

Chapter's cite: Moreno-Castro, C., Dzimińska, M., Krzewińska, A., Warwas, I., & Serra-Perales, A. (2022). Citizens' Political Discourses on Climate Change and Vaccines: A Comparative Study Between Spain and Poland. In D. Palau-Sampio, G. López García, & L. Iannelli (Ed.), *Contemporary Politics, Communication, and the Impact on Democracy* (pp. 329-351). Copyright IGI Global. <https://www.igi-global.com/book/contemporary-politics-communication-impact-democracy/267380>. Posted with permission.

Citizens' political discourses on climate change and vaccines:

A comparative study between Spain and Poland

Carolina Moreno-Castro

Research Institute on Social Welfare Policy, UVEG, Spain

Małgorzata Dzimińska

Department of Labour and Social Policy, University of Łódź, Poland

Aneta Krzewińska

Department of Social Research Methods and Techniques, University of Łódź, Poland

Izabela Warwas

Department of Labour and Social Policy, University of Łódź, Poland

Ana Serra-Perales

Research Institute on Social Welfare Policy, UVEG, Spain

ABSTRACT

The main objective of this chapter is to compare the political discourses of Polish and Spanish citizens on science issues such as vaccines and climate change expressed by the citizens participating in the public consultations held in València (Spain) and Łódź (Poland), during the autumn of 2019. As the general elections were held very close to the public consultations in both countries, it was expected that there would be references to election campaigns, political parties or public policy-making during the debates. Then, those statements explicitly expressing political views on climate change and vaccines were selected from the debate transcripts before applying five specific frames and variables for analysis and interpretation. The results show that more political opinions were expressed in the debates on climate change than on vaccines. Moreover,

the citizens' views on the science-politics dichotomy mainly were negative, with the men mixing science with politics more than the women.

Keywords: Science Decision-Making; Citizen Consultations, Science Communication, Political Discourse, Vaccines, Climate Change, Political Perception of Science.

INTRODUCTION

Political discourse is omnipresent in all areas of the public sphere in democratic societies. It is fuelled both by positive and negative information circulating through numerous sources and channels. This is why it is difficult to remain aloof from the political statements and messages with which our societies are bombarded on a daily basis by the media, billboards, advertisements, social networking sites (hereinafter SNSs) and other dissemination platforms (Anderson, 2009; Luzón, 2013). In the early 1980s, Habermas (1981) was fairly critical of the involvement of the media in the public sphere, because he believed that they played a negative role, given that the communication industries always defended their own particular interests. Basically, he was of the mind that the media's power of propagation allowed its discourses to impact political and social life, alike. Therefore, he considered the media and its structures as fundamental powers that strongly influenced both. Since then, it seems that the influence of the media has declined to the point that they do not now play such an essential role in people's decision-making. On the contrary, international research suggests that, broadly speaking, personal information and SNSs exert the strongest influence in this respect (Entwistle et al., 2011; Álvarez et al., 2017; Campos & Kim, 2017; Martire & Helgeson 2017; Whitehead et al., 2018; Moreno-Castro et al., 2019; Urena, 2019).

In addition to the multiplicity of information channels, with the COVID-19 pandemic it has been confirmed that other aspects, such as the circulation of fake news, have since burst onto the scene (Bimber & Gil de Zúñiga, 2020). These information sources and channels are shaping an ecosystem characterised by an unstable post-public sphere, due to the multifaceted consolidation of the Internet era. According to Schlesinger (2020), this instability should come as no surprise since, over time, the conceptualisation of the foundations and scope of the public sphere has not ceased to change. Indeed, states are constantly developing rules to regulate the boundaries of their political systems. For his part, Davis (2020) calls it the anti-public sphere, defined as that space of online socio-political interaction in which the conversation routinely and radically mocks the ethical and rational norms of democratic discourse. This formerly offline space, which has recently gained visibility thanks to networked digital media, includes a large variety of discursive spaces and platforms, such as supremacist websites, anti-vaccination portals, climate change denial forums, anti-immigration Facebook pages, extremist websites and so forth. On these right-wing and 'truth' (conspiracy) websites, the conversation rides roughshod over the rules of public debate and argumentation (Žuk & Žuk, 2020).

Plenty of international studies have been performed to date on the political polarisation of the discourse on vaccines and climate change (Boykoff, 2008; Broniatowski et al., 2020; Walter et al., 2020; Weingart et al., 2000; Žuk & Žuk, 2020; Cafiero et al., 2021). This chapter, whose aim is to provide a qualitative approach to this line of research, presents the results obtained from two of the public consultations held in five European cities – Vicenza (Italy), Łódź (Poland), Trnava (Slovakia), València (Spain) and Lisbon (Portugal) – during the autumn of 2019, in the framework of the CONCISE project (Moreno-Castro et al., 2020). The intention was to gain further insights into how Europeans built their scientific beliefs, perceptions and attitudes based on the information that they received through various information sources and channels on a daily basis. In order to gather the citizenry's opinions, the five public consultations, on four topics relating to science controversies, namely, vaccines, complementary and alternative medicine (CAM),

climate change and genetically modified organisms (GMOs), were held during the autumn of 2019, with the participation of a total of 497 citizens. Divided into group discussion tables, according to sociodemographic criteria including age and educational level, the attendees debated among themselves for a day (Saturday).

The debates were recorded and transcribed. Subsequently, quantitative and qualitative analyses were performed using the T-Lab linguistic corpus software and the N-Vivo software, respectively. In the five countries, all the debates were staged following the same protocol, which had been previously agreed upon by the CONCISE consortium members (Llorente et al., 2021). Since the 1950s, public consultations have been held in democratic countries so as to allow the citizenry to discuss different issues on the political agenda, to the point that nowadays they are a matter of course for local and international policy-making. Furthermore, different administrations are also now staging online public consultations to gather the citizenry's opinions for designing and implementing specific actions (Boucher, 2009).

The citizens participating in the public consultations, staged in the framework of the CONCISE project, were asked standardised questions aimed at identifying the sources to which they usually resorted for keeping abreast of news on the topics of debate. Likewise, they were asked about the extent to which they trusted those information sources and believed that they were reliable. Then, before concluding the debates, they were asked how they would like to be informed about each discussion topic, namely, how they wanted to receive information and through which channels. This set of questions yielded very interesting, original and useful results for the field of science communication. One of the objectives of the CONCISE project was to re-examine the role that science communication plays in contemporary societies. Science communication is an emerging discipline that encompasses a large number of research objectives, from professional practice to science communication research, through citizen perception of science-related issues (Burns et al., 2003; Bubela et al., 2009; Trench & Bucchi, 2010; Bucchi, 1996). Additionally, very complex scientific issues are inherent to modern societies and continually debated in the public sphere (Brossard & Lewenstein, 2009). That is why the focus was placed on determining how the discussions among the participants would develop, how they would express themselves, what kind of anecdotes they would tell and who they would or would not trust when receiving information. The analysis of their discourses has allowed for ascertaining the extent to which the public is involved, either consciously or unconsciously, in the practice of science, given that the media and SNSs make scientific knowledge available and negotiable (Van Dijck, 2003).

Furthermore, the moderators attempted to make the debates as straightforward as possible in order to allow all the participants to express their views. In all the public consultations, the debates were, by and large, enjoyable and the attendees, who were pleased to be in the limelight, actively participated in them. Additionally, the results generated by the public consultations will be very beneficial for the science communication community, especially scientific experts working for government agencies or non-governmental organisations (NGOs), all of whom seek to develop communication materials and documents to inform citizens on topics relating to science and technology, which Bruine de Bruin and Bostrom (2013) described in a study of citizen contributions to science communication activities.

Science Communication Research

This is particularly the case right now, in the midst of the COVID-19 pandemic, when all national and international public health institutions are striving to disseminate information so as to combat disinformation (Da Silva & Toledo, 2020; Zarocostas, 2020). People need information that does not only fill gaps in their knowledge and corrects their misconceptions, but which also builds on their existing beliefs (Bruine de Bruin & Bostrom, 2013). For this reason, the discussion groups provided information on the citizens' beliefs which will help to design communication materials

for addressing common problems that affect people's decision-making. Likewise, it would be interesting to confirm, through other studies, whether or not those materials lead to a much needed improvement in comprehension and informed decision-making. To a certain extent, the CONCISE project diverged somewhat from the priority lines of research in the field science communication, generally focusing more on the analysis of messages and professional practices than on reception studies. In addition to yielding qualitative results, it was a highly participatory process in which the citizens had the chance to express their own views on the topics debated during the five public consultations, thus providing essential inputs for EU policy-making.

As noted by Brossard and Lewenstein (2009), in democratic societies the citizenry's understanding of science has an important bearing on policy-making on controversial science issues (stem cells, global warming, biotechnology, etc.). Indeed, scientific controversies on which there are a wide range of views are continually debated in the public sphere. Accordingly, science dissemination and outreach activities have been promoted in Western countries during the past three decades, with a view to informing the citizenry before addressing or making decisions on these problems. At the same time, new theoretical concepts of the public understanding of science (hereinafter PUS) have emerged, like, for instance, the linear dissemination of popularisation models emphasising secular knowledge, public commitment, public participation and science policy-making (Lewenstein, 2003).

Empirical research has shown that the public communication of science is more complicated than the knowledge deficit model suggests, as noted by Simis et al. (2016). According to these authors, the deficit model persists in the public communication of science:

1. Because scientists believe that audiences process information rationally, when this is far from being the case.
2. Because this model may be a product of current institutional structures, since many higher education programmes in science, technology, engineering and mathematics (STEM) generally lack formal training in public communication; and
3. Scientists conceptualise 'the public' and relate it to attitudes towards the deficit model, contending that it persists because it can easily influence public science policy-making.

In light of this, Simis et al. (2016) proposed ways of eradicating the deficit model and to move towards more effective science communication practices, including training scientists in communication methods based on social science research and following approaches that involve community members in science-related issues. Emerging at the beginning of the twenty-first century, this last approach to science communication research focused more on its holistic study, than on the PUS because the latter assumes an implicit hierarchy between experts and laypeople (Van Dijck, 2003). The shift from the deficit model to the dialogical model is more present in the theoretical realm than in social reality (Trench, 2008; Horst & Michael, 2011).

Science Communication Movement

According to Bucchi (2013), citizen participation in outreach activities has become a matter of course. Be that as it may, there is no consensus among scholars or people involved in science communication regarding the long-term impact of the science communication movement. The citizenry actively participates in activities aimed at improving science culture, in general, and science communication, in particular. The aim of social science research is chiefly to study how citizens participate in decision-making on science and technology, specifically highlighting the role that the media, SNSs and institutional communication play in the process (Nisbet & Scheufele, 2009). According to Nisbet and Scheufele (2009), there is still a belief that science literacy is both the problem and the solution to social conflicts. In a review of the evolution of climate change, food biotechnology and nanotechnology, these authors offered a series of detailed recommendations for enhancing the public engagement efforts of scientists and their organisations. First and foremost, they emphasised the need to improve science communication through initiatives encompassing media platforms, SNSs and institutional communication, thus

enabling conversations with the public and recognising, respecting and incorporating different values, perspectives and goals.

In light of the foregoing, and taking into account the existing science communication models, the general results of the CONCISE project show that the citizens participating in the public consultations agreed on the four topics of debate more than they disagreed (Brondi et al., 2021; Dziminska et al., 2021; Kupper et al. 2021). In the main, the results allow for arriving at the conclusion that the differences of opinion had to do with age and gender, in addition to the topics of debate. The CONCISE consortium members are currently designing new analyses based on citizen discourses.

This study describes the public consultations held in Poland and Spain, because they were staged very close to the general elections in both countries. Hence the interest in verifying whether or not the citizens had been influenced by the election campaigns and the stances taken by the different political parties on current affairs, such as those discussed in the public consultations. In Poland, the general elections were held on 13 October 2019, while the public consultation was staged nearly three weeks before, on 21 September. As to Spain, the public consultation was staged on 26 October 2019, while the country went to the ballot box a little over two weeks afterwards, on 10 November 2019. By the way, it was the second time that the provisional government in Spain had called elections that year, because it had been impossible to form a government after those held on 28 April 2019, for the lack of a parliamentary majority.

On the other hand, geographically speaking Spain is a Southern European country, whereas Poland is an Eastern European one, for which reason there might have been some significant differences in the political attitudes of the citizens of both countries towards health-related or environmental issues. Besides the fact that it was general election year in both countries, owing to the historical similarities between Spain and Poland and their close bilateral relations in the framework of the European Union it can be claimed that they have been, and still are, on excellent terms. Likewise, the two countries, both with a long Catholic tradition, have implemented democratisation and secularisation processes from a very similar social perspective (Anderson, 2003; Raimundo, 2013; Requena & Stanek, 2013; Meardi et al., 2015; Wojcik, 2017; Moroska-Bonkiewicz & Bourne, 2020).

METHODOLOGY OF THIS STUDY: TOPICS, FRAMES, GENDER AND DATA FLOW

The Relevance of the Topics

This study focuses on climate change and vaccines, two of the four topics of debate in the public consultations staged in Spain and Poland, because they were the ones that were receiving most media coverage at the time. Furthermore, both issues have given—and will certainly continue to give—rise to controversies fanned by climate change deniers or sceptics and anti-vaccine groups or vaccine hesitancy among citizens. The public consultations in Poland and Spain resulted in 900 and 1,120 pages of debate transcriptions, respectively, in which a search was performed on the terms 'politician', 'policies', 'elections', 'election campaigns' and 'political parties' in Spanish and Polish. A summary grid for the variables of analysis, including table number, discursive frame—which allowed for identifying the sociodemographic characteristics of the people participating in each debate—gender, discursive tone, quote and country, was designed in order to explore the citizens' political discourses on climate change and vaccines.

The Specific Frames for the Study

Specific frames were designed for clustering the worldviews of the Spanish and Polish citizens. Media frames have been comprehensively analysed in the fields of media, communication and political communication studies (Entman, 1993; Scheufele, 1999, 2007; Benford & Snow 2000; Dirikx & Gelders, 2010). In the 1980s, Gamson and Modigliani (1989) understood frames as 'interpretative packages in the context of social movements', explaining that the packages consisted of rhetorical devices, such as metaphors, visual images and symbols. So, during the past 30 years, the study of media framing has played an essential role in the public understanding of science and technology. Research enquiring into media debates on current affairs has shown that laypeople use news in different ways and for different purposes than scientists (Nisbet & Mooney, 2007). Scheufele & Turney (2006) observed that 'media frames provide audiences with cognitive shortcuts or heuristics for efficiently processing new information, especially for issues that audience members are not very familiar with'. Accordingly, five specific frames relating to the different views expressed by the citizens in the debates were designed. To this end, 30 quotes with political connotations were selected from the debates on climate change (15) and vaccines (15). Following this, the main points of the arguments, such as trust and mistrust, media bias, marketing and advertising, hopes and wishes, were identified, before determining the extent to which the five frames agreed with the preselected quotes. Cronbach's alpha values of 0.80 and 1 were obtained for the preselected quotes and discursive tone, respectively, thus indicating the acceptable internal consistency of the five frames. There were no statistically significant differences in the rest of the variables, since the information was accurate. The quotes represented the following frames:

- **Lack of responsibility of politicians and distrust towards them.** When citizens disagree with or question political approaches to relevant issues such as climate change and vaccines, including scepticism towards political decisions.
- **Partisan biases in the media.** When the information that citizens retrieve from the media, SNSs or the Internet is politically or ideologically biased or manipulated.
- **Campaign slogans inherent to political marketing.** When political parties or politicians resort to slogans and/or propaganda to broach the subject of climate change and/or vaccines in election debates or rallies. If and when they eventually come to power, they usually do nothing to improve the situation.
- **Greater awareness of public policies.** When citizens harbour the hope that public policies will raise awareness about environmental protection and vaccines in the Third World.
- **Confidence in political decision-making.** When politicians or political parties decide to implement new policies in which citizens have confidence because they are effective.

Gender Dimension of the Study

The gender dimension was also analysed to determine whether or not there were any statistically significant differences. Finally, the 'discursive tone' variable was analysed to identify whether the citizen's views on the political discourse relating to science topics were positive or negative. Once a pre-test had been run on the 30 quotes and the five frames of analysis had been identified, an analysis was performed on the rest of the quotes.

Table 1. Units and variables of analysis

Discursive frames in relation to politics	Gender	Tone	Country
<ul style="list-style-type: none"> • Lack of responsibility of politicians and distrust towards them • Partisan biases in the media • Campaign slogans inherent to political marketing • Greater awareness of public policies • Confidence in political decision-making 	<ul style="list-style-type: none"> • Female • Male 	<ul style="list-style-type: none"> • Positive • Negative 	<ul style="list-style-type: none"> • Poland • Spain

Source: own elaboration.

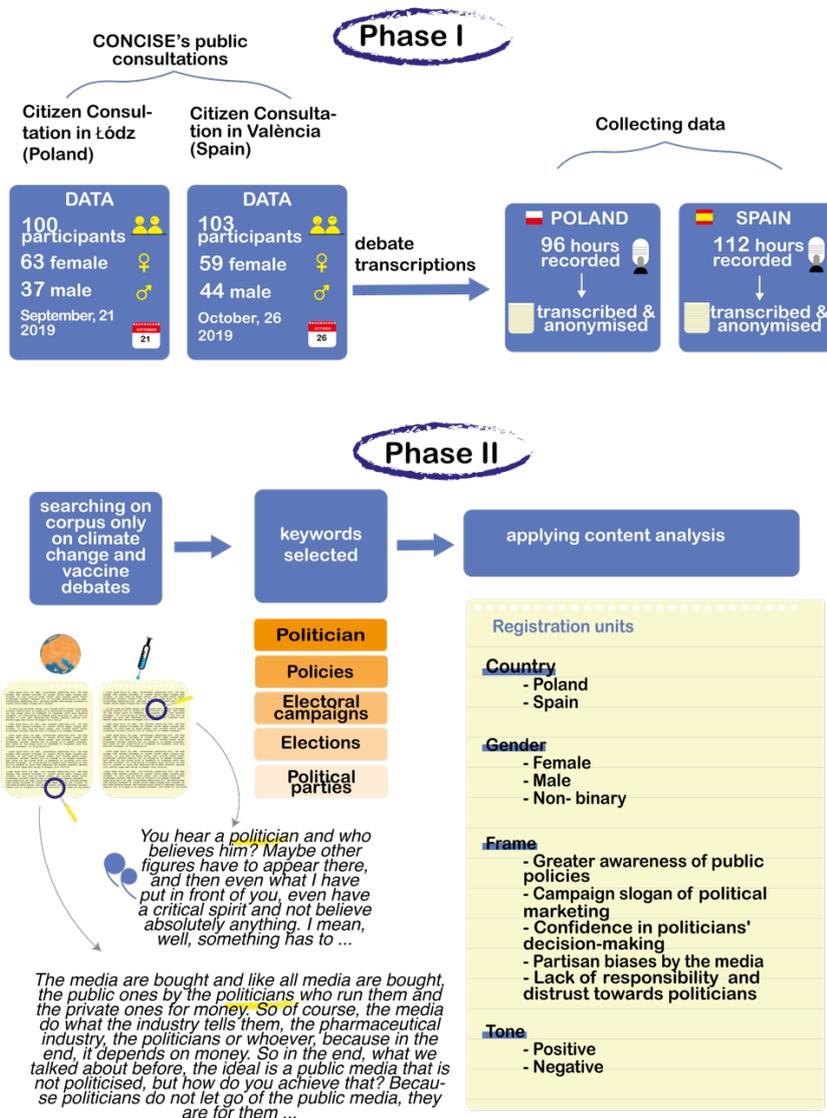
For the statistical data analysis, the statistical software R (version 4.0.2) was used. First, a descriptive analysis of the demographic characteristics of the citizens and their views on climate change and vaccines was conducted. The variables were summarised using absolute and relative frequencies. Then, after calculating the absolute and relative frequencies of the different views expressed by the citizens, a bivariate analysis was performed on them, according to their country of origin. Finally, a Fisher test was run to determine whether or not the views were equally distributed in both groups with an eye to comparing them.

Finally, word clouds were created to summarise the views expressed by the Spanish and Polish citizens in the selected quotes. The data flow diagram below shows the two phases of the research process.

Data Flow of the Comparative Study

The diagram shows the two phases of the research process. In the first stage, the figure explains how the data collection was gathered in the public consultations; and in the second stage, what kind the methodological approach was applied to the citizen's dialogue analysis.

Data Flow diagram



Source: Own design and elaboration

MAIN FINDINGS OF THE POLITICAL DISCOURSE ON CLIMATE CHANGE AND VACCINES

Univariate Descriptive Analysis

Broadly speaking, climate change was the topic with the strongest political connotations, especially in Spain. The Spanish and Polish participants in the public consultations referred 131 times to environmental issues in relation to politics. Even though there were more women in the two public consultations (Spanish men 54.55%; Polish men 60.47%), the men dominated the

political debate on climate change (see Table 2). Moreover, the discursive tone was predominantly negative (82.4%).

Table 2. Descriptive data pertaining to the citizens' views on climate change

Variable		n = 131
		Mean (SD) / n (%) Median (1r, 3r Q.)
Country	• Poland	43 (32.8%)
	• Spain	88 (67.2%)
Gender	• Male	74 (56.5%)
	• Female	57 (43.5%)
Tone	• Negative	108 (82.4%)
	• Positive	23 (17.6%)
Frame	• Lack of responsibility of politicians and distrust towards them	61 (46.6%)
	• Partisan biases in the media	27 (20.6%)
	• Campaign slogans inherent to political marketing	12 (9.2%)
	• Greater awareness of public policies	23 (17.6%)
	• Confidence in political decision-making	8 (6.1%)

Source: own elaboration.

As to this topic, 'Lack of responsibility of politicians and distrust towards them' was the predominant frame. In Poland, at the time, climate change tended not to dominate the political agenda and no debates were organised on this topic in which politicians participated. However, the climate issue did appear in some political statements during the election campaign, being used as a way of highlighting the differences between the candidates of the competing parties, rather than as an important issue that should be addressed. The following statements reflect the general distrust towards politicians as regards climate issues:

'Climate change's very political, and this is a problem because as it's political, it's often biased in one way or another' (Polish woman).

'I once watched a programme in which a well-known right-wing politician with a double-barrelled name [laughter from the others] said that generally there is no climate change, but even if there was, a temperature increase of one or two degrees would be wonderful because the harvest would be better' (Polish man).

In the case of Spain, distrust was expressed, for example, in the following statement:

'You hear a politician talking about climate change and who believes him? Perhaps other people should get a look in. And I've said this before with respect to those who appear talking about climate change. We should have a critical spirit and refuse to believe anyone. That is, well, something that should be believed' (Spanish man).

The higher proportion of Spanish quotes on the subject of climate change with political connotations might be justified by the fact that the UN Climate Change Conference (COP25) was scheduled to be held in Spain (2-13 December 2019). Despite the fact that the presidency was held by the Chilean government, the Spanish government finally hosted the conference in Madrid, owing to the anti-government protests, which left dozens dead and hundreds injured and caused significant damage in the capital Santiago de Chile. In addition, there were plenty of environmental news stories in the media and on SNSs in Spain at the time, which might explain

why there were twice as many political references to climate change during the Spanish public consultation (n = 88) than during its Polish counterpart (n = 43).

The political references to vaccines were much thinner on the ground in the debates held in Spain and Poland during the public consultations, with only 35 being identified, most of which were negative in tone (82.9%). As to the gender dimension, though, the references were more or less equally distributed (see Table 3).

Table 3. Descriptive data pertaining to the citizens' views on vaccines

Variable		n = 35
		Mean (SD) / n (%) Median (1r, 3r Q.)
Country	<ul style="list-style-type: none"> • Poland • Spain 	16 (45.7%) 19 (54.3%)
Gender	<ul style="list-style-type: none"> • Male • Female 	20 (57.1%) 15 (42.9%)
Tone	<ul style="list-style-type: none"> • Negative • Positive 	29 (82.9%) 6 (17.1%)
Frame	• Lack of responsibility of politicians and distrust towards them	14 (40%)
	• Partisan biases in the media	9 (25.7%)
	• Campaign slogans inherent to political marketing	1 (2.9%)
	• Greater awareness of public policies	3 (8.6%)
	• Confidence in political decision-making	8 (22.9%)

Source: own elaboration.

With respect to this topic, the 'Lack of responsibility of politicians and distrust towards them' frame also predominated. In Poland, the citizens remarked that the growing popularity of the anti-vaccine movement and distrust were caused not only by a lack of knowledge but also by the insufficient involvement of experts:

'It's a sign of the times that nowadays everyone thinks they're the smartest. Especially when they're chosen or appointed to a position, the very fact of being appointed predisposes them to believe they're the smartest and know everything. On the other hand, those in power don't necessarily employ wise advisors, but rather loyal ones who aren't necessarily wise [...]. However, I believe it's worth listening to the authorities on some subjects' (Polish man).

It warrants noting, however, that in the vaccine debates 22.9 per cent of the references had to do with the 'Confidence in political decision-making' frame. In Spain, some of the citizens mentioned the Spanish Association of Paediatrics as an excellent information source on children's vaccines. For example:

'I also trust, for instance, the Spanish Association of Paediatrics, which is the institution that issues the technical report on which national policy-making on this issue is based' (Spanish man).

Descriptive Bivariate Analysis

The comparative analysis shows that even though there were differences between the Spanish and Polish citizens as regards most of the variables, these were not statistically significant.

- Comparison by Country

Be that as it may, the men expressed political views more frequently than the women in both the public consultations, notwithstanding the fact that more women than men participated in them, as we explained in the previous paragraphs. This result is fascinating concerning the empowerment that women don't play in the public sphere, as Haraway stated since the 80's decade.

Table 4. Comparison of citizens' views on climate change by country

Country		Poland	Spain	p-value
n (%)		43 (32.82%)	88 (67.18%)	
Gender	• Male	26 (60.47%)	48 (54.55%)	0.58
	• Female	17 (39.53%)	40 (45.45%)	
Tone	• Negative	34 (79.07%)	74 (84.09%)	0.47
	• Positive	9 (20.93%)	14 (15.91%)	
Frame	• Lack of responsibility of politicians and distrust towards them	15 (34.88%)	46 (52.27%)	0.32
	• Partisan biases in the media	11 (25.58%)	16 (18.18%)	
	• Campaign slogans inherent to political marketing	5 (11.63%)	7 (7.95%)	
	• Greater awareness of public policies	10 (23.26%)	13 (14.77%)	
	• Confidence in political decision-making	2 (4.65%)	6 (6.82%)	

Source: own elaboration.

Table 4 was not found statistically significant differences concerning the tone of the speeches or gender of the political discourses on climate change. However, there were some differences between the analysis frames. Distrust of politicians' actions on climate change was greater among Spanish citizens. According to the frame analysis, 'Lack of responsibility of politicians and distrust towards them' was the main context of the dialogues from the Spanish participants (52.27%), compared to 34.88% of the Polish participants.

As can be seen in Table 5, there were practically no statistically significant differences in the variables between the two countries in the debate on vaccines, except in the frames of analysis.

Table 5. Comparison of citizens' views on vaccines by country

Country		Poland	Spain	p-value
n (%)		16 (45.71%)	19 (54.29%)	
Gender	• Male	7 (50%)	11 (57.89%)	0.73
	• Female	7 (50%)	8 (42.11%)	

Tone	• Negative	13 (81.25%)	16 (84.21%)	1.0
	• Positive	3 (18.75%)	3 (15.79%)	
Frame	• Lack of responsibility of politicians and distrust towards them	3 (18.75%)	11 (57.89%)	0.012*
	• Partisan biases in the media	7 (43.75%)	2 (10.53%)	
	• Campaign slogans inherent to political marketing	1 (6.25%)	0 (0%)	
	• Greater awareness of public policies	0 (0%)	3 (15.79%)	
	• Confidence in political decision-making	5 (31.25%)	3 (15.79%)	

Source: own elaboration.

Although most of the references to vaccines were negative in tone, there were three positive ones in each public consultation (p -value = 1), which were related to trust in public vaccination policies. One of the quotes highlighted that confidence in politicians is built through consistent communication and by setting an example: ‘Well, I imagine the president, the prime minister makes an appearance and says, “Ladies and gentlemen, let’s vaccinate”’ (Polish woman).

- Gender Dimension

As to the gender dimension, there were no statistically significant differences in the debates on climate change regarding the tone of the views expressed by the participants (see Table 6).

Table 6. Comparison of citizens’ views on climate change by gender

Gender		Male	Female	p-value
n (%)		74 (56.49%)	57 (43.51%)	
Country	• Poland	26 (35.14%)	17 (29.82%)	0.58
	• Spain	48 (64.86%)	40 (70.18%)	
Tone	• Negative	61 (82.43%)	47 (82.46%)	1.0
	• Positive	13 (17.57%)	10 (17.54%)	
Frame	• Lack of responsibility of politicians and distrust towards them	30 (40.54%)	31 (54.39%)	0.027*
	• Partisan biases in the media	22 (29.73%)	5 (8.77%)	
	• Campaign slogans inherent to political marketing	8 (10.81%)	4 (7.02%)	
	• Greater awareness of public policies	10 (13.51%)	13 (22.81%)	
	• Confidence in political decision-making	4 (5.41%)	4 (7.02%)	

Source: own elaboration.

With respect to the frames of analysis, ‘Lack of responsibility of politicians and distrust towards them’ (40.54%), and ‘Partisan biases in the media’ (29.73%) were the most frequent among the men, while ‘Lack of responsibility of politicians and distrust towards them’ (54.39%) and ‘Greater awareness of public policies’ (22.81%) were the most frequent among the women. From this it can be inferred that the women from both countries were more familiar with political decisions on climate change.

Table 7. Comparison of citizens’ views on vaccines by gender

Gender		Male	Female	p-value
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towards individual actions to curb climate change, like, for example, the classification of urban waste (garbage, plastics, glass, cardboard, batteries, etc.) and device and furniture collection points.

For this reason, the term ‘well’ was apparently related to actions aimed at improving the planet’s health. However, the citizens believed that individual actions should be supplemented by environmental policies and that politicians should make more far-reaching decisions. During the debate, the citizens talked about the problems not only affecting ‘Spain’, but also other ‘countries’, as a consequence of climate change. On the one hand, they referred to the problem of desertification and, on the other, to flash floods caused by phenomena such as cold drops (DANA in Spanish), wreaking widespread havoc. In this sense, they were of the opinion that they were ‘issues’ of a political nature that public policy-making was not addressing (‘see’). In the case of climate change, they stressed the need to implement more public policies to mitigate the effects of such climate-related phenomena and, to a certain extent, criticised the irresponsible attitude of politicians towards this issue.

Although politicians were indeed mentioned in relation to vaccines, the debate basically focused on the lack of information, especially among those groups that want to know more about their side effects. By and large, the Spanish citizens had trust in the vaccines included in the calendar established by the health authorities (‘think’ and ‘believe’). However, they voiced their concerns about the economic interests of pharmaceutical companies (‘economic’ and ‘business’) and also about how the media tended to cover those cases in which unvaccinated children had died with a large dose of sensationalism (social media, the Internet and the traditional media). They considered that the media were not setting a good example and that if the authorities wanted to ensure that all children were vaccinated, this should be achieved with the launching of specific campaigns, rather than with sensational news stories. The debate on vaccines focused more on the lack of clarity and information transparency on their side effects and the need to make other vaccines currently not included in the official calendar available. Finally, one of the most noteworthy findings is the remarkably poor debate on public policy-making and institutional campaigns relating to vaccines.

DISCUSSION ABOUT THE COMPARATIVE STUDY

As stated by Jakučionytė-Skodienė and Liobikienė (2021), to achieve the long-term goals of climate change policies an effort should be made not only to raise awareness about climate change, but also to promote climate-friendly behaviour. They analysed how economic development and Hofstede’s cultural dimensions contributed to raise such an awareness and to promote personal responsibility and actions relating to climate change mitigation. Furthermore, the authors’ aim was to determine whether climate change concerns and personal responsibility had the same degree of influence on all actions associated with climate change mitigation and whether those actions pursued the same goals. They also discovered that the performance of actions relating to climate change mitigation varied across European countries.

The results of our comparative study of Poland and Spain show that the citizens of both countries have little trust in political decision-making regarding climate change, while having a high awareness of such policies. In Poland, in the period around the consultation the actions initiated by Greta Thunberg received a fair amount of media coverage. Citizens, especially young ones, expressed their support, organising the nationwide Youth Climate Strike (Młodzieżowy Strajk Klimatyczny, 20 September 2019) and the General Strike for the Earth (Generalny Strajk dla

Ziemi, 17 September 2019). The citizens involved made no reference to politicians. Environmental protection, climate change and drought were among the most important issues that, for the Poles, should be addressed during the election campaign launched a few weeks before the public consultation was held. It is worth noting that for 34 per cent of the respondents of a telephone survey—on a representative nationwide sample of adult Poles ($n = 1003$), conducted by the company Kantar for TVN and TVN24 on 12 and 13 August 2019—climate change was the third most important issue (along with education), after healthcare and social programmes (Zalewska, 2019). Climate change was even more relevant in a survey conducted by IBRiS for the newspaper *Rzeczpospolita* on 9 and 10 August 2019 (Kolanko, 2019), in which 64 per cent of the respondents considered that, after healthcare, it was the second most important issue that should be addressed during the election campaign. In the broad sense of the word, issues touching on environmental protection, including those directly related to combating climate change, were present in the election programmes of all the political parties. However, they were not given the same importance, with the candidates preferring to propose other solutions (renewable energy sources, development of nuclear energy) (Bellon, 2019).

Our findings show that the citizens participating in the public consultation held in Poland expected climate change topics to be broached in the political debate. However, at the same time, they were often aware that the statements and promises made during election campaigns did not take the shape of specific actions after the elections (e.g. Poland was the only EU country that did not sign the 2050 climate neutrality agreement) (Bodalska, 2019). One of the Polish citizens participating in the public consultation referred to this in the following way:

‘Politicians have already noticed that talking about environmental issues can win them votes, so online electoral programmes now even include sections like ‘How eco are you’, or, in general, whenever politicians make an appearance they talk about these environmental and climate issues, among others. So, it’s now ‘if I don’t talk about climate change, I lose a few votes’. [...] So, yeah, it’s become very politicised’ (Polish woman).

In Spain, during the months running up to the public consultation, digital newspapers published 96,756 news pieces on climate change in Spanish, according to the Mynews digital media database. As noted above, climate change was very much on the media agenda. Almost daily, the media published an update on Greta Thunberg’s activities and the Madrid Climate Conference (COP25).

Improving communication between public institutions and healthcare professionals, on the one hand, and the citizenry, on the other, with the aim of making public health or environmental policy interventions more efficient poses an enormous challenge to contemporary societies, as demonstrated during the COVID-19 pandemic. In a study on vaccines performed by Eguia et al. (2021), the respondents voiced their concern about their lack of effectiveness, safety issues during the vaccination process and their potentially dangerous side effects. In conclusion, the authors recommend that communication be improved so as to convey more straightforward messages.

As already observed, our comparative study of Poland and Spain refers mainly to the vaccination of children. The results of the debates on vaccines in the two public consultations point to the fact that it is a topic rarely broached by politicians. In Poland, it does not receive regular media coverage. Be that as it may, every now and again it becomes a burning issue, especially when the anti-vaccine movement causes a splash. At the time of public consultation in Poland, the movement did not take any newsworthy action. Still, its influence can be observed in the gradual increase in the number of people who refuse to receive mandatory vaccinations, among other aspects. While in 2010 the number of people refusing to receive mandatory vaccinations totalled 3,437, almost 10 years later in 2019, 48,609 cases were registered, namely, 14 times more

(Czarkowski et al. 2020). Thus, the anti-vaccine movement has already taken its toll and its ongoing activities will in all likelihood politicise the issue even more. In Spain, prior to the public consultation, vaccines were a burning issue due to the differences in the children's calendar, which depended, and still depends, on the different regional administrations. For example, the Spanish citizenry want more vaccines to be included in the official calendar. One such case is the meningococcal vaccine, with parents calling for one covering more strains, particularly after the outbreaks registered in several countries, including the United States and the United Kingdom, as of 2015. In Spain, the child vaccination rate was around 98 per cent between 2017 and 2019 (Ministerio de Salud 2020). It is therefore impossible to talk about an anti-vaccine movement in Spain.

CONCLUSIONS

The Spanish and Polish citizens participating in the public consultations held before or after the general elections in each country did not generally refer to science issues in relation to politics, which implies a more 'neutral' perception of science. However, recent studies, such as that performed by Ward (2018), have shown that the movements emerging in the 1950s and the 1960s were the first to condemn certain political regimes for having put science to military uses, thus denying the neutrality of science. Since then, a comprehensive line of research has been developed on the social implications of science and technology. In short, this has highlighted the non-neutral role of science and the Manichean use to which it can be put for the purpose of harming people or the environment. However, contemporary Western societies are currently going to great lengths to promote science as a value per se and as a tool for social progress, evolution and innovation that might have been the benchmark for the citizens participating in the two public consultations held in 2019.

In this context of the probable objective and neutral nature of science, the most exciting finding of our comparative study is that the citizens of both countries separated the two science topics on which they debated from the political sphere, despite their cultural and social differences. Additionally, notwithstanding the proximity of the general elections in both countries, the debate on climate change was more politicised than that on vaccines. Lastly, the Spanish and Polish women were less involved in the political dimension of both debates, while displaying a more positive attitude towards public policies regarding vaccines.

Both of the topics of debate, climate change and vaccines, are becoming progressively more popular and important. New scientific findings, political discourses, actions and challenges like the COVID-19 pandemic have all contributed to this state of affairs. We assume that the number of political references in the debate on vaccines might have been much more numerous if the public consultations had been held during the pandemic. Nonetheless, our findings offer a snapshot of the citizenry's political perceptions of climate change and vaccines in 2019 and a departure point for future studies, especially of the post-pandemic reality.

ACKNOWLEDGEMENTS

This research was supported by the H2020 program from the European Commission [Grant Agreement N. 824537]. Particular thanks to the consortium of the CONCISE project, without whose support the production of this chapter would not have been possible. Also, our thanks to all citizens and stakeholders who participated and involved to the project lifetime in the five European countries where citizen's public consultations were held. Furthermore, the authors are delighted with the referee suggestions that contributed to improving the manuscript. Finally,

thanks to Amaia Crespo for her help with the proper use of gender terminology and Thomas MacFarlane for the English proofreading.

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