance on pseudo-scientific claims is inhibited in particular by trust in scientists working at the University or in a public centre. On the contrary, it is favoured especially by trust in scientific claims made by bloggers or influencers followed by the respondent.

The other parameters in Model 3 generally confirm the findings already suggested by Model 2. Exposure to scientific information maintains its positive relationship with the dependent variable, but at the country level this relationship emerges as statistically significant only in Germany and the UK (Table A.8). Precisely because the effect of exposure to science news is positive, it is important to investigate whether this relationship changes as a function

of trust in mainstream (MA) and alternative scientific authorities (AA). In particular, H2b suggested that reliance on alternative scientific authorities could alter the effect of EX on PBI. This hypothesis is indeed supported by Model 3a which introduces the interaction terms between MA and EX and between AA and EX. Only the latter is statistically significant. Figure 1 provides a more immediate insight of the joint effect of AA and EX on pseudoscientific beliefs. It maps the predicted values of PBI (according to Model 3a) at different levels of trust in alternative scientific authorities and exposure to scientific information. It shows that, for low levels of trust in alternative scientific authorities, the endorsement of pseudoscientific views is low and essentially independent of exposure to scientific information. In contrast, for higher levels of trust in alternative scientific authorities, the relationship between exposure to scientific information (when controlled for education and interest in science) becomes positive.

These results seem to suggest that Keren's (2018) Scientific Division of Labor (SDoL) approach is particularly useful for reading the impact of scientific information on pseudoscientific beliefs. To better capture the concept of scientific division of labour, a four-category typology (TYP) combining low (L) and high (H) levels of trust in MA and AA was constructed[4]. The typology was then included in Model 3b (see Table A.5a in the online appendix) together with its interactions with EX. Both TYP categories and their interactions with EX reveal statistically significant relationships, which can be better assessed through the use of marginal effects.

The first graph in Figure 2 displays the predicted levels of PBI for the four groups of TYP. Consistent with our theoretical expectations, the lowest levels of the index (just over -1.4) are observed for Group 2, composed of people with high levels of trust in MA and low levels of trust in AA. In contrast, pseudoscientific beliefs reach the highest level (almost -0.6 PBI) for

[4] Low and high levels were identified by dividing cases lower than the median value and cases equal to or higher than the median value.

those who value alternative scientific authorities over mainstream scientific authorities: Group 3. Intermediate and similar values are estimated for Group 1 and Group 4. The first group, consisting of people exhibiting low values for both MA and AA, is just above -1. However, it is interesting to note that higher levels of trust in MA do not seem to reduce PBI when combined with high levels of AA, as is the case for people in Group 4. The second graph illustrates the relationship between EX and PBI for the four groups identified by TYP. It confirms that the relationship between the two variables holds, in a positive sense, only for groups characterised by high levels of trust in AA – Group 3 and Group 4 – while it is non-existent when trust in AA is low – Groups 1 and 2. The graph also clarifies the interplay between exposure to scientific information and trust in different types of scientific authority. For low levels of exposure to scientific information, the groups characterised by trust in official scientific authorities (2 and 4) display the lowest levels of endorsement of pseudo-science. When exposure is high, in contrast, trust in alternative authorities makes the difference: groups 3 and 4 exhibit significantly higher levels of PBI than the other two groups.

Model 4 introduces the respondent's ideological self-placement on the left-right axis in the model. All coefficients are negative and statistically significant. This means that they are mainly those who refuse to take a position – the reference category – who express the highest level of PBI, as illustrated by Figure 3. Lower values are observed for those who place themselves in the centre, on the right or centre-right. But they are especially those on the left or centre-left to express the lowest values. As the 5-point scale used in the survey does not allow the identification of ideologically extreme positions, the results cannot fully reject the idea that pseudoscientific beliefs are associated with extremist politics. What the results seem to suggest is that support for pseudoscience is higher on the right of the political spectrum and, especially, among ideological outsiders: people who hold post-ideological orientations and do not recognise the traditional political space and its coordinates. Nevertheless, two observations

are in order. First, the distances between the values illustrated by the graph, although statistically significant, are rather small and Model 4 adds little, in terms of explained variance (46%), when compared to Model 3. Second, the pattern is not consistent across the five countries. In the Netherlands, the UK, and partly in Germany, right-wing voters approach the values of ideological outsiders. In Italy, on the other hand, voters located on the centre and centre-right express the highest values of PBI, while the relationship between PBI and the ideological axis appears particularly less pronounced in France. The weakness and instability of these relationships seem to emphasise the relevance of national factors which might depend on the specific features of national party systems, which will be investigated in the next set of models introducing proximity to major parties into the equation.

Table 3 display the results of a series of models in which the party proximity variables are first introduced one by one and controlled for gender and age only (Model 5a), then they are introduced all together at the country level as additional predictors to Model 4 (Model 5b[5]). Table 3 complements the information provided by the beta parameters with the classification of each party as a populist, far-left or far-right party in the PopuList project.

The most remarkable pattern revealed by the results concerns the association between pseudoscientific beliefs and proximity to parties classified as populist: the beta parameter is positive and statistically significant for 10 out 11 of the parties that fall into this category both for the 5a and the 5b series – in the first case the excluded party is the German Die Linke, in the second case the Italian FDI. Many of these parties also correspond with those classified by PopuList as far-left or far-right, with two exceptions: the Italian FI – moderate right – and M5S – post-ideological or valence populist (Zulianello and Larsen, 2021). Then there are six parties that present positive and statistically significant parameters but are not classified as populist. These are the German FDP, the Dutch CDA and all four British parties considered in this study.

[5] The full model specification and results are provided in Table A.10a-e in the online appendix.

Only the British Liberal Democrats and the Conservative Party, however, remain associated with high PBI values in the full model (5b). It should be noted that this is the only national case that does not include a party classified as populist among the major political forces. Finally, three parties emerge as negatively associated with PBI: the French and German Greens (Europe Écologie Les Verts and Bündnis 90/Die Grünen), together with the Dutch D66 (but only in Model 5a).

5. Conclusion

Scepticism is part of the principles on which science is based. Nevertheless, in the fluid and individualised post-modern society, scepticism has taken on a pathological and obsessive character. Along with ideologies, trust in any kind of authority has crumbled. Science is thus challenged by deviant doctrines which, thanks to the information abundance of the Internet, spread at unprecedented speed, act as powerful cultural attractors for fragmented individual beliefs, merge with conspiracy theories and populist narratives contesting the role of mainstream experts, mainstream politics, and mainstream media.

The Covid-19 pandemic has given further centrality to science and scientific expertise within the public debate. But it has also acted as a great multiplier for pseudoscientific narratives and science-related conspiracy theories, which limit the capacity of political systems to produce ‘good’ decisions on science-related issues (both in terms of individual choices and policy making). This further fuelled the debate on the role of the media and in particular the Web 2.0 in eroding trust in traditional epistemic authorities. For these reasons, the study of psudoscientific beliefs engages several disciplines and different areas of research.

The exploratory study presented in these pages has some limitations concerning both its geographical scope (which includes only five Western European countries) and the indicators

available in the questionnaire. In particular, regarding the relationship between pseudoscientific beliefs and political attitudes, it could not delve into the role of political ideology and radicalism, which will need to be addressed in future developments of this research. Moreover, the analysis focuses on the whole area without exploring country differences. Nevertheless, its findings are particularly relevant both to communication studies and populism studies.

First, the results endorse but at the same time delimit the explanations linking the spread of pseudoscientific beliefs to political *outsiderdom* and populist politics. The research reveals a significant association between the prevalence of pseudoscientific views and the rejection of the traditional categories of left and right. However, this relationship is not always consistent across the five countries. The only political pattern consistently detected across Western Europe connects the adoption of pseudoscientific views to the support for (both left-wing and right-wing) populist parties.

The results are also in line with studies that suggest caution in interpreting the propagation of pseudoscientific beliefs as the result of ignorance or scientific illiteracy. Although less educated people appear more likely to follow misleading scientific claims, higher levels of scientific information do not seem to 'protect' people against them. Pseudoscientific beliefs are actually linked to low levels of education, assumed as a proxy of scientific knowledge. Nevertheless, the empirical evidence supports the idea that the diffusion of scientific information and that strengthening of people's autonomy in their approach to science do not necessarily inhibit adherence to irrational and scientifically unsupported arguments. On the contrary, as suggested by Keren (2018), if not accompanied by an adequate understanding of the division of scientific labour, they can favour the embrace of pseudoscientific views. This was revealed by the interaction between exposition to scientific information and trust in alternative scientific authorities in promoting pseudoscientific beliefs.

The strongest predictors of pseudoscientific beliefs are, in fact, those related to trust in science. People who do not trust (official) science tend to rely more on pseudoscientific theories. But, in order to properly understand the phenomenon under study, the role of distrust in official scientific experts must be complemented by the increasing relevance of the improvised pseudo-expertise of alternative scientific authorities. These include ordinary people and authorities from other (neighbouring or distant) domains. Trust in them emerges as one of the most powerful predictors of pseudoscientific views.

The hybrid media system in which we are all immersed seems to promote contamination between different types of authority, often confusing it with celebrity, while the ideology of the web celebrates the non-expertise of 'normal' people. This undermines the principle of the division of scientific labor and the potential for making 'good' decisions on science-related issues, both in terms of individual choices and in policy making. Thus, as Keren points out, efforts made in improving – especially among the younger generation of digital natives – the public understanding of science should give a central role to the principle of the division of scientific labor (2018). Nevertheless, all the dynamics that characterise the intersection of politics and the media today seem to be pushing in the opposite direction.

The problem of demarcation between science and pseudoscience is also a problem of demarcation between mainstream scientific authorities and alternative scientific authorities, between official sources of scientific knowledge and alternative sources, between experts and celebrities. In this scenario, scepticism becomes a double-edged weapon. And many of those who claim they don't buy scientific claims, then end up buying any cheap, shoddy alternative truth at hand. Because – to paraphrase Chesterton's famous aphorism about God – the step is very short: between doubting everything and believing in everything.

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Table 1. Credibility of science-related statements in Western Europe (France, Germany, Italy, The Netherlands, United Kingdom)

Var. name	Statement	Very or fairly credible	D.K. / N.R.	Not very credible or not all credible	TOTAL	n. cases
Science Denial(ism) items - SD						
overheat	Human behaviour and consumption can cause earth to overheat	75	16	9	100	5081
vax	Vaccination is important to prevent serious illness	77	15	8	100	5081
evolution	Humanity is the result of a long evolution through species	74	17	10	100	5081
smoke	Smoking increases the likelihood of developing some serious diseases	83	12	5	100	5081
sun	The planetary system of which the earth is a part revolves around the sun	75	17	8	100	5081
Pseudo-Theory Promotion items - PTP						
flat	The earth is not round but flat	15	12	73	100	5081
moon	Man has never been to the moon	17	16	67	100	5081
chemtrials	Chemtrails left by aircraft are part of a plot to alter earth's climate	23	23	55	100	5081
homeopathy	Homeopathy is an important tool for curing diseases	42	33	25	100	5081
astrology	Astrology can provide insights into people's future	23	25	52	100	5081
bigpharma	Covid-19 was developed and kept in circulation to benefit pharmaceutical companies	27	22	51	100	5081

Source: Demos & Pi – Unipolis survey (May 2021)

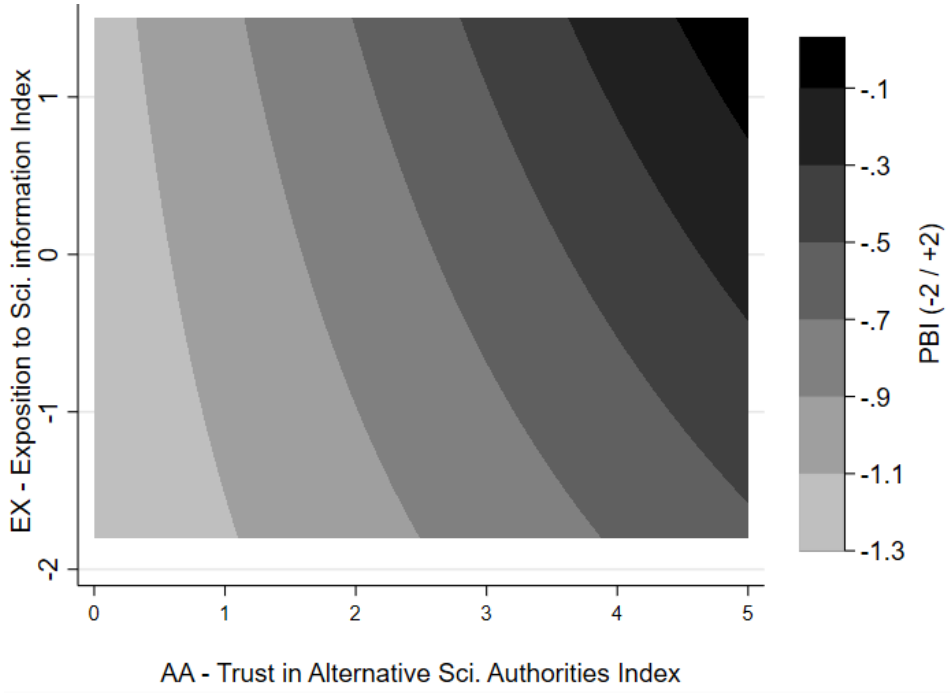
Table 2. OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Model 1				*Model 2*				*Model 3*				*Model 3a*				*Model 4*			
	Coef.	S.E.	Beta	Sig.	Coef.	S.E.	Beta	Sig.	Coef.	S.E.	Beta	Sig.	Coef.	S.E.	Beta	Sig.	Coef.	S.E.	Beta	Sig.
Gender: women [ref: men]	0.064	0.018	0.044	***	0.064	0.017	0.044	***	0.069	0.015	0.048	***	0.07	0.015	0.049	***	0.057	0.015	0.040	***
Age/10	-0.154	0.005	-0.368	***	-0.141	0.005	-0.336	***	-0.099	0.005	-0.235	***	-0.099	0.005	-0.235	***	-0.095	0.005	-0.227	***
Education [ref: Low]																				
- Medium	-0.296	0.022	-0.206	***	-0.266	0.021	-0.185	***	-0.175	0.019	-0.122	***	-0.172	0.019	-0.120	***	-0.173	0.019	-0.120	***
- High	-0.485	0.025	-0.301	***	-0.427	0.024	-0.265	***	-0.275	0.022	-0.171	***	-0.274	0.022	-0.170	***	-0.264	0.022	-0.164	***
IN – Interest in science	-0.270	0.025	-0.161	***	-0.143	0.025	-0.085	***	-0.125	0.022	-0.074	***	-0.108	0.022	-0.064	***	-0.12	0.022	-0.071	***
EX – Exposure to scientific information Index	0.135	0.012	0.164	***	0.213	0.012	0.259	***	0.062	0.011	0.075	***	0.002	0.02	0.002		0.064	0.011	0.078	***
TS – Trust in Science Index					-0.234	0.01	-0.305	***												
MA – Trust in Mainstream Sci. Auth. Index									-0.175	0.006	-0.393	***	-0.171	0.006	-0.383	***	-0.169	0.006	-0.379	***
AA – Trust in Alternative Sci. Auth. Index									0.210	0.005	0.485	***	0.198	0.006	0.457	***	0.210	0.005	0.486	***
EX * MA (interaction)													0.007	0.006	0.029					
EX * AA (interaction)													0.03	0.006	0.079	***				
Ideological self-placement [Ref: not placed]																				
- Left																	-0.141	0.028	-0.060	***
- Centre-left																	-0.161	0.024	-0.085	***
- Centre																	-0.054	0.023	-0.032	*
- Centre-right																	-0.088	0.025	-0.043	***
- Right																	-0.067	0.029	-0.027	*
Constant	-0.040	0.043			-0.202	0.042		***	-0.054	0.040			-0.086	0.041		*	-0.016	0.040		
Country dummies	yes				yes				yes				yes				yes			
Observations	5080				5076				5080				5080				5080			
Adjusted R^2	0.250				0.317				0.451				0.455				0.456			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*

Source: Demos & Pi – Unipolis survey (May 2021)

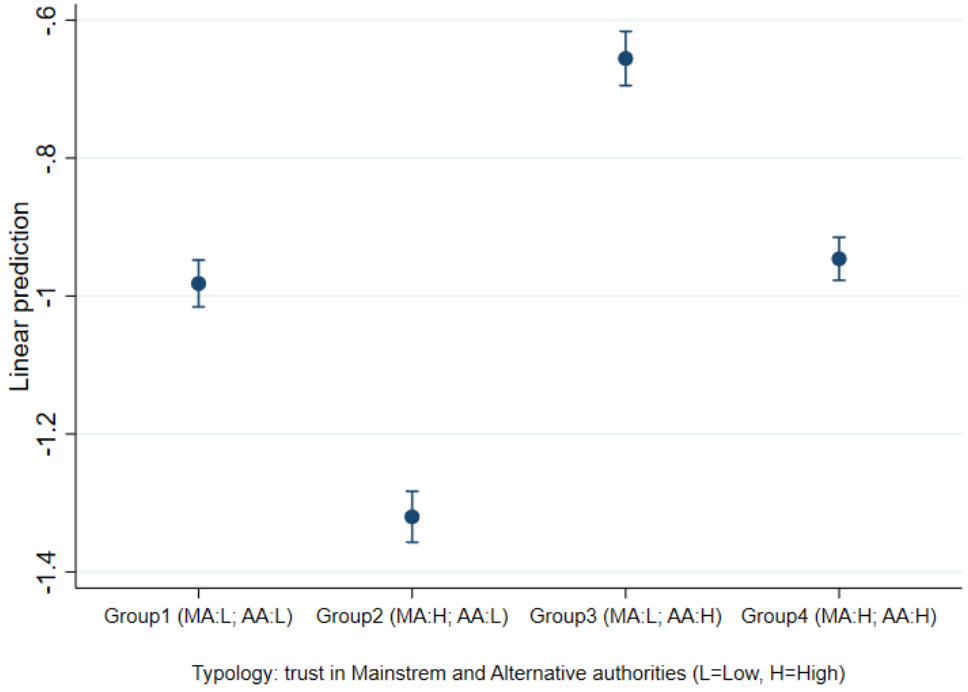
Figure 1. Predicted values of Pseudo-scientific Beliefs Index (PBI)[1] at different levels of trust in alternative scientific authorities and exposure to scientific information

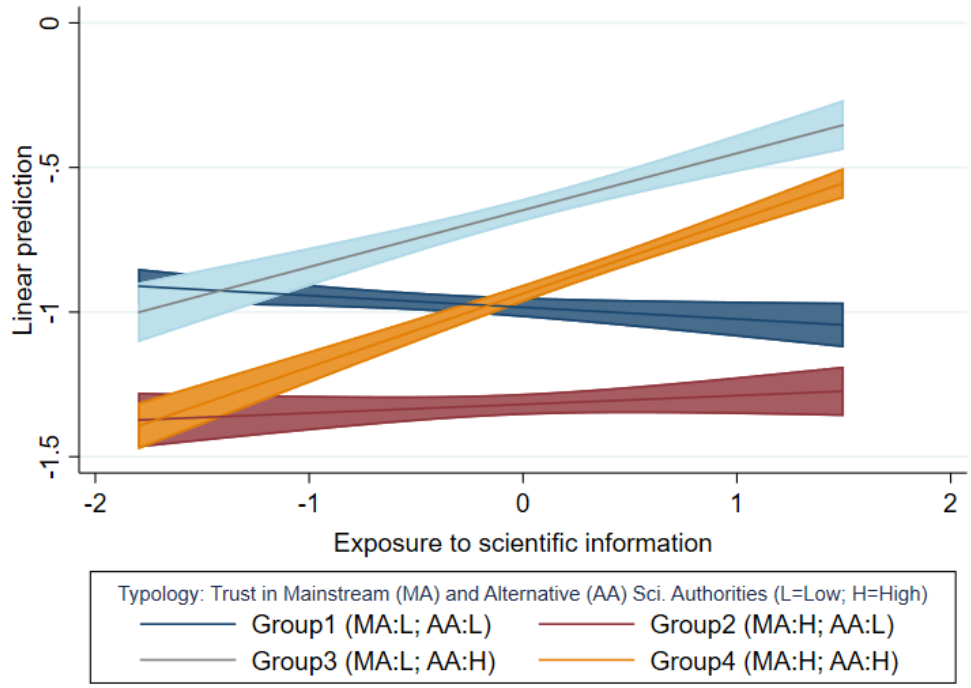


[1] *The predicted values are based on Model 3a (see Table 2)*

Source: Demos & Pi – Unipolis survey (May 2021)

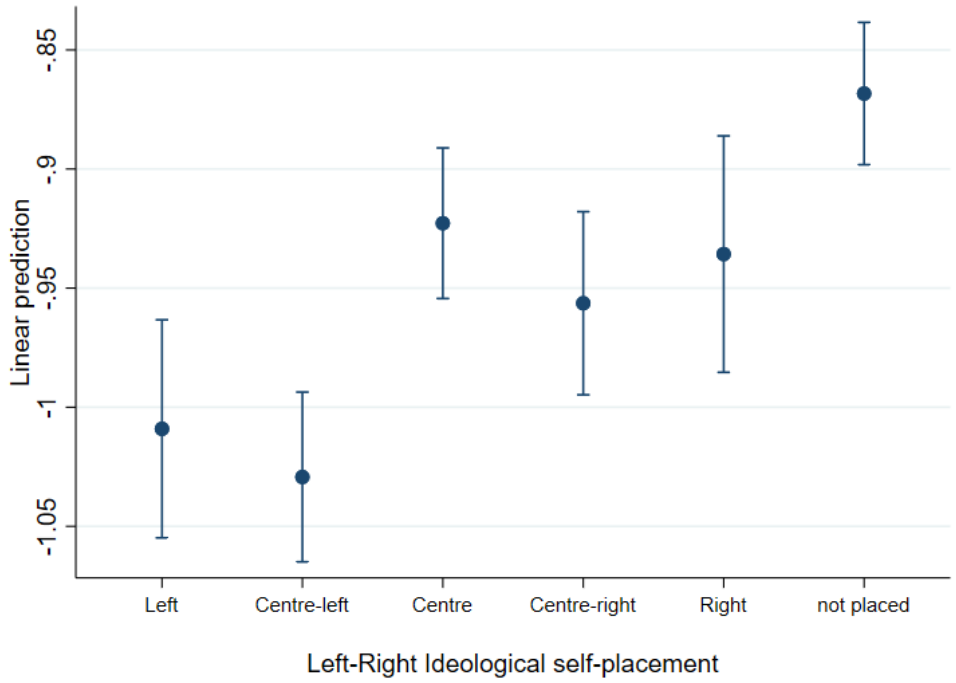
Figure 2. Predicted values of Pseudo-scientific Beliefs Index (PBI)[1] at different levels of trust in mainstream/alternative scientific authorities and exposure to scientific information





[1] *The predicted values are based on Model 3b (see Table A.2 in the Online appendix)*
Source: Demos & Pi – Unipolis survey (May 2021)

Figure 3. Predicted values of Pseudo-scientific Beliefs Index (PBI)[1] for left-right self-placement



[1] *The predicted values are based on Model 3a (see Table 2)*
Source: Demos & Pi – Unipolis survey (May 2021)

Table 3. Pseudo-scientific Beliefs and party proximity – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Party Classification[1]			Models 5a – one for each party[2]		Models 5b – one for each county[3]	
	Populist	Far Left	Far Right	Beta	Sig.	Beta	Sig.
FRA: FI (La France Insoumise)	X	X		0.143	***	0.116	***
FRA: EELV: Europe Écologie Les Verts				-0.077	*	-0.106	***
FRA: PS: (Parti Socialiste)				0.026		0.005	
FRA: LaREM (La République en Marche)				-0.034		0.006	
FRA: LR: (Les Républicains)				0.019		0.040	
FRA: RN (Rassemblement National)	X		X	0.114	***	0.056	*
GER: DL (Die Linke)	X	X		0.050		0.072	*
GER: GR (Bündnis 90/Die Grünen)				-0.082	**	-0.076	**
GER: SPD (Sozialdemokratische Partei Deutschlands)				-0.012		0.023	
GER: FDP (Freie Demokratische Partei)				0.085	*	0.027	
GER: CDU/CSU (Christlich Demokratische Union Deutschlands / Christlich-Soziale Union in Bayern)				0.027		-0.010	
GER: AfD (Alternative für Deutschland)	X		X	0.267	***	0.183	***
ITA: PD (Partito Democratico)				-0.013		-0.049	
ITA: M5S (Movimento 5 Stelle)	X			0.193	***	0.121	***
ITA: FI (Forza Italia)	X			0.307	***	0.180	***
ITA: LE (Lega)	X		X	0.268	***	0.114	**
ITA: FdI (Fratelli d'Italia)	X		X	0.215	***	-0.039	
NED: SP (Socialistische Partij)	X	X		0.083	**	0.029	
NED: GL (GroenLinks)				-0.012		0.020	
NED: PvdA (Partij van de Arbeid)				0.028		-0.011	
NED: D66 (Democraten 66)				-0.069	*	-0.054	
NED: CDA (Christen-Democratisch Appèl)				0.117	***	0.006	
NED: VVD (Volkspartij voor Vrijheid en Democratie)				0.013		-0.015	
NED: PVV (Partij voor de Vrijheid)	X		X	0.284	***	0.075	**
NED: FvD (Forum voor Democratie)	X		X	0.369	***	0.228	***
UK: LP (Labour party)				0.065	*	0.051	
UK: GR (The Green Party of England and Wales)				0.076	*	-0.015	
UK: LD (Liberal Democrats)				0.154	***	0.087	**
UK: CP (Conservative Party / Tory Party)				0.126	***	0.055	*

[1] Classification by PopuList 2.0 (Rooduijn et al 2019)

[2] Each party model is only controlled for gender and age

[3] Each country model is based on Model 4 (see Table 2), introducing the variables on party proximity (see Table A.10 in the Online appendix)

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.1. Credibility of science-related statements in Western Europe - Cronbach's alpha

Var. name	Sign	Item-test corr.	Item-rest corr.	Alpha
overheat (I)	+	0.520	0.392	0.799
vax (I)	+	0.613	0.501	0.789
evolution (I)	+	0.524	0.397	0.799
smoke (I)	+	0.601	0.487	0.790
sun (I)	+	0.532	0.406	0.798
flat	+	0.671	0.571	0.781
moon	+	0.661	0.559	0.783
chemtrials	+	0.685	0.588	0.780
homeopathy	+	0.364	0.218	0.816
astrology	+	0.610	0.498	0.789
bigpharma	+	0.647	0.542	0.784
Test scale				0.807

Note: I = Inverted

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.2a. Credibility of science-related statements – Factor analysis on a polychoric correlation matrix (n. cases: 5081)

Factor loadings (pattern matrix) and unique variances							
Var. name	Factor1	Factor2	Uniqueness		Eigenvalue	Proportion	Cumulative
overheat (I)	0.558	0.569	0.365	Factor1	4.752	0.432	0.432
vax (I)	0.683	0.403	0.371	Factor2	2.263	0.206	0.638
evolution (I)	0.585	0.509	0.399	Factor3	0.710	0.065	0.702
smoke (I)	0.685	0.498	0.284	Factor4	0.615	0.056	0.758
sun (I)	0.615	0.463	0.407	Factor5	0.493	0.045	0.803
flat	0.795	-0.287	0.285	Factor6	0.463	0.042	0.845
moon	0.748	-0.298	0.352	Factor7	0.434	0.040	0.885
chemtrials	0.751	-0.396	0.279	Factor8	0.398	0.036	0.921
homeopathy	0.332	-0.616	0.511	Factor9	0.320	0.029	0.950
astrology	0.653	-0.452	0.370	Factor10	0.280	0.025	0.975
bigpharma	0.702	-0.382	0.362	Factor11	0.272	0.025	1.000

Note: I = Inverted

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.2b. Credibility of science-related statements – Factor analysis on a polychoric correlation matrix (without homeopathy) (n. cases: 5081)

Factor loadings (pattern matrix) and unique variances							
Var. name	Factor1	Factor2	Uniqueness		Eigenvalue	Proportion	Cumulative
overheat (I)	0.589	0.545	0.356	Factor1	4.666	0.467	0.467
vax (I)	0.704	0.373	0.366	Factor2	1.982	0.198	0.665
evolution (I)	0.610	0.498	0.380	Factor3	0.637	0.064	0.729
smoke (I)	0.715	0.447	0.290	Factor4	0.510	0.051	0.780
sun (I)	0.639	0.441	0.397	Factor5	0.465	0.047	0.826
flat	0.781	-0.360	0.261	Factor6	0.459	0.046	0.872
moon	0.734	-0.377	0.319	Factor7	0.402	0.040	0.912
chemtrials	0.729	-0.455	0.262	Factor8	0.324	0.032	0.945
astrology	0.623	-0.476	0.385	Factor9	0.282	0.028	0.973
bigpharma	0.681	-0.445	0.338	Factor10	0.272	0.027	1.000

Note: I = Inverted

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.3. Independent variables

Var. name	Question	Answers
Interest in science:		
V01	In general, how interested would you say you are in scientific-technological evolution?	Very interested; Quite interested; Not very interested; Not interested at all
Exposure to scientific information		
V03A	In your everyday life, how often do you... Receive news on scientific-technological evolution through TV, radio, newspapers, social networks, websites?	Every day or almost every day; At least once a week; At least once a month; Less often; Never
V03B	[…] Search for news on scientific-technological evolution through TV, radio, newspapers, social networks, websites?	Every day or almost every day; At least once a week; At least once a month; Less often; Never
V03C	[…] Intentionally search for news on scientific-technological evolution through TV channels, magazines or websites specialised on these topics?	Every day or almost every day; At least once a week; At least once a month; Less often; Never
V03D	[…] Read books on scientific-technological evolution?	Every day or almost every day; At least once a week; At least once a month; Less often; Never
Trust in science:		
V05A	In general, how much confidence would you say you have in... science, understood as a set of knowledge acquired through research and the application of rigorous methods	Very much; A lot; Little; None
V05B	[…] scientists	Very much; A lot; Little; None
Trust in mainstream and alternative scientific authorities		
V07A	When you hear about theories, discoveries or claims about science, how much confidence do you tend to have if the following is the person talking... A scientist working at the University or in a public centre	Very much; A lot; Little; None at all
V07B	[…] A scientist working for a private company	Very much; A lot; Little; None at all
V07C	[…] A doctor	Very much; A lot; Little; None at all
V07D	[…] A scientific communicator	Very much; A lot; Little; None at all
V07E	[…] A journalist whom you hold in high esteem	Very much; A lot; Little; None at all
V07F	[…] A politician from the party you vote for	Very much; A lot; Little; None at all
V07G	[…] The star of a show you like	Very much; A lot; Little; None at all
V07H	[…] A sportsperson you are a fan of	Very much; A lot; Little; None at all
V07I	[…] A blogger or influencer whom you follow	Very much; A lot; Little; None at all
V07L	[…] A religious figure whom you have as a reference	Very much; A lot; Little; None at all
V07M	[…] A friend or relative	Very much; A lot; Little; None at all

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.4a. Trust in mainstream and alternative scientific authorities – Factor analysis on a polychoric correlation matrix (n. cases: 4921)

Factor loadings (pattern matrix) and unique variances							
Var. name	Factor1	Factor2	Uniq.		Eigenvalue	Proportion	Cumulative
V07A (scientist – public or univ.)	0.524	0.704	0.229	Factor1	5.445	0.495	0.495
V07B (scientist – private)	0.650	0.466	0.360	Factor2	1.788	0.163	0.658
V07C (doctor)	0.578	0.504	0.413	Factor3	0.688	0.063	0.720
V07D (scientific communicator)	0.636	0.461	0.383	Factor4	0.535	0.049	0.769
V07E (journalist)	0.742	0.156	0.426	Factor5	0.473	0.043	0.812
V07F (politician)	0.770	-0.167	0.379	Factor6	0.443	0.040	0.852
V07G (show star)	0.808	-0.370	0.210	Factor7	0.397	0.036	0.888
V07H (sportsperson)	0.804	-0.369	0.218	Factor8	0.387	0.035	0.923
V07I (blogger or influencer)	0.760	-0.371	0.284	Factor9	0.337	0.031	0.954
V07L (religious figure)	0.720	-0.341	0.366	Factor10	0.281	0.026	0.980
V07M (friend or relative)	0.687	-0.173	0.498	Factor11	0.223	0.020	1.000

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.4b. Trust in mainstream and alternative scientific authorities – Factor analysis on a polychoric correlation matrix (without 'friends and relatives') (n. cases: 4932)

Factor loadings (pattern matrix) and unique variances							
Var. name	Factor1	Factor2	Uniq.		Eigenvalue	Proportion	Cumulative
V07A (scientist – public or univ.)	0.545	0.688	0.230	Factor1	5.017	0.502	0.502
V07B (scientist – private)	0.664	0.447	0.360	Factor2	1.770	0.177	0.679
V07C (doctor)	0.577	0.503	0.414	Factor3	0.582	0.058	0.737
V07D (scientific communicator)	0.659	0.430	0.381	Factor4	0.522	0.052	0.789
V07E (journalist)	0.749	0.131	0.422	Factor5	0.448	0.045	0.834
V07F (politician)	0.772	-0.197	0.366	Factor6	0.417	0.042	0.876
V07G (show star)	0.799	-0.394	0.207	Factor7	0.392	0.039	0.915
V07H (sportsperson)	0.793	-0.390	0.219	Factor8	0.341	0.034	0.949
V07I (blogger or influencer)	0.760	-0.401	0.261	Factor9	0.287	0.029	0.978
V07L (religious figure)	0.716	-0.367	0.353	Factor10	0.223	0.022	1.000

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.5a. OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Model 3b			
	Coef.	S.E.	Beta	Sig.
Gender: women [ref: men]	0.072	0.017	0.050	***
Age/10	-0.124	0.005	-0.295	***
Education [ref: Low]				
- Medium	-0.242	0.02	-0.168	***
- High	-0.382	0.024	-0.237	***
IN – Interest in science	-0.184	0.024	-0.110	***
EX – Exposure to scientific information Index	-0.041	0.019	-0.049	*
TYP – High (H) and Low (L) levels of trust in MA and AA (Typology)				
- Group1 (MA: L; AA: L) [ref]				
- Group2 (MA: H; AA: L)	-0.335	0.026	-0.188	***
- Group3 (MA: L; AA: H)	0.336	0.027	0.179	***
- Group4 (MA: H; AA: H)	0.048	0.024	0.031	*
EX * TYP (interaction)				
- Group2 (MA: H; AA: L)	0.071	0.030	0.033	*
- Group3 (MA: L; AA: H)	0.237	0.031	0.105	***
- Group4 (MA: H; AA: H)	0.295	0.025	0.200	***
Constant	-0.251	0.045		***
Country dummies	yes			
Observations	5080			
Adjusted R^2	0.344			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*
Source: Demos & Pi – Unipolis survey (May 2021)

Table A.5b. OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Model 3c				*Model 3d*			
	Coef.	S.E.	Beta	Sig.	Coef.	S.E.	Beta	Sig.
Gender: women [ref: men]	0.065	0.015	0.045	***	0.072	0.015	0.05	***
Age/10	-0.088	0.005	-0.209	***	-0.091	0.005	-0.217	***
Education [ref: Low]								
- Medium	-0.167	0.019	-0.117	***	-0.162	0.019	-0.113	***
- High	-0.245	0.022	-0.153	***	-0.267	0.022	-0.166	***
IN – Interest in science	-0.121	0.022	-0.072	***	-0.113	0.022	-0.067	***
EX – Exposure to scientific information Index	0.058	0.012	0.071	***	0.059	0.011	0.072	***
Factor 1 (Factor analysis in Table A.4b)	0.094	0.011	0.106	***				
Factor 2 (Factor analysis in Table A.4b)	-0.459	0.01	-0.517	***				
V07A (scientist – public or univ.) (dichotomous)					-0.304	0.022	-0.181	***
V07B (scientist – private) (dichotomous)					-0.093	0.018	-0.064	***
V07C (doctor) (dichotomous)					-0.237	0.021	-0.136	***
V07D (scientific communicator) (dichotomous)					-0.115	0.019	-0.079	***
V07E (journalist) (dichotomous)					-0.122	0.018	-0.085	***
V07F (politician) (dichotomous)					0.033	0.02	0.021	
V07G (show star) (dichotomous)					0.205	0.024	0.121	***
V07H (sportsperson) (dichotomous)					0.224	0.023	0.136	***
V07I (blogger or influencer) (dichotomous)					0.297	0.024	0.169	***
V07L (religious figure) (dichotomous)					0.235	0.02	0.149	***
V07M (friend or relative) (dichotomous)					0.03	0.017	0.021	
Constant	-0.054	0.053			-0.074	0.04		
Country dummies	yes				yes			
Observations	4932				5080			
Adjusted R^2	0.479				0.466			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*
Source: Demos & Pi – Unipolis survey (May 2021)

Table A.6. MODEL 1 BY COUNTRY – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	5 COUNTRIES		France		Germany		Italy		The Netherlands		United Kingdom	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Gender: women [ref: men]	0.044	***	0.051		0.041		0.070	*	0.028		0.036	
Age/10	-0.368	***	-0.373	***	-0.444	***	-0.181	***	-0.397	***	-0.424	***
Education [ref: Low]												
- Medium	-0.206	***	-0.244	***	-0.262	***	-0.181	***	-0.211	***	-0.069	
- High	-0.301	***	-0.418	***	-0.252	***	-0.279	***	-0.351	***	-0.215	***
IN – Interest in science	-0.161	***	-0.195	***	-0.164	***	-0.150	***	-0.161	***	-0.151	***
EX – Exposure to scientific information Index	0.164	***	0.098	**	0.190	***	0.095	**	0.118	***	0.237	***
TS – Trust in Science Index												
MA – Trust in Mainstream Sci. Auth. Index												
AA – Trust in Alternative Sci. Auth. Index												
EX * MA (interaction)												
EX * AA (interaction)												
Ideological self-placement [Ref: not placed]												
- Left												
- Centre-left												
- Centre												
- Centre-right												
- Right												
Constant		***		***		***		***		***		**
Country dummies	yes		/		/		/		/		/	
Observations	5080		1030		1009		1014		1001		1026	
Adjusted R^2	0.250		0.257		0.291		0.105		0.277		0.254	

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.7. MODEL 2 BY COUNTRY – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	5 COUNTRIES		France		Germany		Italy		The Netherlands		United Kingdom	
	Beta	Sig.	Beta	Sig.	Beta	Beta	Beta	Sig.	Beta	Sig.	Beta	Sig.
Gender: women [ref: men]	0.044	***	0.046		0.043		0.082	**	0.008		0.030	
Age/10	-0.336	***	-0.346	***	-0.407	***	-0.141	***	-0.378	***	-0.403	***
Education [ref: Low]												
- Medium	-0.185	***	-0.241	***	-0.228	***	-0.151	***	-0.164	***	-0.056	
- High	-0.265	***	-0.408	***	-0.211	***	-0.232	***	-0.294	***	-0.174	***
IN – Interest in science	-0.085	***	-0.120	***	-0.093	**	-0.108	***	-0.081	*	-0.075	*
EX – Exposure to scientific information Index	0.259	***	0.194	***	0.270	***	0.191	***	0.237	***	0.342	***
TS – Trust in Science Index	-0.305	***	-0.255	***	-0.270	***	-0.356	***	-0.239	***	-0.352	***
MA – Trust in Mainstream Sci. Auth. Index												
AA – Trust in Alternative Sci. Auth. Index												
EX * MA (interaction)												
EX * AA (interaction)												
Ideological self-placement [Ref: not placed]												
- Left												
- Centre-left												
- Centre												
- Centre-right												
- Right												
Constant		*		**		***		***		**		
Country dummies	yes		/		/		/		/		/	
Observations	5076		1030		1009		1012		1000		1025	
Adjusted R^2	0.317		0.299		0.434		0.216		0.348		0.350	

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.8. MODEL 3 BY COUNTRY – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	5 COUNTRIES		France		Germany		Italy		The Netherlands		United Kingdom	
	Beta	Sig.	Beta	Sig.	Beta	Beta	Beta	Sig.	Beta	Sig.	Beta	Sig.
Gender: women [ref: men]	0.048	***	0.053	*	0.044		0.069	**	0.039		0.041	
Age/10	-0.235	***	-0.221	***	-0.275	***	-0.110	***	-0.274	***	-0.317	***
Education [ref: Low]												
- Medium	-0.122	***	-0.133	***	-0.160	***	-0.114	***	-0.117	***	-0.053	
- High	-0.171	***	-0.236	***	-0.134	***	-0.183	***	-0.200	***	-0.126	***
IN – Interest in science	-0.074	***	-0.111	***	-0.061	*	-0.073	*	-0.092	**	-0.076	*
EX – Exposure to scientific information Index	0.075	***	0.051		0.085	**	0.023		0.061		0.127	***
TS – Trust in Science Index												
MA – Trust in Mainstream Sci. Auth. Index	-0.393	***	-0.420	***	-0.398	***	-0.331	***	-0.387	***	-0.401	***
AA – Trust in Alternative Sci. Auth. Index	0.485	***	0.458	***	0.473	***	0.464	***	0.448	***	0.518	***
EX * MA (interaction)												
EX * AA (interaction)												
Ideological self-placement [Ref: not placed]												
- Left												
- Centre-left												
- Centre												
- Centre-right												
- Right												
Constant						*		**		***		
Country dummies	yes		/		/		/		/		/	
Observations	5080		1030		1009		1014		1001		1026	
Adjusted R^2	0.451		0.424		0.479		0.356		0.461		0.467	

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.9. MODEL 4 BY COUNTRY – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	5 COUNTRIES		France		Germany		Italy		The Netherlands		United Kingdom	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Gender: women [ref: men]	0.040	***	0.051	*	0.034		0.077	**	0.025		0.022	
Age/10	-0.227	***	-0.217	***	-0.261	***	-0.104	***	-0.254	***	-0.304	***
Education [ref: Low]												
- Medium	-0.120	***	-0.132	***	-0.158	***	-0.106	***	-0.110	***	-0.049	
- High	-0.164	***	-0.232	***	-0.130	***	-0.168	***	-0.175	***	-0.110	***
IN – Interest in science	-0.071	***	-0.113	***	-0.054		-0.095	***	-0.072	*	-0.065	*
EX – Exposure to scientific information Index	0.078	***	0.055		0.084	**	0.021		0.055		0.130	***
TS – Trust in Science Index												
MA – Trust in Mainstream Sci. Auth. Index	-0.379	***	-0.413	***	-0.377	***	-0.306	***	-0.353	***	-0.379	***
AA – Trust in Alternative Sci. Auth. Index	0.486	***	0.461	***	0.467	***	0.406	***	0.451	***	0.525	***
EX * MA (interaction)												
EX * AA (interaction)												
Ideological self-placement [Ref: not placed]												
- Left	-0.060	***	-0.057	*	-0.034		-0.072	*	-0.127	***	-0.086	***
- Centre-left	-0.085	***	0.007		-0.153	***	-0.069	*	-0.177	***	-0.109	***
- Centre	-0.032	*	-0.028		-0.081	*	0.110	***	-0.084	**	-0.083	**
- Centre-right	-0.043	***	-0.045		-0.050		0.061	*	-0.125	***	-0.108	***
- Right	-0.027	*	-0.005		-0.053	*	-0.004		-0.064	*	-0.027	
Constant								**				
Country dummies												
Observations	5080		1030		1009		1014		1001		1026	
Adjusted R^2	0.450		0.426		0.491		0.371		0.481		0.478	

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*

Source: Demos & Pi – Unipolis survey (May 2021)

Table A.10a. MODEL 5b (FRANCE) - OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Coef.	S.E.	Beta	Sig.
Gender: women (ref: men)	0.085	0.033	0.064	*
Age/10	-0.082	0.011	-0.202	***
Education (ref: Low)				
- Medium	-0.169	0.040	-0.126	***
- High	-0.313	0.048	-0.213	***
IN – Interest in science	-0.190	0.046	-0.125	***
EX – Exposure to scientific information Index	0.043	0.024	0.057	
MA – Trust in Mainstream Sci. Auth. Index	-0.159	0.013	-0.387	***
AA – Trust in Alternative Sci. Auth. Index	0.174	0.012	0.429	***
Ideological self-placement (Ref: not placed)				
- Left	-0.154	0.061	-0.078	*
- Centre-left	0.010	0.059	0.005	
- Centre	-0.082	0.057	-0.042	
- Centre-right	-0.159	0.067	-0.070	*
- Right	-0.081	0.055	-0.047	
Party proximity: FI	0.082	0.023	0.116	***
Party proximity: EELV	-0.069	0.021	-0.106	***
Party proximity: PS	0.003	0.023	0.005	
Party proximity: LaREM	0.004	0.019	0.006	
Party proximity: LR	0.027	0.021	0.040	
Party proximity: RN	0.033	0.016	0.056	*
Constant	-0.021	0.099		
Observations	1021			
Adjusted R^2	0.434			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*
Source: Demos & Pi – Unipolis survey (May 2021)

Table A.10b. MODEL 5b (GERMANY) - OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Coef.	S.E.	Beta	Sig.
Gender: women (ref: men)	0.045	0.033	0.032	
Age/10	-0.095	0.010	-0.234	***
Education (ref: Low)				
- Medium	-0.208	0.043	-0.146	***
- High	-0.168	0.050	-0.103	***
IN – Interest in science	-0.092	0.043	-0.060	*
EX – Exposure to scientific information Index	0.057	0.024	0.071	*
MA – Trust in Mainstream Sci. Auth. Index	-0.148	0.012	-0.345	***
AA – Trust in Alternative Sci. Auth. Index	0.180	0.012	0.435	***
Ideological self-placement (Ref: not placed)				
- Left	-0.188	0.077	-0.070	*
- Centre-left	-0.314	0.061	-0.173	***
- Centre	-0.147	0.050	-0.101	**
- Centre-right	-0.203	0.058	-0.103	***
- Right	-0.416	0.098	-0.106	***
Party proximity: DL	0.048	0.019	0.072	*
Party proximity: GR	-0.047	0.016	-0.076	**
Party proximity: SPD	0.016	0.019	0.023	
Party proximity: FDP	0.019	0.018	0.027	
Party proximity: CDU/CSU	-0.006	0.017	-0.010	
Party proximity: AfD	0.128	0.018	0.183	***
Constant	-0.080	0.096		
Observations	978			
Adjusted R^2	0.520			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*
Source: Demos & Pi – Unipolis survey (May 2021)

Table A.10c. MODEL 5b (ITALY) - OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Coef.	S.E.	Beta	Sig.
Gender: women (ref: men)	0.087	0.034	0.066	**
Age/10	-0.042	0.011	-0.104	***
Education (ref: Low)				
- Medium	-0.126	0.037	-0.094	***
- High	-0.242	0.050	-0.138	***
IN – Interest in science	-0.216	0.068	-0.088	**
EX – Exposure to scientific information Index	-0.002	0.025	-0.002	
MA – Trust in Mainstream Sci. Auth. Index	-0.158	0.014	-0.307	***
AA – Trust in Alternative Sci. Auth. Index	0.177	0.013	0.389	***
Ideological self-placement (Ref: not placed)				
- Left	-0.090	0.058	-0.047	
- Centre-left	-0.067	0.055	-0.041	
- Centre	0.163	0.064	0.071	*
- Centre-right	-0.074	0.060	-0.042	
- Right	-0.144	0.074	-0.065	
Party proximity: PD	-0.034	0.022	-0.049	
Party proximity: M5S	0.079	0.018	0.121	***
Party proximity: FI	0.126	0.025	0.180	***
Party proximity: LE	0.072	0.027	0.114	**
Party proximity: FdI	-0.024	0.027	-0.039	
Constant	-0.660	0.108		***
Observations	1004			
Adjusted R^2	0.413			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*
Source: Demos & Pi – Unipolis survey (May 2021)

Table A.10d. MODEL 5b (THE NETHERLANDS) - OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Coef.	S.E.	Beta	Sig.
Gender: women (ref: men)	0.042	0.035	0.029	
Age/10	-0.087	0.011	-0.213	***
Education (ref: Low)				
- Medium	-0.122	0.042	-0.083	**
- High	-0.210	0.047	-0.136	***
IN – Interest in science	-0.102	0.047	-0.066	*
EX – Exposure to scientific information Index	0.022	0.026	0.026	
MA – Trust in Mainstream Sci. Auth. Index	-0.145	0.013	-0.314	***
AA – Trust in Alternative Sci. Auth. Index	0.172	0.013	0.380	***
Ideological self-placement (Ref: not placed)				
- Left	-0.254	0.067	-0.112	***
- Centre-left	-0.318	0.060	-0.169	***
- Centre	-0.158	0.053	-0.093	**
- Centre-right	-0.286	0.059	-0.148	***
- Right	-0.265	0.066	-0.111	***
Party proximity: SP	0.020	0.020	0.029	
Party proximity: GL	0.014	0.023	0.020	
Party proximity: PvdA	-0.008	0.023	-0.011	
Party proximity: D66	-0.040	0.022	-0.054	
Party proximity: CDA	0.005	0.022	0.006	
Party proximity: VVD	-0.010	0.019	-0.015	
Party proximity: PVV	0.051	0.019	0.075	**
Party proximity: FvD	0.116	0.021	0.228	***
Constant	-0.178	0.102		
Observations	953			
Adjusted R^2	0.527			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*
Source: Demos & Pi – Unipolis survey (May 2021)

Table A.10e. MODEL 5b (UNITED KINGDOM) - OLS regression models – Dependent variable: Pseudo-scientific Beliefs Index (PBI)

	Coef.	S.E.	Beta	Sig.
Gender: women (ref: men)	0.035	0.036	0.023	
Age/10	-0.127	0.011	-0.294	***
Education (ref: Low)				
- Medium	-0.074	0.046	-0.048	
- High	-0.170	0.048	-0.109	***
IN – Interest in science	-0.100	0.049	-0.058	*
EX – Exposure to scientific information Index	0.087	0.027	0.106	**
MA – Trust in Mainstream Sci. Auth. Index	-0.172	0.012	-0.381	***
AA – Trust in Alternative Sci. Auth. Index	0.214	0.013	0.491	***
Ideological self-placement (Ref: not placed)				
- Left	-0.286	0.076	-0.100	***
- Centre-left	-0.284	0.059	-0.139	***
- Centre	-0.194	0.051	-0.111	***
- Centre-right	-0.272	0.059	-0.134	***
- Right	-0.124	0.080	-0.040	
Party proximity: LP	0.035	0.020	0.051	
Party proximity: GR	-0.011	0.021	-0.015	
Party proximity: LD	0.071	0.024	0.087	**
Party proximity: CP	0.037	0.018	0.055	*
Constant	-0.003	0.104		
Observations	1022			
Adjusted R^2	0.486			

*Note: Sig. indicates the level of significance; * p < 0.05; ** p < 0.01; *** p < 0.001.*
Source: Demos & Pi – Unipolis survey (May 2021)