National Pride or Economic Utility? Attitudes towards Science in the Light of Political Polarisation[1]

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Abstract: *The paper deals with the political aspects of the perception of science. The relevance of the topic is underpinned, among other things, by the public policy significance of trust in science and the links between national science and national identity. The literature relates the perception of science to ideological positions on the one hand, and to partisan bias on the other. The research underlying the study investigated the relationship between respondents' attitudes towards science and their political preferences using a representative questionnaire sample of 1000 Hungarian respondents. In Hungary, characterised by a high degree of partisan polarisation, we expected the influence of party preference rather than ideological position on the perception of science. A detailed exploration of attitudes yielded more nuanced results than assumed: those who identified themselves as right-wing were less pro-science in general, but the utilitarian perception of science was influenced by party preference in addition to education, i.e. voters of the current government expected more utility and economic returns from science. The perception of science was also influenced by the level of political information. The study also relates the impact of partisan bias to the reception of science policy measures of the Orbán governments.*

Keywords: *science scepticism, partisan bias, polarisation, science policy discourse*

Introduction

There are many ways of looking at the perception of science. One of the basic questions in a social science approach is the degree of trust in science by the lay members of society. From another point of view, science and scientific results can be seen as part of national culture, and can therefore be seen in the context of national identity. A problem often raised in political science is the question of public policy preferences based on scientific findings. Closely related to this is the question of utility: how does policy make use of scientific results? For example, while Hungarians are all proud of Katalin Karikó, inventor of the mRNA vaccine, there is no unanimity on how much public money the state should spend on science, including the question of what scientific goals and what types of research should be supported. Furthermore, the relationship between science and politics is also a matter of neverending debate: in return for state funding, can politics interfere (and if so, to what extent) in the functioning of science?

While trust in science is relatively high in Hungary in general, there are a number of issues that are more specific but also complex and difficult to understand, such as climate change or the COVID pandemic, which involve a number of political decisions. Therefore, it is highly likely that the narratives presented by political actors play a role in shaping opinions on these issues. In addition, in the highly polarised Hungarian political arena, in recent years a number of highly controversial government measures related to science could be observed that have provoked protests. It is therefore worth examining the links between political preferences and attitudes towards science.

This paper aims to contribute to the understanding of this relationship, based on data from a national survey. It is structured as follows: first, it presents the literature on the impact of ideological and partisan polarisation on perceptions of science, and then provides an overview of the context of the research in Hungary. Then the hypothesis and analytical strategy are presented, followed by the results. After presenting descriptive statistics of political preferences and science-related opinions, the latent dimensions of attitudes are explored and explained using regression models. In the conclusion, we summarise the results of hypothesis testing and explanations of science-related attitudes.

Political bias and opinions on science

The spheres of science and politics interact at several points. In his work on the scientific field, Pierre Bourdieu argues that, although the most important characteristic of the field is that it operates according to its own internal norms, it is not independent of its social environment. Its relationship with the field of power is one of the most important determinants of the autonomy of the scientific field (Bourdieu 1975: 197, 1983). Political interference in the function-

ing of science can influence the achievement of structural positions and thus easily erode the internal norms of the field, leading to a deterioration in the quality of scientific work. From a public policy perspective on the relationship between science and politics, the notion of (hyper)instrumentalisation often arises, where science policies are used as a means to achieve political goals not directly related to science, in addition to or even instead of science policy-related goals (Hadley & Gray 2017).

Given the close and multifaceted relationship between science and policy, it is not surprising that a large body of research has addressed the relationship between policy preferences and attitudes on science.

These studies often try to offer explanations within the conceptual framework of political (ideological) polarisation or partisan bias. Ideological polarisation (i.e. for example, the extremity of left-right self-definition) can result in a society where there is little agreement on issues among different political actors (and their followers) (Fiorina et al. 2010; Patkós 2022). In this case, issues that are not subject to political contestation in less polarised societies can also become politicised position issues (Stokes 1992). The presence of partisan bias has a similar effect, but in this case it is not the ideological distance but (too) strong partisan identity that makes the range of politicised opinions broad and voters' policy preferences divided along party identity lines (Iyengar et al. 2012, Patkós 2023).[2] Attitudes to science are more influenced by religious, moral and political beliefs than by socio-demographic data such as age and social status (Rutjens et al. 2018).

According to the literature, each political ideology has its own 'favourite' scientific topic on which it takes anti-science views. Political conservatism is a predictor for scepticism in climate change (Rutjens et al. 2018). However, liberals are more accepting of anti-technology pseudo-scientific views such as homeopathy, anti-GMO or that using mobile phones causes cancer. Also, left-wingers tend to be anti-vaccine or anti-pharmaceutical because of their distrust of big corporations (Szabados 2019). In essence, science scepticism cannot be reduced to a single political cluster or camp, it prevails everywhere, just on different issues.

In the United States, science scepticism among Republican voters is a well--researched topic (Gauchat 2012; Lewandowsky et al. 2013). Longer-term data series show that, while a few decades ago conservative voters had the most trust in science, recently they have the least (Gauchat 2012). The correlation

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2 In addition to partisan bias, another explanatory factor that often emerges in the political perception of science is populism, which is often associated with a general scepticism towards science as being anti-elitist and anti-institutional (Kennedy 2019). Research in Europe has shown a correlation between some aspects of populist politics and science scepticism, at least at the macro level: those countries with more popular populist parties also had higher levels of anti-(childhood) vaccination attitudes (Kennedy 2019).

holds even when controlling for education, and the authors explain it by the increasingly political nature of the issue. In addition to lower levels of trust in science, Republican voters are especially opposed to the public funding of scientific research and basing social policy on science. While scientific topics with policy implications are unpopular among free marketers in the US, science scepticism is not associated with, for example, opposition to vaccination (Lewandowsky et al. 2013).

Research on Europe, and Eastern Europe in particular, is much rarer in this topic. A comparative study of 24 countries on science scepticism found that the strongest relationship between political conservatism and science scepticism is clearly found in North America. The more culturally distant the society was from the United States, the less the perception of science depended on ideological positions, for example in Arab countries. Two East European countries were also included in this comparative study: in the case of the more 'Westernised' Poland, there was a correlation between conservatism and science scepticism, whereas in the case of Romania, no such correlation was found (Rutjens et al. 2022).

There are, of course, differences not only geographically, but also between different subjects within science in terms of the role of political bias. It is partly because of the immeasurably large regulatory implications that climate change has become one of the most politically divisive scientific topics of our time. Several studies have explored the relationship between partisan polarisation and climate change perceptions: in the US (Dunlap & McCright 2008) and in Europe, according to Eurobarometer data (McCright et al. 2016), the gap between right and left attitudes on climate change is widening, and a link between populism and climate scepticism has been demonstrated (Yan et al. 2022).

The other topic that has been much studied in terms of political bias is of course the COVID pandemic (Clinton et al. 2021; Conway et al. 2021; Farkas et al. 2022). The pandemic was a special time because of the global focus on science and the role of scientists. Heavy governmental action linked to scientific findings was compounded by uncertainties within the scientific community and the plethora of fake news and misinformation surrounding the pandemic – it is no wonder that most of the scientific facts about the pandemic were politically judged. The difference in attitudes and behaviour of Republican and Democratic voters in the United States towards the pandemic is well known. Clinton and his co-authors have even called the epidemic a 'Partisan Pandemic', and rightly so, as the partisan bias among Americans was even reflected in regional mortality rates (Clinton et al. 2021).

Studies suggest that politically biased science scepticism also exists on the 'supply side' of political actors' communication (Mede & Schäfer 2020). Populist leaders tend to be hostile to science and scientists because of their general anti-establishment and anti-elite rhetoric. Examples such as Donald Trump's 'gut instinct' (versus scientific evidence) or Jair Bolsonaro's similar

comments show that in science populism (Eberl et al. 2023), common sense triumphs over the 'ivory tower' of the academic elite.

However, a comparative study examined the impact of four populist leaders (Putin, Erdogan, Trump and Orbán) on the success of science-related populism, and found no systematic populist anti-science policies. In fact, all of the above leaders either left science funding unchanged or outright increased it. Moreover, scientific results also benefit nationalist rhetoric. Consequently, Putin and Erdogan engage in almost no anti-science rhetoric. However, the research shows that Donald Trump and (to a slightly lesser extent) Viktor Orbán do have a populist specificity in spreading misinformation on several ideologically important scientific issues. Donald Trump spreads misinformation on climate change, while Orbán spreads misinformation on some parts of Hungarian history.

However, the attack on academic freedom and autonomy, which clearly characterises authoritarian regimes, is not specifically anti-science, but the manifestation of a general authoritarian policy that also extends to culture and education. In this case, the aim of the authoritarian leader is to not have autonomous, potentially critical groups, but to have political control over science. This aim is achieved by reallocating resources and replacing academic leaders (Szabados 2019). In other words, authoritarian politicians often have more of a problem with scientists than with science, as we will see in Hungary below.

In sum, there are multiple, intersecting and complementary explanations for politically based science scepticism. Sympathies with anti-elitist and/or anti-institutional political trends, ideologically based opposition to regulation, and strong partisan identity may all influence attitudes towards science. Of all these factors, the present study focuses specifically on the role of ideological position and partisanship.

The Hungarian context

It is a well-known fact from the political science literature that the level of political polarisation in Hungarian society is particularly high (Körösényi 2013; Patkós 2022). Accordingly, there are few issues that are judged in the same way by different political camps. It is important to clarify, however, that the high level of polarisation is not understood in terms of ideological positions (the right-left or even the conservative-liberal axis). One possible definition of ideological polarisation is to look at how far apart the median voter on the right and the median voter on the left are. Partisan polarisation, on the other hand, measures how differently government parties and opposition parties evaluate political events, such as the performance of the government (Patkós 2023). The two indicators are significantly positively related. However, while *ideological* polarisation increased in Hungary in the 2000s (Körösényi 2013), the trend reversed in the 2010s (Kmetty 2015). On the other hand, the level

of *partisan* polarisation remained extremely high throughout the last decade (Patkós 2022).

In spite of the high level of polarisation, there has not been much research in Hungary on the political bias of the perception of science. Eszter Farkas and her co-authors investigated the perception of COVID vaccines and science in general in the context of the COVID pandemic (Farkas et al. 2022). Their results showed that a respondent's position on the conservative-liberal scale influenced their perceptions of vaccines as well as science in general: the more conservative the respondents were, the more sceptical they were of vaccines and the less they trusted in science. In contrast, a respondent's party preference (measured in a pro-government/opposition dichotomy), despite the high level of partisan bias in Hungary, only affected general science scepticism, not attitudes towards vaccines. The authors explained this by the fact that the propagation of COVID vaccines was one of the few issues on which the Hungarian government and the opposition had similar positions (Farkas et al. 2022). However, it is reasonable to assume that if the research had distinguished between Eastern (Chinese, Russian) and Western (German/US, British) vaccines, on which political actors were far from unanimous, the effect of partisan bias would probably have been reflected in the COVID vaccine issue. [3]

The COVID pandemic thus created a special situation in Hungary, but the politicisation of the perception of science in a more general context was only partially addressed in the study referred to. What we would like to address in this paper is a more general impact of the political discourse on science. To clarify this question, we recall the other issues (outside the COVID pandemic) that have made science issues part of the political discourse in recent years in Hungary.

Hungary's Fundamental Law, adopted in 2011, protects the freedom of science, as did the previous Constitution. However, the Orbán governments, which have been in power continuously since 2010, have changed the previous structure of the scientific field on several points. Controversial science policy measures include, for example, the subordination of the previously independent National Fund for Scientific Research (OTKA) to the National Research Development and Innovation Office (NKFIH), the creation of new institutes for historical sciences, parallel to the existing network of academic institutions. However, although they were covered by the press, these measures did not really reach the attention of the wider public. The first case that caused a great political storm both in Hungary and abroad was the Lex CEU. This series of events, which ended with the departure of the Central European University to Vienna, is well documented (Bárd 2020; Enyedi 2018, 2022; Láncos 2021).

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3   On the association between vaccine choice and sources of information, another study found that people who self-reported listening to politicians' advice on vaccination were more likely to accept Eastern (and British) vaccines (Kutasi et al. 2022).

The conclusion of legal analyses is that in this case the government restricted the freedom of science by a regulatory change. The so-called Lex HAS, i.e. the detachment of the Academic Research Institutes Network from the Hungarian Academy of Sciences, was assessed in a similar way (Láncos 2021; Pap 2021). In my previous analysis, I identified the Lex CEU as a textbook example of hyper-instrumentalisation (Kristóf 2021). The government's communication on science in these cases was not clear. Ideological arguments played a somewhat less important role in the debate over the separation of the HAS's research institutes than in the CEU case, with the greatest emphasis on instrumental arguments. Arguments about the economic utility of scientific results were often made in public by those supporting the government's position.[4]

These actions in relation to the academic institutional system fit well with the government's general attempts at elite exchange and the dismantling of autonomy in the cultural sphere (Kristóf 2017, 2021). Similar results were obtained by Szilvia Horváth (Horváth 2022: 20), who provided the most detailed analysis to date of the interference between the Orbán regime and the academic sphere. On the one hand, she identified the anti-elitist and anti-scientific elements that characterise the populist style in general. On the other hand, she explicitly assessed the abolition of academic autonomy as part of the Orbán regime's attempts at ideological and institutional hegemony, as part of the authoritarian exercise of power in other public policy areas. All of these governmental efforts are carried out in an expansive manner, with increasing intensity, creating planned and intended conflicts (Horváth 2022).

Research question and analytical strategy

Taking into account the degree of partisan polarisation and the instrumental science policy measures described above, we wanted to know how the perception of science in Hungary is related to political attitudes. On the basis of the literature presented above, we put forward the following hypothesis:

H1: The effect of partisan bias. The political orientation of respondents plays a role in the perception of science. However, political differences in attitudes towards science in Hungary are not mapped along ideological differences but along party preference.

The hypotheses were tested by a nationally representative survey of 1000 respondents. The data was collected as part of the Median Institute Omnibus in June 2021, using a telephone (CATI) survey method. In the survey, we sought to map attitudes towards science in a sophisticated way. The respondents' agreement (on a Likert scale) with 12 statements about science was assessed, and the

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4   For example, 'Hungary's economy is only a tiny fraction of the world economy. Hungarian taxpayers cannot be expected to fund basic research that will be utilised elsewhere' (Gábor Náray Szabó: Aunt Mary and science https://www.magyaridok.hu/velemeny/mari-neni-es-a-tudomany-3228115/).

latent structure behind the responses was explored using factor analysis. The two emerging factors were explained using linear regression models.

The respondents' ideological position (self-positioning on a 5-point left-right scale) and party preference (want/do not want a change of government) were considered as explanatory variables. Our reason for using the left-right scale rather than the conservative-liberal scale is that it is the most commonly used scale to measure ideological polarisation (Bafumi & Shapiro 2009; Lesschaeve 2017; Patkós 2023). In Hungary, it is also the most commonly used scale for the assessment of political preferences (Kmetty 2014). It can also be used for comparative purposes and correlates with a number of non-political attitudes and behaviours (Patkós 2022). While it does correlate with partisan divisions, it is distinct from mere party preferences (Tóka 2005).

Basic socio-demographic variables (gender, year of birth, place of residence, and education) and information about science policy were used as control variables. The latter was measured by familiarity with some science policy measures (Lex CEU, Lex HAS and the development of the Budapest campus of the Chinese Fudan University that was currently debated at the time of the survey).

Results

Descriptive statistics

The distribution of respondents' ideological positions is shown in Table 1.

Table 1: Many people use the terms left and right to describe their political positions. How would you describe yourself in terms of your political position? (%)

Definitely left-wing	5.9
More left-wing	10.4
Neither left nor right	45.4
More right-wing	15.7
Definitely right-wing	17.4
Don't know, don't answer	5.2
Total	100

Source: Author

It can be seen that the ideological polarisation, at least measured on the right--left scale, is not strong, as the distribution is unimodal, with almost half of the respondents classifying themselves in the middle. Thus, we do not see the U-shaped or strongly flat distribution typical of ideological polarisation (Pat-

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kós 2023). It should be noted, however, that the scale is not symmetric. Only a minority of the 16.3 percent of left-wingers identify themselves as definitely left-wing, while more than half of the right-wingers, who are twice as many (33.1%), identify themselves as definitely right-wing (17.4%).

We measured the partisan divide by asking about government change (Table 2).

Table 2: Overall, what do you think would be better, if after the next election… (%)[5]

there is a change of government	43.1
or the current government stays	46.1
Don't know, don't answer	10.9
Total	100

Source: Author

Almost half of the respondents (46%) would prefer the current government to stay, 43 percent would prefer a change of government and 10.6% do not know or do not want to answer this question.

Information about government science policy measures was measured by the following questions (Table 3).

Table 3: Familiarity with science policy measures (%)

	Yes
Have you heard that in 2019 the government separated the Research Institutes of the Hungarian Academy of Sciences from the HAS and placed them under a new research network?	50.6
Have you heard that the Central European University (CEU) has moved from Budapest to Vienna?	63.9
Have you heard that the Chinese Fudan University will open a campus in Budapest?	80.7

Source: Author

At the time of the survey, the debate about Fudan University was currently taking place in the media, so a significant majority of respondents (80.7%) had heard about it. Fewer, but still the majority of respondents, remembered previous science policy measures, such as the Lex CEU (63.9%) and the Lex HAS (50.6%). Those who had heard about these measures were asked what they thought of them (Table 4).

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5 There is a significant (Cramer's V= 0.582) correlation between ideological position and preference for change of government.

Table 4: Agreement with science policy measures (%)

To what extent do you consider the measure to be beneficial or detrimental to Hungary?	Very or rather detrimental	Ambivalent	Very or rather beneficial	Don't know/ Don't answer
Lex MTA	54.8	19.4	19.6	6.1
Lex CEU	55.7	21.2	17.7	5.5
Fudan University	48.5	22.6	22.9	5.9

Source: Author

Among those who had heard about these government measures, far more people considered them detrimental than beneficial. The percentage of those agreeing was slightly higher than 20 percent (22.9%) for Fudan University alone.

Attitudes towards science were assessed by agreeing with the following 12 statements (Table 5). Respondents were given the statements in random order. Table 5 presents the statements in order of percentage of agreement.

Table 5: Attitudes towards science. How much do you agree with the following statements? (%)

	Strongly or somewhat disagree	Ambivalent	Strongly or somewhat agree	N/A
Having excellent Hungarian scientists is an important part of our national pride.	2.4	5.0	91.1	1.5
Scientific researchers should be better endowed financially.	1.8	7.2	87.4	3.5
It is important that Hungarian scientists do not go abroad, but stay and work in Hungary.	4.0	8.5	86.5	1.1
Politicians should listen more to scientists when making decisions.	3.9	11.6	82.9	1.6
The results of scientific research should have some material benefit.	5.8	14.7	77.2	2.2
Politics should not interfere in scientific matters.	8.0	14.3	75.9	1.8
Different disciplines are equally useful.	8.0	14.4	74.8	2.8
You can trust what scientists say.	6.1	26.9	65.0	2.0
It should be up to scientists themselves to decide what scientific research should be funded by the state.	12.3	29.5	54.9	3.4
The state should only fund scientific research that is economically viable.	30.1	24.3	43.7	1.9

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	Strongly or somewhat disagree	Ambivalent	Strongly or somewhat agree	N/A
Natural science is more useful than social science or humanities.	28.3	29.0	37.4	2.8
Hungary is too small a country to try to achieve great scientific results on its own.	57.6	16.7	24.0	1.7

Source: Author

The first seven items were not proved to be divisive. These could be called 'pro-science' statements, with which the majority of respondents agreed. They are proud of our excellent scientists who should be better endowed and kept in Hungary, politicians should listen to them but not interfere in scientific matters, and different disciplines are equally useful but they should have material utility. There were two statements – scientists can be trusted and scientists themselves should be able to decide how science is funded – for which a larger proportion of respondents chose the middle of the scale. The last three statements – that the state should only fund research that is economically viable, that natural science is more useful than others, that Hungary is too small to achieve great scientific results – were much less pro-science and were agreed with by a minority of respondents.

The latent structure of attitudes towards science

In order to identify the factors that influence respondents' attitudes towards science, we first searched for a latent structure behind the attitude variables using factor analysis (maximum likelihood method). Our final 2-factor model included 10 statements (Table 6).

Our first factor is a general pro/anti science attitude consisting of seven variables. A respondent scoring high on this factor trusts scientists, is proud of them, would make them stay in Hungary, endowed them more and considers all sciences equally important. In addition, according to this factor, science is clearly superior to politics: politicians should not interfere in scientific matters, but should listen more to scientists when making decisions.

The second factor consists of three variables and shows how much the respondent agrees with the utilitarian conception of science, and is therefore called utilitarian attitude. A respondent scoring high on this factor agrees that natural science is more useful than other disciplines, that the state should only fund research that is economically viable and that Hungary is too small a country to try to achieve great scientific results on its own.

Table 6: Rotated factor matrix of attitudes towards science, KMO = .745

	Factors	
	General pro-science attitude	Utilitarian attitude
Politics should not interfere in scientific matters.	**.528**	-.108
Politicians should listen more to scientists when making decisions.	**.652**	.008
Different disciplines are equally useful.	**.510**	-.025
You can trust what scientists say.	**.431**	.075
It is important that Hungarian scientists do not go abroad, but stay and work in Hungary.	**.482**	.167
Having excellent Hungarian scientists is an important part of our national pride.	**.485**	.107
Scientific researchers should be better endowed financially.	**.416**	.050
The state should only fund scientific research that is economically viable.	.120	**.610**
Hungary is too small a country to try to achieve great scientific results on its own.	-.028	**.455**
Natural science is more useful than social science or humanities.	.049	**.542**

Source: Author

Regression models

Once these two factors were identified, regression models were built to explain the factors. In the first model, we explained general pro-science attitude factor using political preferences and socio-demographic control variables (Table 7).[6]

The factor of general pro-science attitude was only correlated with year of birth among the socio-demographic control variables (gender, year of birth, place of residence, education). The older the respondent, the more likely they were to hold a pro-science attitude, although the effect was very weak. Of our political explanatory variables, party preference, measured by the desire for a change of government did not prove to be a significant explanatory variable. Ideological position, however, mattered: those who identified themselves as right-wing were less pro-science compared to those who identified themselves in the centrum. Among the information variables, familiarity with the Fudan University issue also showed a positive correlation with pro-science attitude.

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6   The regression models did not include agreement of science policy measures, only the familiarity with them. This allowed us to measure how well informed respondents were about science policy issues. It would also have been interesting to examine agreement of measures in the context of ideological position and partisan divisions, but including these variables would have severely reduced the number of respondents we could include in the regression analysis. Therefore in the end these variables were not used in the multivariate analysis.

Table 7: Linear regression model,[7] dependent variable: General pro-science attitude

	B	Std. Error	Beta	t	sig
Constant	15.786	4.067		3.882	.000
Gender	.124	.063	.073	1.964	.050
Year of birth	-.008***	.002	-.169	-4.083	**.000**
Place of residence (reference category: village)					
Budapest	.021	.096	.010	.225	.822
City	.126	.091	.058	1.379	.168
Town	.129	.079	.071	1.643	.101
Education level (reference category: elementary school)					
Vocational school	.187	.106	.095	1.766	.078
High school	.192	.104	.110	1.842	.066
Tertiary education	.041	.116	.020	.351	.726
Pro-government voter	.043	.078	.025	.549	.583
Left-right scale (reference category: centrum)					
Left-wing	-.005	.089	-.002	-.055	.957
Right-wing	-.278**	.082	-.156	-3.404	**.001**
Heard about: HAS	.060	.073	.035	.815	.416
Heard about: CEU	.036	.077	.020	.467	.641
Heard about: Fudan University	.270**	.093	.123	2.902	**.004**

Source: Author. ****p>0.001, **p>0.01, *p>0.05*

However, the explanatory power of the model as a whole was weak (Nagelkerke R^3=.089). This is not really surprising, given that most of the statements included in the general pro/anti science attitude factor were not particularly divisive, so the variance of the factor was low.

As a next step, we build a linear regression model to explain the other utilitarian perception of science factor (Table 8)

The explanatory power of this second regression model explaining the utilitarian attitude factor is much more acceptable (Nagelkerke R^3=.262). Several of both the control and explanatory variables show significant correlations with the dependent variable. The effect of age (year of birth) is similar in strength and direction as in the previous model: the older the respondent, the more likely they are to agree with the utilitarian conception of science. Education, on the other hand, shows a negative correlation: the utilitarian attitude is mainly held by less educated respondents.

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7   There is no confounding multicollinearity between the independent variables. The multicollinearity VIF test values are given in the Appendix.

Table 8: Linear regression model,[8] independent variable: Utilitarian attitude

	B	Std. Error	Beta	t	sig
Constant	23.314	3.254		7.164	.000
Gender	-.074	.051	-.049	-1.466	.143
Year of birth	-.012***	.002	-.267	-7.168	**.000**
Place of residence (reference category: village)					
Budapest	-.110	.076	-.056	-1.436	.151
City	.036	.073	.019	.491	.623
Town	.012	.063	.007	.184	.854
Education level (reference category: elementary school)					
Vocational school	-.225**	.085	-.128	-2.655	**.008**
High school	-.308***	.084	-.198	-3.685	**.000**
Tertiary education	-.604***	.093	-.328	-6.510	**.000**
Pro-government voter	.184**	.062	.121	2.955	**.003**
Left-right scale (reference category: centrum)					
Left-wing	-.001	.071	-.001	-.021	.983
Right-wing	.102	.065	.064	1.562	.119
Heard about: HAS	-.204***	.059	-.134	-3.475	**.001**
Heard about: CEU	-.110	.061	-.068	-1.793	.073
Heard about: Fudan University	.038	.075	.020	.513	.608

Source: Author. ***p>0.001, **p>0.01, *p>0.05

The political explanatory variables paint a significantly different picture than in the previous model. The effect of the ideological position (right-left scale) is replaced by the effect of the party preference: those who would not change government are more in agreement with the utilitarian conception of science. Among the variables measuring familiarity of science policy measures, in this model it is not the familiarity with the Fudan University issue but the familiarity with the HAS research network issue that shows a significant negative correlation with the utilitarianism factor as dependent variable.

Conclusion

We consider the most important result of our research that we have been able to investigate the relationship between attitudes towards science and political bias in Hungary in a more detailed way than before. The factor analysis revealed two dimensions of attitudes: the dimension measuring the utilitarian/

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8   There is no confounding multicollinearity between the independent variables. The multicollinearity VIF test values are given in the Appendix.

non-utilitarian perception of science was clearly distinguished from the more general pro-science/anti-science axis.

In terms of testing our hypothesis about political bias, when we disaggregated attitudes towards science into several dimensions, we found significant differences. Our hypothesis was thus partially confirmed.

Regarding the general pro-science attitude, our results were partially similar to those of Farkas and co-authors (Farkas et al. 2022), although their examination was carried along the conservative-liberal axis, whereas in the present study we used the left-right axis. The difference between the two studies, however, is that in our data only ideological position, and not party preference, determined the attitudes towards science. This is probably due to our more detailed attitude questions, which included many statements on which voters of different political parties do not take different positions. In the present study, general pro-science attitude was not a divisive issue (Stokes 1992).

In contrast, utilitarian attitude on science has proved to be more of a position issue. Accordingly, our regression model, including political variables, was found to have much higher explanatory power compared to the low-variance general pro-science attitude. Indeed, in contrast to pro-science attitude, in the case of utilitarianism, it was not ideological position but the pro-government/opposition dichotomy that had significant effect, as originally hypothesised. However, it should be noted that, in addition to partisan bias, the higher explanatory power of the model was also due to the fact that more educated and less educated people seem to think differently about science along this attitude dimension. While trust in science, pride and appreciation of Hungarian scientists were typical of respondents at all levels of education, less educated respondents also had a more utilitarian approach to science.

Returning to the core question of partisan bias, pro-government respondents had a more utilitarian view of the role of science than those in opposition. While we cannot, of course, conclude from the analysis presented in this paper whether we can indeed see the effect of political discourse on these results, our hypothesis is strengthened by the fact that familiarity with the case of the Hungarian Academy of Sciences also had a significant effect in the model explaining utilitarianism. The majority of respondents who had heard about the annexation of research institutes from the HAS, disagreed with this measure and rejected the utilitarian argument in their attitudes towards science that otherwise echoed the government position.

The partisan bias thus concerns those elements of perceptions of science that have been foregrounded in government action and discourse. While in other dimensions of attitudes towards science, the science scepticism of right-wing respondents, often observed worldwide, prevails in Hungary as well.

According to our results, partisan bias can be dangerous for the reputation of science. Strategies to bridge politically motivated differences in attitudes

towards science might include several measures. A set of proposals developed in the context of the COVID epidemic[9] suggests that it is better to communicate science-related information by well-known experts rather than politicians. However, they could also be supported by celebrities, as they are more relatable to the general public than scientists.

It is also important to fight against fake news and conspiracy theories, but certainly not by treating the representatives of pseudoscience as equal debating partners for scientists in the mainstream media (Szabados 2019). Scientific communication should be accessible and science communicators themselves should avoid ideologically distorted arguments that make it difficult to cross partisan lines. For the same reason, the anti-science label should be used with caution in the context of any political action, emphasising instead the existence of a scientific consensus on a specific scientific issue.

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Appendix

Multicollinearity statistics of linear regression models

	General pro/anti science attitude		Utilitarian attitude	
	Tolerance	VIF	Tolerance	VIF
Constant				
Gender	.935	1.070	.935	1.070
Year of birth	.749	1.336	.749	1.336
Place of residence (reference category: village)				
Budapest	.693	1.443	.693	1.443
City	.724	1.381	.724	1.381
Town	.681	1.469	.681	1.469
Education level (reference category: elementary school)				
Vocational school	.445	2.250	.445	2.250
High school	.357	2.797	.357	2.797
Tertiary education	.408	2.452	.408	2.452
Pro-government voter	.618	1.619	.618	1.619
Left-right scale (reference category: centrum)				
Left-wing	.779	1.283	.779	1.283
Right-wing	.610	1.640	.610	1.640
Heard about: HAS	.698	1.433	.698	1.433
Heard about: CEU	.724	1.381	.724	1.381
Heard about: Fudan University	.707	1.414	.707	1.414

Source: Author