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**Pathogen Threat Increases Electoral Success for Conservative Parties: Results from a Natural Experiment with COVID-19 in France.**

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## **Pathogen Threat Increases Electoral Success for Conservative Parties: Results from a Natural Experiment with COVID-19 in France.**

### **Abstract**

Conservative ideology is closely linked with pathogen prevalence, and adherence to conservative values increases under pathogen threat. To this day, few studies have demonstrated this effect using ecological voter data. For the first time, we analyse results from an election (the 2020 French local election) which was held during the growing COVID-19 spread in the country. Using mixed modelling on county-level data ( $N = 96$ ), we show that *perceived* COVID-19 threat (search volume indices) but not *real* threat (prevalence rates) prior to the election are positively associated with an increase in conservative votes only. These results were robust to adjustment on several covariates including abstention rates, prior electoral scores for conservative parties, and economic characteristics. Overall, a 1% increase in COVID-19 search volumes lead to an increase in conservative votes of .25%, 95% CI [.08, .41]. These results highlight the relevance of evolutionary theory for understanding real-life political behaviour and indicate that the current COVID-19 pandemic could have a substantial impact on electoral outcomes.

### **Public Significance Statement**

Pathogen prevalence tends to increase conservative sociopolitical attitudes. Using data from local elections in France which occurred during the COVID-19 pandemic in 2020, we demonstrate that perceived – but not actual - pathogen prevalence is associated with increased electoral success for conservative - but not xenophobic - parties.

**Keywords:** Coronavirus, pathogen threat, COVID-19, election, conservative, behavioural immune system.

## 1. INTRODUCTION

The world is currently undergoing a pandemic of COVID-19, a novel coronavirus. As of April 10, 2020, 1,521,252 people were diagnosed with a COVID-19 infection and 92,798 died from the virus (WHO, 2020). With a case fatality rate estimated around 2-3% (Cao et al., 2020), COVID-19 represents a potent and salient global threat. So far, the health and economic impacts of COVID-19 have been subjected to extensive assessment (McKibbin, & Fernando, 2020). However, few studies have investigated its political consequences (Karwowski et al., 2020). Incidentally, the current pandemic occurred at the same time as local elections in France, which gave us an unprecedented opportunity to directly assess how prevalence of COVID-19 may impact electoral outcomes *in vivo*. More specifically, we expected that COVID-19 threat – as a pathogen-caused infection (SARS-COV-2) – would increase preference for conservative parties (Terrizzi, Shook, & McDaniel, 2013).

Current evolutionary theories of political psychology converge in linking pathogen threat and social conservatism (Thornhill, Fincher, & Aran, 2009). In fact, pathogens come with high costs for their hosts, which have facilitated the evolution of anti-pathogen defence mechanisms. Besides a physiological immune system that deals with pathogens inside the organism, humans have developed a parallel immune system to monitor, detect and actively avoid physical contact with pathogens (the so-called ‘behavioural immune system’; Schaller, 2011). This system is designed to favour behaviours that reduce interpersonal contacts – hence limit one’s likelihood of contracting infectious diseases.

Accordingly, individuals display increased risk aversion, introversion and decreased openness to experience under pathogen threat (Schaller, & Murray, 2008). Similarly, ecological pathogen prevalence is associated with the development of collectivistic cultures which tend to be more socially conservative (e.g., more adherence to norms and traditions; Varnum, & Grossmann, 2016). For example, evidence suggests that the 2014 Ebola outbreak did influence electoral

preference for conservative candidates during federal elections held later that year (Beall et al., 2016; see Schaller et al., 2017 for a replication). Likewise, historical prevalence of non-zoonotic diseases predicted conservative votes for the 2016 US presidential election (Zmigrod, Ebert, Götz, & Rentfrow, 2020), and research suggests that ideology differently relates to threat sensitivity, with liberals being more sensitive to economic threats while conservatives to pathogen related ones (Fiagbenu, Proch, & Kessler, 2019).

From this perspective, it is expected that the threat posed by COVID-19 could trigger temporary shifts in ideological preferences in favour of conservatism, which could affect immediate electoral outcomes. Supporting a social conservative-shift under COVID-19 threat, a longitudinal study among Californian residents revealed that individuals reported higher adherence to gender role conformity and gender stereotypes during the pandemic compared to before (Rosenfeld, & Tomiyama, 2020). Thus, we hypothesized that COVID-19 threat would increase electoral success for conservative parties. This hypothesis was recently tested in a series of experiments manipulating COVID-19 threat salience. Among representative samples of US and Polish citizens, COVID-19 threat was found to increase preference for conservative ideology and conservative political candidates (Karwowski et al., 2020).

Despite this robust converging evidence, there remains a lack of studies assessing the impact of current (vs. historical) pathogen prevalence on electoral outcomes directly – for obvious reasons. Therefore, it is still not clear whether pathogen threat from ongoing non-zoonotic diseases could carry over and ‘go to the ballot’. The present study was precisely set up to address this issue in the context of the 2020 local elections in France. There, elections were maintained though COVID-19 was spreading across the country, yielding a unique opportunity to test our hypothesis. To do so, we measured *real* pathogen threat using COVID-19 cases counts and *perceived* threat from volumes of online search related to COVID-19 (due to high media coverage).

## 2. METHODS

### 2.1. Data collection

#### 2.1.1. Electoral outcomes

France is divided into several layers of governance, from municipalities (*'communes'*;  $N = 34,968$ ) inserted in counties (*'départements'*;  $N = 101$ ), themselves part of larger territories (*'régions'*;  $N = 18$ ). Here, we examined voting shares for different parties during the French local (municipality) elections which took place in March of 2020. These elections are run on two-rounds, according to a proportional representation scheme with a majority premium for larger municipalities. Despite the COVID-19 pandemic, authorities maintained the first round on March the 15<sup>th</sup>, but the second (March the 22<sup>nd</sup>) was subsequently cancelled.

Our electoral outcome data represents the share of votes for each party at the end of the first round - for municipalities of more than 1,000 inhabitants. These were obtained through a press application which aggregates data from municipalities at the department level, using raw data from a State repository<sup>1</sup>. The same application allowed us to retrieve scores for the previous local election of 2014 to obtain adjustment variables (previous voting shares for different parties). From this data, we computed voting shares by summing the percentage of votes for parties with similar ideologies (see Appendix 1 for details).

#### 2.1.2. COVID-19 Threat

We decided to use two measures of COVID-19 threat. First, we gathered the number of diagnosed COVID-19 cases, available at the county-level<sup>2</sup> (*'département'*) as aggregated by the

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<sup>1</sup> <https://www.data.gouv.fr/fr/datasets/elections-municipales-2020-resultats/> available from [https://www.challenges.fr/politique/infographie-municipales-retrouvez-la-carte-des-resultats-du-premier-tour-ville-par-ville\\_702873](https://www.challenges.fr/politique/infographie-municipales-retrouvez-la-carte-des-resultats-du-premier-tour-ville-par-ville_702873)

<sup>2</sup> <https://www.santepubliquefrance.fr/recherche/#search=COVID-19%20Point%20épidémiologique>

French health authorities on March 10 (5 days before the elections). We then divided these by population size for each county to obtain a COVID-19 prevalence rate, normalized per 100,000 inhabitants. Besides this ‘objective’ threat indicator, we also needed a ‘subjective’ index of individual exposure to actual threat. At this time in France, the COVID-19 pandemic was not as widespread as now and many counties only had a handful cases. This meant that COVID-19 was probably limited to a few local clusters, and not necessarily threatening to most individuals living in the same geographical cluster. Thus, we decided to include search volume indices (i.e., Google Trends) for the words ‘*COVID-19*’, ‘*coronavirus*’ and ‘*covid*’ ( $\alpha = .73$ ) averaged over the time period preceding the elections (January 1<sup>st</sup> - March 14<sup>th</sup>, 2020) and into a single score. This index, ranging from 0 to 100 reflects the percentage of search terms related to COVID-19 - normalized relative to the highest search volume - and constitutes a proxy for individual online exposure to pathogen threat-related contents. In fact, search volume data reliably taps into collective perceptions and have been found to predict offline behavior in various domains (e.g. Preis, Moat, & Stanley, 2013).

### *2.1.3. Social & Economic Indicators*

We collected a series of potential socio-economic confounds from the French National Institute for Statistics and Economic Studies (INSEE<sup>3</sup>). These included the most up-to-date statistics for population census, unemployment, poverty and mortality rates as well as average per capita income.

## **2.2. Analytic Strategy**

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<sup>3</sup> <https://statistiques-locales.insee.fr/#bbox=-997689,6661347,2487500,1619645&c=indicator&view=map2>

Our final dataset (accessible at <https://osf.io/pvmjf/>) included 96 counties (101 minus overseas territories for which COVID-19 and election data was not available). Because these counties belong to several territories (*'régions'*), spatial clustering needed to be accounted for. Thus, we decided to test our hypotheses using mixed modelling (Schielzeth, & Nakagawa, 2013). In addition, sensitivity analyses would be carried out by running models both with and without covariates, including potential confounds such as prior electoral outcomes. Overall, the study's biases due to its observational nature would be partly balanced by careful consideration of crucial confounds, and variable design (COVID-19 threat indicators temporally precede March 15 electoral outcomes).

### 3. RESULTS

#### 3.1. COVID-19 Threat indicators

A first mixed-model was run to assess the relationship between our two COVID-threat indicators, specified as follows: *COVID-19 Search Volume*  $\sim I + (I \mid region) + COVID-19 Prevalence$ . The model was adequate (Restricted Maximum Likelihood,  $AIC = 674$ ,  $r^2_{conditional} = .44$ ). It highlighted a positive link between COVID-19 prevalence and search volumes  $\beta = .47$ , 95%CI[.29,.65],  $p < .001$  ( $r^2_{marginal} = .17$ ). Therefore, objective and perceived COVID-19 threat were linked but did display some considerable non-overlap.

#### 3.2. Hypothesis Test

A mixed-model was run to assess the relationship between COVID-19 threat and general right-wing votes, specified as follows: *Right-wing votes*  $\sim I + (I \mid region) + COVID-19 Prevalence + COVID-19 Search Volume$ . The model was adequate (Restricted Maximum Likelihood,  $AIC = 636$ ,  $r^2_{conditional} = .32$ ;  $r^2_{marginal} = .08$ ). It indicated no noticeable effect of COVID-19 prevalence,  $\beta = -.08$ , 95%CI[-.25,.08],  $p = .33$ , but a substantial positive effect of COVID-19



search volume  $\beta = .23$ , 95%CI[.07,.40],  $p = .007$ . Thus, it seemed that perceived – not real - pathogen threat was linked with increased right-wing votes.

The same models were re-run using conservative and extreme right-wing votes as outcomes. Importantly, the effect of COVID-19 was driven by an increase in conservative votes  $\beta = .25$ , 95%CI[.08,.41],  $p = .004$ , (Model  $r^2_{\text{marginal}} = .09$ ) while extreme right-wing votes were overall unaffected  $\beta = -.01$ , 95%CI[-.02,.01],  $p = .06$  (figure 1). This led us to consider conservative votes as the main study outcome for increased accuracy (results are similar using general right-wing votes). As expected too, no relationship was observed between our threat indicators and other types of political parties - thus not reported.

[INSERT FIGURE 1 HERE]

### 3.3. Sensitivity Analyses

We ran another mixed-model dropping COVID-19 prevalence to assess whether the effect of search volume was spurious, but the effect remained stable on conservative votes  $\beta = .21$ , 95%CI[.06,.35],  $p = .007$ . Finally, we computed a model with relevant covariates – including 2014 conservative votes - to probe the artefactual nature of our results, specified as: *Conservative votes*  $\sim 1 + (1 / \text{region}) + \text{COVID-19 Prevalence} + \text{COVID-19 Search Volume} + \text{2014 Conservative votes} + \text{Abstention rates} + \text{Population} + \text{Income} + \text{Mortality} + \text{Unemployment} + \text{Poverty}$ . Although these improved model fit with comparable parsimony (Restricted Maximum Likelihood,  $AIC = 592$ ,  $r^2_{\text{conditional}} = .54$ ;  $r^2_{\text{marginal}} = .57$ ), the effect of COVID-19 search volumes remained unchanged,  $\beta = .24$ , 95%CI[.09,.39],  $p = .003$ . The full model table can be found on the OSF project page (<https://osf.io/pvmjf/>)

## 4. DISCUSSION

To the best of our knowledge, this study is the first of its kind to assess the direct impact of a global pathogen threat on electoral outcomes, thus ecological voter behaviour. Current

psychological theories of threat regulation predict that COVID-19 – a deadly, anxiogenic, societal threat - would lead to either polarization (i.e. increased extremist votes; Jonas et al., 2014; Pyszczynski, 2019), increased right and far-right votes (Jost, 2017) or even in left votes (because these parties are perceived as more competent to manage health-related issues; see Eadeh & Chang, 2020). Yet, as predicted by the Parasite Model of Democratization and Behavioural Immune System Theory, we did observe a positive association with perceived COVID-19 threat prior to the election and electoral success of conservative parties *only*. These findings highlight the power of evolutionary theorizing to explain human reactions to ecological threats.

The effect of COVID-19 threat was robust to adjustment on several potential confounds including prior electoral success of conservative parties. Replicating recent results from Zmigrod et al. (2020) and Karwowski et al. (2020), we confirmed that pathogen threat effects can translate into real-world political outcomes, extending well-known effects of historical pathogen threats on ideological preferences to ongoing pandemics. With a 1% increase in pathogen threat salience is associated with between .08 to .41% supplementary votes for conservative parties. This moderate effect size is in line with meta-analytical estimates of the links between behavioural immune system mechanisms and social conservatism (Terrizzi, et al., 2013).

In addition to these empirical findings, our study identified two boundary conditions of interest for evolutionary political science (Petersen, 2015). First, the effect of COVID-19 on conservative votes was only observable when measuring *perceived* (exposure to online materials related to the pandemic) and not necessarily *real* (prevalence rates) threat. This underlines the crucial role of media and public communication in shaping collective perceptions of the pandemic and – possibly – their political consequences. Moreover, COVID-19 threat effects only seemed to affect conservative, not extreme-right wing votes. This finding aligns

with prior evidence showing that xenophobia and out-group prejudice tend to be more related to parasite stress (albeit weakly; Tybur et al., 2016) and not necessarily pathogen prevalence (Thornhill et al., 2009). Still, these results point at the need to separate conservatism and xenophobia when assessing pathogen threat effects on voting and raise the question whether similar political gains could extend to non-conservative candidates (e.g. liberals) using arguments emphasizing conservative values.

#### **4.1. Limitations**

The present findings' implications should be conditioned to some caveats that we will now discuss. First and foremost, the study design remains observational. Even if pathogen threat measures were taken prior to the elections and that major confounds have been controlled for, we cannot exclude the influence of non-measured confounding variables. For example, historical county-level prevalence of infectious diseases (especially non-zoonotic ones) might relate to current pathogen threat perceptions (e.g. through cultural transmission) and ultimately explain the observed relationship between COVID-19 search volumes and conservative votes. For lack of available data, we could not rule out this explanation. Future research designs should therefore include both current and historical pathogen prevalence to assess the presence of confounding or mediation mechanisms (see Fiedler, Harris, & Schott, 2018).

Other limitations pertain to field constraints and cultural specificities that warrant caution when generalizing the effects. In the face of growing COVID-19 cases, the French authorities decided to suspend the elections, which bounded our data to results from the 1<sup>st</sup> round of a 2-round election. Although this does not invalidate the findings themselves, replicating these results when voters' choice is restricted to only a few alternatives might constitute a stronger test of Behavioural Immune System Theory (Platt, 1964). For instance, in absence of conservative candidate(s), would voters still prefer the 'relatively' more conservative candidate(s) available?

Relatedly, French politics have specific features that should be taken into account. Compared to the US for instance, French conservative parties tend to be more socially liberal: they support women's access to free abortion and would not argue against universal healthcare. To the extent that French conservatives are still more socially conservative French liberals (on issues such as same-sex marriage), our test remains valid, but cross-cultural moderators should be considered when generalizing the findings to other contexts (see Malka, Lelkes, & Soto, 2019).

Finally, we demonstrated that pathogen threat *perceptions* were driving increases in right-wing votes. This finding is important because actual COVID-19 threat's effects could paradoxically decrease during the pandemic (e.g., perceptions of low number of cases) or increase after the pandemic is gone (e.g., reminders of the pandemic in public discourse and the media). Therefore, the political effects of pathogen threat may be further modulated by structural factors such as freedom of press (i.e. prevalence of pro-government information) or healthcare systems' efficacy in managing the pandemic.

## **4.2. Conclusion**

Within the inferential boundaries of this study, we are confident that our results constitute original robust evidence for the existence of a pathogen threat effect on electoral outcomes. We hope these findings stimulate further research on the ecological determinants of electoral success, and inform policy makers regarding decisions to maintain or delay elections during global threats such as pandemics. We conclude that the current COVID-19 pandemic could substantially contribute to electoral successes for conservatives, in areas where threat perceptions remain salient.

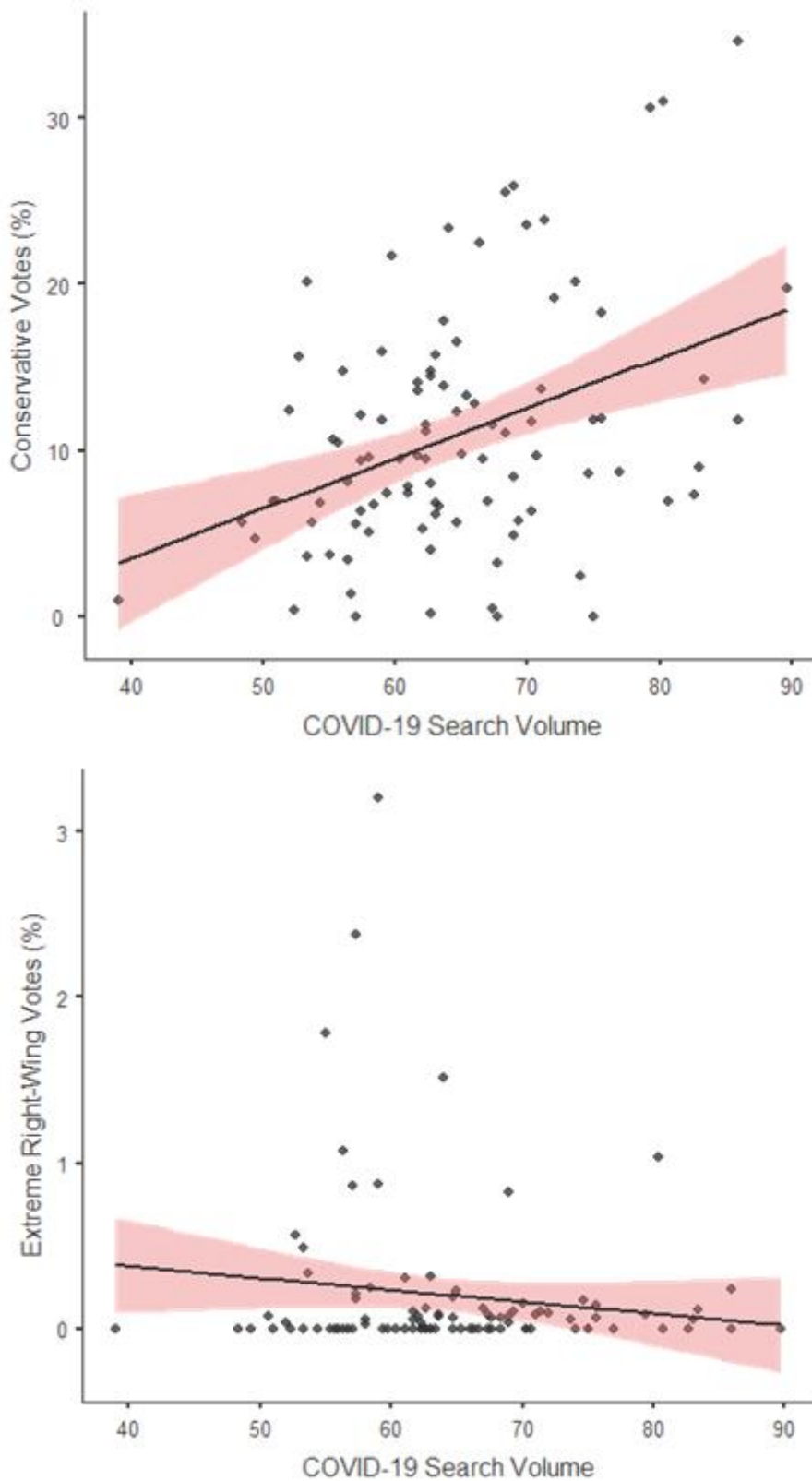
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## FIGURES



*Figure 1.* Plot of the relationship between COVID-19 search volumes and proportion of conservative (above) and extreme right-wing votes (below). Areas in red represent SEs.

## Appendix 1.

Unlike the bipartisan political system prevalent in the US, French politics is defined by the coexistence of several parties that often overlap in terms of ideology. These typically gather a few percentage of total votes and may cooperate or compete at different levels and institutional times. For instance, the '*French Communist Party*', '*Working Class Struggle*' and the '*New Anti-Capitalist Party*' all embody very similar Marxist (far-left) ideologies, and each ran a candidate during the 2017 presidential election. However, they often unite under common electoral rolls (e.g. '*extreme-left*') during local elections to seize control of municipalities. The apparent institutional diversity is therefore superficial, as most parties can be classified under distinct ideological 'labels' (far-left, left, right, far-right). Still, to rule out potential biases, we left aside local independent candidates and parties with no defined political orientation.

Accordingly, we created scores for extreme-left by summing votes from the '*Left-party*', '*Radical-left Party*', '*Unsubmissive France*', '*French Communist Party*'. Liberal votes scores were obtained from the '*Socialist Party*', '*United left*', '*Various-Left*', '*Pro-Environment Party*', '*Europe Environment & Greens*'. Centre votes were aggregated from '*La République en Marche!*' (current ruling party), '*United Democrats & Independents*', '*United centrists*, *Various-Center*' and conservative votes scores from '*Various Right*', '*United Right*', '*Union for a Popular and Republican Movement*', '*Republicans*'. Finally, extreme right-wing votes were scored from '*Far-right*', '*National Front*', '*Rise Up France!*'. Then, a general left-wing score was computed from both liberal and extreme-left wing scores. A similar operation was carried out to obtain a global right-wing score. Abstention rates were kept as a control variable.