Partisanship and anti-elite worldviews as correlates of science and health beliefs in the multi-party system of Spain

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Abstract

In a national sample of 5,087 Spaniards, we examine the prevalence of ten specific misperceptions over five separate science and health domains (climate change, 5G technology, genetically modified foods, vaccines, and homeopathy). We find that misperceptions about GMOs and general health risks of 5G technology are particularly widespread. While we find that partisan affiliation is not strongly associated with any of the misperceptions aside from climate change, we find that two distinct dimensions of an anti-elite worldview – anti-expert and conspiratorial mindsets – are better overall predictors of having science and health misperceptions in the Spanish context. These findings help extend our understanding of polarization around science beyond the most common contexts (e.g., the United States) and support recent work suggesting anti-elite sentiments are among the most important predictors of factual misperceptions.

Keywords: misperceptions, science, health, partisanship, anti-elite worldview, Spain

Social scientists are paying more and more attention to the problem of misperceptions — factual beliefs that are contrary to the best available evidence or consensus expert opinion (e.g., Flynn et al. 2017). In the case of the United States, misperceptions about the economy (Bartels 2002), foreign policy (Kull et al. 2003), and science (e.g. climate change) are often strongly linked to partisanship. This US-based finding has had an effect on how researchers explain the psychological mechanism that leads individuals to accept as fact information that is contrary to the best available evidence. Researchers routinely point to individual differences in political ideology (Nyhan & Reifler 2010, Kahan et al. 2017, Gaines et al. 2007). Our project focuses on two aspects that have received less attention in misperception research so far. First, we examine the association between individual differences and misperceptions in a political context outside of the U.S. Second, we examine an alternative and competing individual differences explanation for misperceptions: anti-elite worldviews.

So far, most research on misperceptions (about scientific issues) has been conducted in the U.S., where parties are ideologically sorted (Levendusky 2013) and affectively polarized. The U.S.' two-party system is so entrenched that the same two parties have been dominant since 1860. These partisan divisions permeate every aspect of domestic political competition in the U.S. (Mason 2018) to the extent that we expect to see partisan division and disagreement at all turns.

Two aspects are worth highlighting: First, while there is reason to believe that the political context determines the relationship between partisanship and misperceptions it is difficult to test the causal effect in a study. After all, we cannot randomize exposure to a two- or multi-party system. However, we can explore the association between individual differences and misperceptions in different political contexts. That is what we do in this study. Second, even though partisanship clearly can matter and often does in the U.S. (especially once parties take divergent stands on an issue), research shows that other individual differences are also important. In fact, religiosity and anti-elite worldviews — particularly the facet of a conspiratorial worldview — have been repeatedly linked to misperceptions in the U.S. (e.g., Drummond & Fischhoff 2017, Lewandowsky et al. 2013, Garrett & Weeks 2017). With this in mind, the need for research examining and comparing the

relationship between different individual differences and misperceptions becomes clear.

In this research, we use data from Spain to explore the association between misperceptions and several potentially competing individual differences: partisanship, religiosity, and two separate constructs that capture an anti-elite worldview (anti-expert and conspiratorial worldviews). Specifically, we examine the prevalence of ten misperceptions among the Spanish public across five distinct science and health domains: climate change, GMOs, 5G technology, vaccines, and alternative medicine (homeopathy).

Our results reveal that anti-expert and conspiratorial worldviews exhibit the strongest association with misperceptions. While partisanship is sometimes associated with misperceptions in our data, these effects are neither large nor consistent. Anti-expert and conspiratorial worldviews are more consistently associated with factually inaccurate beliefs about science and health, and the magnitude of these relationships are in most cases larger than other individual differences we examine. Moreover, we observe considerable variation in the prevalence of misperceptions. Misperceptions about GMOs are particularly widespread — more than twice as many Spaniards are misinformed as are accurately informed. Yet on other issues — such as whether vaccines cause autism or whether 5G helps spread the coronavirus — only a very small percentage of Spaniards are misinformed.

Below, we review the potential mechanisms underlying the relationship between individual differences and misperceptions, we discuss misperceptions in the Spanish multi-party context, and we introduce anti-expert and conspiratorial worldviews as individual-differences constructs.

Partisanship and misperceptions

Previous research shows that individual differences – such as partisanship or religiosity – are associated with factual beliefs about science (e.g., Drummond & Fischhoff 2017, Hornsey et al. 2018*a*, Pasek 2018, Rutjens et al. 2018, Hornsey et al. 2016, Smith & Mayer 2019, Hornsey et al. 2018*b*). The extent to which science beliefs are polarized based on individual differences has been tested for climate change, GMOs, vaccines, and evolution, and less often for other topics (e.g., stem cell

research, the Big Bang, nanotechnology). In general, research from the U.S. — the focus of much of this work (Rutjens & van der Lee 2020) — has found that partisanship alone tends to be correlated with climate beliefs, while both partisanship and religiosity are linked with beliefs on a number of other science issues (Drummond & Fischhoff 2017, Rutjens et al. 2018). On some issues like GMOs[1] there is little evidence of political and religious polarization (Drummond & Fischhoff 2017, Rutjens et al. 2018, Hasell & Stroud 2020, though also see Pasek, 2018), and for other issues such as vaccines and vaccination, findings are mixed (Hornsey et al. 2018*a*, Rutjens et al. 2018, Veenstra et al. 2014). One reason we may see little consistent political polarization on some topics such as GMOs is that these issues have yet to exhibit clear politicization at the elite level despite the circulation of misinformation among the public (Flynn et al. 2017).

Though similar to findings from the U.S. case, correlates of science misperception outside the U.S. differ in some important ways. Regarding climate change, for example, partisanship still matters in much of the rest of the world, though it is most influential in Anglophone countries (Hornsey et al. 2016, Smith & Mayer 2019, Hornsey et al. 2018*b*). The European context surrounding GMOs may be different than the U.S. as well, as the issue receives more attention and there is more vocal opposition in some quarters. Further, in more secular Western European countries, like the Netherlands, spirituality rather than religiosity may do more to shape science beliefs (Rutjens & van der Lee 2020). While homeopathy is relatively low-profile in the U.S. (McPhetres & Pennycook 2019), it is so popular in some European countries that it is covered under national healthcare systems (Lobera & Rogero-García 2020). This issue has become more prominent in Spanish politics – the Spanish health ministry has been campaigning against E.U. rules that classify homeopathic products as medicines, despite the popularity of homeopathy in Spain (Paun 2019). In short, there may be cross-national heterogeneity in the correlates of science beliefs, which underlines the need for misperception research in non-US political contexts.

The political context is likely to affect misperceptions as well as the relationship between par-

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[1]Note that there are a number of expert panels or groups that have issued statements of GMO safety (in terms of both consumption and environmental effects). While there may be uncertainty about long-term GMO effects on the environment, for example, there is no clear evidence that they do in fact harm the environment (Landrum et al. 2019).

tisanship and misperceptions. One potential explanation for this are cueing processes. Party cues and their effect on (political) behaviour are country-specific. They are not only likely to differ between two-, and multi-party systems, but also between political contexts that are characterized by temporal stability or instability (Guntermann 2019, Steenbergen et al. 2007, Stoeckel et al. 2021, Westwood et al. 2018). So far, it has not yet been comprehensively examined to what extent partisanship structures political misperceptions differently in a two-party system such as the U.S., and a multi-party system such as Spain. While it seems genuinely difficult to gain causal and ecologically valid evidence for how political contexts determine the relationship between partisanship and misperceptions, we underline the importance of exploring the association between individual differences such as partisanship and misperceptions in non-US political contexts such as Spain.

But in what ways might the political context of Spain shape the ways individual differences (e.g., partisanship) relate to misperceptions? The party system in Spain appears to be an interesting case to explore which potential mechanisms are at play behind the relationship between individual differences and misperceptions. The political landscape showcases a multi-party system contrasted with high levels of partisanship (Torcal et al. 2018) and a very salient issue polarization related to the national-peripheral identities (Linz & Montero 1999). Note that while we aim to explore the association between individual differences (e.g., partisanship, anti-elite worldviews), and misperceptions in Spain, we do not test how political contexts causally determine the relationship between partisanship and misperceptions. It is also worth noting that the media system in Spain may uniquely influence the degree to which members of the public hold misperceptions. Spain's media environment is typically characterized as a polarized pluralist system; not coincidentally, like the U.S. and other Southern European countries, the media system in Spain is thought to more readily foster exposure to online disinformation than those in Northern Europe (Humprecht et al. 2020). This may differently contribute to the misperceptions we examine (note that we do not attempt to test relationships between self-reported media use and these outcomes due to methodological concerns (see Jürgens et al. (2020)).

Anti-elite worldviews and the polarization of factual beliefs

Typically construed as individual differences (i.e., an individual's stable disposition), anti-elite worldviews have been linked to rejection of scientific consensus, particularly regarding climate change and vaccines (Lewandowsky et al. 2013,0, Garrett & Weeks 2017, Motta 2018, Merkley 2019, Hornsey et al. 2018*a*,0). Anti-elite worldviews can be divided into a) anti-expert and b) conspiratorial worldviews.

Anti-expert worldviews refer to people's tendency to mistrust, suspect, and despise experts and intellectuals. In this body of research, scientists and medical professionals are considered the most typical experts. By definition, anti-expert worldviews motivate people to oppose scientific consensus (e.g., on climate change), mistrust a wide array of institutions such as the government, and reject related expert advice (Han et al. in press, Merkley 2019). There are diverse sources and drivers of anti-expert worldviews. Most importantly, misperceiving experts' knowledge advantage — i.e. overestimating one's own and/or underestimating expert's knowledge — leads to mistrust of experts (Fernbach et al. 2019, Motta et al. 2018, Lyons et al. 2020). Further, not valuing science, education, and technological as well as human progress are likely to lead to a disregard of the relevance of experts. Finally, seeing knowledge and information as an instrument that can be used (by experts) to exploit people will likely foster skepticism towards expert information (Merkley 2019, Rigney 1991).

Conspiratorial worldviews refer to people's tendency to endorse conspiracy theories, i.e. unsubstantiated explanations of phenomena presumably caused by a small organization consisting of powerful people exploiting others for their own benefit. Conspiratorial worldviews motivate people to believe in convenient "alternatives," and disbelieve inconvenient facts. The latter often results in referring to inconvenient scientific evidence as a hoax (Lewandowsky et al. 2013, Garrett & Weeks 2017). Research has likewise identified diverse sources and drivers of conspiratorial worldviews (Goreis & Voracek 2019). Distrust of authority, for instance, may be a main driver of endorsement of and engagement with conspiracy theories. Similarly, political cynicism fosters the tendency to endorse conspiracy theories (Lewandowsky et al. 2013, Swami et al. 2010).

Besides diverse individual-level sources and drivers of anti-elite worldviews, there are also potential sources from a social identity perspective. In its original conception, social identity is "the individual's knowledge that he [sic] belongs to certain social groups together with some emotional and value significance to him of this group membership," (Tajfel 1972, p. 292). Accordingly, individuals with anti-elite worldviews often feel a sense of community (aided by online discussion) and conceive of themselves as a unique group working in opposition to corrupt power (Franks et al. 2017, Byford 2011), and place value in this resistance. Further, an anti-elite identity fits classic conceptions in that individuals reflect self-definitions of their positions in a system of social categories, by which members define themselves as well as others (Turner 1975, Tajfel 1982, Abrams & Hogg 1990). Those with an anti-elite identity perceive the out-group as subgroups of "evil elites," for example (Franks et al. 2017). The in-group, meanwhile, are those awakened to the supposed reality of a world controlled by the elite. Similarly, others have conceived an anti-elite social identity that rejects status quo institutions (and the experts who inhabit them) as elitist enterprises opposed to the will of the masses (Schulz et al. 2018, Jagers & Walgrave 2007). This view is often entwined with populism. This group identity locates experts, journalists, and other "elites" as the out-group, who can be seen as working on behalf of entrenched elected officials opposing the masses (Mazzoleni et al. 2003, Krämer 2018). Working from a social identity perspective, Schulz et al. (2018) argue that members of this anti-elite in-group must distance themselves from the mainstream elites that constitute their out-group to maintain their identity. Accordingly, scientific expertise is frequently rejected (Kennedy 2019, Lockwood 2018, Mede & Schäfer 2020). Rejecting the influence of out-group members in this manner is unsurprising, as normative group positions are defined perhaps more through contrast with out-groups than through in-group assimilation (Hogg & Reid 2006). These identities in question are inherently defined by and acquire meaning in relation to an "Other" (Tajfel 1972). Anti-expert worldviews and conspiratorial worldviews are centered on an us-vs-them narrative of the world. In both cases, they drive group polarization and rejection of scientific consensus.

While anti-expert and conspiratorial worldviews represent distinct individual differences con-

structs, they conceptually tap into the same anti-elite worldview construct. In fact, anti-expert and conspiratorial worldviews capture different aspects of people's anti-elite tendencies. We contribute to existing research — that has often either focused on anti-expert *or* conspiratorial worldviews — by explicitly examining how both anti-expert and conspiratorial worldviews jointly explain misperceptions.

Overall, we contribute to the broad body of work on science beliefs by examining polarization across multiple individual differences — partisanship, religiosity, anti-expert and conspiratorial worldviews — over an omnibus of science and health topics (anthropogenic climate change; GMO consumption and environmental impact; 5G technology's consequences; vaccine misperceptions; and homeopathy efficacy) in the Spanish national context.

Methods

Participants

Using the online survey firm YouGov, we collected survey responses (in Spanish) from a national sample in Spain in May-June 2020. YouGov recruits a large panel of opt-in respondents and then uses a weighting and matching algorithm to create a sample that mirrors the demographics of the Spanish public. (YouGov determines the specific eligibility and exclusion criteria for their panel).

Participation in the study was voluntary and participants received YouGov points for their participation. We obtained a total sample of 5087 participants (2592 men, 2495 women, 26% university educated, M_{age} = 45.11, SD_{age} = 14.45), including an oversample of participants residing in Catalonia. All results and analyses that follow use the weights supplied by YouGov to match the demographics of the Spanish population.

Note that we pre-registered our study on the OSF platform (https://osf.io/eztck). We also provide our data and code on OSF (https://osf.io/b6e43/).

Procedure

After providing informed consent, participants responded to demographic questions (including religiosity), reported which political party they felt closest to, and completed several scales to capture individual differences such as anti-expert and conspiratorial worldviews. The questionnaire also included a number of questions we asked as a part of a larger project comparing misperceptions across Europe. We investigated misperceptions in seven domains, five about science and health misperceptions (the focus of this study) and two others that were excluded from the analyses because they are about other issues. Respondents were randomly assigned to two of our domain-specific misperceptions batteries. [2]

Materials

The measures we used are described below. Note that the questionnaire was administered in Spanish; the questions we cite below are translations. All items included a "don't know" response option unless specified otherwise.

Misperceptions

We asked participants to use a 5-point Likert scale to indicate their agreement with a series of ten items that reflect misperceptions in the field of science and health. Full item wording (and response distributions) are available in Table SI1 in the supplemental material. Note that our items were informed by existing literature on misperceptions in the field of science and health (e.g., Arvanitoyannis & Krystallis 2005, Enders et al. 2020, Hasell et al. 2020, Leshner 2009, Lyons et al. 2019).

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[2]The randomization strategy was not equal probability across all batteries. Those who were assigned to the GMO battery were excluded from being assigned to the vaccine battery and vice versa (this relates to participants who are excluded from analysis here because they received experimental treatments about those batteries). Similarly, those who where assigned to homeopathy were excluded from being assigned to 5G and vice versa.

Anti-expert worldview

Anti-expert worldview was measured using the following three items on a 5-point Likert scale from *strongly disagree* to *strongly agree*: "I am more confident in my opinion than other people's facts," "Most of the time I know just as much as experts," and "Experts really don't know that much" (M = 2.56, SD = 0.82, α = .69) (for more detail on this scale, see Han et al. (in press)).

Conspiratorial worldview

A conspiratorial worldview (Uscinski et al. 2016) was measured using the following four items on a 5-point Likert scale from *strongly disagree* to *strongly agree*: "Much of our lives are being controlled by plots hatched in secret places," "Even though we live in a democracy, a few people will always run things anyway," "The people who really 'run' the country are not known to the voter," and "Big events like wars, recessions, and the outcomes of elections are controlled by small groups of people who are working in secret against the rest of us," (M = 3.65, SD = 0.82, α = .77) (for more detail on this scale, see Han et al. (in press), Uscinski et al. (2016)).

Partisanship

Partisanship was measured using the question, "To which of the following political parties do you feel closest to?", with the following options: Partido Popular (PP), Partido Socialista Obrero Espanol (PSOE), Podemos, Vox, Ciudadanos - Partido de la Ciudadania (Cs), Other, None, or "I don't know." Respondents in Catalonia were also presented with two Catalonian parties, meaning they chose between the PP, the PSOE, Podemos, Vox, En Comu Podem, Esquerra Republicana de Catalunya/Izquierda Republicana de Cataluna, and Junts Per Catalunya/Juntos por Cataluna. In our analyses, we use indicators for PP, Podemos, Vox, Ciudadanos, other party (collecting some of the minor parties listed above), and no party (including none and don't know), with PSOE, currently the largest party, as the reference group.

Religiosity

Religiosity was measured using the item: "Lots of things come up that keep people from attending religious services even if they want to. Thinking about your life these days, how often do you go to religious services?" on a scale the ranged from *never* (1) to *once a week or more* (7) (*M* = 2.39, *SD* = 1.71).

Covariates

In addition to standard demographics (age, gender, and university education), we asked a true/false question about the number of members of parliament (350) to measure general political knowledge: "There are 550 members in the Congress of Deputies." We use indicators for correct and don't know responses, leaving the incorrect response ('true') as the reference category.

Results

All findings below report the results of the weighted data analyses. The weighted population estimates were computed using the "survey" R-package (Lumley 2020) with the weights provided by YouGov. We begin our analyses by examining the extent of agreement with our misperceptions items. Next, we check correlations within and across the five domains before we come to the core of this research, examining whether and how partisanship, religiosity, and anti-elite worldviews are associated with misperceptions.

The Prevalence of Misperceptions in Science and Health

Table SI1 in the supplemental material lists each question along with the full response distribution. Following Kuklinski et al. (2000), there is an important distinction to be made being *mis*informed and being *un*informed. Emphasizing this distinction, the table includes three additional columns that indicate the proportion of respondents who are "misinformed" (reporting beliefs that are inconsistent with scientific evidence), who are "informed" (reporting beliefs that are consistent with

scientific evidence), and who are "uninformed" (reporting that they 'do not know' the answer, or reporting that they 'neither agree nor disagree').

Table SI1 in the supplemental material is sorted from highest to lowest ratio of misinformed to informed. In one domain we find a much higher ratio of misinformed to informed respondents than in all other domains: genetically modified foods. There are many more Spaniards who are misinformed than informed about the effects of GMOs on the environment (a ratio of 2.17) and about the safety of genetically modified foods (a ratio of 2.13). In addition, one of the 5G questions (concerning a supposed health risk of the new mobile network) also shows a higher share of misinformed than informed.

To detect possible patterns across supporters of the different parties we split up our sample by party affiliation and replicated the response distribution table for party (see tables SI2 to SI5 in the supplemental material). We found no indication of different misperceptions across supporters of Spain's political parties. While the ratios of misinformed to informed vary slightly depending on respondents' preferred party, misperceptions about GMOs and 5G are always at the top of the list.

Correlations of misperceptions across domains

Table 1 shows the pairwise correlation between our misperceptions outcome variables. Items are coded such that higher scores indicate greater misperceptions (i.e., we recoded "I believe genetically modified foods are as safe to eat as conventional foods," and "The Earth is getting warmer mostly because of human activity such as burning fossil fuels."). The weighted correlations were calculated using the *svycor* function from the "jtools" R-package (Long 2017). Furthermore, this function[3] uses a sample-weighted bootstrapping procedure ($n = 2000$) to test whether the correlation coefficients are distinguishable from zero. For the most part, misperceptions are correlated reasonably highly within each domain. Looking at misperceptions about vaccines, for instance, we find a .36 correlation between the belief that vaccines cause autism and the belief that they can give

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[3] sycor employs the wtd.cor function from the "weights" package (Pasek 2017) to return standard errors and p-values for the correlation coefficients

you the flu. At .58, the two homeopathy misperceptions (that they cure the flu, and that they cure cancer) are even more more strongly correlated.

What about correlations across domains? Will respondents who hold misperceptions about one domain also hold misperceptions about others? The correlations matrix in table 2 points to a pattern: Misperceptions are clearly correlated across domains.

That means that participants whose beliefs about vaccinations are contrary to the best available evidence or consensus expert opinion typically also hold beliefs about homeopathy and 5G technology that are contrary to the best available evidence or consensus expert opinion. There is only one domain in which misperceptions do not seem to spill over: Climate change. Respondents who did not believe in the human causes of climate change were no more and no less likely to hold misperceptions about GMOs, 5G, or vaccines. [4] [5]

Correlates of misperceptions

We estimate a series of OLS regression models to examine whether and how partisanship, religiosity, and anti-elite worldviews are associated with misperceptions. Variables are coded so that higher values indicate greater misperceptions (i.e., we reverse coded "I believe genetically modified foods are as safe to eat as conventional foods" (GMO: Eating) and "The Earth is getting warmer mostly because of human activity such as burning fossil fuels" (Climate Change)). Missing data and "don't know" answers were removed via listwise deletion. To facilitate comparison across independent variables, all variables are scaled 0-1. Table 2 shows the results for science-related misperceptions (climate change, GMOs, and 5G). Table 3 shows results for health-related misperceptions (vaccines, homeopathy). Both tables show two models for each misperception. The first model (the column on the left, respectively) focuses on the role of partisanship. The reference category is sup-

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[4]Correlations between climate change and homeopathy were less clear: We find a .2 correlation with the belief that homeopathy is an effective cure for cancer but only a non-significant .03 correlation with the belief that it is an effective cure for the flu.

[5]Note that the randomization procedure described above means that we cannot compute correlations across all domains, hence the gaps in the table. We cannot compute the correlation between misperceptions in the domain of GMOs and vaccinations, or the correlation between the domains of 5G and homeopathy. The design also results in different case counts for each misperception.

port for the left-leaning PSOE (which was in power at the time the study was run).[6] The second model (on the right) adds measures for religiosity, anti-expert, and conspiratorial worldviews (right column). The models include controls for age, gender, education, and level of political knowledge. The corresponding coefficient plots in figures 1 and 2 visualize the models on the right hand side, including anti-elite worldviews.

The coefficient plots show that partisanship is not consistently related to misperceptions. While some party affiliations are statistically significant in some models, the effects are small. We find no evidence of any link between support for any particular party and misperceptions in any of the five domains we investigated.

Neither supporters of the populist left-wing party Podemos nor supporters of the populist right-wing party Vox exhibit consistently greater misperceptions than supporters of the mainstream left-leaning PSOE (our reference category). There is only one domain – climate change – in which supporters of one party – Vox – show significantly greater misperceptions than supporters of the other parties (see the outlier in the correlation plot in figure 1). Respondents who support 'no party' at all are also more likely to be misinformed about climate change.

If partisanship does not predict the prevalence of misperceptions in Spain then what does? We find that anti-elite worldviews predict misperceptions across all five domains. Anti-expert world-views have a strong and significant effect on seven of the ten misperceptions we tested. Conspiratorial worldviews have a strong and significant effect on nine of them. Both predicted belief in the myths around 5G networks transmitting the coronavirus, vaccines causing autism, HPV vaccinations at age 12 promoting sexual activity, and homeopathy being an effective cure for mild diseases, anti-expert worldviews predicted scepticism of human-cause climate change, and belief that vaccines can give you the flu, while conspiratorial worldviews predicted belief that GMOs harm the environment, and that the new 5G network poses health risks.

Surprisingly, two of the coefficients for conspiratorial worldviews were negative: Holding a conspiratorial worldview was associated with *lower* levels of misperceptions about the safety of

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[6]We also estimated models with supporters of Vox and Podemos, respectively, as reference categories. These additional tables can be found in the supplemental material.

eating GMO food and with *lower* levels of misperceptions about climate change. These anomalous results may represent measurement error as these two items were presented to participants as accurate statements, while all others were presented as inaccurate statements. The answer options were the same for all misperceptions items, and the GMO eating item ("I believe genetically modified foods are as safe to eat as conventional foods.") and the Climate Change item ("The Earth is getting warmer mostly because of human activity such as burning fossil fuels.") were reverse coded for our analyses (see item wording in Table SI1 in the supplemental material)[7]. Besides measurement error due to how items were formulated, it also seems important to underline that the items used to capture misperceptions were created ad hoc (but drawn from the existing literature on misperceptions in the context of health and science) and do not stem from a validated questionnaire. Further, we found that conspiratorial worldviews were slightly, but significantly correlated with overall response time. Hence, we cannot rule out that respondents scoring high (vs. low) on conspiratorial worldviews, were relatively careless in filling out the survey. Having said this, one has to be careful when interpreting the results.

In addition, our data shows that religiosity predicted misperceptions in three of the five domains: vaccines, homeopathy, and climate change. However, this effect was smaller than the effect of anti-elite and conspiratorial worldviews. Overall, the models including anti-expert and conspiratorial worldviews as well as religiosity explained the variation in our outcome variables much better than the models focusing on party support. R-squared values for the latter range between .03 and .09; whereas r-squared values for the larger models range between .08 and .20.

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[7]It is worth noting that despite the opposite-signed associations for conspiracism and the GMO-eating and GMO-environment beliefs, there is a strong correlation between the items overall ($r = .52$) which decreases across conspiracism (within the lowest conspiracism tercile $r = .60$, within the highest conspiracism tercile $r = .43$) but remains fairly strong. Others have also noted seemingly inconsistent beliefs among those with conspiratorial worldviews (Wood et al. 2012).

Figure 1: Regression Coefficients Predicting Science Misperceptions
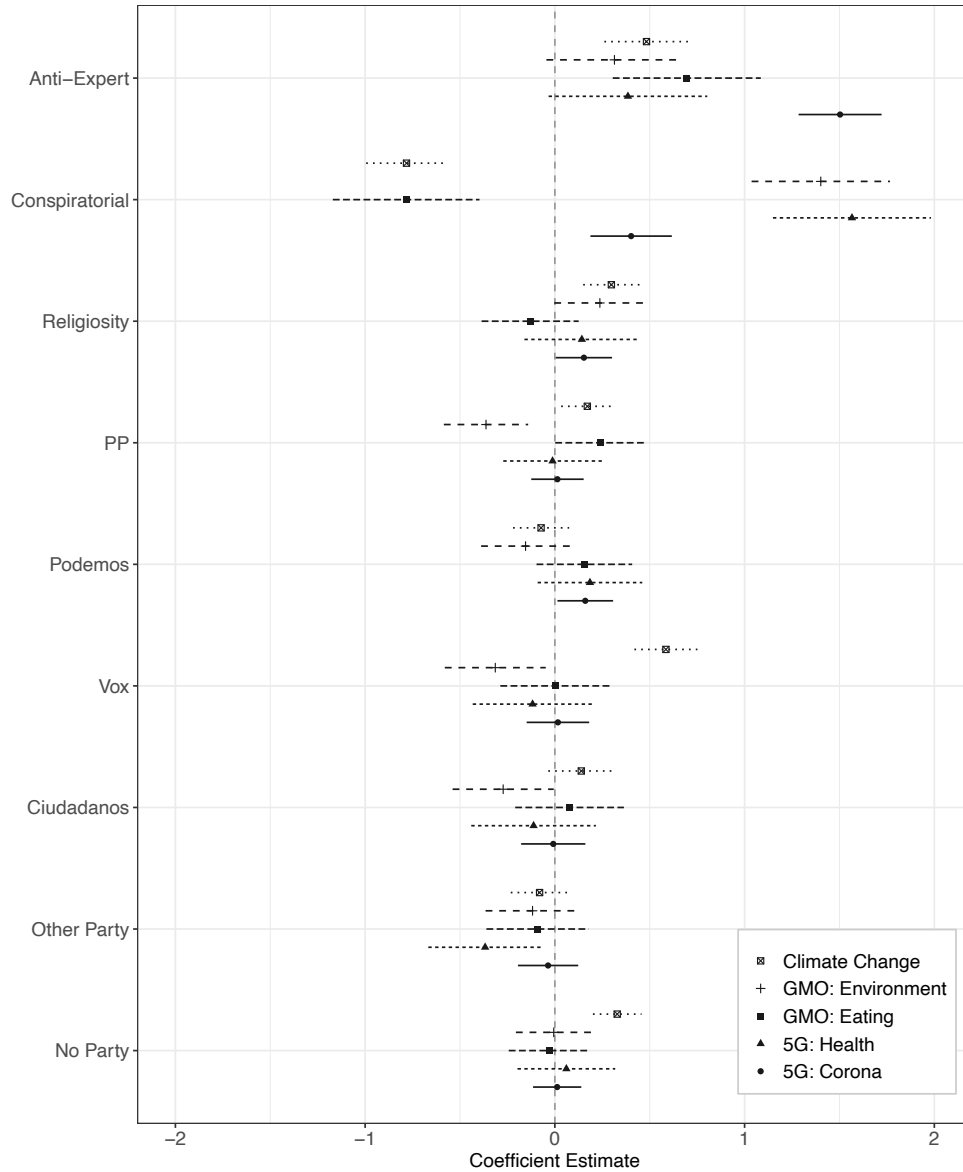
Notes: Coefficient estimates controlling for demographics and political knowledge.

Error bars are 95% confidence intervals. Note that we scaled anti-expert, conspiratorial, and religiosity 0-1 to facilitate comparison across independent variables.

Table 1: Correlations Between Misperception Domains

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GMO environment (1)	1 (864)									
GMO eating (2)	0.33*** (845)	1 (926)								
Climate change (3)	-0.18* (191)	0.03 (212)	1 (1959)							
Vax HPV (4)			0.05 (186)	1 (798)						
Vax autism (5)			0.05 (210)	0.57*** (749)	1 (868)					
Vax flu (6)			-0.12 (232)	0.29*** (789)	0.36*** (849)	1 (970)				
Homeopathy cancer (7)	0.21 (77)	0.09 (77)	0.20* (218)	0.56*** (76)	0.55*** (79)	0.20 (90)	1 (792)			
Homeopathy flu (8)	0.32** (78)	0.44*** (78)	0.03 (218)	0.27 (77)	0.37** (79)	-0.03 (91)	0.58*** (770)	1 (792)		
5G Coronavirus (9)	0.14* (403)	-0.02 (403)	-0.04 (674)	0.49*** (414)	0.45*** (415)	0.13* (414)			1 (828)	
5G health risk (10)	0.33** (70)	0.25 (73)	0.02 (203)	0.41** (75)	0.40** (85)	0.32** (92)			0.42** (649)	1 (703)

$* \ p < .05$, $** \ p < .01$, $*** \ p < .005$ (two-sided). The number of observations used in analyzing each pair of variables are reported in parentheses.

Figure 2: Regression Coefficients Predicting Health Misperceptions

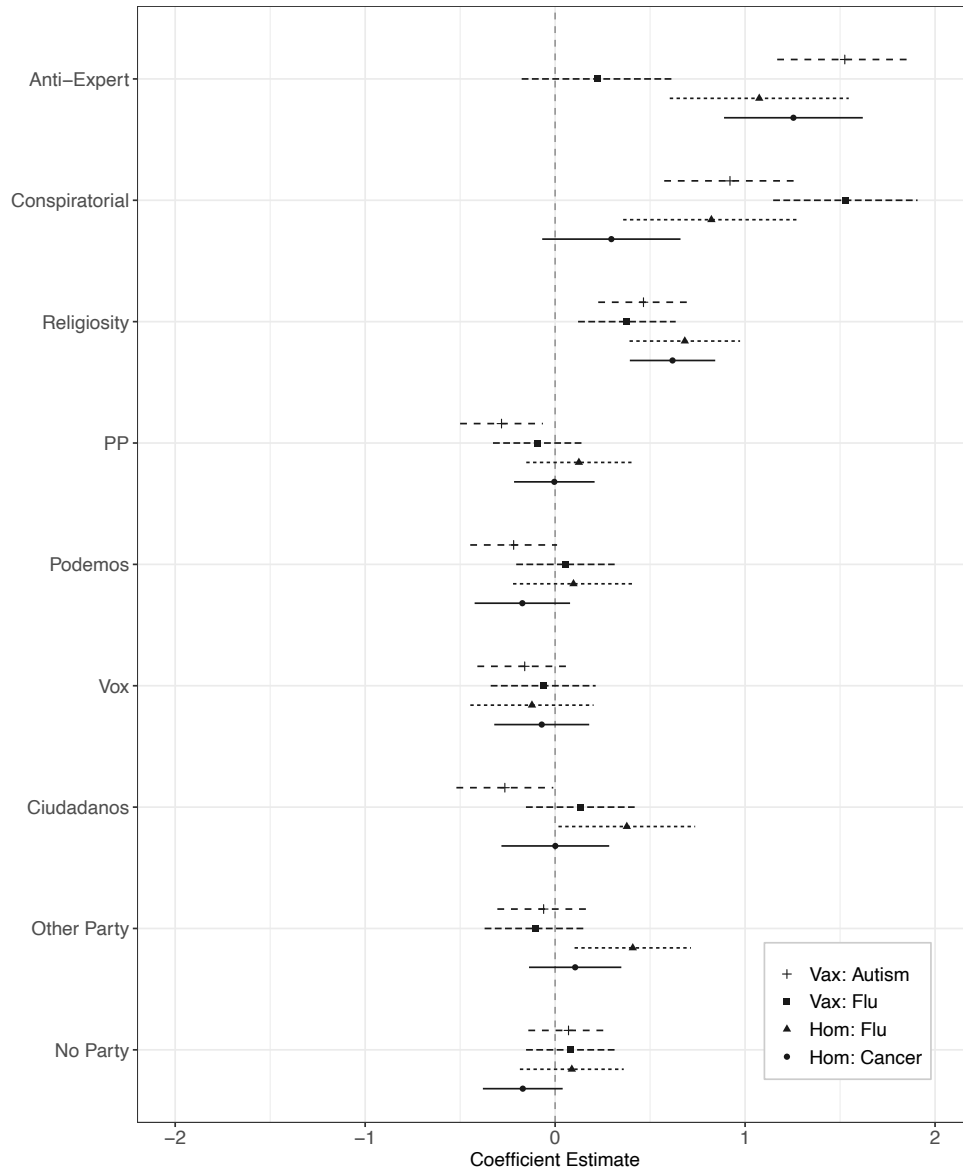Notes: Coefficient estimates controlling for demographics and political knowledge.
Error bars are 95% confidence intervals. Note that we scaled anti-expert, conspiratorial, and religiosity 0-1 to facilitate comparison across independent variables.

Table 2: Science misperceptions across groups

	Climate Change		GMO Environment		GMO Eating		5G Health		5G Corona	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
(Intercept)	0.78***	1.05***	3.34***	2.48***	3.08***	3.22***	2.56***	1.56***	1.59***	0.78***
	(0.10)	(0.12)	(0.17)	(0.19)	(0.18)	(0.21)	(0.19)	(0.21)	(0.10)	(0.11)
PP	0.23***	0.17*	-0.21	-0.36**	0.20	0.24*	0.23	-0.01	0.24***	0.01
	(0.07)	(0.07)	(0.11)	(0.11)	(0.12)	(0.12)	(0.13)	(0.13)	(0.07)	(0.07)
Podemos	-0.16*	-0.07	-0.13	-0.15	0.07	0.16	0.22	0.18	0.15	0.16*
	(0.08)	(0.08)	(0.12)	(0.12)	(0.13)	(0.13)	(0.15)	(0.14)	(0.08)	(0.07)
Vox	0.59***	0.59***	-0.12	-0.31*	-0.04	0.00	0.17	-0.12	0.27*	0.02
	(0.08)	(0.08)	(0.14)	(0.14)	(0.15)	(0.15)	(0.16)	(0.16)	(0.09)	(0.08)
Ciudadanos	0.13	0.14	-0.24	-0.27*	0.02	0.08	0.02	-0.11	0.11	-0.01
	(0.09)	(0.09)	(0.14)	(0.14)	(0.15)	(0.15)	(0.17)	(0.17)	(0.09)	(0.09)
Other Party	-0.20*	-0.08	-0.05	-0.12	-0.16	-0.09	-0.23	-0.37*	0.00	-0.04
	(0.08)	(0.08)	(0.13)	(0.13)	(0.14)	(0.14)	(0.16)	(0.15)	(0.08)	(0.08)
No Party	0.36***	0.33***	0.12	-0.01	-0.08	-0.03	0.21	0.06	0.15*	0.01
	(0.07)	(0.07)	(0.10)	(0.10)	(0.11)	(0.11)	(0.14)	(0.13)	(0.07)	(0.06)
Anti-Expert		0.48***		0.31		0.70***		0.39		1.50**
		(0.11)		(0.18)		(0.20)		(0.21)		(0.11)
Conspiratorial		-0.78***		1.40***		-0.78***		1.57***		0.40***
		(0.11)		(0.19)		(0.20)		(0.21)		(0.11)
Religiosity		0.30***		0.24		-0.13		0.14		0.15**
		(0.08)		(0.12)		(0.13)		(0.15)		(0.08)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	1942	1937	857	855	919	917	696	694	2268	2261
R^2	0.07	0.11	0.03	0.11	0.05	0.08	0.09	0.18	0.03	0.13

* $p < .05$, ** $p < .01$, *** $p < .005$ (two-sided). All models include age, gender, university education, and political knowledge as controls, and employ survey weights. Cell entries are OLS regression coefficients with standard errors in parentheses.

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Table 3: Health misperceptions across groups

	Vax: Autism		Vax: HPV		Vax: Flu		Homeopathy: Flu		Homeopathy: Cancer	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
(Intercept)	2.45***	1.23***	2.47***	1.74***	2.75***	1.70***	2.24***	1.31***	2.18***	1.48***
	(0.16)	(0.18)	(0.16)	(0.19)	(0.17)	(0.20)	(0.22)	(0.25)	(0.17)	(0.20)
PP	-0.08	-0.28*	0.19	-0.06	0.10	-0.09	0.41**	0.13	0.22*	-0.00
	(0.12)	(0.11)	(0.12)	(0.12)	(0.12)	(0.12)	(0.14)	(0.14)	(0.11)	(0.11)
Podemos	-0.25	-0.22	-0.28*	-0.25*	0.09	0.05	0.11	0.10	-0.21	-0.17
	(0.13)	(0.12)	(0.13)	(0.12)	(0.14)	(0.13)	(0.17)	(0.16)	(0.14)	(0.13)
Vox	0.08	-0.16	0.01	-0.27	0.15	-0.06	0.22	-0.12	0.20	-0.07
	(0.14)	(0.13)	(0.14)	(0.14)	(0.14)	(0.14)	(0.17)	(0.17)	(0.13)	(0.13)
Ciudadanos	-0.18	-0.26*	-0.14	-0.31*	0.21	0.13	0.46*	0.38*	0.07	0.00
	(0.14)	(0.13)	(0.14)	(0.14)	(0.15)	(0.15)	(0.19)	(0.18)	(0.15)	(0.14)
Other Party	-0.05	-0.06	-0.07	-0.04	-0.00	-0.11	0.49**	0.41**	0.13	0.11
	(0.13)	(0.12)	(0.14)	(0.13)	(0.14)	(0.14)	(0.16)	(0.16)	(0.13)	(0.12)
No Party	0.25*	0.07	0.11	0.01	0.22	0.08	0.33*	0.09	0.01	-0.17
	(0.12)	(0.11)	(0.12)	(0.11)	(0.12)	(0.12)	(0.14)	(0.14)	(0.11)	(0.11)
Anti-Expert		1.52***		0.94***		0.22		1.07***		1.25***
		(0.18)		(0.19)		(0.20)		(0.24)		(0.19)
Conspiratorial		0.92***		0.45*		1.53***		0.82***		0.30
		(0.18)		(0.19)		(0.19)		(0.24)		(0.19)
Religiosity		0.47***		0.80***		0.38**		0.68***		0.62***
		(0.12)		(0.13)		(0.13)		(0.15)		(0.11)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	862	861	792	790	964	963	786	785	786	785
R^2	0.05	0.20	0.06	0.15	0.05	0.13	0.05	0.14	0.07	0.18

* $p < .05$, ** $p < .01$, *** $p < .005$ (two-sided). All models include age, gender, university education, and political knowledge as controls, and employ survey weights. Cell entries are OLS regression coefficients with standard errors in parentheses.

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Discussion

In this study, we examined the overall level of misperceptions in science and health beliefs in Spain. Most importantly, we find that partisanship is not strongly associated with any of the misperceptions aside from climate change, and that two distinct dimensions of an anti-elite worldview – anti-expert and conspiratorial worldviews – are better predictors of having misperceptions in the Spanish context.

We note some important limitations to this work. Most notably, like many studies of polarization surrounding science, we rely on cross-sectional data. While the substantive meaning of our anti-elite variables suggest a general mechanism, our evidence remains suggestive. Also, as we note the degree of variance explained in some of our models is modest: party model R^2 ranges from 3-9% across misperceptions, while R^2 for models accounting for anti-expert views and conspiratorial worldviews ranges from 8-20%. In addition, we rely on a single country. Further studies ought to investigate the link between anti-elite worldviews and misperceptions across domains in other countries with varying political systems.

Perhaps our most important contribution is that our data reveal no evidence of partisanship predicting misperceptions in the context of Spain. Support for a particular party was not associated with higher levels of misperceptions. (Note the one exception of Vox support predicting climate change misperceptions). This finding adds nuance to a body of literature that is, in many ways, informed by the highly polarised, two-party system of the United States. While partisanship is not strongly associated with misperceptions in Spain, other individual differences seem to matter more. As observed in other contexts (Rutjens et al. 2018, Pasek 2018), religiosity is modestly associated with a few of the health and science misperceptions in Spain. A much better predictor of misperceptions is an anti-elite worldview. While the anti-elite worldview particularly stands out, a conspiratorial worldview is associated with most of the misperceptions we examined. This complements recent work that suggests anti-elite sentiments, rather than ideological commitments or party affiliations, are strongly linked with vaccine hesitancy, for instance (Stoeckel et al. 2022). This line of work argues that a more general lack of trust in institutions is likely causally prior to

both (populist) party affiliation and specific misperceptions about health and science.

It should also be acknowledged that in the context of science, anti-expert views as we and others have measured them represent distrust of *mainstream* experts and expert consensus; those that hold such views may instead select their own "experts" that offer views outside the consensus and more in line with their own (Yeo et al. 2015). Likewise, individuals espousing conspiracist worldviews often form communities around figureheads or "heroes" such as "maverick" scientists to whom group members often defer and for whom public vilification acts as proof of belonging (Franks et al. 2017). In the future, more work may be dedicated to teasing apart antipathy toward *all* experts versus antipathy toward the consensus in particular, and what the implications of such a distinction might be.

In this research, we employ a large nationally representative sample of an understudied nation, and assess misperceptions on a wide array of science and health issues, including relatively recent misperceptions in the field of 5G technology. Even though concerns over 5G are recent, misperceptions about alleged health risks are already widespread, and associated with conspiratorial thinking. Looking at the ratio of misinformed to informed respondents, we find that misperceptions about GMOs and 5G health risks are more widespread than misperceptions about vaccines, homeopathy, and climate change. This is true for supporters of all parties. There is only one exception: Climate change denial is more wide-spread among supporters of the right-wing populist party Vox. We might speculate on different conditions encouraging greater levels of misperceptions for GMOs and 5G, respectively. Historically, GMOs have been more distrusted in Europe than in the U.S. (Ceccoli & Hixon 2012, Wunderlich & Gatto 2015), and so cultural differences may play a role in this case. A lack of polarization on the issue also allows for misperceptions to be held across the political spectrum, rather than being concentrated on one pole. For 5G risks, we might speculate that as a newer issue, there has been less messaging in public discourse about its safety, less related knowledge uptake, and therefore greater potential for rumors to spread in its absence.

Asking respondents to assess false statements across various domains also allows us to examine correlations between misperceptions across these domains. Our data shows that vaccine

misperceptions, in particular, tend to be correlated with misperceptions in several other domains, especially as they relate to health (GMOs, homeopathy, and 5G risks). As such it is possible that anti-vaccine beliefs may "contaminate" other domains in an "oil-spill" model of belief consolidation (DellaPosta 2020), or that they represent a larger latent construct around health misperceptions. Likewise, though anti-expert and conspiratorial worldviews are often conceived as individual differences, they also possess properties of social identities (Schulz et al. 2018, Franks et al. 2017). Such views coincide with an us-vs-them mentality and a rejection of supposedly naive outgroups (Franks et al. 2017), for instance. Future work, especially that which focuses outside entrenched two-party systems, may consider these as such alongside the standard political and religious groups in this literature.

Our findings underline the importance of country-specific strategies to correct misperceptions. If, as we find, Spaniards who hold anti-elite worldviews are particularly prone to resisting expert opinions then any interventions in Spain ought to target and address these anti-elite worldviews.

References

Abrams, D. & Hogg, M. A. (1990), 'Social identification, self-categorization and social influence', *European review of social psychology* **1**(1), 195–228.

Arvanitoyannis, I. S. & Krystallis, A. (2005), 'Consumers' beliefs, attitudes and intentions towards genetically modified foods, based on the 'perceived safety vs. benefits' perspective', *International journal of food science & technology* **40**(4), 343–360.

Bartels, L. M. (2002), 'Beyond the running tally: Partisan bias in political perceptions', *Political Behavior* **24**(2), 117–150.

Byford, J. (2011), *Conspiracy theories: A critical introduction*, Springer.

Ceccoli, S. & Hixon, W. (2012), 'Explaining attitudes toward genetically modified foods in the european union', *International Political Science Review* **33**(3), 301–319.

DellaPosta, D. (2020), 'Pluralistic collapse: The âoil spillâ model of mass opinion polarization', *American Sociological Review* p. 0003122420922989.

Drummond, C. & Fischhoff, B. (2017), 'Individuals with greater science literacy and education have more polarized beliefs on controversial science topics', *Proceedings of the National Academy of Sciences* **114**(36), 9587–9592.

Enders, A. M., Uscinski, J. E., Klofstad, C. & Stoler, J. (2020), 'The different forms of covid-19 misinformation and their consequences', *The Harvard Kennedy School Misinformation Review* .

Fernbach, P. M., Light, N., Scott, S. E., Inbar, Y. & Rozin, P. (2019), 'Extreme opponents of genetically modified foods know the least but think they know the most', *Nature Human Behaviour* **3**(3), 251.

Flynn, D., Nyhan, B. & Reifler, J. (2017), 'The nature and origins of misperceptions: Understanding false and unsupported beliefs about politics', *Political Psychology* **38**(S1), 127–150.

Franks, B., Bangerter, A., Bauer, M. W., Hall, M. & Noort, M. C. (2017), 'Beyond âmonologicali-tyâ? exploring conspiracist worldviews', *Frontiers in psychology* **8**, 861.

Gaines, B. J., Kuklinski, J. H., Quirk, P. J., Peyton, B. & Verkuilen, J. (2007), 'Same facts, different interpretations: Partisan motivation and opinion on iraq', *The Journal of Politics* **69**(4), 957–974.

Garrett, R. K. & Weeks, B. E. (2017), 'Epistemic beliefsâ role in promoting misperceptions and conspiracist ideation', *PloS one* **12**(9), e0184733.

Goreis, A. & Voracek, M. (2019), 'A systematic review and meta-analysis of psychological research on conspiracy beliefs: Field characteristics, measurement instruments, and associations with personality traits', *Frontiers in Psychology* **10**, 205.

Guntermann, E. (2019), 'Party influence where predispositions are strong and party identification is weak: Assessing citizensâ reactions to party cues on regional nationalism in spain', *Party Politics* **25**(4), 609–620.

Han, H., Blackburn, A. M., Jeftic, A., Tran, T., Stoeckli, S. & Vestergren, S. (in press), 'Validity testing of the conspiratorial thinking and anti-expert sentiment scales across 24 languages from a large-scale global dataset', *Epidemiology and Infection* .
URL: *https://psyarxiv.com/q3rkj/*

Hasell, A., Lyons, B. A., Tallapragada, M. & Jamieson, K. H. (2020), 'Improving gm consensus acceptance through reduced reactance and climate change-based message targeting', *Environmental Communication* **14**(7), 987–1003.

Hasell, A. & Stroud, N. J. (2020), 'The differential effects of knowledge on perceptions of genetically modified food safety', *International Journal of Public Opinion Research* **32**(1), 111–131.

Hogg, M. A. & Reid, S. A. (2006), 'Social identity, self-categorization, and the communication of group norms', *Communication theory* **16**(1), 7–30.

Hornsey, M. J., Harris, E. A., Bain, P. G. & Fielding, K. S. (2016), 'Meta-analyses of the determinants and outcomes of belief in climate change', *Nature climate change* **6**(6), 622–626.

Hornsey, M. J., Harris, E. A. & Fielding, K. S. (2018*a*), 'The psychological roots of anti-vaccination attitudes: A 24-nation investigation.', *Health Psychology* **37**(4), 307.

Hornsey, M. J., Harris, E. A. & Fielding, K. S. (2018*b*), 'Relationships among conspiratorial beliefs, conservatism and climate scepticism across nations', *Nature Climate Change* **8**(7), 614–620.

Humprecht, E., Esser, F. & Van Aelst, P. (2020), 'Resilience to online disinformation: A framework for cross-national comparative research', *The International Journal of Press/Politics* **25**(3), 493–516.

Jagers, J. & Walgrave, S. (2007), 'Populism as political communication style: An empirical study of political parties' discourse in Belgium', *European Journal of Political Research* **46**(3), 319–345.

Jürgens, P., Stark, B. & Magin, M. (2020), 'Two half-truths make a whole? on bias in self-reports and tracking data', *Social Science Computer Review* **38**(5), 600–615.

Kahan, D. M., Peters, E., Dawson, E. C. & Slovic, P. (2017), 'Motivated numeracy and enlightened self-government', *Behavioural Public Policy* **1**(1), 54–86.

Kennedy, J. (2019), 'Populist politics and vaccine hesitancy in western europe: an analysis of national-level data', *European journal of public health* **29**(3), 512–516.

Krämer, B. (2018), 'Populism, media, and the form of society', *Communication Theory* **28**(4), 444–465.

Kuklinski, J. H., Quirk, P. J., Jerit, J., Schwieder, D. & Rich, R. F. (2000), 'Misinformation and the currency of democratic citizenship', *Journal of Politics* **62**(3), 790–816.

Kull, S., Ramsay, C. & Lewis, E. (2003), 'Misperceptions, the media, and the iraq war', *Political Science Quarterly* **118**(4), 569–598.

Landrum, A. R., Hallman, W. K. & Jamieson, K. H. (2019), 'Examining the impact of expert voices: Communicating the scientific consensus on genetically-modified organisms', *Environmental Communication* **13**(1), 51–70.

Leshner, A. I. (2009), Public praises science; scientists fault public, media: Scientific achievements less prominent than a decade ago. Pew Research Center. Downloaded November 8, 2022 from `https://www.pewresearch.org/politics/2009/07/09/public-praises-science-scientists-fault-public-media/`.

Levendusky, M. S. (2013), 'Why do partisan media polarize viewers?', *American Journal of Political Science* **57**(3), 611–623.

Lewandowsky, S., Gignac, G. E. & Oberauer, K. (2013), 'The role of conspiracist ideation and worldviews in predicting rejection of science', *PloS one* **8**(10), e75637.

Lewandowsky, S., Gignac, G. E. & Oberauer, K. (2015), 'The robust relationship between conspiracism and denial of (climate) science', *Psychological Science* **26**(5), 667–670.

Linz, J. J. & Montero, J. R. (1999), 'The party systems of spain: Old cleavages and new challenges'.

Lobera, J. & Rogero-García, J. (2020), 'Scientific appearance and homeopathy. determinants of trust in complementary and alternative medicine', *Health Communication* pp. 1–8.

Lockwood, M. (2018), 'Right-wing populism and the climate change agenda: exploring the linkages', *Environmental Politics* **27**(4), 712–732.

Long, J. A. (2017), *jtools: Analysis and Presentation of Social Scientific Data*. R package version 0.9.0.

Lumley, T. (2020), *R Package "survey"*.

Lyons, B. A., Hasell, A., Tallapragada, M. & Jamieson, K. H. (2019), 'Conversion messages and attitude change: Strong arguments, not costly signals', *Public Understanding of Science* **28**(3), 320–338.

Lyons, B. A., Merola, V. & Reifler, J. (2020), 'Shifting medical guidelines: Compliance and spillover effects for revised antibiotic recommendations', *Social Science & Medicine* p. 112943.

Mason, L. (2018), *Uncivil agreement: How politics became our identity*, University of Chicago Press.

Mazzoleni, G., Stewart, J. & Horsfield, B. (2003), *The Media and Neo-populism: A Contemporary Comparative Analysis*, Greenwood Publishing Group.

McPhetres, J. & Pennycook, G. (2019), 'Science beliefs, political ideology, and cognitive sophistication', *OSF preprint* .
URL: *https://osf.io/ad9v7/*

Mede, N. G. & Schäfer, M. S. (2020), 'Science-related populism: Conceptualizing populist demands toward science', *Public Understanding of Science* p. 0963662520924259.

Merkley, E. (2019), 'Anti-intellectualism, populism, and motivated resistance to expert consensus', *Public Opinion Quarterly* .

Motta, M. (2018), 'The dynamics and political implications of anti-intellectualism in the united states', *American Politics Research* **46**(3), 465–498.

Motta, M., Callaghan, T. & Sylvester, S. (2018), 'Knowing less but presuming more: Dunning-kruger effects and the endorsement of anti-vaccine policy attitudes', *Social Science & Medicine* **211**, 274–281.

Nyhan, B. & Reifler, J. (2010), 'When corrections fail: The persistence of political misperceptions', *Political Behavior* **32**(2), 303–330.

Pasek, J. (2017), *Package "weights": Weighting and Weighted Statistics*. R package version 1.0.1.

Pasek, J. (2018), 'It's not my consensus: Motivated reasoning and the sources of scientific illiteracy', *Public Understanding of Science* **27**(7), 787–806.

Paun, C. (2019), 'Spain's homeopathy backlash', *Politico EU* .

URL: *https://www.politico.eu/article/spain-joins-backlash-against-homeopathy/*

Rigney, D. (1991), 'Three kinds of anti-intellectualism: Rethinking hofstadter', *Sociological Inquiry* **61**(4), 434–451.

Rutjens, B. T., Sutton, R. M. & van der Lee, R. (2018), 'Not all skepticism is equal: Exploring the ideological antecedents of science acceptance and rejection', *Personality and Social Psychology Bulletin* **44**(3), 384–405.

Rutjens, B. T. & van der Lee, R. (2020), 'Spiritual skepticism? heterogeneous science skepticism in the netherlands', *Public Understanding of Science* **29**(3), 335–352.

Schulz, A., Wirth, W. & Müller, P. (2018), 'We are the people and you are fake news: A social identity approach to populist citizensâ false consensus and hostile media perceptions', *Communication Research* p. doi:10.1177/0093650218794854.

Smith, E. K. & Mayer, A. (2019), 'Anomalous anglophones? contours of free market ideology, political polarization, and climate change attitudes in english-speaking countries, western european and post-communist states', *Climatic Change* **152**(1), 17–34.

Steenbergen, M. R., Edwards, E. E. & De Vries, C. E. (2007), 'Whoâs cueing whom? mass-elite linkages and the future of european integration', *European Union Politics* **8**(1), 13–35.

Stoeckel, F., Carter, C., Lyons, B. A. & Reifler, J. (2022), 'The politics of vaccine hesitancy in europe', *European Journal of Public Health* .

Stoeckel, F., Lyons, B. & Reifler, J. (2021), 'Public misperceptions of european integration in the uk', *Journal of Elections, Public Opinion, and Parties* .

Swami, V., ChamorroâPremuzic, T. & Furnham, A. (2010), 'Unanswered questions: A preliminary investigation of personality and individual difference predictors of 9/11 conspiracist beliefs.', *Applied Cognitive Psychology* **24**(6), 749–761.

Tajfel, H. (1972), 'Social categorization, english manuscript of la catégorization sociale', *Introduction à la psychologie sociale* **1**.

Tajfel, H. (1982), 'Social psychology of intergroup relations', *Annual review of psychology* **33**(1), 1–39.

Torcal, M., Martini, S. & Orriols, L. (2018), 'Deciding about the unknown: The effect of party and ideological cues on forming opinions about the european union', *European Union Politics* **19**(3), 502–523.

Turner, J. C. (1975), 'Social comparison and social identity: Some prospects for intergroup behaviour', *European journal of social psychology* **5**(1), 1–34.

Uscinski, J. E., Klofstad, C. & Atkinson, M. D. (2016), 'What drives conspiratorial beliefs? The role of informational cues and predispositions', *Political Research Quarterly* **69**(1), 57–71.

Veenstra, A. S., Hossain, M. D. & Lyons, B. A. (2014), 'Partisan media and discussion as enhancers of the belief gap', *Mass Communication and Society* **17**(6), 874–897.

Westwood, S. J., Iyengar, S., Walgrave, S., Leonisio, R., Miller, L. & Strijbis, O. (2018), 'The tie that divides: Cross-national evidence of the primacy of partyism', *European Journal of Political Research* **57**(2), 333–354.

Wood, M. J., Douglas, K. M. & Sutton, R. M. (2012), 'Dead and alive: Beliefs in contradictory conspiracy theories', *Social Psychological and Personality Science* **3**(6), 767–773.

Wunderlich, S. & Gatto, K. A. (2015), 'Consumer perception of genetically modified organisms and sources of information', *Advances in Nutrition* **6**(6), 842–851.

Yeo, S. K., Xenos, M. A., Brossard, D. & Scheufele, D. A. (2015), 'Selecting our own science: How communication contexts and individual traits shape information seeking', *The ANNALS of the American Academy of Political and Social Science* **658**(1), 172–191.

Supplemental material:

Partisanship and anti-elite worldviews as correlates of science and health beliefs in the multi-party system of Spain

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Table SI1: Proportion of the population holding misperceptions by item

Question wording	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	Misinformed	Informed	Uninformed	Ratio
I believe that genetically modified food harms the environment.	10.93%	25.26%	29.95%	13.16%	3.55%	17.15%	36.19%	16.71%	47.10%	2.17
I believe genetically modified foods are as safe to eat as conventional foods.	5.39%	15.00%	26.97%	28.57%	14.96%	9.12%	43.52%	20.39%	36.08%	2.13
The new 5G mobile network poses health risks.	9.25%	17.24%	33.01%	14.99%	10.47%	15.04%	26.49%	25.47%	48.04%	1.04
I believe you can get the flu from the flu vaccine.	6.02%	28.67%	20.13%	23.38%	15.59%	6.20%	34.69%	38.98%	26.33%	0.89
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	9.35%	26.48%	18.62%	22.02%	18.48%	5.06%	35.83%	40.50%	23.67%	0.88
I believe some vaccines cause autism in healthy children.	2.57%	6.18%	14.48%	24.74%	36.17%	15.86%	8.75%	60.91%	30.34%	0.14
I believe HPV vaccination at age 12 promotes sexual activity.	2.52%	3.65%	19.64%	20.63%	29.97%	23.60%	6.17%	50.59%	43.24%	0.12
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	32.86%	40.47%	14.38%	6.82%	2.01%	3.46%	8.83%	73.34%	17.83%	0.12
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	1.34%	7.73%	8.37%	20.09%	57.76%	4.72%	9.07%	77.85%	13.08%	0.12
5G technology helps transmit coronavirus.	2.58%	4.28%	11.96%	15.85%	48.43%	16.90%	6.86%	64.8%	28.85%	0.11

Note: The reported ratios estimate the ratio of misinformed to informed responses. The misperceptions in the table are ordered by ratio from largest to smallest.

Table SI2: Misinformed proportions by party: PSOE and PP

item	party	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	misinformed	informed	uninformed	ratio
I believe genetically modified foods are as safe to eat as conventional foods.	PSOE	2.51	12.54	35.08	29.82	13.31	6.74	43.13	15.05	41.81	2.87
I believe that genetically modified food harms the environment.	PSOE	10.95	27.06	30.28	10.26	3.12	18.33	38.01	13.38	48.61	2.84
The new 5G mobile network poses health risks.	PSOE	7.43	18.14	33.97	13.96	12.66	13.84	25.57	26.62	47.81	0.96
I believe you can get the flu from the flu vaccine.	PSOE	5.48	28.52	19.68	23.13	19.14	4.03	34.01	42.28	23.72	0.80
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	PSOE	5.69	24.18	18.53	26.11	21.68	3.80	29.87	47.79	22.33	0.62
People who come to live here from other countries are more likely to commit violent crimes than people who were born here.	PSOE	4.48	14.54	24.28	29.29	25.02	2.37	19.02	54.32	26.66	0.35
I believe some vaccines cause autism in healthy children.	PSOE	4.12	6.04	13.42	23.15	39.65	13.62	10.16	62.80	27.04	0.16
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	PSOE	2.11	8.28	6.70	16.13	63.52	3.26	10.39	79.65	9.97	0.13
I believe HPV vaccination at age 12 promotes sexual activity.	PSOE	2.65	4.13	20.40	23.02	30.65	19.14	6.78	53.67	39.55	0.13
5G technology helps transmit coronavirus.	PSOE	1.62	3.91	10.39	15.15	52.39	16.53	5.53	67.5	26.92	0.08
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	PSOE	37.42	43.26	11.71	3.15	2.09	2.37	5.24	80.68	14.08	0.06
People who come to live here from other countries are more likely to commit violent crimes than people who were born here.	PP	8.79	30.09	33.45	18.78	6.54	2.36	38.88	25.32	35.81	1.54
The new 5G mobile network poses health risks.	PP	9.00	25.35	31.22	15.11	7.62	11.70	34.36	22.73	42.92	1.51
I believe that genetically modified food harms the environment.	PP	9.19	21.12	33.60	16.59	3.88	15.61	30.31	20.48	49.21	1.48
I believe genetically modified foods are as safe to eat as conventional foods.	PP	10.19	18.80	23.51	31.71	9.91	5.89	41.61	28.99	29.40	1.44
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	PP	11.18	31.93	18.12	15.26	17.75	5.75	43.12	33.02	23.87	1.31
I believe you can get the flu from the flu vaccine.	PP	7.68	27.69	16.21	28.54	13.52	6.35	35.37	42.07	22.56	0.84
I believe HPV vaccination at age 12 promotes sexual activity.	PP	4.59	5.98	17.29	16.07	25.74	30.33	10.58	41.81	47.62	0.25
5G technology helps transmit coronavirus.	PP	5.08	3.95	10.93	19.73	41.47	18.84	9.03	61.20	29.77	0.15
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	PP	1.73	9.03	12.68	22.55	51.63	2.38	10.76	74.18	15.07	0.15
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	PP	26.33	43.33	18.93	7.94	1.32	2.15	9.26	69.66	21.08	0.13
I believe some vaccines cause autism in healthy children.	PP	1.48	5.38	15.80	16.27	39.35	21.71	6.86	55.63	37.51	0.12

Table SI3: Misinformed proportions by party: Podemos and Vox

item	party	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	misinformed	informed	uninformed	ratio
I believe genetically modified foods are as safe to eat as conventional foods.	Podemos	9.10	16.42	22.28	33.61	12.87	5.72	46.48	25.53	27.99	1.82
I believe that genetically modified food harms the environment.	Podemos	12.14	25.64	26.53	19.37	3.92	12.41	37.78	23.29	38.94	1.62
The new 5G mobile network poses health risks.	Podemos	15.37	16.73	27.06	15.44	11.23	14.18	32.10	26.67	41.24	1.20
I believe you can get the flu from the flu vaccine.	Podemos	5.13	29.34	21.79	14.73	21.02	7.99	34.46	35.76	29.78	0.96
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	Podemos	6.67	20.43	22.27	23.78	23.30	3.54	27.10	47.08	25.82	0.58
People who come to live here from other countries are more likely to commit violent crimes than people who were born here.	Podemos	3.33	8.85	17.43	31.24	36.35	2.79	12.18	67.59	20.22	0.18
I believe some vaccines cause autism in healthy children.	Podemos	3.79	4.21	10.56	19.52	52.30	9.62	8.00	71.81	20.19	0.11
5G technology helps transmit coronavirus.	Podemos	3.54	4.05	13.31	13.11	53.57	12.41	7.60	66.68	25.72	0.11
I believe HPV vaccination at age 12 promotes sexual activity.	Podemos	1.78	2.85	15.07	13.87	45.41	21.02	4.63	59.28	36.09	0.08
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	Podemos	50.38	35.55	7.01	3.67	2.36	1.03	6.02	85.93	8.04	0.07
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	Podemos	1.89	0.00	8.59	13.67	67.52	8.33	1.89	81.19	16.92	0.02
People who come to live here from other countries are more likely to commit violent crimes than people who were born here.	Vox	28.75	34.71	22.87	8.37	4.98	0.33	63.46	13.35	23.19	4.75
I believe genetically modified foods are as safe to eat as conventional foods.	Vox	4.50	17.46	27.90	30.71	14.17	5.28	44.87	21.95	33.17	2.04
I believe that genetically modified food harms the environment.	Vox	7.52	20.31	43.65	18.46	1.35	8.71	27.83	19.81	52.36	1.40
The new 5G mobile network poses health risks.	Vox	13.80	15.92	28.62	15.98	14.64	11.05	29.72	30.62	39.66	0.97
I believe you can get the flu from the flu vaccine.	Vox	8.90	24.20	19.95	21.32	17.69	7.94	33.10	39.01	27.89	0.85
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	Vox	5.90	24.65	20.77	28.09	16.35	4.24	30.54	44.44	25.01	0.69
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	Vox	18.27	36.25	21.61	13.03	5.46	5.38	18.49	54.52	26.99	0.34
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	Vox	0.86	10.74	8.75	26.47	51.31	1.86	11.60	77.79	10.61	0.15
I believe some vaccines cause autism in healthy children.	Vox	3.22	5.30	16.26	27.39	31.13	16.71	8.52	58.51	32.96	0.15
I believe HPV vaccination at age 12 promotes sexual activity.	Vox	3.37	2.21	19.67	19.00	29.01	26.74	5.58	48.01	46.42	0.12

Table SI4: Misinformed proportions by party: Cs and Other

item	party	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	misinformed	informed	uninformed	ratio
I believe genetically modified foods are as safe to eat as conventional foods.	Cs	0.73	25.35	29.50	25.50	15.97	2.95	41.47	26.08	32.45	1.59
I believe that genetically modified food harms the environment.	Cs	7.82	22.86	38.99	17.88	2.45	10.01	30.68	20.33	49.00	1.51
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	Cs	15.43	27.23	16.66	21.18	18.27	1.24	42.65	39.45	17.90	1.08
I believe you can get the flu from the flu vaccine.	Cs	5.05	33.01	17.74	29.43	10.62	4.16	38.06	40.05	21.90	0.95
The new 5G mobile network poses health risks.	Cs	7.04	15.27	25.78	21.18	8.73	22.00	22.31	29.90	47.78	0.75
People who come to live here from other countries are more likely to commit violent crimes than people who were born here.	Cs	1.99	26.62	22.51	19.79	24.63	4.46	28.61	44.42	26.97	0.64
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	Cs	1.15	9.51	3.90	20.98	59.90	4.57	10.66	80.87	8.46	0.13
I believe some vaccines cause autism in healthy children.	Cs	0.83	5.69	15.86	21.54	45.92	10.16	6.52	67.46	26.02	0.10
5G technology helps transmit coronavirus.	Cs	1.37	5.79	10.32	19.59	50.36	12.58	7.16	69.94	22.90	0.10
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	Cs	30.56	42.63	18.06	5.34	0.42	3.00	5.76	73.19	21.06	0.08
I believe HPV vaccination at age 12 promotes sexual activity.	Cs	0.00	4.28	18.64	21.58	34.05	21.44	4.28	55.64	40.08	0.08
I believe genetically modified foods are as safe to eat as conventional foods.	other	2.23	16.41	21.83	32.62	19.18	7.73	51.80	18.64	29.56	2.78
I believe that genetically modified food harms the environment.	other	16.46	19.43	33.56	15.52	4.27	10.76	35.89	19.79	44.32	1.81
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	other	16.62	29.46	13.36	23.46	13.87	3.23	46.08	37.33	16.59	1.23
I believe you can get the flu from the flu vaccine.	other	4.52	30.82	17.00	27.53	18.37	1.77	35.33	45.90	18.77	0.77
The new 5G mobile network poses health risks.	other	7.01	7.30	37.21	15.46	19.14	13.89	14.31	34.59	51.09	0.41
People who come to live here from other countries are more likely to commit violent crimes than people who were born here.	other	4.94	14.31	22.37	30.26	25.32	2.81	19.24	55.58	25.17	0.35
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	other	0.53	8.40	11.72	17.23	53.82	8.30	8.93	71.06	20.01	0.13
I believe some vaccines cause autism in healthy children.	other	0.35	6.03	14.62	32.86	31.62	14.52	6.39	64.48	29.13	0.10
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	other	42.71	39.66	5.86	5.47	1.73	4.57	7.19	82.38	10.43	0.09
I believe HPV vaccination at age 12 promotes sexual activity.	other	0.00	2.85	22.48	21.00	27.65	26.03	2.85	48.65	48.51	0.06
5G technology helps transmit coronavirus. 0.06	other	0.31	3.51	12.16	15.66	49.56	18.80	3.82	65.21	15.19	30.96

Table SI5: Misinformed proportions by party: No party

item	party	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	misinformed	informed	uninformed	ratio
I believe that genetically modified food harms the environment.	none	11.52	30.47	19.45	6.97	4.53	27.06	41.99	11.50	46.52	3.65
I believe genetically modified foods are as safe to eat as conventional foods.	none	7.16	9.89	22.45	21.12	19.53	19.86	40.65	17.05	42.31	2.38
The new 5G mobile network poses health risks.	none	7.45	14.94	41.36	12.07	3.98	20.19	22.39	16.06	61.55	1.39
I believe you can get the flu from the flu vaccine.	none	5.49	28.63	26.85	20.08	8.04	10.92	34.12	28.11	37.76	1.21
Do you feel that homeopathic medicines are an effective cure for everyday health concerns such as allergies, headaches, fatigue, cold sores and the flu?	none	9.42	26.96	19.88	17.52	16.11	10.11	36.38	33.63	29.99	1.08
People who come to live here from other countries are more likely to commit violent crimes than people who were born here.	none	4.89	18.37	33.92	23.08	14.62	5.12	23.26	37.70	39.04	0.62
I believe some vaccines cause autism in healthy children.	none	2.13	9.35	15.66	34.47	17.39	21.01	11.48	51.86	36.67	0.22
The Earth is getting warmer mostly because of human activity such as burning fossil fuels.	none	24.44	38.98	18.35	10.79	1.45	5.99	12.24	63.42	24.34	0.19
I believe HPV vaccination at age 12 promotes sexual activity.	none	2.98	2.13	22.57	25.99	22.55	23.79	5.11	48.54	46.35	0.11
How about serious conditions such as cancer: Do you feel that homeopathic medicines are an effective cure for serious conditions such as cancer?	none	0.43	7.28	5.97	24.70	55.23	6.39	7.71	79.93	12.36	0.10
5G technology helps transmit coronavirus.	none	3.12	3.76	12.58	15.15	46.14	19.25	6.88	61.29	31.83	0.11

Table SI6: Science misperceptions across groups (reference party: Vox)

	Climate Change		GMO Environment		GMO Eating		5G Health		5G Corona	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Intercept)	1.50***	1.87***	3.33***	2.42***	2.97***	3.15***	2.97***	1.62***	1.96***	0.81***
	(0.12)	(0.16)	(0.20)	(0.24)	(0.21)	(0.26)	(0.24)	(0.29)	(0.12)	(0.15)
PP	-0.37***	-0.41***	-0.09	-0.07	0.26	0.25	0.06	0.10	-0.01	-0.02
	(0.09)	(0.09)	(0.15)	(0.14)	(0.15)	(0.16)	(0.17)	(0.16)	(0.09)	(0.09)
Podemos	-0.77***	-0.73***	-0.01	0.12	0.14	0.16	0.05	0.31	-0.12	0.22*
	(0.10)	(0.10)	(0.15)	(0.15)	(0.16)	(0.17)	(0.19)	(0.19)	(0.10)	(0.09)
PSOE	-0.60***	-0.63***	0.13	0.28*	0.06	0.03	-0.17	0.12	-0.25**	0.02
	(0.08)	(0.09)	(0.14)	(0.13)	(0.14)	(0.15)	(0.17)	(0.17)	(0.09)	(0.08)
Ciudadanos	-0.47***	-0.48***	-0.13	-0.02	0.10	0.10	-0.15	0.01	-0.16	-0.01
	(0.11)	(0.11)	(0.17)	(0.16)	(0.18)	(0.18)	(0.21)	(0.20)	(0.11)	(0.10)
Anti-Expert		0.41**		0.06		0.38		0.31		1.76***
		(0.13)		(0.20)		(0.22)		(0.25)		(0.22)
Conspiratorial		-0.79***		1.26***		-0.54*		1.63***		0.08
		(0.13)		(0.21)		(0.22)		(0.25)		(0.23)
Religiosity		0.12		0.28*		-0.04		0.18		0.44**
		(0.09)		(0.14)		(0.15)		(0.18)		(0.16)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	1385	1382	621	620	668	667	505	504	1649	1646
R^2	0.063	0.089	0.025	0.093	0.051	0.061	0.075	0.174	0.030	0.162

* $p < .05$, ** $p < .01$, *** $p < .005$ (two-sided). All models include age, gender, university education, and political knowledge as controls, and employ survey weights. Cell entries are OLS regression coefficients with standard errors in parentheses.

Table SI7: Health misperceptions across groups (reference party: Vox)

	Vax: Autism		Vax: HPV		VAX: Flu		Homeopathy: Flu		Homeopathry: Cancer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Intercept)	2.76***	1.14***	2.46***	1.32***	2.98***	1.75***	2.72***	1.37***	2.43***	1.16***
	(0.21)	(0.24)	(0.22)	(0.26)	(0.22)	(0.28)	(0.27)	(0.33)	(0.22)	(0.27)
PP	-0.16	-0.13	0.18	0.20	-0.04	-0.03	0.22	0.24	0.02	0.07
	(0.15)	(0.14)	(0.16)	(0.15)	(0.16)	(0.16)	(0.18)	(0.17)	(0.14)	(0.14)
Podemos	-0.38*	-0.08	-0.30	0.03	-0.06	0.12	-0.10	0.23	-0.43**	-0.12
	(0.16)	(0.15)	(0.17)	(0.17)	(0.17)	(0.17)	(0.20)	(0.20)	(0.16)	(0.16)
PSOE	-0.10	0.15	-0.01	0.29*	-0.15	0.06	-0.18	0.16	-0.21	0.08
	(0.14)	(0.13)	(0.14)	(0.14)	(0.15)	(0.15)	(0.17)	(0.17)	(0.14)	(0.13)
Ciudadanos	-0.27	-0.12	-0.15	-0.04	0.07	0.19	0.23	0.46*	-0.14	0.09
	(0.17)	(0.16)	(0.18)	(0.17)	(0.19)	(0.18)	(0.22)	(0.21)	(0.18)	(0.17)
Anti-Expert		1.62***		0.91***		0.29		0.79**		1.11***
		(0.20)		(0.22)		(0.24)		(0.27)		(0.22)
Conspiratorial		0.95***		0.58*		1.36***		0.92***		0.62**
		(0.21)		(0.22)		(0.23)		(0.27)		(0.22)
Religiosity		0.51***		0.88***		0.38*		0.85***		0.63***
		(0.14)		(0.15)		(0.15)		(0.18)		(0.14)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	636	636	583	582	707	707	561	560	559	558
R^2	0.050	0.227	0.048	0.159	0.050	0.117	0.040	0.134	0.063	0.181

* $p < .05$, ** $p < .01$, *** $p < .005$ (two-sided). All models include age, gender, university education, and political knowledge as controls, and employ survey weights. Cell entries are OLS regression coefficients with standard errors in parentheses.

Table SI8: Science misperceptions across groups (reference party: Podemos)

	Climate Change		GMO Environment		GMO Eating		5G Health		5G Corona	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Intercept)	0.73***	1.14***	3.31***	2.54***	3.11***	3.32***	3.02***	1.93***	1.84***	1.04***
	(0.11)	(0.14)	(0.18)	(0.22)	(0.19)	(0.24)	(0.24)	(0.26)	(0.12)	(0.13)
PP	0.40***	0.32***	-0.07	-0.19	0.12	0.09	0.01	-0.20	0.11	-0.25**
	(0.08)	(0.09)	(0.13)	(0.14)	(0.14)	(0.15)	(0.16)	(0.16)	(0.08)	(0.08)
PSOE	0.17*	0.09	0.14	0.16	-0.08	-0.13	-0.22	-0.19	-0.14	-0.20**
	(0.08)	(0.08)	(0.12)	(0.12)	(0.12)	(0.13)	(0.15)	(0.15)	(0.08)	(0.07)
Vox	0.77***	0.73***	0.01	-0.12	-0.14	-0.16	-0.05	-0.31	0.12	-0.22*
	(0.10)	(0.10)	(0.15)	(0.15)	(0.16)	(0.17)	(0.19)	(0.19)	(0.10)	(0.09)
Ciudadanos	0.30**	0.25*	-0.12	-0.14	-0.04	-0.07	-0.20	-0.30	-0.04	-0.24*
	(0.10)	(0.10)	(0.15)	(0.15)	(0.16)	(0.16)	(0.20)	(0.19)	(0.10)	(0.09)
Anti-Expert		0.41**		0.06		0.38		0.31		1.76***
		(0.13)		(0.20)		(0.22)		(0.25)		(0.13)
Conspiratorial		-0.79***		1.26***		-0.54*		1.63***		0.08
		(0.13)		(0.21)		(0.22)		(0.25)		(0.13)
Religiosity		0.12		0.28*		-0.04		0.18		0.44***
		(0.09)		(0.14)		(0.15)		(0.18)		(0.09)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	1385	1382	621	620	668	667	505	504	1649	1646
R^2	0.063	0.089	0.025	0.093	0.051	0.061	0.075	0.174	0.030	0.162

* $p < .05$, ** $p < .01$, *** $p < .005$ (two-sided). All models include age, gender, university education, and political knowledge as controls, and employ survey weights. Cell entries are OLS regression coefficients with standard errors in parentheses.

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Table SI9: Health misperceptions across groups (reference party: Podemos)

	Vax: Autism		Vax: HPV		VAX: Flu		Homeopathy: Flu		Homeopathry: Cancer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Intercept)	2.38***	1.06***	2.16***	1.35***	2.91***	1.87***	2.62***	1.60***	2.00***	1.05***
	(0.19)	(0.22)	(0.20)	(0.24)	(0.21)	(0.25)	(0.26)	(0.31)	(0.21)	(0.25)
PP	0.22	-0.05	0.48**	0.18	0.03	-0.14	0.32	0.01	0.45**	0.19
	(0.15)	(0.14)	(0.16)	(0.15)	(0.16)	(0.16)	(0.18)	(0.18)	(0.15)	(0.15)
PSOE	0.28*	0.24*	0.29*	0.26*	-0.09	-0.06	-0.08	-0.07	0.22	0.20
	(0.13)	(0.12)	(0.14)	(0.13)	(0.14)	(0.14)	(0.17)	(0.16)	(0.14)	(0.13)
Vox	0.38*	0.08	0.30	-0.03	0.06	-0.12	0.10	-0.23	0.43**	0.12
	(0.16)	(0.15)	(0.17)	(0.17)	(0.17)	(0.17)	(0.20)	(0.20)	(0.16)	(0.16)
Ciudadanos	0.11	-0.03	0.15	-0.07	0.13	0.08	0.33	0.23	0.29	0.20
	(0.16)	(0.15)	(0.17)	(0.17)	(0.18)	(0.18)	(0.22)	(0.21)	(0.18)	(0.17)
Anti-Expert		1.62***		0.91***		0.29		0.79**		1.11***
		(0.20)		(0.22)		(0.24)		(0.27)		(0.22)
Conspiratorial		0.95***		0.58*		1.36***		0.92***		0.62**
		(0.21)		(0.22)		(0.23)		(0.27)		(0.22)
Religiosity		0.51***		0.88***		0.38*		0.85***		0.63***
		(0.14)		(0.15)		(0.15)		(0.18)		(0.14)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	636	636	583	582	707	707	561	560	559	558
R^2	0.050	0.227	0.048	0.159	0.050	0.117	0.040	0.134	0.063	0.181

* $p < .05$, ** $p < .01$, *** $p < .005$ (two-sided). All models include age, gender, university education, and political knowledge as controls, and employ survey weights. Cell entries are OLS regression coefficients with standard errors in parentheses.