Moralizing the COVID-19 Pandemic: Self-Interest Predicts Moral Condemnation of Other's Compliance, Distancing and Vaccination

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Abstract

The emergence of the novel coronavirus has put societies under tremendous pressure to instigate massive and rapid behavior change. Throughout history, an effective strategy to facilitate novel behaviors has been to morally condemn those who do not behave in an appropriate way. Accordingly, here, we investigate if complying with the advice of health authorities—e.g. to physically distance or vaccinate—has emerged as a moralized issue during the COVID-19 pandemic. In Study 1, we rely on data ($N = 94K$) from quota-sampled rolling cross-sectional online surveys from eight countries (Denmark, Sweden, Germany, France, Italy, Hungary, the UK, and the US). We find that large majorities find it justified to condemn those who do not keep a distance to others in public and around half of respondents blame ordinary citizens for the severity of the pandemic. Furthermore, we identify the most important predictors of condemnation to be behavior change and personal concern, while institutional trust and social distrust also play large but less consistent roles. Study 2 offers a registered replication of our findings on a representative sample of Britons ($N = 1.5K$). It shows that both moralization and condemnation of both vaccination and general compliance are best predicted by self-interested considerations.

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1 Introduction

During the COVID-19 pandemic, health authorities have sought to educate citizens on proper behavior: A responsible citizen avoids crowded areas, keeps a safe distance to all others, wears a face mask in public, and avoids touching others (Chu et al. 2020). These behaviors have not come easy to many people. To begin with, all habits are difficult to change (Marcus, Neuman, & MacKuen 2000), but the habits around social interactions concern the core of human nature. Humans are social animals, and mingling with others is a fundamental instinct (Dunbar 1998). While analyses demonstrated dramatic changes in behavior across the world during the first wave of the COVID-19 pandemic in March 2020 (e.g. Jørgensen, Bor, & Petersen 2021), public opinion data also shows that compliance decreased by mid-summer 2020 in several countries.¹ Consistent with this, the World Health Organization warned that compliance throughout the pandemic had been dwindling and several countries showed signs of “pandemic fatigue” (WHO 2020).

Yet, given the economic and welfare costs of government-mandated lockdowns (Clemmensen, Petersen, & Sørensen 2020; Fernandes 2020), voluntary behavior change remains an important remedy against the COVID-19 pandemic until vaccines become *globally* available (Chu et al. 2020). Thus, the authorities in most countries seek to sustain behavioral change through a combination of restrictions, informational campaigns, and nudges. Importantly, however, such top-down strategies alone may have limited effects. For one, in democracies, it is not possible, nor normatively desirable to strictly enforce restrictions that affect the private lives of citizens. The literature both on compliance in general and compliance during the COVID-19 pandemic highlights that it is driven to a large extent by citizen-level perceptions (Tyler 2006) for example, about the legitimacy of restrictions (Chan et al. 2020) and the perceived threat from COVID-19 (Harper, Satchell, Fido, & Latzman 2020). From this perspective, public compliance is as much shaped by ordinary citizens’ views and behaviors as by top-down efforts from the authorities.

In this manuscript, we focus on a bottom-up process that has a proven track record in

¹A number of international research projects and survey agencies monitored compliance, e.g., Imperial College London’s Covid-19 Behavior Tracker, the HOPE project in Denmark, or YouGov’s Covid-19 Public Monitor (last accessed 2021-Nov-01).

instigating rapid behavioral and attitudinal change but has received limited attention in research on the COVID-19 pandemic: moralization. To moralize is to promote rules and norms, which purport that certain behaviors are moral imperatives, and hence violating them is immoral and worthy of condemnation (DeScioli & Kurzban 2013; Rozin 1999, 218). Moralization has been crucial for example, in the fight against secondhand smoking (Rozin & Singh 1999). Health authorities have leveled information campaigns against smoking for decades, but behavioral change only emerged—and did so quickly—when exposing others to secondhand smoking was labelled immoral. Anecdotal evidence suggests that compliance with health advice regarding COVID-19 quickly became a moral issue when the pandemic hit the world in the spring of 2020. Countless news reports described often violent confrontations between ordinary citizens with regards to physical distancing or mask wearing.² These reports appear to be especially abundant in the US, where disease avoidance became heavily polarized along partisan lines (Gollwitzer et al. 2020).

In this manuscript, we ask, first, whether compliance with health advice to mitigate the COVID-19 pandemic has emerged as a moral issue across countries during the COVID-19 pandemic. Second, we investigate *who* is most likely to moralize compliance. Study 1 offers the most comprehensive comparative data on moral condemnation related to physical distancing to date, relying on large, quota-sampled online surveys from eight Western democracies: Denmark, Sweden, Germany, France, Italy, Hungary, the UK, and the US (total N = 93,722). Study 2 builds on a representative online sample from the UK (N = 1,532) and offers a pre-registered replication of our main findings. It relies on scales of both moral condemnation and moralization, and includes both the issue of vaccination and compliant behavior in general.

Our data show convincing evidence for high levels of moralization across countries. At the same time, the results that we present also inform theoretical debates over the nature of moralization by showing that moralization is essentially egotropic in nature. The more likely someone is to benefit from public compliance with official health advice, the more likely they are to support moralization.

²See, e.g., these reports from [Michigan](#), [New York](#), and [Budapest, Hungary](#) (last accessed on 2021-Nov-03).

2 Why Would People Moralize Compliance with Health Advice?

Moralization can be defined as “the process through which preferences are converted into values” (Rozin 1999, 218). Unlike conventional preferences, moralized convictions are behavior-guiding principles that feel universally and objectively true, independently of whether the authorities mandate them or not (Skitka 2010). Moralized actions are considered virtuous in and of themselves, often heavily discounting specific consequences (Ryan 2019). Consequently, people are unwilling to compromise on moral issues (Delton, DeScioli, & Ryan 2020; Ryan 2017).

The exact function of morality is a hotly debated topic (e.g. Shackelford and Hansen (2015)), but most accounts agree that morality is rooted in the complexities of humans’ social life. Gintis, Henrich, Bowles, Boyd, and Fehr (2008) see morality as the cornerstone of human altruism; Curry (2016) proposes that morality has evolved as a mechanism to solve a wide variety of coordination and cooperation dilemmas; and DeScioli and Kurzban (2013) posit that morality is a tool for choosing sides in conflicts. However, all these accounts agree that one key function of morality is social: To incentivize particular behaviors in others through *moral condemnation* (DeScioli & Kurzban 2009).

Condemnation is a key element of moralized conviction and, in part, distinguishes those convictions from conventional preferences: People experience outrage when their moralized principles are breached and feel personally motivated to inflict costs on the perpetrator (Fiske & Tetlock 1997). Moralization thus fuels what is often termed third-party punishment, that is, punishment from individuals not directly engaged in a given interaction (DeScioli & Kurzban 2009). Imagine that Alex hits Bertie. If Bertie retaliates it is an instance of second-party punishment. If, however, Casey intervenes and punishes Alex, it is an instance of third-party punishment. If there is no prior relationship between Bertie and Casey, this intervention is likely motivated by a moral outrage caused by Alex’s norm-breaking behavior. As Ryan (2017; 2019) demonstrates, many political attitudes are conventional in the sense that citizens simply leave it to the government to address the problem. When political attitudes become moralized, however, people are prone to become personally involved in the matter.

Third-party punishment often takes a social form rather than a physical or monetary form. The mere act of condemnation is a form of punishment-by-stigmatization that signals to the

target and other audience members that the punisher lowered their valuation of the target and is therefore less likely to act pro-socially towards them in the future (Sznycer et al. 2016). Moreover, condemnation also signals that the punisher is likely to act in similar ways towards any other actor who violates the moralized principle. Thus, moralization incentivizes the observation of specific behaviors and can therefore lead individuals who are otherwise neutral about the behavior to still follow it for the fear of condemnation. Accordingly, moralization is a tool in the negotiation of norms within groups, and the goal of moralizing a particular conviction is to establish it as a norm within the group (DeScioli & Kurzban 2013).

In March 2020, the COVID-19 pandemic and associated distancing advice and policies arguably facilitated one of the largest synchronous changes in behavior in human history. Following this, in 2021, the COVID-19 pandemic facilitated the biggest vaccination effort in human history. The communication surrounding distancing, vaccinations and other health advice has been shown to tap into a range of value-based considerations from trust (Jørgensen, Bor, & Petersen 2021; Lindholt, Jørgensen, Bor, & Petersen 2021) and empathy (Pfattheicher, Nockur, Böhm, Sassenrath, & Petersen 2020; Pfattheicher, Petersen, & Böhm 2021) over national identity (Van Bavel et al. 2021) to concerns over one’s personal health (Lindholt et al. 2021). There is ample reason to expect that, at least for some, compliance with advice from the health authorities become a moral issue during the COVID-19 pandemic. Indeed, previous research found evidence for moralization in Britain, the US and New Zealand (Graso, Chen, & Reynolds 2021; Van Assche, Politi, Van Dessel, & Phalet 2020). However, these studies relied on small convenience samples and have not sought to quantify the level of moralization. Below, we investigate if substantial parts of society moralized the COVID-19 pandemic using large samples of respondents resembling the population of eight countries.

3 Who Moralizes Compliance with Health Advice?

To the extent, we find evidence for the existence of moralization and condemnation during the COVID-19 pandemic, the next question is this: Who are the condemners? Or, more precisely, what are the psychological motivations that lead some individuals to moralize compliance during the COVID-19 pandemic?

Within moral psychology, there are two competing perspectives. One perspective focuses

on the role of egotropic or self-interested motives (DeScioli, Massenkoff, Shaw, Petersen, & Kurzban 2014; Kurzban 2011; Kurzban, Dukes, & Weeden 2010; Petersen 2013). People “could benefit from manipulating the propensity of others to engage in third-party punishment, if this punishment can be directed toward people who challenge the interest of the individual” (Petersen 2013, 79). In other words, a clever way to further one’s interest is to claim that acts that harm the *self* are immoral and should therefore be socially condemned. For example, Kurzban et al. (2010) show that moral views on recreational drug-use did not reflect principled considerations but rather strategic interests related to access to sexual partners. Similarly, DeScioli et al. (2014) showed that moral views about resource divisions did not reflect principled considerations, but rather self-interested stakes in different division rules.

Meanwhile, the other perspective focuses on sociotropic or altruistic factors (Gintis et al. 2008; Richerson & Boyd 2008). According to this view, people punish norm-violators altruistically as a means to support and sustain their group. While third-party punishment is costly for individuals, the norms motivating such behavior have spread because they yield sufficient benefits at the group level. In short, condemnation is a way to ensure the cohesion and cooperativeness of one’s group by claiming that acts that harm the *group* are immoral and should therefore be socially condemned.

To sum up, the two perspectives about moral condemnation disagree whether the fundamental driver of moralization is concerns for yourself or for others. At the same time, both perspectives argue that moral condemnation is motivated by a desire to see others comply with particular norms and, hence, share a number of predictions. In essence, the more one believes that a norm is important, and the more one worries that others will not comply with it, the more likely one is to moralize.

On the basis of the predictions *shared* by the different theoretical approaches to moralization during the COVID-19 pandemic, we can specify three key factors that could predict variation in the condemnation of those who do not comply with health advice: (1) people’s own behavior; (2) people’s perception of the sources of the advice; and (3) people’s perception that others cannot be trusted to follow the health advice.

Specifically, to explain variation in moralization during the COVID-19 pandemic, first, we ask if people who themselves follow official recommendations are more likely to incentivize others

to do the same. Changing one’s own behavior to fight the coronavirus is a credible signal that someone considers the official health advice relevant and important. Besides, people who have already paid the price of cooperation are particularly interested in ensuring that others follow suit too (Tooby & Cosmides 2010).

Second, given that health recommendations are being promoted by the government and health authorities, it is plausible that having more confidence in the authorities increases the perceived severity of the crisis and the urgency to promote the official guidelines. Indeed, trust in the authorities have been found to be the primary determinant of e.g. taking up the vaccine during the COVID-19 crisis (Lindholt et al. 2021). Thus, we also investigate if individuals who trust more in state institutions are also more motivated to push others to do follow the guidelines.

Third, we should expect people who view others as unlikely to comply with the government’s recommendations to be more motivated to take it on themselves to enforce compliance and condemn others. A key psychological construct to tap into such perceptions is interpersonal trust. Individual differences in interpersonal trust generally reflect differences in perceptions about whether others are willing to contribute to public goods, which benefit all, irrespective of whether they contributed to it or not. In the context of the pandemic, hindering the transmission of the virus is a public good; wearing a mask, avoiding physical contact, or getting vaccinated yield important benefits to those most vulnerable to the disease (Johnson, Dawes, Fowler, & Smirnov 2020). Thus, while *institutional* trust may increase moralization, next research question asks if people low in *interpersonal* trust are more motivated to moralize protective behavior in the context of the COVID-19 pandemic and condemn others for not observing the underlying recommendation.

Turning to predictions where the egotropic and the sociotropic accounts diverge, the key question is whether condemners are mostly concerned about the impact of non-compliance on themselves or whether they are mostly concerned about the impact of non-compliance on others. The immediate self-interested concern in the context of COVID-19 is whether oneself or close family members get sick. But there may also be additional personal concerns about, for example, personal employment if the non-compliance of others leads to further restrictions and lockdowns. Independently of the specific nature of the personal concerns, we examine (as

our fourth research question), if people who are more concerned about the impact of COVID-19 on *themselves* are more likely to engage in moral condemnation. As a modern version of the Nietzschean view of morality (Nietzsche 1994), this perspective entails that while morality is often praised for its virtuousness, it is essentially self-interest in disguise.

In contrast, the sociotropic perspective motivates our fifth, and last research question: do people morally condemn non-compliance to help *others*? In the context of the COVID-19 pandemic, there are multiple relevant sociotropic concerns. Most importantly, individuals can be concerned about the health impact of non-compliance and how this generates an overheated hospital system, or they can be concerned about the national economic consequences of renewed lockdowns if individuals do not comply. In addition, concerns can relate to society's ability to help disadvantaged groups or the impact of continued lockdowns on social unrest.

4 Study 1 – Cross-cultural investigation

4.1 Case Selection

Our objective is to better understand who and to what extent moralized the COVID-19 pandemic in Western democracies. We focus on *democracies* because rights and freedoms guaranteed by a democratic regime offer more room for bottom-up pressures like moralization to shape human behavior. We limit our attention to *Western* democracies out of convenience and fully acknowledge the need to study these topics in other regions too. Admittedly, Western democracies still encompass a diverse region with many unique countries. Yet, as our theory of moralization is rooted in deep-seated psychological processes, we expect to find some common trends across Western democracies. In other words, we are more interested in finding the similarities across a diverse set of countries than in explaining what causes certain differences.

Our strategy was to rely on a most different systems design logic and sample a diverse set of Western democracies. We posit that insofar as we are able to identify common trends across our selected cases, we may cautiously assume that our findings would generalize to other Western democracies. Given how volatile life became during the pandemic, we considered it important to get a longitudinal component of the survey, despite it increasing costs considerably. We therefore launched a rolling cross-sectional panel survey with an omnibus of various measures in eight countries (Denmark, Sweden, Germany, France, Italy, Hungary, the UK, and the US)

in the first weeks of the pandemic (April 9, 2020). Our study period runs until November 7, 2020.

We consider it to be one of the key advantages of our data that we capture the state of eight societies very early during the pandemic. At the same time, it means that we had to launch our data collection during a period of uncertainty concerning epidemic trajectories or government responses. We sought to diversify our cases in terms of standard macro-level indicators (Section B.1 in the online appendix (OA) offers an overview). Among other things, our countries vary on wealth (GDP PPP ranging from \$34K in Hungary to \$65K in the USA), their level of democracy (Freedom House Democracy Scores ranging from 70 in Hungary to 100 in Sweden), ethnic polarization (fractionalization index ranging from 0.06 in Sweden to 0.49 in the USA) and size of the welfare state (social expenditure in % of the GDP ranging from 19 in the USA to 31 in France).

In retrospect, we can confidently state that our eight countries also encompass substantial variation in terms of the toll of the pandemic and government responses. On April 9, 2020, the pandemic was already slowing down in Italy, while being at or near its first peak in France, UK and Sweden with a 7-day rolling average of COVID-19 related deaths between 9 to 14 per million citizens. Meanwhile, in Denmark, Germany, and Hungary the first wave took a markedly smaller toll with COVID-19 deaths below 3 per million. These early months have been characterized by rather stringent government responses in almost all countries. According to the 0-100 scale developed by the Oxford Covid-19 Government Response Tracker, the stringency ranged from 65 in Sweden, which avoided total lockdowns at high costs, to 92 in Italy, where large parts of the country have been under hard lockdown for several weeks.

The summer months brought a relative appeasing in both deaths and stringency in most countries, although to a very different extent. Sweden sought to change policies as little as possible and hovered at a level between 55 and 65 in the Government Response Tracker. Italy, the UK, and the USA, which were slow to respond in the Spring paid a heavy price and were unable to open up too much in the Summer – their stringency levels stayed above 60. Meanwhile, France, Germany, Hungary, and Denmark have witnessed major reopening with stringency dropping below 50, and in the latter two cases close to 40. It is notable that by August the death counts have dropped close to 0 in all countries but the United States.

Finally, the Fall brought the start of the second wave of infections. By the last date of our study period, November 7, 2020, the death levels were well on their way to match or to overshadow the first wave in several countries, but particularly Hungary (9 deaths per million), France (8 deaths per million) and Italy (6 deaths per million). Meanwhile, Denmark, Germany and Sweden managed still to keep the virus at bay, and the UK and the USA were in between these two groups. The stringency of government responses was below the Spring levels in every single country although at very different levels ranging from 40 in Denmark to 79 in France.

4.2 Data

In each round of the data collection, the survey company Epinion sampled approximately 500 adult respondents from the population of eligible voters in each country, setting quotas on age, gender, and geography to mimic the marginal distributions in the population. Smaller deviations from these quotas are corrected with post-stratification weights (see Statistical Analysis Section below). The respondents were recruited from large web-panels maintained by Norstat (in Denmark) and CINT (in the other seven countries) and thus exclude all citizens without internet access. Still, we consider that online surveys constitute the best and safest method to study samples resembling the populations during a pandemic. Participants are reimbursed via lotteries for gift certificates. After answering a survey, respondents are 'quarantined' for eight days and become eligible to be invited again afterwards. We exploit this feature of our data in the within-respondent analyses below. The survey was conducted in line with the national ethical guidelines for conducting survey-based research involving human subjects. Informed consent was obtained from each participant at the beginning of the survey.

Section B.2 in the OA offers a detailed overview of sample sizes and dates for each of the 34 waves we include here. Respondents answered questions in a roughly 20-minutes-long omnibus survey including a broad range of topics all related to the corona crisis from physical contact to policy evaluations.

Our sample is slightly imbalanced across countries as Denmark was oversampled, especially in the first months of data collection, for reasons unrelated to this manuscript. We also collected data more frequently in the first part of the study period: in April we fielded a wave twice a week, but from May we shifted to weekly waves (see details in Section B.2 in the OA). We rely on

multilevel modeling to reduce the effect of this imbalance. In total, the overall sample includes 34 data-rounds and 93,722 observations. Section B.3 in the OA offers sample descriptives.

4.3 Methods

4.3.1 Outcome Variables

Study 1 analyzes moralization via condemnation, which has been highlighted as a key and unique feature of moralized attitudes (DeScioli & Kurzban 2009). In Study 2 below, we provide a replication with more direct measures. Specifically, Study 1 relies on two variables tapping into levels of moral condemnation: condemning norm-breakers and blaming ordinary people for their behavior. How can we know if physical distancing has become a moral issue? We could ask whether people have condemned anyone for breaking the social norm. Yet, personal experience with condemnation is likely a rare, costly, and sensitive behavior. Instead, we use an indirect measure, asking to what extent the respondent feels it is “justified to condemn those who do not keep a distance to others in public”. This is a much more common, less costly, and less sensitive issue, which could therefore be more accurately assessed in an online survey. We measure this outcome on a standard 5-point Likert scale, which we transform into a 0-1 continuous variable for our analyses.

Yet, the condemnation variable remains mute on how frequently respondents experience that others do not keep their distance in public. Consequently, we employ a secondary outcome variable that taps into the extent to which respondents believe that the corona crisis has become this severe “because lay individuals did not take the virus seriously enough”. Blaming the people is measured on a simple binary yes-no scale. The two outcome variables are weakly correlated (*Pearson’s* $r = 0.20$). We report detailed question wordings in the OA Section A.

4.3.2 Predictors of Moral Condemnation

We rely on four sets of correlates in our statistical models, measuring 1) degree of behavioral change as a response to the pandemic, 2) interpersonal and institutional trust, 3) levels of concern, and finally, 4) standard demographic covariates.

First, to measure broadly the psychological motivation to enforce norms around physical distancing, we focus on whether respondents changed their own behavior. Moralization is an

effective tool against free riding, and those who pay the price of cooperation should be more motivated to ensure that others do, too. Accordingly, we asked the following: “To what degree do you feel that the current situation with the corona virus has made you change your behavior to avoid spreading infection?” and measured answers on a four-point scale from “not at all” to “to a high degree”. We expect more behavior change to lead to more moralization.

Second, trust often plays a central role in matters of social cooperation. As explained, moralization about physical distancing during a pandemic is one of the few issues where social and institutional trust are expected to have opposite effects. Social trust renders moralization superfluous; if most people can be trusted, there is no need to waste effort on moral condemnation. We measure social trust with a standard question: “Do you think that most people by and large are to be trusted or that you cannot be too careful when it comes to other people?” on an 11-point scale. Conversely, institutional trust could be considered an indicator of political legitimacy. People with high institutional trust are likely to believe that the new social norms propagated by the state and government are good and right. This may add an additional level of motivation to moralize beyond mere concern or behavior change. Respondents indicate their level of confidence in the government on a standard 11-point scale.

Third, theories of moralization agree that people who are concerned about the consequences of the pandemic are more likely to moralize but disagree on whether it is primarily personal or social concern that drives these effects. We rely on a battery of five items measuring concern on a four-point scale from “not at all” to “to a high degree”. An exploratory factor analysis indicates that the items load on two factors. The first taps into more personal concerns about 1) the self and the family and 2) hospitals’ ability to help the sick. The other taps into more social concerns about 3) society’s ability to help the disadvantaged, 4) social unrest and crime, and 5) the country’s economy.³ We expect higher concern to lead to higher moralization.

Fourth, we rely on demographic variables in our models. We include a dummy variable for those who identify as female. We include a continuous variable for age. We add a dummy for having completed tertiary education (level 5 or higher according to the UNESCO’s International Standard Classification of Education). Finally, respondents are asked to answer which party

³Item 1 (self and family) and item 3 (help the disadvantaged) load on both factors, but for the sake of conceptual clarity and simplicity, we lump these items with the theoretically relevant group. Indices based on factor loadings correlate very strongly with our simple averages 0.91 and 0.97 for personal and social concern, respectively. In OA Section C.2.2, we also replicate our analyses with a more theoretically motivated split of items, which lumps all concern items, except “self and family” under social concerns.

or candidate they voted for at the last first-order national election. This variable is recoded into a variable that indicates whether the respondent voted for a left-wing party, a right-wing party, or neither. All continuous variables are standardized with a mean of 0 and a unit of two standard deviations. This makes the coefficients of continuous variables and binary indicators comparable (Gelman 2008).

4.3.3 Statistical Analysis

A methodological challenge posed by our data is the clustering due to multiple countries and waves. We address this challenge by relying on multilevel regression modeling. Our baseline models rely only on the demographic covariates but include varying intercepts for countries and survey waves. Next, we add the other predictors, first, one-by-one and then, all in a single model. All coefficients remain substantively similar in the pooled model; therefore, we rely on this for further analyses. Yet, these models assume that the correlation of the psychological predictors is the same across all countries. We relax this assumption by adding varying slopes for the five psychological correlates. At each step of increasing model complexity, we verify that the model fit is improved by standard information criteria (AIC and BIC). Full model details are reported in Section C.1 of the OA.

All of our models include post-stratification weights, which ensures that our samples are informative of the population. Weights have been calculated by the data provider and include data on party choice, region, education, age and gender interactions, house type, and household size. Because the continuous variables are re-scaled with a mean of zero and a unit of two standard deviations, coefficient estimates could be interpreted as the difference between a respondent one standard deviation below average and a respondent one standard deviation above average on a predictor. Given our large sample sizes, traditional significance estimates are uninformative (most estimates are significant). Therefore, our results section focuses on substantive effect sizes.

As robustness checks, we rerun our main models without post-stratification weights. Moreover, by adding varying slopes for survey rounds, we investigated whether the strength of the associations between our outcomes and the psychological predictors changes in time. We found no meaningful time trends in the strength of these associations. See Section C.2 in the OA for

details.

4.4 Results

4.4.1 Descriptive analyses

Figure 1 displays the two outcome variables for each country across the study period. The countries are ordered by the overall level of moralization we observe. A number of important descriptive patterns emerge. First, as the blue points indicate, a large majority of our respondents readily condemn norm breaking related to physical distancing. The average value is around 0.7 across the entire period in all countries, except the US, where it is around 0.6. It is notable how little initial levels of condemnation are dependent on the severity of the pandemic, Italians and Hungarians, or the Brits and Germans condemned those who did not physically distance to similar extent, yet they experienced vastly different infection levels.

Second, the red points on Figure 1 show that consistently fewer respondents blame laypeople than condemn norm-breakers. Still, for most of the study period, the sample means range between 0.35 and 0.6. It is notable that blaming the people varies much more across countries than moralization, suggesting that respondents everywhere moralize physical distancing but disagree about how large the problem of non-compliance is. Again, levels of blame are remarkably independent of objective indicators of behavior and severity. Italians blamed people initially to the same extent as Danes (or Hungarians, or Swedes) despite very different actual infection levels and very different levels of baseline conformity and rule-following. Germany and France have consistently exhibited the lowest level of blame.

Third, both condemnation and blame show some temporal dynamics. Both measures were at their peak in the spring, witnessing the highest death rates in most countries and characterized by a global sense of urgency and fear, often paired with stringent government restrictions. Moralization has decreased substantially over the summer in Italy, Hungary, Denmark, and Germany. This trend is always more profound in blaming the people than in condemning norm breakers. Interestingly, there is little to no decrease in moralization in the countries hit the hardest by the pandemic: Sweden, France, the UK, and the US. Although the absolute levels of moralization are not the highest in these countries, the lack of a decline may mean that these countries stayed on edge. Meanwhile, despite a surge in infections in Hungary, Italy, and

Germany, our data show no evidence that moralization also rebounded to or beyond Spring 2020 levels.

Figure 1: Time Trends in Levels of Moralization – Condemning Norm Breakers in Blue, Blaming the People in Red – and COVID-19-Related Deaths across the Eight Countries

Note: Red and blue points denote weighted sample means. Error bars denote 95% confidence intervals. Smooth lines display loess curves. Dashed black lines denote COVID-19-related deaths per 1 million citizens.

4.4.2 Individual-level correlates of moralization

Next, we turn our attention to the individual-level correlates of moralization. Who is more likely to condemn norm breakers and blame the people for the pandemic? Figure 2 reports the fixed effects from the multilevel regression model, partially pooling data across all eight countries in our sample. These estimates can be interpreted as the average correlations across the eight countries. First, it is apparent that there are relatively little asymmetries by demographic correlates, with the exception of age and moralization. Elderly respondents condemn

about 10 percentage points more than young respondents (33% of a standard deviation (SD) in condemnation). Interestingly, however, there is no age asymmetry when it comes to blaming the people, perhaps because the elderly follow physical distancing guidelines strictly (Jørgensen, Bor, & Petersen 2021) and see the same behavior among their peers. Although the coefficient estimates for sex, education, and partisanship often reach statistical significance because of our large sample size, these associations remain substantively small at around two percentage points or less (i.e., less than 7% of a SD in the outcomes).

Figure 2: Individual-Level Correlates of Moralization and Blaming the People

Note: Fixed effect coefficient estimates from linear multilevel regression models corresponding to a two-standard deviation change in the independent variables. The outcomes are coded 0-1. Error bars are 95% confidence intervals.

When it comes to concern, we find that personal concern is a consistently strong correlate of moralization, whereas social concern (once personal concern is controlled for) is not. Respon-

dents with higher levels of concern are on average 11 percentage points more likely to approve condemnation (37% of a SD) and 9 percentage points more likely to blame the people (19% of a SD).

Looking at self-reported behavior change to mitigate the effects of the pandemic, we find a remarkably similar picture. People who report higher behavior change are 10 percentage points more likely to condemn and blame laypeople compared to people reporting lower behavior change (35% and 19% of a SD, respectively). Importantly, we find these strong associations despite both concern and behavior change variables being skewed, with most respondents reporting some or high levels of concern or behavior change.

Finally, consistent with the theories, we find that both institutional and social trust are meaningfully correlated with our outcomes, albeit in opposite directions. Respondents who trust institutions more are about 8 percentage points more likely to condemn others (26% of a SD) and five percentage points more likely to blame the people (10% of a SD). That said, it is worth noting that these estimates have much higher uncertainty than other variables in our model due to larger cross-country variance (see below). Accordingly, the estimate for blaming the people does not reach statistical significance. Meanwhile, trusting other people is negatively correlated with moralization. Respondents with higher social trust morally condemn eight percentage points less and blame other people 11 percentage points less (27% and 23% of a SD, respectively).

4.4.3 Similarities and differences across countries

To investigate cross-country heterogeneity, we display the correlations by country (i.e. the varying slopes) in Figure 3. The first and main lesson is the remarkable similarity across countries. Particularly for personal concern, social concern, and behavior change, the coefficient estimates are substantively similar in all eight countries. We have high confidence that these relationships generalize well to other Western democracies.

At the same time, Figure 3 also explains the higher uncertainty in the associations for social and institutional trust reported above: these relationships show more cross-country variation. In the US, people higher versus lower on social trust are equally likely to moralize, whereas in the other seven countries, these relationships are large and negative. One potential explanation

for this is that the extreme levels of partisan polarization over physical distancing (Gollwitzer et al. 2020) reduces the role of trust in all other Americans in general, and increases the role of trust in more specific groups that one is likely to interact with.

Finally, institutional trust shows the most inter-country variability among our predictors. While it is a consistent and strong correlate in Denmark, Germany, Hungary, and Italy, it is associated with condemnation but not blaming the people in France and the UK; it is not associated with either outcome in Sweden; and it is not associated with condemnation but negatively associated with blaming the people in the US. It is notable that the latter three countries (Sweden, UK, and the USA) are also stand out for non-standard government response. In the case of Sweden, this was a reluctance to use hard lockdown as a mitigation strategy and the government’s emphasis on empowering people to behave responsibly (as opposed to a more antagonistic relationship, where the government needs to restrain its citizens). Meanwhile, the UK and the US institutions were somewhat reluctant to acknowledge the real severity of the corona crisis. President Trump has admitted to intentionally downplaying the virus; while in the UK, the government first sought to reach herd immunity and reversed course (at a heavy price) later on.

4.4.4 Within-respondent analyses

Our analyses so far have limited internal validity. We find that people who are a) more personally concerned, b) changed their behavior more, and c) trust institutions more, and d) trust other people less are also more likely to moralize. Yet, we do not know to what extent these psychological factors cause moralization. As the next test of our predictions, we repeat our analyses among the 15,088 respondents who completed the survey at multiple times (total N = 39,907). Two-way fixed effects regression models purge variation across respondents and survey waves thereby zooming in on within-respondent changes in attitudes over and above national trends. As a consequence, these models control for all omitted variables that do not change for respondents between the waves or do not change for waves between respondents (Mummolo & Peterson 2018).

As usual with these models, limiting our attention to unique within-respondent variation of the predictors diminishes the strength of the associations, yet they retain statistical significance.

Figure 3: Cross-Country Differences in the Psychological Correlates of Moralization

Note: Varying slope estimates from linear multilevel regression models corresponding to a two-standard deviation change in the independent variables. The outcomes are coded 0-1. Error bars are 95% confidence intervals.

The average within-respondent change in our independent variables correspond to 2-7 percentage points of a standard deviation change in the residualized (i.e., demeaned) condemnation variable. That said, for those who change their psychological motivations the most in our sample, this predicted change is 16-51 percentage points of a standard deviation in the outcome. These associations are similar for blaming the people, amounting to 5-7 percentage points of a standard deviation in the residualised outcome for an average within-individual change in the predictors and 31-55 percentage points of a standard deviation change for maximum observed within-individual change in the predictors. The only exception is institutional trust, which is not associated with blaming the people in our panel samples controlling for respondent and wave fixed effects.

To further probe the internal validity of these estimates, we conduct two standard robustness tests in the Online Appendix Section C.2. First, we lead the independent variables, to test if we can detect signs of reverse causality or simultaneity that could bias our estimates. These models show that the within-respondent change in the outcomes between interviews j and $j + 1$ is correlated with changes in the predictors in the same period, but not with the change in the predictors the following period (between interviews $j + 1$ and $j + 2$). Besides the coefficient estimates of the predictors are virtually unchanged whether we also include the lead predictors or not. The only exception to this rule is the relationship between social concerns and blaming the people, where a significant lead indicates that an increase in blame feeds back into higher social concerns. Then again, this finding reinforces one of the main conclusion from our analyses: personal concerns play a larger role in moralizing than social concerns. Overall, these models do not indicate that reverse causality or simultaneity is a major issue.

Second, we also rerun our within-respondent analyses with individual-specific linear time trends. These models relax the common trends assumption and use within-unit variation above and beyond this individual linear time trend. Again, the model estimates are more noisy, but substantively unaffected by these additions. The main takeaway from these fixed effects models is that the associations reported in our multilevel models are unlikely to be simple statistical artefacts.

5 Study 2 – Pre-registered conceptual replication

Study 1 demonstrated that large parts of Western democratic societies moralized physical distancing during the first few months of the COVID-19 pandemic. Consistent with most theories of moralization, Study 1 found that moral condemnation was predicted by factors associated with the perceived general importance of motivating others to comply: especially that respondents themselves had changed behavior to avoid spreading the infection and distrusting other people were strong predictors of condemning norm-breakers and blaming the people for the pandemic. We found somewhat smaller and less consistent effects for trusting political institutions, i.e., the source of the health advice. Speaking to key theoretical debates within the literature on moralization, we furthermore found that what mattered was the personal rather than social importance of compliance. In support of theories of egotrophic moralization and in

opposition to theories of sociotropic moralization, we found that those who condemned others were those who personally felt vulnerable to COVID-19.

At the same time, Study 1 suffers from a number of limitations. First, the outcome measures do not concern all relevant aspects of the pandemic. While we theorize that condemning norm-breakers and blaming laypeople are fundamental aspects of moralization, they do not offer direct evidence of the link between moralization and condemnation in the sense that the measures did not directly capture whether people thought of compliance with health advice was an absolute moral rule. Furthermore, Study 1 focused mainly on physical distancing. While this has been the cornerstone of preventive measures at the first stages of the pandemic, it is but one of the non-pharmaceutical interventions against COVID-19. Other important measures include wearing masks, isolating when showing signs of illness, and vaccination. Accordingly, Study 2 shifts attention to these latter behaviors and includes questions about moralization specifically.

A second set of limitations in Study 1 concern methodological issues. The measures employed in Study 1 were necessarily constrained by the realities of a large omnibus survey designed at the beginning of the pandemic: they were short measures designed to paint a broad picture about the eight societies during the COVID-19 crisis. Study 2 seeks to reduce measurement error and the loose links to prior research by adapting validated, multi-item measures from the literature on moralization, as well as developing finely-tuned, multi-item measures to better distinguish between personal and social concerns. Finally, Study 1 is a non-pre-registered, exploratory investigation, and as such it may suffer from an inflated rate of false-positive errors. We therefore pre-registered all hypotheses, measures and analyses of Study 2 at https://aspredicted.org/TV9_M9F [Blinded].

5.1 Hypotheses

We pre-registered four hypotheses, corresponding to the five relevant predictors identified in Study 1: (1) personal concern, (2) social concern, (3) behavior change, (4) institutional and (5) social trust. Recall that while we found positive relationships between moralization and personal concern, behavior change and institutional trust, for social trust the effect was negative, and for social concern close to zero. We investigate the relationship between these five predictors and four outcome variables concerning moralizing and condemning vaccine hesitancy

and general non-compliance with guidelines against COVID-19. Hypothesis 1 focuses on the theoretical debate between egotropic and sociotropic theories of moralization, while hypotheses 2-4 focus on the general set of factors that predict the motivation to exert moral pressure on others according to both theories.

1. Personal concern is more positively correlated than social concern (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)-vaccination against COVID-19 and (d) with condemning (non)-compliance with guidelines against COVID-19.
2. Retrospective behavior change is positively correlated (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)vaccination against COVID-19 and (d) with condemning (non)-compliance with guidelines against COVID-19.
3. Institutional trust is positively correlated (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)-vaccination against COVID-19 and (d) with condemning (non)-compliance with guidelines against COVID-19.
4. Social trust is negatively correlated (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)-vaccination against COVID-19 and (d) with condemning (non)-compliance with guidelines against COVID-19.

5.2 Data

To investigate the hypotheses, we fielded an online survey in the United Kingdom between July 7 and July 13, 2021. We relied on the UK because the coronavirus’s delta-variant hit the country hard, causing a major third wave in infections, if not deaths. This context had yet again made the epidemic a salient topic in the UK potentially creating a fertile ground for moralization.

We relied on YouGov’s online panel, employing quotas to ensure that the sample resembles the population on gender, age, education, and geographic region (see details in Table [D.1](#) in the

OA). In all, 1,532 individuals completed the survey.⁴ Following the pre-registration, we employ post-stratification weights (calculated by YouGov) in all analyses. This post-stratification re-weights the data to correct the slight imbalances that remain after quota sampling by matching our data to population margins on gender, age, education, and geographic region.

5.3 Outcome variables

Our hypotheses concern four outcomes: moralization and condemnation of vaccination and compliance. We generate indices for each outcome by averaging across all items relevant for that particular variable. Respondents answered the outcome questions on scales ranging from 1 (strongly agree) to 7 (strongly disagree). Each index is re-scaled to 0-1 range with higher values indicating more moralization or condemnation. We report alpha statistics to demonstrate that our indices have high reliability (except for social concern, where reliability is medium).

The first outcome variable, moralization of vaccination is an eight-item battery adapted from Ringel and Ditto’s 2019 moralization of obesity scale by replacing obesity related terms with vaccination related behaviors (e.g., “refusing to take up a coronavirus vaccine is disrespectful”). Together, the items form a reliable scale ($\alpha = 0.92$). The second outcome, moralization of compliance is another eight-item battery adapted from Salomon et al’s 2017 moralization of climate change scale (e.g., “complying with the official guidelines regarding COVID-19 decreases suffering in others”) that together form a reliable scale ($\alpha = 0.91$). For the two measures of condemnation, we design an original four-item battery. It includes 1) Study 1’s item on condemnation, 2) an item on feelings of anger, which have been linked to moral judgement (Russell & Giner-Sorolla 2011), and finally, an item on direct and another on indirect punishment, both identified as strategically employed responses to norm-violations (Molho, Tybur, Van Lange, & Balliet 2020). The two batteries are identical except for evoking non-vaccination or failure to comply with guidelines. Both batteries form reliable scales (for both $\alpha = 0.90$).

⁴In the pre-registration we planned to exclude “don’t know” answers. Yet, upon collecting the data, we found missing data only on two categorical demographic variables: education and vote choice. Instead of excluding 276 respondents for this reason, in the main analyses reported here, we directly model “don’t knows” as a response option on these questions. Section D.5 demonstrates that our results are unchanged by this decision.

5.4 Predictors

Corresponding to the hypotheses, we measure five main correlates: personal concerns, social concerns, retrospective behavior change, institutional trust, and social trust. We re-scale each measure to range between 0 and 1 with higher values indicating more concern, more behavioral change, and higher trust, respectively.

For hypothesis (1), the main correlates are personal and social concern. Personal concerns are measured with a six-item battery e.g., “thinking about the coronavirus (COVID-19) makes me feel personally threatened” ($\alpha = 0.92$). Social concerns are measured with a five-item battery e.g., “I was worried about the state of the British economy throughout the corona crisis” ($\alpha = 0.56$). For each statement, respondents stated their agreement on scales ranging from 1 (strongly agree) to 7 (strongly disagree). For hypothesis (2), the main correlate is retrospective behavior change that was measured using a single question from Study 1: To what degree did you change your behavior to avoid spreading infection throughout the coronavirus (COVID-19) pandemic? The question had four answer categories (to a high degree, to a certain degree, to a lesser degree, not at all). For hypothesis (3), institutional trust was measured using a standard question: Give your assessment on a scale from 0 to 10, where 0 indicates that you have no confidence in the government at all and 10 indicates that you have full confidence in the government. For hypothesis (4), social trust was measured using a standard question: Do you think that most people by and large are to be trusted or that you cannot be too careful when it comes to other people? Respondents answered on a scale from 0 (you cannot be too careful) to 10 (most people are to be trusted).

In addition to the main correlates, the models also contain the following demographic covariates: sex, age, education, and vote choice in the 2019 general election.

5.5 Statistical Analysis

Following our pre-registration, we tested our hypotheses using OLS models regressing each of the four outcome variables on the five correlates and demographic covariates. In addition, the models include post-stratification weights as discussed above. We compute the unstandardized regression coefficients. Given the 0-1 scaling of all continuous variables, this means that the estimates can be interpreted as percentage point change in the respective outcome associated

with a min-max difference in the respective correlate. We employ two-sided significance tests with robust standard errors. In the pre-registration, we specified that we would run robustness tests, where instead of adding all four independent variables to a single model, we include them one-by-one, while adjusting for demographic covariates (see Figure OA2). Moreover, we also re-run the results while excluding the post-stratification weights (see Figure OA3). These robustness checks replicate all of our findings reported below.

5.6 Results

First, we report descriptive, post-hoc analyses on the overall levels of moralization in the sample. Figure 4 displays the distributions of our four outcome variables, moralizing and condemning vaccination and general compliance with health advice. Four notable descriptive results emerge. Most importantly, 1) general levels of moralization and condemnation have been high in the UK in the summer of 2021. (Moralizing vaccination $M(SD) = .63(.25)$, Condemning vaccination $M(SD) = .57(.28)$, Moralizing compliance $M(SD) = .74(.21)$, Condemning compliance $M(SD) = .68(.26)$). 2) Respondents appear to moralize more readily than to condemn, which makes perfect sense given the inherent costliness of moralistic punishment. 3) People moralize and condemn general compliance with health advice more than vaccination. 4) Underpinning that condemnation is an inherent feature of moralization, we find very high levels of correlation between the moralization and condemnation both for vaccines ($r = .85$) and for general compliance ($r = .76$). Unsurprisingly, those who moralize one issue are also likely to moralize the other ($r = .65$) and the same is true for condemning ($r = .76$).

Figure 5 shows the results from the estimations as specified above (see section D.2 in the OA for the full models). The findings strongly support hypothesis 1: personal concern is more strongly positively correlated than social concern with each of the outcomes. Thus, a difference between the highest and lowest personal concern is associated with a 29 percentage points increase in moralization of vaccination, a 35 percentage points increase in moralization of compliance, a 41 percentage points increase in condemnation of (non)vaccination, and a 47 percentage points increase in condemnation of non(compliance). To the contrary, social concern do not statistically significantly correlate with any of the outcomes. F-tests that compare the estimated personal and social concern coefficients, corroborate that personal concern is more

Figure 4: Distribution of moralizing and condemning vaccination and general compliance, Study 2

Note: The dots denote the median, the thick lines denote the interquartile range.

strongly positively correlated with each of the outcomes than social concern is. Note, that the robustness analyses where we include the main correlates one-by-one show that social concern correlates positively with each of the outcomes (see Figure OA2). However, the personal concern correlations are similarly stronger and the F-tests consistently support that personal concern is more strongly positively correlated with each of the outcomes than social concern is.

Hypotheses 2 and 3 are similarly supported by the results: retrospective behavior change and institutional trust, respectively, positively correlate with each of the outcomes. In particular, the difference between lowest and highest levels in retrospective behavior change is associated with a 21 percentage points increase in moralization of compliance, a 28 percentage points increase in moralization of compliance, a 14 percentage points increase in condemnation of (non)vaccination, and a 25 percentage points increase in condemnation of non(compliance). The same change in institutional trust is associated with a 16 percentage points increase in moralization of compliance, a 13 percentage points increase in moralization of compliance, a 21 percentage points increase in condemnation of (non)vaccination, and a 19 percentage points

Figure 5: Correlates of Moralization and Condemnation, Study 2

Note: Black filled circles are unstandardized regression coefficients. Error bars denote 95% confidence intervals.

increase in condemnation of non(compliance).

Finally, hypothesis 4 - that social trust is negatively correlated with each of the outcomes - is only partially supported by the results. On the one hand, replicating the results from Study 1, social trust is negatively associated with both condemnation outcomes. Comparing those with highest versus lowest levels of social trust we find a difference of 7 and 9 percentage points in condemnation of (non)vaccination and (non)compliance, respectively. On the other hand, the results also show that the estimated associations are statistically indistinguishable from zero when it comes to social trust and the two moralization outcomes.

6 Conclusions and Discussion

In this manuscript, we documented widespread moralization related to compliance with health advice during the COVID-19 pandemic motivating citizens to condemn and shame each other. This is consistent with media reports of several – sometimes even fatal – incidents between people condemning no compliance with the health advice during pandemic and people

condemning the advice itself. In Study 1, we investigated this issue comparatively, relying on quantitative survey data across eight Western democratic countries during the COVID-19 pandemic. We found that in all countries, most respondents think it is justified to condemn those who break the new norms of physical distancing. Meanwhile, about half of respondents believe that laypeople are to blame for the pandemic. In Study 2, we focused on the UK and found extensive moralization of both general compliance with the health authorities' advice and vaccination as well as condemnation of those who were not complying or getting vaccinated. The diversity of the sample of countries implies that moral condemnation likely has been a feature of other developed democracies too during the COVID-19 pandemic.

These findings provide an empirical demonstration of a key point within theories of moralization: That rapid normative change within valued domains of life will often be accompanied and reinforced by moralized views (Rozin & Singh 1999). The COVID-19 pandemic is in this regard a perfect example. When the pandemic hit the world in early 2020, it facilitated one of the largest behavior changes in history, as people around the globe synchronously engaged in distancing (Jørgensen, Bor, & Petersen 2021). This was facilitated by communication that activated a range of value-infused considerations including trust, empathy, national identity, and personal fear (Jørgensen, Bor, Lindholt, & Petersen 2021; Pfattheicher et al. 2020; Van Bavel et al. 2021). As shown here, the result was widespread moralization of compliance with the advice from the health authorities.

The results also provide an empirical demonstration of another key point within the literature on moralization: That third-party punishment - i.e., condemnation of others - is integral to moralization processes. In Study 2, moralization and condemnation as measured independently and parallel results were obtained. These findings are in line with the view that morality is a social phenomenon rather than merely a matter of one's own conscience (Kurzban 2011), in the sense that moral views shapes behaviors towards and judgments of others.

While most theories of moralization converge on the importance of values and condemnation for moralization, the present results also shed light on key theoretical debates within the moralization literature: Whether the underlying driver of condemnation is self-interest or societal interest? While moralized language is highly universalistic (Skitka 2010) and we often associate morality with altruism (Gintis et al. 2008), our results firmly support the theory that moralistic

condemnation is about incentivizing others to engage in behavior that aligns with the interests of the self rather than with the interests of society. In Studies 1 and 2, we find that personal concern regarding the pandemic is a strong predictor of condemnation and moralization regarding general compliance, distancing, and vaccinations. Social concerns are consistently insignificantly related to these views once personal concerns are taken into account. Analyses using two-way fixed effects models on panel data support the argument that the associations reflect a causal effect from personal concern to moralization. Given this role of personal concern, it may seem surprising that moral discourse, at face value, is so oriented towards universalism and “the greater good”. Psychological research suggest that this reflects that moralization is a mobilization or recruitment device whereby individuals seek to show how their own interests aligns with the interests of potential recruits (Tooby & Cosmides 2010). It is exactly because of the universalism that moral discourse is able to fulfil this function, although the underlying motivation may be self-interested.

While these findings demonstrate the power of moralization theory to illuminate patterns during a massive, behavior-changing crisis like the COVID-19 pandemic, our analyses are also subject to a number of limitations. First, while our two-way fixed effects models increase our confidence in a causal relationship between personal concern, behavioral change, and moralization, we cannot rule out that time-variant confounders bias the estimated relationship. Thus, future research may seek to employ experimental methods to increase the internal validity of the present findings. Second, our analysis zeroes in on individual-level psychological processes but remains mute on macro-level trends. What makes Italians and Hungarian moralize more (on average) than Americans? Why do Swedes blame laypeople more than French people do? Future research should explore how elite dynamics and cultural differences (among other things) shaped these processes. Third, it is beyond the scope of our analysis to test whether moralization works, i.e. whether it indeed yields more compliance with the advice of the health authorities in others. The literature on moralization offers solid evidence that moralization is an important tool for compliance (Gintis, Bowles, Boyd, Fehr, et al. 2005), but especially in polarized societies, condemning some for not following the new norms may even backfire (Prosser, Judge, Bolderdijk, Blackwood, & Kurz 2020). Backfiring may not just take the form of intensified conflict, but the stigmatization associated with moralization may also negatively

influence the motivation to be tested and facilitate the tracing of close contacts. Stigmatization has thus been raised as a key obstacle to test-and-trace strategies in relation to other epidemics, such as sexually transmitted diseases (Villa et al. 2020).

These limitations notwithstanding, the findings may have important practical implications regarding the management of crises that requires massive behavioral change. The pandemic is an obvious example but there are other similar crises, such as the climate crisis, on the horizon. In the face of such crises, democratic societies may face limitations regarding the degree to which the necessary behavior changes can be facilitated through formal restrictions and regulations. However, the present manuscript documents that moralization can easily and strongly be activated among those who are concerned and who themselves engage in behavior change. This moralization among behavioral “first movers” can subsequently act as a “bottom-up” force that incentivizes others, creating a tipping-point dynamic whereby the novel behaviors spread throughout the population (DeScioli & Kurzban 2013), beyond what can be reached through formal regulation. At the same time, it is wise to remember that moralization is a potent tool and carries the risk of backfiring. As any potent tool, moralization should thus be utilized with care.

7 Availability of Data and Computer Code

All data and code required to reproduce our analyses are publicly available in an OSF repository at <https://osf.io/byrh7/> [Anonymised]

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Online Appendix

Moralizing the COVID-19 Pandemic: Self-Interest Predicts Moral Condemnation of Other's Compliance, Distancing and Vaccination

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A Study 1 Question Wordings

Outcomes: Condemn

To what extent do you agree with the following statements? “It is completely justified to condemn those who do not keep a distance to others in public.”

[Completely agree, Somewhat agree, Neither agree nor disagree, Somewhat disagree, Completely disagree]

Outcomes: Blame

In your opinion, why did the corona crisis become so severe? Please select all that applies. “Because lay individuals did not take the virus seriously enough.”

[Yes / No]

Concern about COVID-19

To what degree are you concerned about the consequences of the coronavirus ...

1. ... *for you and your family?*
2. ... *for hospitals' ability to help the sick?*
3. ... for society's ability to help the disadvantaged?
4. ... on social unrest and crime?
5. ... on the country's economy?

[To a high degree, To a certain degree, To a lesser degree, Not at all]

Note that the first two items in *italics* form the personal concern scale, whereas the other three items form the social concern scale.

Changing behavior

To what degree do you feel that the current situation with the Corona virus has made you change your behavior to avoid spreading infection?

[To a high degree, To a certain degree, To a lesser degree, Not at all]

Institutional trust

Give your assessment on a scale from 0 to 10, where 0 indicates that you have no confidence in the government at all and 10 indicates that you have full confidence in the government.

[0 - No confidence at all ... 10 - Full confidence]

Social trust

Do you think that most people by and large are to be trusted or that you cannot be too careful when it comes to other people?

[0 - You cannot be too careful ... 10 - Most people are to be trusted]

B Study 1 Descriptive Statistics

B.1 Macro-Level Statistical Indicators

Table OA1: Country Level Macro Statistics Reflecting Considerable Variability in Our Case Selection

	Denmark	France	Germany	Hungary	Italy	Sweden	UK	USA
Stringency (Apr 7)	72	88	77	77	92	65	80	73
Stringency (Nov 9)	40	79	59	57	67	56	75	63
Deaths (Apr 7)	2.4	13.4	2.3	1.0	9.7	8.7	13.7	5.3
Deaths (Nov 9)	0.6	7.6	1.5	9.1	6.4	2.1	5.1	2.9
GDP	\$60K	\$49K	\$56K	\$34K	\$44K	\$56K	\$49K	\$65K
Welfare state (%GDP)	28	31.2	25.1	19.4	27.9	26.1	20.6	18.7
Ethnic fraction.	0.08	0.10	0.17	0.15	0.11	0.06	0.12	0.49
FH Dem-cy Score	97	90	94	70	89	100	94	86

Notes: 1) Stringency: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government. 0-100 scale, higher number indicate more restrictive COVID-19 policies 2) Deaths: 7-day rolling average of COVID-19 related deaths per million citizens via European Centre for Disease Prevention and Control. 3) GDP: World Bank's estimates of per capita Gross Domestic Product at purchasing power parity (2019). 4) Welfare state: Social expenditure as percentage of GDP from OECD. 5) Ethnic fractionalization: an index developed by Alberto Aleseina; et. al (2003). J of Econ Growth 8, 155–194. The numbers reflect the probability that two randomly drawn individuals from a country are not from the same group 6) Freedom House's Democracy Scores: Freedom in the world 2020 report. Aggregate scores reflecting both political rights and civil liberties: 0 = least free, 100 = most free

B.2 Sample sizes and dates by waves and countries

Table OA2: Sample sizes and dates by Survey Waves and Country

Wave	Median date	Denmark	France	Germany	Hungary	Italy	Sweden	UK	USA
1	2020-04-10	556	505	493	473	513	493	485	493
2	2020-04-13	564	492	503	494	494	489	484	495
3	2020-04-17	544	505	512	478	497	477	488	498
4	2020-04-20	545	500	482	523	520	505	512	493
5	2020-04-24	511	494	488	482	500	479	493	485
6	2020-04-27	501	0	0	0	0	0	0	0
7	2020-04-30	508	504	550	530	509	483	531	488
8	2020-05-04	498	0	0	0	0	0	0	0
9	2020-05-06	373	501	505	527	489	484	510	487
10	2020-05-11	646	0	0	0	0	0	0	0
11	2020-05-14	529	509	515	528	504	491	517	492
12	2020-05-18	524	0	0	0	0	0	0	0
13	2020-05-21	466	505	533	523	498	485	517	497
14	2020-05-26	498	0	0	0	0	0	0	0
15	2020-05-28	516	503	525	519	513	495	509	493
16	2020-06-01	510	0	0	0	0	0	0	0
17	2020-06-04	517	494	506	500	516	485	483	492
18	2020-06-09	505	0	0	0	0	0	0	0
19	2020-06-11	513	516	502	497	510	499	494	503
20	2020-06-17	501	504	503	498	510	478	488	495
21	2020-06-24	499	493	514	492	513	495	486	493
22	2020-06-30	503	0	0	0	0	0	0	0
23	2020-07-08	511	495	513	474	508	493	482	478
24	2020-07-15	506	0	0	0	0	0	0	0
25	2020-07-22	518	509	506	516	509	504	488	511
26	2020-08-05	488	500	513	521	494	504	495	505
27	2020-08-19	519	491	512	513	497	505	491	510
28	2020-09-02	513	504	505	518	509	500	495	508
29	2020-09-16	519	0	0	0	0	0	0	0
30	2020-09-23	0	508	513	517	524	517	498	518
31	2020-09-29	513	0	0	0	0	0	0	0
32	2020-10-14	508	510	507	508	503	498	489	501
33	2020-10-28	508	0	0	0	0	0	0	0
34	2020-11-04	0	510	514	510	529	499	505	493

B.3 Sample Demographics with and without Weighting

Table OA3: Sample Characteristics by Country Group

variable	Denmark	France	Germany	Hungary	Italy	Sweden	UK	USA
Age	48 (19)	46 (15)	48 (15)	45 (15)	42 (13)	47 (16)	42 (14)	41 (14)
Age – weighted	49 (18)	48 (16)	49 (16)	47 (15)	47 (14)	48 (17)	46 (15)	45 (15)
Female	0.5 (0.5)	0.52 (0.5)	0.51 (0.5)	0.52 (0.5)	0.52 (0.5)	0.5 (0.5)	0.52 (0.5)	0.53 (0.5)
Female – weighted	0.51 (0.5)	0.52 (0.5)	0.51 (0.5)	0.53 (0.5)	0.52 (0.5)	0.5 (0.5)	0.51 (0.5)	0.51 (0.5)
Higher education	0.55 (0.5)	0.45 (0.5)	0.41 (0.49)	0.37 (0.48)	0.35 (0.48)	0.4 (0.49)	0.48 (0.5)	0.7 (0.46)
Higher education – weighted	0.33 (0.47)	0.33 (0.47)	0.29 (0.45)	0.26 (0.44)	0.17 (0.38)	0.37 (0.48)	0.39 (0.49)	0.58 (0.49)
Left	0.51 (0.5)	0.39 (0.49)	0.36 (0.48)	0.2 (0.4)	0.18 (0.38)	0.36 (0.48)	0.44 (0.5)	0.33 (0.47)
Left – weighted	0.45 (0.5)	0.35 (0.48)	0.32 (0.47)	0.16 (0.37)	0.19 (0.39)	0.33 (0.47)	0.4 (0.49)	0.35 (0.48)
Right	0.36 (0.48)	0.28 (0.45)	0.35 (0.48)	0.35 (0.48)	0.52 (0.5)	0.43 (0.5)	0.34 (0.47)	0.32 (0.47)
Right – weighted	0.41 (0.49)	0.32 (0.47)	0.43 (0.5)	0.4 (0.49)	0.5 (0.5)	0.47 (0.5)	0.36 (0.48)	0.33 (0.47)
Abstain	0.13 (0.34)	0.34 (0.47)	0.29 (0.45)	0.46 (0.5)	0.3 (0.46)	0.21 (0.41)	0.22 (0.42)	0.34 (0.48)
Abstain – weighted	0.13 (0.34)	0.33 (0.47)	0.25 (0.43)	0.44 (0.5)	0.31 (0.46)	0.2 (0.4)	0.24 (0.43)	0.32 (0.47)
N	16,430	11,052	11,214	11,141	11,159	10,858	10,940	10,928

C Study 1 Supplementary Results

C.1 Full Model Details

Tables OA4 and OA5 report full details for the seven multilevel models in the step-wise regression-building procedures. In both tables, model 7 denotes the final model constituting the basis of Figures 2 and 3 in the main text.

Table OA4: Individual Level Correlates of Condemning Norm-breakers

	<i>Dependent variable:</i>						
	Condemning norm-breakers					Pooled model	Varying slopes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age	0.1 (0.002)	0.1 (0.002)	0.1 (0.002)	0.1 (0.002)	0.1 (0.002)	0.1 (0.002)	0.1 (0.002)
Female	−0.001 (0.002)	0.003 (0.002)	−0.001 (0.002)	0.01 (0.002)	0.01 (0.002)	−0.01 (0.002)	−0.01 (0.002)
Higher ed.	−0.001 (0.002)	−0.003 (0.002)	−0.01 (0.002)	−0.01 (0.002)	−0.000 (0.002)	−0.001 (0.002)	−0.002 (0.002)
Party:Left	0.03 (0.002)	0.03 (0.002)	0.02 (0.002)	0.02 (0.002)	0.04 (0.002)	0.02 (0.002)	0.01 (0.002)
Party:Right	0.03 (0.002)	0.02 (0.002)	0.02 (0.002)	0.02 (0.002)	0.03 (0.002)	0.02 (0.002)	0.02 (0.002)
Pers.conc.	0.2 (0.002)					0.1 (0.002)	0.1 (0.01)
Soc.conc		0.1 (0.002)				0.005 (0.002)	0.01 (0.01)
Beh.change			0.1 (0.002)			0.1 (0.002)	0.1 (0.01)
Inst. trst				0.1 (0.002)		0.1 (0.002)	0.1 (0.02)
Soc. trst					−0.1 (0.002)	−0.1 (0.002)	−0.1 (0.01)
Constant	0.7 (0.02)	0.7 (0.02)	0.7 (0.02)	0.7 (0.02)	0.7 (0.02)	0.7 (0.02)	0.7 (0.02)
Observations	91,464	91,464	91,464	91,464	91,464	91,464	91,464
Akaike Inf. Crit.	32,854.0	37,218.0	33,450.9	38,436.4	38,177.1	27,664.7	26,079.5

Table OA5: Individual Level Correlates of Blaming Regular People

	<i>Dependent variable:</i>						
	Blaming laypeople for pandemic					Pooled model	Varying slopes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age	0.02 (0.003)	0.01 (0.003)	0.01 (0.003)	0.01 (0.003)	0.01 (0.003)	0.01 (0.003)	0.01 (0.003)
Female	0.02 (0.003)	0.02 (0.003)	0.02 (0.003)	0.03 (0.003)	0.02 (0.003)	0.001 (0.003)	0.000 (0.003)
Higher ed.	0.01 (0.003)	0.01 (0.004)	−0.002 (0.003)	0.01 (0.004)	0.02 (0.004)	0.01 (0.003)	0.01 (0.003)
Party:Left	0.03 (0.004)	0.03 (0.004)	0.02 (0.004)	0.03 (0.004)	0.05 (0.004)	0.02 (0.004)	0.02 (0.004)
Party:Right	−0.02 (0.004)	−0.02 (0.004)	−0.02 (0.004)	−0.02 (0.004)	−0.01 (0.004)	−0.02 (0.004)	−0.02 (0.004)
Pers.conc.	0.1 (0.003)					0.1 (0.004)	0.1 (0.01)
Soc.conc		0.1 (0.003)				0.000 (0.004)	0.004 (0.01)
Beh.change			0.1 (0.003)			0.1 (0.004)	0.1 (0.01)
Inst. trst				0.03 (0.003)		0.1 (0.004)	0.05 (0.03)
Soc. trst					−0.1 (0.003)	−0.1 (0.004)	−0.1 (0.02)
Constant	0.4 (0.03)	0.4 (0.03)	0.5 (0.02)	0.4 (0.03)	0.4 (0.03)	0.5 (0.03)	0.5 (0.03)
Observations	93,166	93,166	93,166	93,166	93,166	93,166	93,166
Akaike Inf. Crit.	146,493.1	147,671.8	146,717.5	148,280.2	147,150.6	144,648.4	143,879.5

Tables OA6 and OA7 report full model details for two-way fixed effects regression models, regressing condemning norm breakers and blaming laypeople, respectively, on psychological predictors. Table OA8 in turn reports the average (SD) and maximum (Max) change in the residualised predictors, that is, zooming in on within-individual differences over and above broad national changes and how much these independent variables vary. The table then reports the effect size estimates scaled to these average or maximum within-individual changes.

Table OA6: Two-way Fixed Effects Models on Condemning Norm-breakers

	<i>Dependent variable:</i>					
	Condemning norm-breakers					
	(1)	(2)	(3)	(4)	(5)	(6)
Beh.change	0.03*** (0.004)					0.02*** (0.004)
Pers.conc.		0.04*** (0.004)				0.04*** (0.004)
Soc.conc			0.02*** (0.004)			0.01* (0.004)
Inst. trst				0.02** (0.01)		0.02*** (0.01)
Soc. trst					-0.02*** (0.004)	-0.03*** (0.004)
Observations	39,225	39,225	39,225	39,225	39,225	39,225
Adjusted R ²	0.57	0.57	0.57	0.57	0.57	0.57

Note:

*p<0.05; **p<0.01; ***p<0.001

Table OA7: Two-way Fixed Effects Models on Blaming Laypeople

	<i>Dependent variable:</i>					
	Blaming laypeople					
	(1)	(2)	(3)	(4)	(5)	(6)
Beh.change	0.03*** (0.01)					0.03*** (0.01)
Pers.conc.		0.05*** (0.01)				0.03*** (0.01)
Soc.conc			0.03*** (0.01)			0.02* (0.01)
Inst. trst				-0.002 (0.01)		0.01 (0.01)
Soc. trst					-0.03*** (0.01)	-0.03** (0.01)
Observations	39,907	39,907	39,907	39,907	39,907	39,907
Adjusted R ²	0.37	0.37	0.37	0.37	0.37	0.37

Note: *p<0.05; **p<0.01; ***p<0.001

Table OA8: Scaled Two-way Fixed Effects Effect Size Estimates

Variable	SD	Max	Condemn average	Condemn max	Blame average	Blame max
Beh.change	0.26	1.49	0.05	0.30	0.06	0.33
Pers.conc.	0.23	1.75	0.07	0.51	0.07	0.55
Soc.conc	0.24	1.89	0.04	0.32	0.06	0.43
Inst. trst	0.16	1.30	0.02	0.16	0	-0.02
Soc. trst	0.22	1.45	-0.04	-0.25	-0.05	-0.31

C.2 Additional Analyses

C.2.1 Main Results without Weights

Table OA9 demonstrates that adding post-stratification weights to correct for sampling bias does not drive any of our results. Models 1 and 3 reproduce our main results from varying slopes models using the pooled sample. Meanwhile, models 2 and 4 report the same models but omit post-stratification weights. Across models 1-2 and 3-4, the partial regression coefficients are almost identical.

Table OA9: Rerunning Main Multilevel Regression Models without Weights

	<i>Dependent variable:</i>			
	Condemning norm-breakers		Blaming laypeople	
	Weights	No weights	Weights	No weights
	(1)	(2)	(3)	(4)
Age	0.1 (0.002)	0.1 (0.002)	0.01 (0.003)	0.001 (0.003)
Female	-0.01 (0.002)	-0.01 (0.002)	0.000 (0.003)	0.01 (0.003)
Higher ed.	-0.002 (0.002)	-0.003 (0.002)	0.01 (0.003)	0.01 (0.003)
Party:Left	0.01 (0.002)	0.02 (0.002)	0.02 (0.004)	0.02 (0.004)
Party:Right	0.02 (0.002)	0.02 (0.002)	-0.02 (0.004)	-0.02 (0.004)
Pers.conc.	0.1 (0.01)	0.1 (0.01)	0.1 (0.01)	0.1 (0.01)
Soc.conc	0.01 (0.01)	0.004 (0.01)	0.004 (0.01)	-0.002 (0.01)
Beh.change	0.1 (0.01)	0.1 (0.01)	0.1 (0.01)	0.1 (0.01)
Inst. trst	0.1 (0.02)	0.1 (0.02)	0.05 (0.03)	0.05 (0.03)
Soc. trst	-0.1 (0.01)	-0.1 (0.02)	-0.1 (0.02)	-0.1 (0.02)
Constant	0.7 (0.02)	0.7 (0.02)	0.5 (0.03)	0.5 (0.03)
Observations	91,464	91,464	93,166	93,166
Akaike Inf. Crit.	26,079.5	11,760.7	143,879.5	128,248.4

C.2.2 Lumping “concern about hospitals” item with social concern items

Table OA10 demonstrates that our main theoretical finding – that personal concerns matter more than social concerns for moralization – hold even if we lump the item about “hospitals’ ability to help the sick” with the other 3 social concern items. Columns 1 and 3 report the original estimates, columns 2 and 4 report the estimates with hospitalizations lumped with social concern. Although the estimates for social concern are no longer so close to 0, they remain 1.5-2 times smaller than the estimates for personal concern.

Table OA10: Re-running main models with alternative split of concern items

	<i>Dependent variable:</i>			
	Condemning norm-breakers		Blame ppl	
	Original	Alternative	Original	Alternative
	(1)	(2)	(3)	(4)
Personal concern	0.11 (0.01)		0.09 (0.01)	
Social concern	0.01 (0.01)		0.004 (0.01)	
Personal concern		0.08 (0.01)		0.06 (0.01)
Social concern		0.04 (0.01)		0.04 (0.01)
Observations	91,464	91,464	93,166	93,166
Akaike Inf. Crit.	26,079.54	26,169.60	143,879.50	143,949.90

C.2.3 Temporal Dynamics

Figure OA1: We find no meaningful time trends in the relationship btw the outcomes and the psychological predictors

C.2.4 Two-way fixed effects robustness checks

Table OA11: Robustness test for parallel trends assumption in 2FE models

	<i>Dependent variable:</i>					
	Moralize			Blaming laypeople		
	Main (1)	Lead IV (2)	Unit-spec time (3)	Main (4)	Lead IV (5)	Unit-spec time (6)
Beh.change	0.02*** (0.004)	0.02*** (0.01)	0.02*** (0.01)	0.03*** (0.01)	0.02 (0.01)	0.02 (0.01)
Pers.conc.	0.04*** (0.004)	0.04*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03 (0.02)	0.06*** (0.01)
Soc.conc.	0.01* (0.004)	0.01 (0.01)	0.01 (0.01)	0.02* (0.01)	0.01 (0.02)	−0.02 (0.01)
Inst. trst	0.02*** (0.01)	0.03** (0.01)	0.01 (0.01)	0.01 (0.01)	−0.03 (0.02)	0.03 (0.02)
Soc. trst	−0.03*** (0.004)	−0.02*** (0.01)	−0.02** (0.01)	−0.03** (0.01)	−0.04* (0.02)	−0.03* (0.02)
Beh.change (lead)		0.01 (0.01)			0.01 (0.01)	
Pers.conc.(lead)		0.01 (0.01)			−0.01 (0.02)	
Soc.conc. (lead)		0.01 (0.01)			0.05** (0.02)	
Inst. trst (lead)		0.01 (0.01)			−0.03 (0.02)	
Soc. trst (lead)		−0.01 (0.01)			0.01 (0.02)	
Leaded Independent variables		✓			✓	
Unit-specific time trends			✓			✓
Observations	39,225	15,625	39,225	39,907	15,874	39,907
Adjusted R ²	0.57	0.60	0.60	0.37	0.38	0.40

Note:

*p<0.05; **p<0.01; ***p<0.001

D Study 2 Supplementary Results

D.1 Sample Demographics with and without Weighting

	Unweighted	Weighted
Female	0.52	0.52
Age		
18-24	0.11	0.11
25-39	0.26	0.25
40-49	0.16	0.16
50-65	0.24	0.24
65+	0.23	0.23
Education		
Low	0.56	0.57
High	0.40	0.39
NA	0.04	0.04
Party		
Conservative	0.32	0.32
Labour	0.30	0.29
Liberal Democrat	0.12	0.12
SNP	0.04	0.04
Plaid Cymru	0.00	0.00
Brexit Party	0.02	0.02
Green	0.03	0.03
Other	0.04	0.04
NA	0.15	0.16

D.2 Full Model Details

	Moralize vaccination	Moralize compliance	Condemn (non)vaccination	Condemn (non)compliance
Personal concerns	0.28*** (0.03)	0.35*** (0.02)	0.41*** (0.03)	0.47*** (0.03)
Social concerns	-0.03 (0.04)	-0.02 (0.03)	0.01 (0.04)	-0.06 (0.04)
Behavior change	0.21*** (0.03)	0.28*** (0.02)	0.14*** (0.03)	0.25*** (0.03)
Institutional trust	0.16*** (0.02)	0.13*** (0.02)	0.21*** (0.03)	0.19*** (0.02)
Social trust	-0.00 (0.03)	-0.02 (0.02)	-0.07** (0.03)	-0.09*** (0.02)
Male	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Female	-0.07*** (0.01)	-0.00 (0.01)	-0.07*** (0.01)	-0.04*** (0.01)
Age: 18-24	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Age: 25-39	-0.07*** (0.02)	-0.04** (0.02)	-0.08** (0.03)	-0.03 (0.02)
Age: 40-49	-0.06** (0.02)	-0.03 (0.02)	-0.08** (0.03)	-0.04 (0.02)
Age: 50-65	-0.04 (0.02)	-0.02 (0.02)	-0.06* (0.03)	-0.03 (0.02)
Age: 66+	0.03 (0.02)	0.01 (0.02)	0.02 (0.03)	0.01 (0.02)
Education: Low	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Education: High	0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Education: Don't know	0.03 (0.03)	-0.04 (0.02)	0.05 (0.03)	-0.02 (0.03)
Conservatives	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Labour	0.03 (0.02)	0.05*** (0.01)	0.05* (0.02)	0.04* (0.02)

Liberal Democrats	0.06** (0.02)	0.07*** (0.01)	0.07** (0.02)	0.05* (0.02)
SNP	0.03 (0.03)	0.06** (0.02)	0.05 (0.04)	0.03 (0.03)
Plaid Cymru	0.13 (0.13)	0.12* (0.06)	0.21 (0.11)	0.18 (0.10)
Brexit Party	0.03 (0.05)	0.06 (0.04)	0.08 (0.06)	0.07 (0.05)
Green	0.07 (0.04)	0.06** (0.02)	0.06 (0.04)	0.05 (0.03)
Other	-0.01 (0.03)	0.03 (0.02)	0.01 (0.03)	-0.00 (0.03)
Don't know	0.00 (0.02)	0.03* (0.01)	0.02 (0.02)	0.01 (0.02)
Constant	0.29*** (0.04)	0.27*** (0.03)	0.21*** (0.05)	0.23*** (0.04)
N	1532	1532	1532	1532
adj. R^2	0.242	0.481	0.262	0.411

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

D.3 Regressing the outcomes on the five predictors one-by-one

Figure OA2: Study 2 results replicate when we factor in each of the main correlates subsequently

Note: Black filled circles are unstandardized regression coefficients. Error bars denote 95% confidence intervals.

D.4 Main Results without Weights

Figure OA3: Study 2 results replicate when we exclude the post-stratification weights

Note: Black filled circles are unstandardized regression coefficients. Error bars denote 95% confidence intervals.

D.5 Excluding participants with missing data on vote and education

	Moralize vaccination	Moralize compliance	Condemn (non)vaccination	Condemn (non)compliance
Personal concerns	0.26*** (0.03)	0.33*** (0.02)	0.37*** (0.04)	0.42*** (0.03)
Social concerns	-0.05 (0.04)	-0.06* (0.03)	0.03 (0.05)	-0.06 (0.04)
Behavior change	0.21*** (0.03)	0.28*** (0.03)	0.14*** (0.04)	0.27*** (0.03)
Institutional trust	0.17*** (0.03)	0.14*** (0.02)	0.21*** (0.03)	0.20*** (0.02)
Social trust	-0.02 (0.03)	-0.03 (0.02)	-0.11*** (0.03)	-0.10*** (0.02)
Male	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Female	-0.06*** (0.01)	-0.01 (0.01)	-0.07*** (0.01)	-0.04*** (0.01)
Age: 18-24	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Age: 25-39	-0.05 (0.03)	-0.04* (0.02)	-0.07* (0.03)	-0.03 (0.03)
Age: 40-49	-0.04 (0.03)	-0.03 (0.02)	-0.06 (0.03)	-0.04 (0.03)
Age: 50-65	-0.03 (0.03)	-0.02 (0.02)	-0.05 (0.03)	-0.03 (0.03)
Age: 66+	0.05 (0.03)	0.01 (0.02)	0.03 (0.03)	0.00 (0.03)
Education: Low	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Education: High	0.02 (0.01)	0.01 (0.01)	0.01 (0.02)	0.01 (0.01)
Conservatives	0.00 (.)	0.00 (.)	0.00 (.)	0.00 (.)
Labour	0.03 (0.02)	0.05*** (0.01)	0.04* (0.02)	0.04* (0.02)
Liberal Democrats	0.06** (0.02)	0.07*** (0.01)	0.07** (0.02)	0.05* (0.02)

SNP	0.03 (0.04)	0.06** (0.02)	0.04 (0.04)	0.03 (0.03)
Plaid Cymru	0.14 (0.13)	0.13* (0.06)	0.21* (0.11)	0.19* (0.09)
Brexit Party	0.05 (0.05)	0.07 (0.04)	0.10 (0.06)	0.08 (0.05)
Green	0.07 (0.04)	0.06** (0.02)	0.06 (0.04)	0.05 (0.03)
Constant	0.30*** (0.05)	0.30*** (0.03)	0.22*** (0.05)	0.24*** (0.05)
N	1202	1202	1202	1202
adj. R^2	0.224	0.467	0.247	0.400

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

CONFIDENTIAL - FOR PEER-REVIEW ONLY
Moralizing Physical Distancing during the COVID-19 Pandemic (#70070)

Created: 07/07/2021 02:57 AM (PT)

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1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?

- (1) Personal concern is more strongly positively correlated than social concern (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)vaccination against COVID-19 and (d) with condemning (non)compliance with guidelines against COVID-19.
- (2) Retrospective behavior change is positively correlated (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)vaccination against COVID-19 and (d) with condemning (non)compliance with guidelines against COVID-19.
- (3) Institutional trust is positively correlated (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)vaccination against COVID-19 and (d) with condemning (non)compliance with guidelines against COVID-19.
- (4) Social trust is negatively correlated (a) with moralization of vaccination against COVID-19; (b) with moralization of compliance with guidelines against COVID-19, (c) with condemning (non)vaccination against COVID-19 and (d) with condemning (non)compliance with guidelines against COVID-19.

3) Describe the key dependent variable(s) specifying how they will be measured.

We measure 4 dependent variables (measurement specified below) corresponding to our 4 hypotheses. For each of the dependent variables, we average across all items to form indices.

(A) Moralization of vaccination

To what extent do you agree or disagree with the following statements?

- (1) Refusing to take up a coronavirus vaccine is disrespectful.
- (2) Accepting a coronavirus vaccine is a moral virtue.
- (3) Rejecting a coronavirus vaccine is a moral failing.
- (4) Refusing to take up a coronavirus vaccine is a sign of personal weakness.
- (5) Taking or not taking a coronavirus vaccine is NOT a moral issue.
- (6) If a person is allowed to take up a coronavirus vaccine, they should take it.
- (7) Even if it was culturally acceptable to refuse a coronavirus vaccine, it would still be wrong.
- (8) Refusing to take a coronavirus vaccine would be wrong even if refusal had no negative health effects.

(B) Moralization of compliance

To what extent do you agree or disagree with the following statements?

- (1) Complying with the official guidelines regarding COVID-19 decreases suffering in others.
- (2) Following the instructions from the authorities protects others'.
- (3) By taking action against the coronavirus, I can feel good about myself.
- (4) Wearing facemasks in public is morally good.
- (5) Engaging in close physical contact while having flu-like symptoms is morally wrong.
- (6) It is morally wrong to socialize if one has come in close contact with someone infected with coronavirus.
- (7) Refusing to wear a facemask in public is morally wrong.
- (8) Socially isolating with a sore throat and low fever is morally good.

(C) Condemning (non)vaccination

To what extent do you agree or disagree with the following statements?

- (1) It is completely justified to condemn those who do not take up a coronavirus vaccine when offered.
- (2) When I hear about someone refusing to take a coronavirus vaccine, it makes me angry.
- (3) Those who refuse to take a coronavirus vaccine should be punished with a fee.
- (4) It is completely justified for public institutions and private businesses to refuse service to people who refuse getting a COVID-19 vaccine without a good medical reason.

(D) Condemning (non)compliance

To what extent do you agree or disagree with the following statements?

- (1) It is completely justified to condemn those who do not follow the official guidelines when it comes to the corona crisis.
- (2) When I hear about someone violating the health authorities' COVID-19 guidelines, it makes me angry.
- (3) Those who violate the official policies against the coronavirus should be punished with a fee.
- (4) It is completely justified for public institutions and private businesses to refuse service to people who refuse to comply with the health authorities' recommendations regarding COVID-19.

4) How many and which conditions will participants be assigned to?

For hypothesis (1) the independent variables are "personal concerns" and "social concerns". For both we average across all items to form indices.
 Personal concerns

To what extent do you agree or disagree with the following statements?

- 1) Thinking about the coronavirus (COVID-19) makes me feel personally threatened.
- 2) I am afraid of catching the coronavirus (COVID-19).
- 3) I am not worried about catching the coronavirus (COVID-19).
- 4) I am worried that I or people I love will get sick from the coronavirus (COVID-19).
- 5) I am stressed around other people because I worry, I'll catch the coronavirus (COVID-19).
- 6) I have tried hard to avoid other people because I don't want to get sick.

Social concerns

To what extent do you agree or disagree with the following statements?

- (a) The pandemic made me concerned about hospitals' ability to help the sick.
- (b) The pandemic made me worry about society's ability to help the disadvantaged.
- (c) The pandemic made me concerned about social unrest and crime.
- (d) I was worried about the state of the British economy throughout the corona crisis.
- (e) The pandemic threatened the rights and freedoms of the British population as a whole.

For hypothesis (2) the independent variable is retrospective behavior change.

To what degree did you change your behaviour to avoid spreading infection throughout the coronavirus (COVID-19) pandemic? [To a high degree, To a certain degree, To a lesser degree, Not at all]

For hypothesis (3) the independent variable is institutional trust

Give your assessment on a scale from 0 to 10, where 0 indicates that you have no confidence in the government at all and 10 indicates that you have full confidence in the government. [0 - No confidence at all . . . 10 - Full confidence]

For hypothesis (4) the independent variable is social trust.

Do you think that most people by and large are to be trusted or that you cannot be too careful when it comes to other people? [0 - You cannot be too careful . . . 10 - Most people are to be trusted]

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

We will use OLS regression to estimate the association between each of the dependent variables and our four independent variables. Models will include all four independent variables as well as a battery of covariates (sex, age, education, vote choice in the last national first order election). Models will also include post stratification weights that reweights the data to fit the population margins on age, gender, education and region. In these analyses, we scale all continuous variables 0-1, including the dependent and key independent variables. We will compute the unstandardized regression coefficients. We will test the hypotheses that personal concerns are more strongly correlated with our dependent variables than social concerns are by applying F-tests that compare the coefficients of our two key independent variables for each of the dependent variables. For the other three hypotheses we simply test if the coefficient is significantly different from 0 in the expected direction. We will use two-sided tests.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

We will retain all respondents who complete the entire survey. We will exclude "do not know" answers.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

Sample of United Kingdom residents, age 18+ and N=1500. To obtain the sample, quota-sampling on gender, age, geography and education will be used to achieve a sample that is nationally representative of the population on these dimensions.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We will run robustness tests where instead of adding all four independent variables to a single model, we include them one-by-one, while adjusting for demographic covariates.