

## Research Note

# Explaining Conspiracy Beliefs and Scepticism around the COVID-19 Pandemic

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**Abstract:** *Public opinion on COVID-19 provides new empirical evidence for the debate on the ideological contours of conspiracy theories. I report findings from a web survey in Greece where participants were recruited via paid advertising on Facebook and the study sample was adjusted for age, gender, education, domicile, and region of residence using a nationally representative reference sample. I find that beliefs about conspiracy theories are more correlated than the values associated with established political ideologies, and that conspiracy beliefs and scepticism about the pandemic are best explained by belief in unrelated political and medical conspiracy theories. No other demographic or attitudinal variable has such a strong influence, and the results are robust to different statistical specifications. In comparison, the effect of ideology measured by left-right self-placement is rather negligible and further moderated by trust in government. The results have implications for the strategies aimed at fighting disinformation during public health emergencies.*

**Zusammenfassung:** *Die öffentliche Meinung zum Thema Covid-19 liefert neue empirische Befunde für die Debatte über das ideologische Wesen von Verschwörungstheorien. Wir berichten über die Ergebnisse einer Online-Umfrage in Griechenland, für die die Teilnehmer über bezahlte Anzeigen auf Facebook gewonnen wurden. Diese Stichprobe wurde anschließend nach Alter, Geschlecht, Bildung, Wohnort und Wohnregion unter Zugrundelegung einer national repräsentativen Referenzstichprobe gewichtet. Wir stellten dabei fest, dass verschwörungstheoretische Überzeugungen stärker korrelieren als die Werte, die mit etablierten politischen Ideologien assoziiert werden, und dass Verschwörungsglaube und Zweifel an der Pandemie am besten durch den Glauben an miteinander unverbundene politische und medizinische Verschwörungstheorien erklärt werden können. Keine andere demografische oder einstellungsbezogene Variable hat einen so starken Einfluss, und die Ergebnisse sind verschiedenen statistischen Spezifikationen gegenüber robust. Im Vergleich ist der Effekt von Ideologien, die mithilfe der Links-Rechts-Selbsteinschätzung gemessen wurden, eher vernachlässigbar und weithin durch Regierungsvertrauen gekennzeichnet. Die Resultate haben Auswirkungen auf die Entwicklung von Strategien zur Bekämpfung der Desinformation in Fällen von gesundheitspolitischen Notlagen.*

**Résumé:** *L'opinion publique sur le Covid-19 fournit de nouvelles données empiriques au débat sur les contours idéologiques des théories du complot. Cette note de recherche rend compte des résultats d'un sondage en Grèce dont les participant.e.s ont été recruté.e.s via des publicités payées sur Facebook. L'échantillon d'étude a ensuite été ajusté par repondération de l'âge, le genre, le niveau éducationnel, le domicile et la région de résidence en utilisant un échantillon national représentatif de référence. On constate que les croyances de complot sont plus corrélées que les valeurs associées à des idéologies politiques établies, et que les croyances de complot ainsi que le*

*scepticisme relatif à la pandémie s'expliquent le mieux par des croyances dans des théories de complot politiques et médicales indépendantes les unes des autres. Il s'agit de la seule variable démographique ou attitudinale qui exerce une telle influence et les résultats ne dépendent pas des différentes spécifications statistiques. En revanche, l'influence de l'idéologie, telle qu'on la mesure selon l'auto-placement sur l'échelle gauche-droite est négligeable et modérée selon la confiance à l'égard du gouvernement. Les résultats peuvent s'appliquer aux stratégies qui visent à lutter contre la désinformation du public dans des situations d'urgence sanitaire.*

KEYWORDS: Conspiracy beliefs, COVID-19 pandemic, Political attitudes

## Introduction

The 2020 novel coronavirus (SARS-CoV-2) pandemic motivated a global health campaign to reduce COVID-19 infections by hand washing, physical distancing, and self-isolation, and many governments took harsh measures to contain the spread of the virus. Crucially, this public health emergency has been taking place in an environment where misinformation is spread rapidly through social media platforms. This 'infodemic' prompted the World Health Organization (WHO) to engage in public information campaigns debunking myths and conspiracy theories around the virus. Nevertheless, misconceptions about SARS-CoV-2 remain widespread (Geldsetzer 2020; Miller 2020; Motta et al. 2020; Pennycook et al. 2020a; Uscinski et al. 2020).

Conspiracy theories are often seen as a particular type of misinformation and are most commonly defined as proposed explanations of events in which a small group of persons is acting in secret for their own benefit and against the common good (Uscinski et al. 2016: 58) and as 'attempts to explain the ultimate causes of significant social and political events and circumstances with claims of secret plots by two or more powerful actors' (Douglas et al. 2019: 4). While medical conspiracy theories have involved a variety of topics (Oliver and Wood 2014b), there is a tendency for conspiracy theories to appear during virus-related epidemics, as illustrated before SARS-CoV-2 in the cases of HIV (Goertzel 1994), A/H1N1 (Setbon and Raude 2010), Ebola (Earnshaw et al. 2019), and the Zika virus (Klofstad et al. 2019). In all of these cases, conspiracy theories followed a similar narrative, arguing that the viruses were created in laboratories with the intention to harm a particular country or group of people, and to help big pharmaceutical companies increase their profits.

A predominant current in political science considers that conspiracy beliefs are mediated by partisan and ideological predispositions (Smallpage et al. 2017). New conspiracy theories are likely to be viewed through a partisan lens and endorsed or rejected according to the cues signalled by the political actors engaged in conflicts on the underlying issues. For instance, by examining various conspiracy theories with partisan leanings in the US, Miller et al. (2016) can argue that political orientations can be used to explain why certain individuals are more likely to endorse conspiracy theories, while Enders and Smallpage (2019a) find that partisan-motivated reasoning has an effect on conspiracy beliefs. In this line of reasoning, researchers often argue that political extremism (Van Prooijen et al. 2015) and right-wing ideology (Walter and Drochon 2020) serve as good predictors of beliefs on various conspiracy theories.

Others, however, argue that belief in conspiracies is spread evenly across political ideology and partisanship (Uscinski et al. 2016; Uscinski and Olivella 2017). When it comes to medical conspiracy beliefs, research has shown that authoritarianism or conservatism may be less relevant as explanatory factors (Oliver and Wood 2014a). For instance, Klofstad et al. (2019) did not find partisanship to be a predictor of endorsing conspiracy beliefs about the Zika virus, because the issue was not politicized across partisan lines. Similarly, partisanship seems to be an explanatory factor for COVID-19 conspiracy beliefs in the US and Canada (Uscinski et al. 2020), but not in the UK, where politics around the virus did not succumb to partisan polarization (Pennycook et al. 2020a). Recent randomized experiments have established that the relationship between partisanship and beliefs around COVID-19 is driven by affective polarization (Druckman et al. 2020), so it follows that ideology may be less relevant in non-polarized contexts.

Contrary to the partisanship and ideology hypothesis, insights from cognitive science suggest that conspiracy beliefs ‘stick’ because they are related to rumour, which is ‘hardwired’ into the human brain (Andrade 2020), and that, despite the variability in conspiracy theory topics, there are certain underlying psychological processes that facilitate them (Douglas et al. 2019; Oliver and Wood 2014a; van Prooijen and Douglas 2018). These predispositions, it is argued, are often orthogonal to partisanship (Uscinski et al. 2016).

Moreover, comparisons between medical conspiracy beliefs and other, unrelated, political conspiracy beliefs show that those who believe in one conspiracy theory are also likely to believe in others (Carey et al. 2016; Enders and Smallpage 2019b; Goertzel 1994). Those who believe in existing conspiracy theories are much more likely to believe in fictitious conspiracy theories as well (Swami et al. 2011). As Sutton and Douglas (2014: 255) remark, ‘the most consistent finding in the psychology of conspiracy theories [...] is that belief in one particular conspiracy theory is predicted by belief in other theories—even when they refer to completely unrelated events and protagonists’. For some, this suggests that, ‘belief in conspiracies might work as a monological worldview, or belief system, in which individual beliefs reinforce one another in a coherent narrative, not different from a political ideology’ (Castanho Silva et al. 2017: 426), while others reject the monological explanation (Douglas et al. 2019; Sutton and Douglas 2014), arguing that the evidence merely indicates that conspiracy believers have certain conspiratorial predispositions.

Irrespective of disagreements among rival theories, and from a political science perspective, the focus on COVID-19 provides new empirical evidence to the debate about the ideological contours of conspiracy theories. This contribution revisits the debate in the context of COVID-19 conspiracy theories. In particular, it does so by comparing consistency among belief in different conspiracy theories to consistency among ideologically related policy preferences, and by examining whether support for COVID-19 conspiracy theories and scepticism about the pandemic can be best explained by other conspiracy beliefs or by one’s placement in the ideological spectrum.

## Methods

The data come from a web survey in Greece (fieldwork: 1–8 April 2020), a country in which conspiracy theories about COVID-19 and scepticism about how the government dealt with the epidemic circulated widely over social media. In addition, Greece exemplifies a case where the pandemic was not polarized extensively across partisan lines, at least in its early phase. For these reasons, while the current study is limited to one country, it

sheds light on the role of conspiracy beliefs in the ongoing COVID-19 pandemic beyond what we know from numerous case studies that have been conducted in the US, Canada, and the UK.

### **Political Attitudes, Conspiracy Beliefs and COVID-19 Scepticism**

After an introductory informed consent page, respondents were directed to a page with six demographic questions following the wording of the European Social Survey (ESS). The survey also included 14 questions that were worded as typical political attitude questions, as well as three items on popular conspiracy theories in Greece as indicated in previous surveys (see Gemenis 2020: p. 100). The questions had a five point ('disagree' / 'rather disagree' / 'neither agree nor disagree' / 'rather agree' / 'agree') response scale with an additional 'no opinion' option, and were placed on individual web pages in a random order. Mokken scale analysis indicated that the three conspiracy items formed a strong conspiracy beliefs scale (Loevinger's  $h = .64$ ).

The 14 questions also included four items that are used as dependent variables in the regression analyses of this paper. One item asked respondents whether they agreed with a popular COVID-19 conspiracy theory ('the coronavirus was created in a laboratory as a biological weapon'), and three items were worded to tap scepticism about the COVID-19 pandemic. In particular, one item asked whether respondents agreed that COVID-19 was merely an excuse to suppress civil liberties, another whether the measures against the pandemic were excessive because COVID-19 is less dangerous compared to the common flu, and another whether respondents would prefer the country to achieve herd immunity by letting most people contract COVID-19. English translations of the wording and distributions of responses for each of the 14 questions are available in the Supplementary Material (Table A1).

### **Trust in Institutions**

Using the ESS wording, a battery of questions asked respondents to indicate their trust in the parliament, the church, the police, the national health system, the government, and the European Union using a 1–10 scale. The order of presentation of the six institutions was randomized.

### **Political Knowledge**

Five questions intending to measure political knowledge were given on individual web pages in random order. These questions asked respondents to match public figures at both national and European level to their political offices (health minister, health ministry COVID-19 spokesperson, development minister, Italian prime minister, head of the IMF). Each question had four possible answers in addition to 'I don't know', and while only one of the answers was correct, the remaining answers were worded to sound plausible. The knowledge questions were not compulsory and respondents could simply move to the next web page using the pre-selected 'no response' option. The responses to these questions were recoded as either correct or incorrect (the latter including 'I don't know' responses). Mokken scale analysis indicated that four of these questions formed a medium strength political knowledge scale (Loevinger's  $h = .4$ ).

## Health and Socio-Economic Variables

Near the end of the survey, a transition page indicated to respondents that there were about to complete the survey and that they were only a few noncompulsory questions left. These questions included a 0–10 left-right scale self-placement question (ESS wording with an additional ‘other’ option), subjective income (ESS wording, four levels), and four yes/no questions asking respondents whether they considered themselves or a family member to be vulnerable in terms of their health, and whether their employment or the employment of a family member had been affected negatively by the epidemic. The mean time taken to complete the questionnaire was 11 minutes and 40 seconds (*std.dev* = 412 seconds, *N* = 5, 155).

## Participants and Study Size

To recruit respondents, I shared an invitation with a link to the survey on social media (Facebook, Twitter, Reddit) but most respondents (over 90%) came from paid advertising on Facebook (target: Greece, 18–65+). Facebook has been long used as a sampling frame to study elusive populations but is now being used increasingly in general purpose surveys as its sampling frame has grown much larger than any crowdworking platform (Boas et al. 2020; Zhang et al. 2020). Facebook users are less likely to experience survey fatigue and to be overwhelmingly over the threshold of digital literacy compared to respondents in crowdworking platforms (Munger et al. 2018; Zhang et al. 2020). Furthermore, Facebook quota samples have been compared rather favourably to probability-based online samples and are often used to generate valid measures of political attitudes (Sances 2018; Zhang et al. 2020). The Facebook ads were shown to 302,561 Facebook users, leading to 13,157 unique clicks. From those clicks, 8,637 respondents reached the survey landing page and 6,625 started the survey after the informed consent page. Out of those 6,625 respondents, 5,155 completed the survey.

## Sample Adjustment

Facebook employs an algorithm to optimize ad delivery by favouring users who are most likely to click on the ad. This means that the demographic characteristics of the end sample are likely to differ from the underlying population. Furthermore, a comparison between respondents who completed the survey and those who dropped out at any time after the demographic questions page showed statistically significant differences in terms of the demographics (results reported in the Supplementary Material Table A3).

To address these and other possible sources of bias, I applied adjustments using entropy reweighting (Hainmueller 2012) on the basis of auxiliary variables drawn from a nationally representative reference sample. Such adjustments have been used successfully to deal with selection bias and coverage error in non-probability samples (Schonlau and Couper 2017: 285–288). The reference sample was a random digit dialing (70% landlines, 30% mobile phones) CATI survey conducted by the Metron Analysis polling company on behalf of Dianeosis (2020), an Athens-based non-profit think-tank (fieldwork: 8–15 April 2020), and the auxiliary variables used were age, education, male/female, urban/rural, and the four NUTS 1 regions. The sample adjustment also took into account the previously computed weights of the CATI survey for age and gender. With this approach I was able to match the first three moments (mean, variance, skewness) of all auxiliary variables in the study

sample to those in the reference sample (detailed results are reported in the Supplementary Material Table A6).

## Quantitative Variables and Statistical Methods

The statistical analyses reported in the results included only the respondents who completed the survey ( $N = 5\,155$ ) and, additionally, excluded those who indicated that they live outside Greece ( $N = 28$ ). Respondents who did not provide answers to either of the auxiliary variables were also excluded as no weights could be computed ( $N = 527$ ). The conspiracy beliefs and political knowledge scales were constructed by taking the mean excluding 'no opinion' and missing responses respectively. Further missing values were treated with pairwise deletion in the correlation analyses and listwise deletion in the regression analyses. For the correlation analysis, the 14 variables measuring political attitudes, conspiracy beliefs and COVID-19 scepticism were treated as ordinal in polychoric correlations. For ease of interpretation, however, the same variables were treated as continuous in the ordinary least squares (OLS) regression analyses. Other ordinal variables (education, subjective income, political interest) were also treated as continuous. Sensitivity analyses using ordered logistic regressions and OLS regressions where ordinal variables were fully factorized are reported in the Supplementary Material Tables A8–A11). In all cases, the substantive conclusions in the results are similar to those drawn from ordered logistic regressions and OLS regressions with fully factorized ordinal variables.

## Results

Table 1 presents polychoric correlations among the 14 political attitude, conspiracy theory and COVID-19 scepticism survey items. As evident from comparing the two shaded areas of the table, the correlations among the conspiracy theory and COVID-19 scepticism survey items (mean absolute  $\rho = .53$ ) are much higher compared to the correlations among the standard political ideology items (mean absolute  $\rho = .20$ ). In this sense, we see that endorsement of the COVID-19 conspiracy theory is highly correlated to beliefs about other, unrelated, conspiracy theories. With regard to the correlations between conspiracy/scepticism and political attitude items, Table 1 shows that the largest correlations are attained for the question concerning the respondents' evaluation of whether Greece benefited from being a member of the EU.

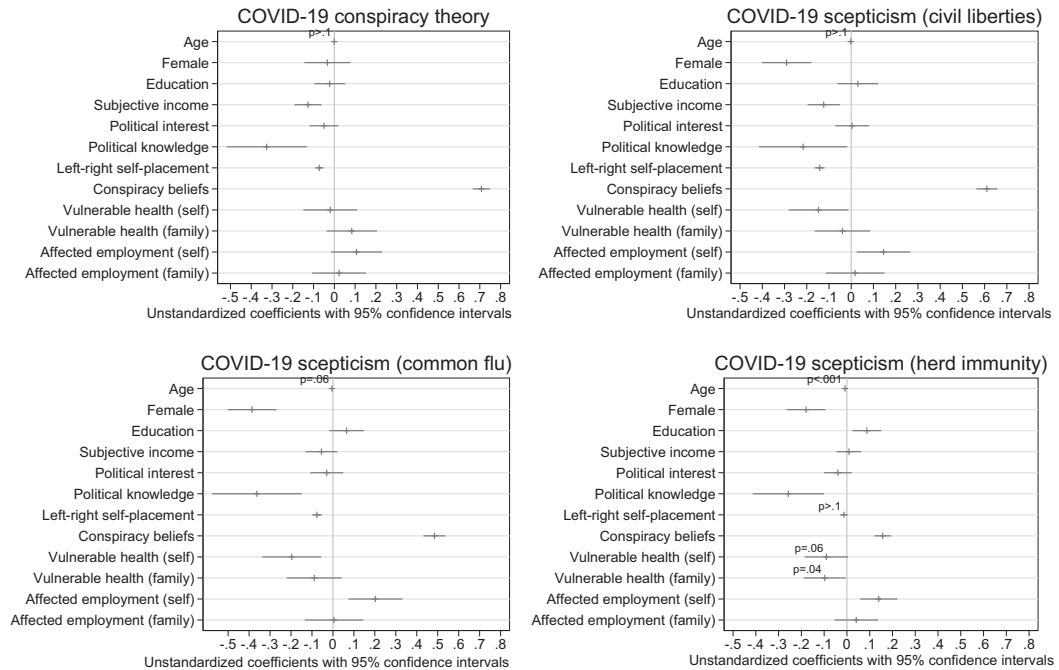
The panels in Figure 1 present the results from OLS regressions aiming to explain endorsement of COVID-19 conspiracy theory and scepticism using demographic and attitudinal variables. The figure presents a largely consistent picture. Respondents who had more political knowledge were less likely to endorse the COVID-19 conspiracy theory and be sceptical about the pandemic. Men and those whose work was affected negatively by the pandemic were more likely to endorse the scepticism items but not the COVID-19 conspiracy theory. The effects of age and education are virtually indistinguishable from zero, save the item on herd immunity, where younger and more educated respondents were slightly more likely to endorse the view that it would be preferable to deal with the pandemic by letting most people contract SARS-CoV-2. I hypothesize that this is most likely due to younger and more educated respondents being familiar with the concept of herd immunity. The effects of other variables are either indistinguishable from zero (e.g.

Table 1: Pairwise correlations among political attitudes, conspiracy theory and COVID-19 scepticism survey items.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Greece benefited from the EU	<i>40.87</i>													
2 Support for privatisation	.38	<i>38.82</i>												
3 State intervention in the economy	.12	.26	<i>25.54</i>											
4 Income redistribution	-.34	-.40	-.20	<i>63.45</i>										
5 Immigration opposition	-.06	.37	.18	-.16	<i>56.11</i>									
6 Support for abortion	.12	-.11	-.05	.06	-.41	<i>80.15</i>								
7 Cannabis legalisation	-.07	-.17	.01	.15	-.33	.27	<i>23.73</i>							
8 Cancer cure conspiracy theory	-.45	-.06	-.01	.26	.32	-.23	-.05	<i>40.23</i>						
9 COVID-19 conspiracy theory	-.55	-.20	-.07	.32	.27	-.18	-.02	.64	<i>53.52</i>					
10 Greek crisis conspiracy theory	-.41	-.03	.00	.18	.41	-.25	-.12	.69	.66	<i>43.34</i>				
11 Chemtrails conspiracy theory	-.38	.00	.03	.22	.44	-.32	-.13	.65	.60	.68	<i>25.94</i>			
12 COVID-19 scepticism (civil liberties)	-.55	-.32	.03	.32	.06	-.10	.18	.55	.61	.56	.50	<i>29.88</i>		
13 COVID-19 scepticism (common flu)	-.45	-.24	.12	.21	.11	-.15	.17	.46	.49	.49	.42	.80	<i>25.18</i>	
14 COVID-19 scepticism (herd immunity)	-.29	-.13	.20	.07	.03	-.09	.22	.22	.29	.28	.18	.60	.73	<i>8.0</i>

Note: Entries are polychoric correlations. Entries in italics in the main diagonal indicate percentage endorsement of each item ('agree' plus 'complete agree'). All entries are adjusted using entropy reweighting (age, gender, education, domicile, region).

Figure 1: Multivariate OLS regression results.



Note: The dependent variables (measured on five point agree/disagree scales) are reported on top of the plots. Results are adjusted using entropy reweighting (age, gender, education, domicile, region). For clarification, p values are also reported for unstandardized coefficients close to zero.

political interest), or less consistent along the four dependent variables (e.g. vulnerable personal health).

A closer evaluation of the results reveals that the effect size of nearly all variables is not *substantially* important despite being *statistically* significant. The only exception is the effect of the conspiracy beliefs scale (consisting of three items measuring belief in conspiracies unrelated to COVID-19) which is both statistically significant and substantially important. This becomes evident if we translate the unstandardized coefficients of Figure 1 into the quantity of interest: change in the dependent variable. An effect size of .71 (top left panel) implies that a one point change on the conspiracy beliefs scale is associated with a .71 point change in endorsing the COVID-19 conspiracy theory, keeping the other variables constant. Since conspiracy beliefs are measured by averaging three conspiracy items on a five point scale, the endorsement of the three unrelated conspiracies will result in a 2.84 point change ( $4 * 0.71$ ) in the dependent variable, which could move a respondent from ‘rather disagree’ over to beyond ‘rather agree’ when it comes to the COVID-19 conspiracy theory. As evident from the results, no other variable (considering their level of measurement) exerts such an effect on any of the dependent variables. For instance, the largest effect of left-right self-placement is found in the regression concerning scepticism connecting COVID-19 to civil liberties. The effect is -.14, indicating that movement on the left-right scale produces an effect which is at most 1.4 ( $10 * 0.14$ ). That is half the size of the effect of beliefs to *unrelated* conspiracy theories and, in



any case, insufficient to change the dependent variable in a way that a respondent would move from opposing to endorsing scepticism.

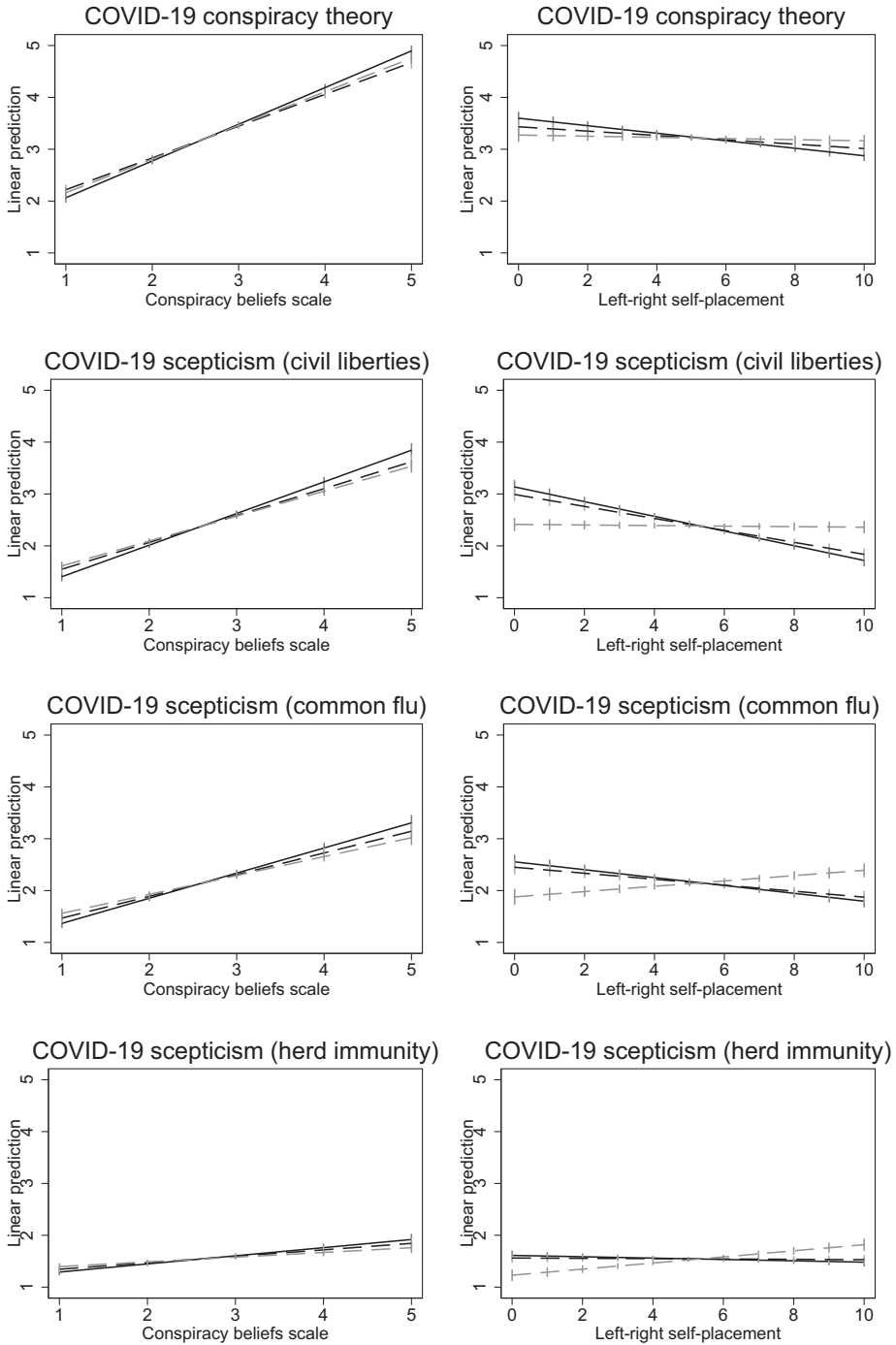
To better visualize the estimated effects, Figure 2 plots the predictive margins of the OLS regressions. The regression coefficients are translated to linear predictions across different values of the independent variables of interest, with all other variables kept to their actual values in the dataset. As is evident in the plots on the left of Figure 2, the effect of belief in different conspiracies on the COVID-19 conspiracy item is substantial, but less so on the COVID-19 scepticism items. The effects, however, are robust to controlling for other strong correlates of the COVID-19 conspiracy and scepticism items, namely the perceived benefit from EU membership (the item that correlates the strongest to all conspiracy beliefs and scepticism items) and trust in the government (Miller et al. 2016), as reported in the Supplementary Material (Tables A12 and A13). The differences in the effects estimated by the baseline model (solid lines) and those with the additional controls (dashed lines) are rather negligible (regression results are reported in the Supplementary Material). The comparison to the respective effects of left-right ideology shown in the plots on the left of Figure 2 is telling. In each and every case the effects of left-right self-placement on COVID-19 conspiracy theory and scepticism items are less substantial than the effects of the conspiracy beliefs scale. Moreover, controlling for trust appears to moderate even further the small effects of left-right ideology, unlike the more substantial effects of belief in other conspiracy theories.

## Discussion

The analysis showed that conspiracy beliefs relate to each other more than the values of established political ideologies relate to each other, confirming that conspiracy beliefs, irrespective of their subject, form a coherent narrative. This was true not only for the COVID-19-related items as also shown elsewhere (Miller 2020) but, as previously argued (Goertzel 1994), for seemingly unrelated conspiracy theories as well. Of course, it could be argued that beliefs around different conspiracy theories correlate simply because they are items of the same underlying construct (Sutton and Douglas 2014: 266), such as conspiracy thinking. Although I did not examine the impact of various psychological variables that have been proposed in the literature (Douglas et al. 2019; van Prooijen and Douglas 2018), this argument, even if true, does not invalidate the results provided in this contribution. If indeed the ultimate explanation lies in some deeper psychological correlates, then the explanation cannot be in one's left-right self-placement which lies further down in the funnel of causality. Putting the psychological antecedents aside and adopting a political science perspective, I found that the effects of belief in unrelated conspiracy theories are strong and robust, unlike the effects of left-right ideology.

Consistent with previous work on the relationship between virus-related and political conspiracy theories (Enders and Smallpage 2019b; Goertzel 1994), I showed that conspiracy beliefs and scepticism about the COVID-19 pandemic are best explained by belief in *unrelated* political and medical conspiracy theories, with the effects being robust to controlling for other political attitudes and trust in the government. In comparison, the effect of ideology, measured either by self-placement on the left-right scale or by attitudes associated with political ideologies, was rather negligible and significantly further moderated by trust in the government. While it is uncertain whether the results presented here are generalizable, they serve as a useful antithesis to the ideological extremity hypothesis which has been partly based on the statistically significant, but weak,

Figure 2: Predictive margins from OLS regressions.



Note: The lines represent linear predictions (y axis) across different levels of the dependent variables (x axes) for the baseline model presented in Figure 1 (solid lines), and models controlling for attitudes towards European integration (dashed black lines) and trust in the government (dashed grey lines).

relationship between left-right self-placement and conspiracy beliefs in bivariate analyses (Van Prooijen et al. 2015).

Moreover, this contribution found that the respondents who felt the country had not benefited from EU membership were more likely to endorse conspiracy beliefs and to be sceptical with regard to the COVID-19 pandemic. This supports the notion that conspiracy theories in Greece are associated with collective victimhood (Antoniou et al. 2020; Skoulariki 2018), and the view of conspiracy beliefs as a between-group phenomenon more generally (van Prooijen and van Lange 2014). Future research could further investigate the interaction between collective victimhood and conspiracy beliefs around COVID-19.

The findings have important policy implications, considering that conspiracy beliefs are consequential in that they impact human behaviour (van Prooijen and Douglas 2018: 899–900). Given that prior conspiracy beliefs on unrelated subjects inform belief in new conspiracy theories, the findings suggest that the deep rooted nature of conspiracy beliefs should be taken into account when designing strategies aimed to fight disinformation during public health emergencies (Andrade 2020: 513–515). Recent evidence from randomized experiments in the context of COVID-19 misinformation presents conflicting accounts on the efficacy of various interventions aiming to correct misinformation in the context of the SARS-CoV-2 pandemic and the associated ‘infodemic’ (Erceg et al. 2020; Kreps and Kriner 2020; Pennycook et al. 2020b). Consequently, empowering citizens by improving health literacy and critical thinking early on, rather than employing scare tactics later, seems to be the way forward.

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## Open research badges



This article has earned Open Data and Open Materials badges for making publicly available the digitally-shareable data necessary to reproduce the reported results. The data is available at <https://www.doi.org/10.7910/DVN/FGMNNF>.

## Data Availability Statement

The data that support the findings of this study are openly available in the Harvard Dataverse, at <https://www.doi.org/10.7910/DVN/FGMNNF>.

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### **Supporting Information**

Additional Supporting Information may be found in the online version of this article:  
Supplementary Material

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