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journal homepage: [www.elsevier.com/locate/jebo](http://www.elsevier.com/locate/jebo)Solidarity and fairness in times of crisis<sup>☆</sup>Alexander W. Cappelen<sup>a</sup>, Ranveig Falch<sup>a,b</sup>, Erik Ø. Sørensen<sup>a</sup>, Bertil Tungodden<sup>a,\*</sup><sup>a</sup> FAIR, Department of Economics, Norwegian School of Economics, Helleveien 30, Bergen 5045, Norway<sup>b</sup> Max Planck Institute for Research on Collective Goods, Kurt-Schumacher- Str. 10, Bonn 53113, Germany

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## ABSTRACT

In a large-scale pre-registered survey experiment with a representative sample of more than 8000 Americans, we examine how a reminder of the COVID-19 pandemic causally affects people's views on solidarity and fairness. We randomly manipulate whether respondents are asked general questions about the crisis before answering moral questions. By making the pandemic particularly salient for treated respondents, we provide causal evidence on how the crisis may change moral views. We find that a reminder about the crisis makes respondents more willing to prioritize society's problems over their own problems, but also more tolerant of inequalities due to luck. We show that people's moral views are strongly associated with their policy preferences for redistribution. The findings show that the pandemic may alter moral views and political attitudes in the United States and, consequently, the support for redistribution and welfare policies.

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## 1. Introduction

The COVID-19 pandemic has dramatically affected our lives and imposed huge health and economic costs on people worldwide. It presents unprecedented medical, economic, and societal challenges, and has led to staggering unemployment and restrictions in daily life that would have been unimaginable for most people just a short time ago: travel bans, closed schools, and shutdown of businesses.

The pandemic raises fundamental moral and political questions about what we owe one another (Sandel, 2020) and has the potential to change our moral views. In response to the pandemic, there are widespread calls for solidarity (Guterres, 2020), encouraging people to give priority to public health concerns over their own self-interest and to support those who are most affected. The heated debate about solidarity across borders and globalization has been reinforced, with some arguing for increased global cooperation and others arguing that the appropriate response to the crisis is more

<sup>☆</sup> The experiments reported in this paper were conducted by The Choice Lab at the Centre for Experimental Research on Fairness, Inequality and Rationality (FAIR) at NHH Norwegian School of Economics. We are grateful to Kevin Delaney, Michael J. Sandel, Robert M. Sapolsky, Hallgeir Sjåstad, and Gus Wezerek for great comments and suggestions. Funding for the experiments was provided by the European Research Council Project FAIR No. 788443, and the Research Council of Norway through its Centres of Excellence Scheme, FAIR project No 262675. The funders had no role in study design, data collection and analysis, decision to publish or preparation of the manuscript. No other funding bodies were involved.

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protectionism (Schifferees, 2020). The pandemic has also invoked fundamental questions about fairness, reflecting the fact that the health and economic costs of the pandemic are unevenly distributed and to a great extent a result of factors outside individual control. It has triggered an intense political debate about the fair allocation of medical resources and fair compensation for those who suffer economically as a result of the pandemic (Emanuel et al., 2020; Bell, 2020).

To provide causal evidence on how the COVID-19 pandemic may shape people's moral views, we conducted a large-scale pre-registered survey experiment with a nationally representative sample of more than 8,000 Americans. All participants were asked questions about key components of their moral views (Haidt, 2012): the degree to which they think society's problems should be given priority over one's own problems (**solidarity**), the degree to which they think their country's problems should be given priority over global problems (**nationalism**), and the extent to which they view inequalities due to luck as fair (**fairness**). To shed light on the broader impact of the COVID-19 pandemic on the political debate, we also asked respondents about their attitudes to economic redistribution and universal health care.

To study how the pandemic may change people's moral views, we randomly allocated the respondents into a treatment group and a control group. Immediately before answering the moral questions, the respondents in the treatment group, but not in the control group, were reminded of the COVID-19 pandemic by questions about how the pandemic had affected their community and how long they expected the crisis to last. The question about the effect on the community highlights the fact that COVID-19 is a contagious disease that spreads from person to person in a community.

The experimental design makes the pandemic particularly salient for the treated respondents. If we assume that a reminder of the pandemic shifts moral views in the same direction as the pandemic itself, the treatment effect identifies the directional effect of how the crisis shapes people's moral view. The size of the treatment effect, both overall and for different subgroups, will depend on the extent to which the COVID-19 reminder increases the salience of the crisis for the treated respondents and on the extent to which the increased salience of the crisis affects their moral views (Benjamin et al., 2010). Clearly, the pandemic was already highly salient in society when we conducted our study. The high salience may reduce the effects of the reminder because individuals already have the pandemic on top of their mind, but may also increase the effects since individuals may be more responsive to reminders of the pandemic (Benjamin et al., 2010).

The pandemic may shift people's moral views through different mechanisms. It may instigate social learning (Bandura, 1977) and establish new role models (Jensen and Oster, 2009; Kosse et al., 2020; La Ferrara et al., 2012; Abel, & Brown). Extraordinary moral acts of ordinary people may become a source of inspiration and imitation, and the moral standards of political leaders may be seen as signals of social norms (House, 2018). In line with the social heuristics hypothesis (Gintis et al., 2003; Henrich et al., 2006; Rand et al., 2012; Peysakhovich and Rand, 2016), the crisis may make certain behaviors more successful in social interactions, and these behaviors may be internalized as default heuristics and, ultimately, as components of people's moral views. Finally, the pandemic may shape people's moral reasoning through the situational features of the crisis and political debate, and thereby activate new moral intuitions (Haidt, 2012) and affect people's deliberate moral reasoning (Greene, 2014).

The present study does not aim to identify which of these mechanisms are of greater importance in shaping people's moral views during the pandemic; however, in the discussion of the results we will provide examples of features of the crisis that are likely to invoke one or several of these mechanisms.

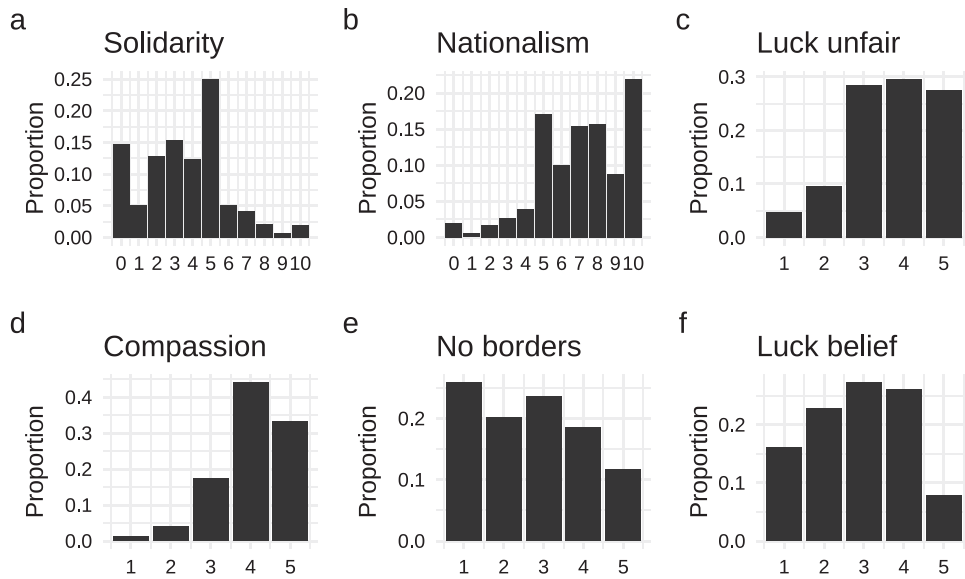
## 2. Sample and methods

We here provide a description of the sample and methods used in the study. In the Supplementary Information, we provide variable definitions, supporting figures and tables, multiple hypothesis adjustments (Section A), and the full set of questions (Section B).

A total of 8116 unique respondents from the general population in the US, 18 years of age or older, were recruited by a leading international survey provider (Ipsos). The respondents were randomly allocated to either a treatment group, who were reminded of the COVID-19 pandemic ( $n = 4074$ ), or a control group ( $n = 4042$ ), before answering a set of survey questions. The respondents also answered a set of standard background questions. The experiment ran between March 24, and April 2, 2020 as part of the Ipsos eNation online omnibus, which aims to be balanced and representative of the general population in the US (based upon region, gender, age, and household income data from the US Census Bureau).

The sample is balanced between the treatment group and the control group on the observable characteristics of the respondents (Table S1 in the Supplementary Information). The median respondent in the sample is 49 years old and the median household income is 57,500 USD. Almost 20% of the respondents have reached retirement age and about 40% have at least a bachelor's degree. The sample is balanced on political affiliation, with about 37% expressing support for the Republican party and 42% for the Democratic party.

The data sources, the structure of the experiment, and the empirical strategy were pre-specified at the American Economic Association's registry for randomized controlled trials prior to receiving the data (Cappelen et al., 2020). We pre-registered that the main analysis would focus on the causal effects of the reminder on selfishness, nationalism and inequality acceptance, which is reported in the present analysis, and that the heterogeneity analysis would focus on age, gender, income, education, political affiliation, and whether the respondent lived in a more or less affected area. We use population weights to account appropriately for various demographic factors in our analysis, where The Current Population Survey from the US Census Bureau is used to determine the weighting targets. In addition to our key variables Solidarity, Nationalism and Luck unfair, we asked three supplementary questions related to these three dimensions of people's moral



**Fig. 1.** Distributions of outcomes. *Note:* Pooled population-weighted proportions of respondents that chose each of the response alternatives for the three main variables; *Solidarity*, *Nationalism* and *Luck unfair*, and for the three other pre-specified variables related to people's moral views; *Compassion*, *No borders* and *Luck belief*. For *Solidarity*, the scale is from 0: "absolute priority to solving my own problems" to 10: "absolute priority to solving my society's problems"; for *Nationalism*, 0: "absolute priority to solving global problems" to 10: "absolute priority to solving their country's problems". For the other variables, the scale is from 1: "Strongly disagree" to 5: "Strongly agree".

views (*Compassion*, *No borders*, *Luck belief*). We provide  $p$ -values adjusted for multiple hypothesis testing of the effect of the COVID-19 reminder on all six variables (see Tables S18a–S23).<sup>1</sup>

### 3. Results

In this section, we present how the reminder about the pandemic affected the moral responses and policy attitudes of the respondents. All reported  $p$ -values are for two-sided Wald tests ( $z$ -tests), and all the main results are robust to the multiple hypothesis adjustments (Romano and Wolf, 2005; 2016).

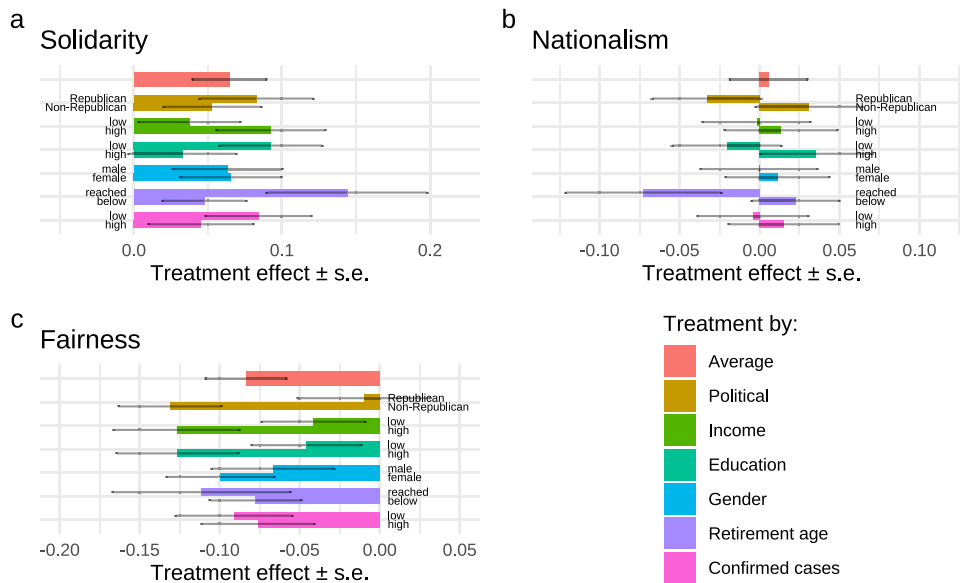
#### 3.1. Moral views

A key component of people's moral views is the extent to which they are willing to show solidarity with others even when it is costly in terms of their own self-interest. The experimental literature has shown that a substantial fraction of subjects in economic experiments show some solidarity with others, even though there is considerable heterogeneity in the relative weight people attach to their own self-interest (Fehr and Schmidt, 1999; Engel, 2011; Cappelen and Tungodden, 2019). To investigate whether the COVID-19 reminder moves people towards solidarity or towards self-interest, we asked the participants whether they thought they should give priority to solving society's problems or to solving their own problems. They answered on a 0–10 scale, where 0 means "absolute priority to solving my own problems" and 10 means "absolute priority to solving my society's problems."

It has been argued that the situational features of the crisis put people in a moral conundrum that may trigger opposing intuitions on this question (Kluger, 2020). The feeling of a common enemy may bring us together, whereas stress and anxiety may activate selfish impulses. The pandemic has made salient the selfless behavior of many individuals and groups in society, e.g., the heroism of the health workers (Brandt et al., 2020), and people-to-people solidarity has flourished through activities such as assisting elderly people and neighbors with shopping and volunteer work in hospitals (Left, 2020). At the same time, selfish behavior has been evident, as illustrated by hoarding in shops and people not respecting the call for social distancing.

The majority of the respondents thought they should give priority to solving their own problems, as shown in Fig. 1a, with an average response of 3.57 (standard deviation 2.32). In Table S3, we show that the degree to which people express

<sup>1</sup> Data and code are in the Github repository available at <https://github.com/FAIR-NHH/mmynt>. We also collected data on happiness, some specific policy questions on compensation, and some exploratory survey questions that we plan to publish separately.



**Fig. 2.** Effect of the COVID-19 reminder on outcomes. *Note:* This figure illustrates the effect of the COVID-19 reminder on the solidarity, nationalism, and fairness variables. The variables are standardized with the population-weighted standard deviation. High and low levels of household income, education, and confirmed cases are defined by being above or at/below the weighted median in the sample. The estimated effects and sandwich standard errors are based on population-weighted linear regressions including control variables for the indicated groups and other basic demographics. See Tables S3–S6 for complete regression specifications. In Fig. S1, we report how the treatment impacts the distribution of the solidarity, nationalism, and fairness variables.

solidarity with others is strongly associated with their background characteristics: females and respondents with higher education express more solidarity, while Republicans and people who have reached the retirement age express less solidarity.

In Fig. 2a, we report the standardized effect of the COVID-19 reminder on solidarity for the full sample and for different subgroups. In line with our pre-specified hypothesis, we find that respondents who were reminded of the pandemic were significantly more likely to agree with the view that one should give priority to society's problems rather than one's own problems. Controlling for background characteristics, the extent to which the respondents prioritized society's problems over their own increased by 0.065 standard deviations in the treatment group ( $z = 2.56$ ,  $p = 0.010$ , Table S3). The share of respondents who put at least as much weight on society's interests as their own (response of 5 or more) increased by 10%, from 37.6% to 40.9%. From Fig. S1, we observe that most of the treatment effect is driven by the participants with less extreme views. Finally, we observe from Fig. 2a that the direction of the shift is the same for all subgroups, it is independent of political affiliation, income, education, gender, age and confirmed cases (see also Table S4). In addition to the question on solidarity, we asked whether the respondents agreed or disagreed with the statement that compassion for those who are suffering is the most crucial virtue (1: "Strongly disagree", 5: "Strongly agree"). Fig. 1d provides the distribution of answers, where we observe that the large majority agree with compassion being a crucial virtue. In Tables S7a and S24, we show that the average treatment effect and all subgroup treatment effects for the compassion question are in the same direction as for the solidarity question, though not always statistically significant. Finally, we observe a significant average treatment effect on an index combining the solidarity and compassion questions (0.105 standard deviations,  $z = 2.86$ ,  $p = 0.004$ , Table S24).

The extent to which our solidarity should extend across borders has been an important topic in the normative literature (Rawls, 2001; Singer, 2011), but there is less research on how people actually trade off global interests and the interests of their own society (Cappelen et al., 2013; Greene, 2014). To study whether the COVID-19 reminder causes people to focus more on the needs of our own society, which we refer to as nationalism, we asked the respondents whether they thought their country's leaders should give priority to solving global problems or to solving their country's problems. They answered on a 0–10 scale where 0 means "absolute priority to solving global problems" and 10 means "absolute priority to solving their country's problems."

The pandemic has made the trade-off captured by this question salient in various ways, as illustrated by poor countries struggling to get scarce medical resources to combat the coronavirus because the United States (US) and Europe are outspending them (Bradley, 2020). In many cases, the crisis has been conceived as a zero-sum game among world leaders, who push nationalist arguments that undermine global collective attempts to fight the virus (Goodman et al., 2020). It has caused people to question the potential for international arrangements and the willingness of countries to truly share the burden in times of crisis (Vallée, 2020). Our pre-registered hypothesis was therefore that the COVID-19 reminder would cause people to express less solidarity across borders. At the same time, it should be noted there are possible countervailing effects. The

crisis has provided examples of global solidarity and collaboration. Countries have sent health workers and supplies to other countries to support their fight against the virus (Wood, 2020), and we have witnessed unprecedented worldwide scientific collaboration in the development of vaccines against the virus (Kupferschmidt, 2020; Organization, 2020b).

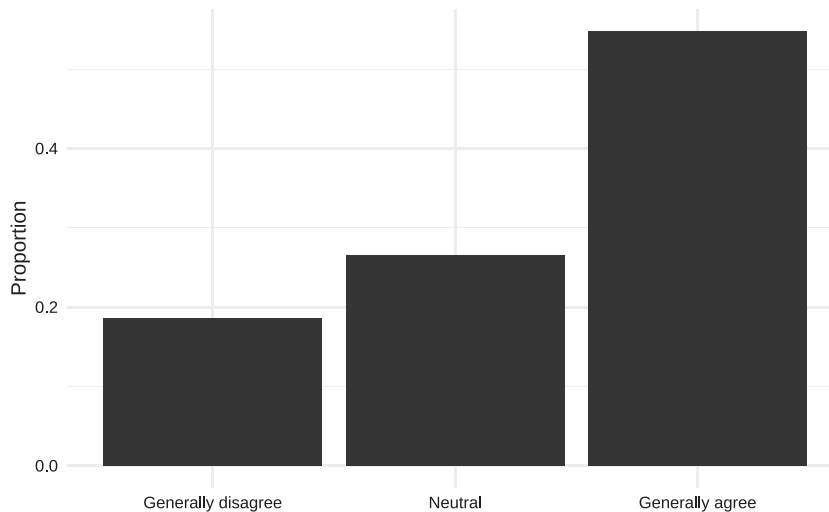
Fig. 1b shows that respondents largely agreed that their country's leaders should give priority to solving their country's problems, with an average response of 7.1 (standard deviation 2.38). In Table S3, we show that support for nationalism is strongly associated with background characteristics: Republicans, people who have reached the retirement age, and females are significantly more in agreement with focusing on solving their country's problems, whereas people with higher education are significantly more focused on global problems. In Fig. 2b, we report the effect of the COVID-19 reminder on nationalism for the full sample and for different subgroups. The COVID-19 reminder had no significant effect on the response to this question ( $z = 0.24$ ,  $p = 0.812$ , Table S3), and this holds for all subgroups (see also Table S5). A large majority in both the treatment group and the control group (73%) agree that the country's leaders should give priority to their country's problems (a response of 6 or more). In Fig. S1, we show that the null result applies across the distribution of responses. It is also robust to instead looking at the question about whether respondents wish that the world did not have nations or borders (1: "Strongly disagree", 5: "Strongly agree"). In Fig. 1e, we observe that the majority would not have preferred a world without borders. In Table S25, we show that there is no average treatment effect on the no border question ( $z = -0.80$ ,  $p = 0.424$ ) or on an index combining the two questions ( $z = 0.66$ ,  $p = 0.508$ ), even though we note in Table S7b that there are significant treatment effects for some of the subgroups. We observe a positive treatment effect for older people and significant negative treatment effects for younger people and people who live in states with few confirmed cases; the differences in treatment effects for age and confirmed cases are highly significant. Taken together, the results may reflect that the pandemic has counteracting effects on nationalism, highlighting both critical global issues and national sentiments among political leaders. These effects may speak differently to different subgroups, but cancel each other out in the aggregate treatment effects on the nationalism and no border questions.

Fairness is of fundamental importance for people and economic experiments have shown that people typically find inequalities due to luck unfair (Cappelen et al., 2007; Cappelen and Tungodden, 2019), even though a recent large-scale study of the US and Norway shows significant differences in fairness views between countries: Americans are much more accepting of inequalities due to luck than are Norwegians (Almås et al., 2020). To study whether the crisis has affected people's views on whether inequalities due to luck are unfair, we asked the respondents whether they considered it unfair if luck determines people's economic situation (1: "Strongly disagree", 5: "Strongly agree").

The pandemic has accentuated concerns about inequality in society. It has called attention to how important life outcomes can be determined by factors beyond individual control, and to how the crisis reinforces existing inequalities (Pinsker, 2020). The crisis might change how people think about inequalities due to luck by affecting whether people conceive luck to be controllable (option luck) or uncontrollable (brute luck). This distinction has played a key role in the normative political literature (Dworkin, 1981), and recent experimental work has shown that it is of great importance for people's willingness to accept inequalities due to luck (Møllerstrom et al., 2015). The most immediate consequence of the pandemic is that it creates health and economic inequality as a product of chance. Some people have bad health luck and become infected or have bad economic luck and become unemployed or experience some other unforeseen economic loss because of the crisis. Our pre-registered hypothesis was therefore that the COVID-19 reminder would make people less accepting of inequalities due to luck and consider luck to be more important in determining people's economic situation. But the role of choice has also been highlighted in the pandemic. Public health officials and the media have emphasized the precautions that people can take to reduce the risk of getting infected by washing their hands, maintaining social distance, and avoiding crowded places (Organization, 2020a). The fact that the crisis reinforces existing economic inequalities in the US has revived the question about the extent to which these inequalities—and the economic losses people experience during the crisis—reflect individual choices or factors beyond individual control.

Fig. 1c shows that the majority of respondents considered inequalities due to luck as unfair, with an average response of 3.66 (standard deviation 1.12). In Table S3, we show that inequality acceptance is strongly associated with background characteristics. In particular, Republicans, people with high income, and people who have reached the retirement age are significantly more accepting of inequality, whereas females are significantly less accepting of inequality. In Fig. 2c, we observe that, in contrast to our pre-registered hypothesis, the COVID-19 made people significantly more accepting of inequalities due to luck. The COVID-19 reminder caused the respondents to consider luck less unfair by 0.084 standard deviations in the treatment group compared with the control group ( $z = -3.28$ ,  $p = 0.001$ , Table S3). Overall, the share of respondents in the treatment group who found inequalities due to luck unfair (responses 4 and 5) was reduced by about 10%, from 60.3% in the control group to 54.2% in the treatment group ( $z = -5.04$ ,  $p < 0.001$ ). We observe from Fig. 2c that the direction of the shift is the same for all subgroups independent of age, gender, income, education, political affiliation and confirmed cases (see also Table S6).<sup>2</sup> Finally, we asked whether the respondents agreed or disagreed with the statement that luck is an important determinant of people's economic situation (1: "Strongly disagree", 5: "Strongly agree"). In Fig. 1f, we observe that there is substantial disagreement on this question. In Table S26, we show that there is no effect of the reminder on beliefs about the role of luck ( $z = -0.35$ ,  $p = 0.727$ ), and this null result is robust across subgroups, see Table S7c. However,

<sup>2</sup> Fig. S1 reports how the distribution of the responses is affected by the treatment. For the luck unfair question, the effect is that the right tail is pushed towards the middle.



**Fig. 3.** Policy preferences: Redistribution. *Note:* Pooled population-weighted proportions of respondents that chose each of the response alternatives to the question about whether they agree that the US government should aim to reduce economic differences.

we find a highly significant treatment effect on an index combining the answers to the luck unfair question and the luck belief question ( $-0.092$  standard deviations,  $z = -2.40$ ,  $p = 0.017$ , Table S26).

### 3.2. Policy attitudes

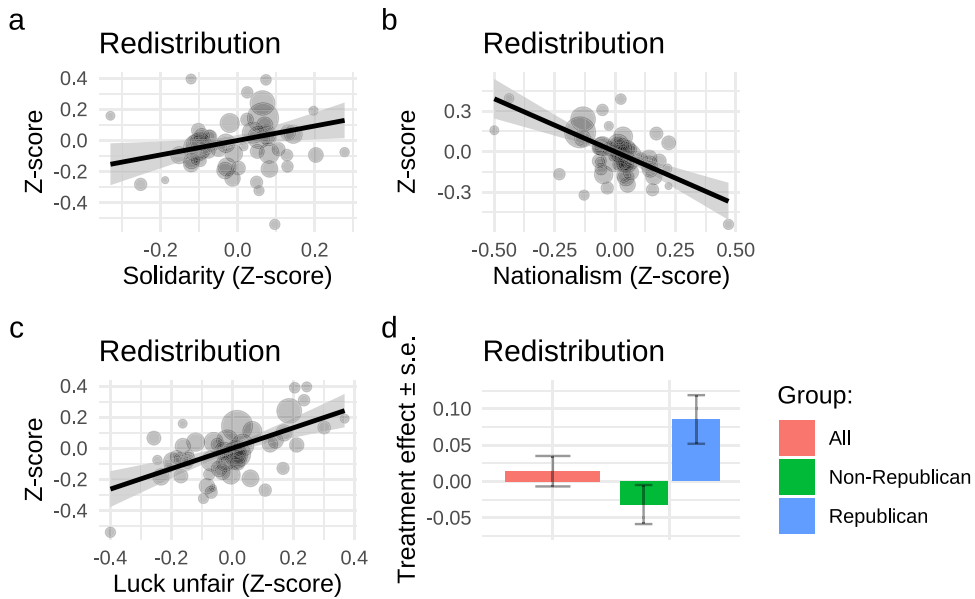
The pandemic has led to extensive discussions about the government's responsibility to implement policies that mitigate economic inequality and to ensure the health of all Americans. To study the implications of the pandemic for the broader policy debate, we asked the respondents about their attitudes to economic redistribution and universal health coverage, where our pre-registered hypothesis was that the COVID-19 reminder would make people more supportive of redistribution in society.

Specifically, we asked the respondents whether they agreed that the US government should aim to reduce economic differences on a 1–3 scale, where 1 means “generally disagree” and 3 means “generally agree,” and we asked whether the federal government is responsible for ensuring that all Americans have health care coverage, with a binary “yes/no” response scale. Fig. 3 shows that the majority of Americans agree that the government should aim to reduce economic differences, but we also observe that a significant minority disagree. In terms of universal health coverage, 62.7% of the respondents agree that this is the responsibility of the federal government.

The moral views studied in this paper are predictive of people's policy attitudes (Table S8–S13).<sup>3</sup> Fig. 4a–c show at the state level how the measures of solidarity, nationalism, and fairness are associated with support for income-equalizing policies. We observe that there is more support for economic redistribution in states where respondents assign more priority to society's problems relative to their own, believe that their leaders should assign more priority to global problems relative to their country's problems, and are more averse to luck-based inequality. In Fig. S2, we show that the patterns are very similar for support for universal health care. In Tables S8 and S9, we show that these findings hold at the individual level, including when controlling for state-fixed effects and other background characteristics. Finally, in Tables S10–S13, we show that the patterns remain when we conduct the individual-level analysis by party affiliation, and we observe that the moral views are particularly predictive of the policy attitudes of Republicans.

The associations between the moral views and the policy attitudes suggest that the treatment effects on solidarity and fairness pull in opposite directions in terms of policy attitudes. The fact that the COVID-19 reminder increased solidarity

<sup>3</sup> Inspired by an anonymous referee, we ran an experiment on Amazon Mechanical Turk with about 1000 US participants to study whether the moral value questions *Solidarity* and *Luck unfair* are predictive of behavior in an incentivized real-effort dictator game. Half of the respondents were dictators and half recipients. The results are reported in Table S2, see Appendix B4 for the instructions for the experiment. We do not find an association between the answers to the *Solidarity* question and the dictator behavior, but suggestive evidence of a negative association between the amount kept for self and the view that it is unfair if luck determines people's economic situation. We note that the two survey questions used in the present study are strongly associated with political views in the expected direction: Republicans agree less to putting society first and are less likely to consider luck determining income to be unfair. In contrast, the association between dictator game behavior and political affiliation goes against the existing evidence in the literature on political differences, with Republicans taking less to themselves than the population at large. The findings may reflect that the experiment was conducted with a participant pool from the Amazon Mechanical Turk, but suggests that survey questions may be more predictive of political affiliation than dictator game behavior. We believe that an interesting avenue for future research would be to examine the relationship between these survey questions and individual choices in various economic environments, and to investigate the methodological strengths and weaknesses of using survey questions versus incentivized experiments when studying moral motivation.



**Fig. 4.** Moral views and support for redistribution. *Note:* Panels a–c show state-level correlations between support for redistribution and the solidarity, nationalism, and fairness variables, all standardized by the population-weighted means and standard deviations. The size of the state marker indicates the state's population. See Table S8 for the corresponding regression specifications with individual level data (supporting the pattern we observe in the state-level data). Panel d shows the treatment effect of the COVID-19 reminder on redistribution; pooled and broken down by political affiliation. The estimated effects and sandwich standard errors are based on population-weighted linear regressions, including the same control variables as in Fig. 2. See Tables S14–S15 the complete regression specifications.

suggests that there should be more support for redistribution, given the pattern observed in Fig. 4a, whereas the fact that the COVID-19 reminder made people more accepting of inequalities due to luck suggests that there should be less support for redistribution, given the pattern observed in Fig. 4c. Consistent with the treatment effects on the moral responses having countervailing effects on policy attitudes, we observe in Fig. 4d that there is no significant treatment effect of the COVID-19 reminder on attitudes to economic redistribution for the full sample.

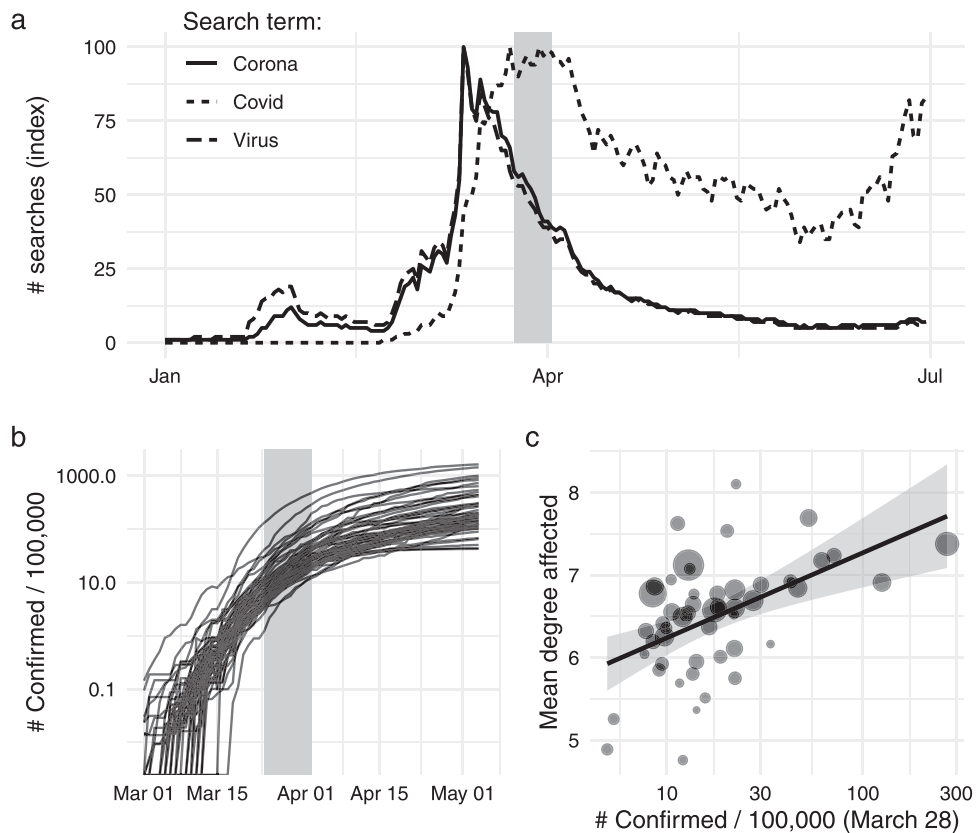
However, we do find an interesting political heterogeneity in the treatment effect on economic redistribution ( $z = 2.40$ ,  $p = 0.016$ , Table S15), as shown in Fig. 4d. The COVID-19 reminder makes Republicans more supportive of economic redistribution ( $z = 2.08$ ,  $p = 0.038$ ), whereas we do not find a significant effect for non-Republicans ( $z = -1.21$ ,  $p = 0.228$ ). This political difference is consistent with how the COVID-19 reminder has different effects on the moral views of Republicans and non-Republicans. The COVID-19 reminder causes a significant increase in inequality acceptance among non-Republicans ( $z = -4.07$ ,  $p < 0.001$ , Table S6), but has no significant effect on inequality acceptance among Republicans ( $z = -0.24$ ,  $p = 0.813$ ); the difference is statistically significant ( $z = 2.29$ ,  $p = 0.022$ ). Thus, the effects on the moral responses suggest that the COVID-19 reminder should cause an increase in support for economic redistribution among Republicans based on the increase in solidarity and the absence of an effect on inequality acceptance, in line with what we observe in Fig. 4d. For the non-Republicans, there are countervailing effects on their moral responses, consistent with the absence of an effect on support for economic redistribution.

In Table S16, we show that the COVID-19 reminder has no effect on the support for universal health coverage among Republicans or non-Republicans, which suggests that attitudes to this policy are hard to shift in the polarized political landscape in the US.

#### 4. Discussion

Our study suggests that the crisis has the potential to change moral views in the US in a way that may shape moral views and public policy. While some aspects of the COVID-19 pandemic are unprecedented, it shares key features with many other public health emergencies and with natural disasters (Cassar et al., 2017; Havidán et al., 2006). Importantly, such crises represent a risk to everyone in society and create health and economic inequalities as a product of chance. The effects of the COVID-19 pandemic we have documented could therefore apply to other crises, but more research is needed to establish whether our findings are generalizable.

We find evidence suggesting that the pandemic moves Americans towards solidarity, independent of political affiliation, gender, age, and geography. The increase in solidarity may reflect that the crisis makes salient the selfless behavior of others in society, but it may also reflect an increased recognition of our mutual dependence. This finding is in line with other studies on the effect of dramatic life events showing that personal exposure to violence or war causes people to become



**Fig. 5.** The pandemic in the survey period. *Note:* Panel a shows the relative frequency of the search terms “corona”, “covid” and “virus” on Google Trends. Panel b shows, shaded in grey, the survey period and the number of confirmed cases per capita in each state as aggregated from the Johns Hopkins database [Dong et al. \(2020\)](#). Panel c shows the degree to which treated survey participants report that they consider their local community to be affected (0: not at all affected, 10: extremely affected) and the number of confirmed cases in the middle of the survey period, by state (the corresponding figure for the expectation of how long the crisis will last, is reported in Fig. S5). The size of the state marker indicates the state’s population.

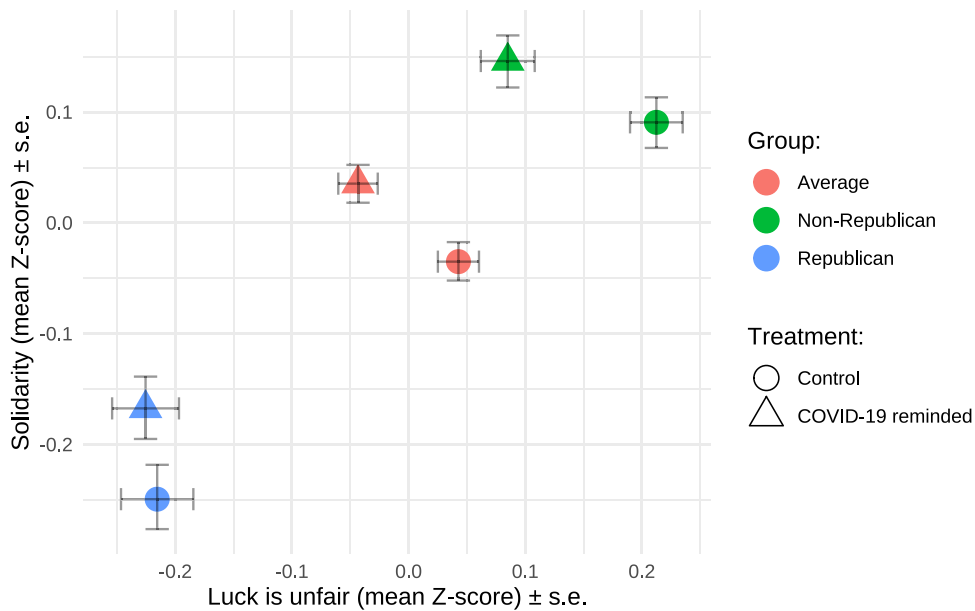
more altruistic ([Bauer et al., 2014, 2016](#); [Voors et al., 2012](#)), but contrasts with studies suggesting that economic recessions make people more selfish ([Fisman et al., 2015](#)).

We find evidence suggesting that the crisis also may shape inequality acceptance. We expected the pandemic to make people less accepting of such inequalities, based on the idea that the crisis highlights how chance shapes life outcomes. In contrast, we find that people become more accepting of inequality, consistent with the crisis making people focus more on luck as being controllable. This may reflect that the pandemic has highlighted the role of individual choice, but it may also reflect a self-serving bias in people’s fairness views ([Babcock et al., 1995](#); [Konow, 2000](#); [Rodriguez-Lara and Moreno-Garrido, 2012](#)). People may unconsciously aim to maintain a belief in a just world where inequality reflects controllable factors ([Lerner, 1980](#); [Bénabou and Tirole, 2006](#)), which also would serve as a rationale for not providing more support to those who are most affected by the crisis.

At the time of the study, the crisis was omnipresent. [Fig. 5a](#) reports Google Trends statistics for the search terms “corona”, “covid” and “virus”, and documents that the study was conducted in a period when the interest in the pandemic peaked. The headlines in the main newspapers also reflected a wide range of views on the crisis, from fear to optimism. To illustrate, the front page of the New York Times on March 25, 2020 contained a story about an astronomical surge in COVID-19 cases in New York City, a story about the democrats being optimistic about finalizing a political compromise on a \$2 trillion economic package for a bailout fund, and a story about president Trump insisting that he did not view the coronavirus as any more dangerous than the flu.

In [Fig. 5b](#), we show the development of the number of confirmed cases in each state before, during, and after the survey period. We observe that the pandemic had rapidly developed when we implemented the survey. Finally, in [Fig. 5c](#), we show that the responses to the question in the COVID-19 reminder concerning the extent to which the respondents considered their local community to be affected are strongly associated with the confirmed number of cases in the state of the respondents. This provides evidence of the respondents in the treatment group paying attention to the COVID-19 reminder, and, thus, suggests that the experimental design succeeded in creating random variation in how salient the pandemic was for the respondents when answering the moral and policy questions.





**Fig. 6.** Treatment effects and political identification. *Note:* The figure shows the population-weighted averages of the fairness and solidarity variables for the control group and the treatment group, for the pooled sample and by political affiliation. The variables have been standardized with population-weighted means and standard deviations.

From Fig. 5c, we observe that there is some variation in the actual and perceived exposure to the crisis across states, see also Figs. S3–S5. As reported in Fig. 2, we do not find differential treatment effects based on the actual number of confirmed cases in the state of the respondent, see also Tables S4–S7. This is robust to focusing on perceived exposure. One of the COVID-19 reminders was a question about how affected they perceive their local community to be. If we divide the states into above and below the mean reported level on this question, there is no significant difference in estimated treatment effects between these two groups of states (see Table S17). The absence of differential effects may reflect that greater exposure to the crisis creates opposing forces: it may make people more susceptible to the COVID-19 reminder but at the same time also more saturated with the pandemic (Benjamin et al., 2010). Alternatively, it may also reflect that the salience of the crisis is determined by developments at the national level more than at the state level, and thus that there is not much variation in the salience among the participants in our sample.

The study was designed to shed light on the directional effect of the crisis on moral views. Clearly, our design does not allow us to provide any estimate on the potential size of the effect. The full impact of the crisis is likely to be much larger than any effect we can capture through a COVID-19 reminder. Still, it is instructive to compare the estimated treatment effects with the average difference in moral views among Republicans and non-Republicans with respect to solidarity and inequality acceptance. From Fig. 6, we observe that the change in the moral views of Americans due to the reminder equals about one-fifth of the difference that we observe between Republicans and non-Republicans in the control group on each of the moral dimensions. Given that the full impact is likely to be much larger and that these dimensions are predictive of people's policy preferences, we believe that our findings are suggestive of the pandemic having the potential to shape the political landscape and welfare policy in the US.

Our results add to the emerging literature studying the impact of the pandemic on social preferences and attitudes to redistributive policies. These early papers suggest the pandemic has magnified hostility against foreigners (Bartoš et al., 2020) and increased the support for health care and unemployment insurance programs (Rees-Jones et al., 2020). The evidence on how the pandemic affects generosity is mixed (Brañas Garza et al., 2020; Sterba and Hars, 2020). This literature has also examined how social preferences affect health behaviors during the pandemic, where the main result is that prosocial individuals are more likely to follow physical distancing guidelines, stay home when sick, and buy face masks.

We should note that our findings may be sensitive to the nature of the treatment question. We asked how the pandemic had affected the respondent's local community, and, in line with other studies showing that priming community membership increases charitable donations (Kessler and Milkman, 2018), we found an increase in pro-sociality. However, if we instead had asked questions about how the crisis affected the respondents themselves, then we might have triggered a more selfish focus. This illustrates the importance of perspective-taking in crisis times, and how the broader public debate can be critical in shaping people's level of pro-sociality.

An intriguing question for future research is whether effects of the crisis on moral views are lasting and carry over to the policy debate. In this respect it is interesting to note that the share of Americans who agree that health care coverage is the responsibility of the federal government has increased compared to before the pandemic (Jones, 2020). Additionally,

related studies on wars, natural disasters and economic shocks have shown that people internalize moral perspectives that emerge in times of crisis (Barr et al., 2016; Bauer et al., 2014, 2016; Giuliano and Spilimbergo, 2014; Voors et al., 2012), and there is experimental and observational evidence of habit formation in moral behavior suggesting that the changes that we observe in the present study may be sustained in normal times (Gintis et al., 2003; Henrich et al., 2006; Rand et al., 2012; Peysakhovich and Rand, 2016). Therefore, our results give some reason to believe that the pandemic may cause more solidarity among Americans in the long run, but also greater acceptance of inequalities due to luck.

### Declaration of Competing Interest

The authors contributed equally to this work. They have all contributed to the design, the data analysis, and the drafting and critical revision of the article. The author has reviewed and approved the final article. Declaration of interests: none.

### Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.jebo.2021.03.017](https://doi.org/10.1016/j.jebo.2021.03.017).

### References

- Voors, M.J., Nillesen, E.E.M., Verwimp, P., Bulte, E.H., Lensink, R., Soest, D.P.V., 2012. Violent conflict and behavior: a field experiment in Burundi. *Am. Econ. Rev.* 102 (2), 941–964. doi:[10.1257/aer.102.2.941](https://doi.org/10.1257/aer.102.2.941).
- Abel, M., Brown, W., 2020. Prosocial behavior in the time of COVID-19: the effect of private and public role models. IZA Discussion Paper Series, No. 13207. <https://ssrn.com/abstract=3596673>.
- Almås, I., Cappelen, A.W., Tungodden, B., 2020. Cutthroat capitalism versus cuddly socialism: are Americans more meritocratic and efficiency-seeking than Scandinavians? *J. Polit. Econ.* 128 (5), 1753–1788. doi:[10.1086/705551](https://doi.org/10.1086/705551).
- Babcock, L., Loewenstein, G., Issacharoff, S., Camerer, C., 1995. Biased judgement of fairness in bargaining. *Am. Econ. Rev.* 85 (5), 1337–1343. doi:[10.1073/pnas.1521250113](https://doi.org/10.1073/pnas.1521250113).
- Bandura, A., 1977. Self-efficacy: toward a unifying theory of behavioral change. *Psychol. Rev.* 84 (2), 191–215. doi:[10.1016/0146-6402\(78\)90002-4](https://doi.org/10.1016/0146-6402(78)90002-4).
- Barr, A., Miller, L., Ubeda, P., 2016. Moral consequences of becoming unemployed. *Proc. Natl. Acad. Sci.* 113, 4676–4681. doi:[10.1073/pnas.1521250113](https://doi.org/10.1073/pnas.1521250113).
- Bartoš, V., Bauer, M., Cahliková, J., Chytilová, J., 2020. Covid-19 Crisis Fuels Hostility Against Foreigners. CESifo Working Paper No. 8309.
- Bauer, M., Blattman, C., Chytilová, J., Henrich, J., Miguel, E., Mitts, T., 2016. Can war foster cooperation? *J. Econ. Perspect.* 30 (3), 249–274. doi:[10.1257/jep.30.3.249](https://doi.org/10.1257/jep.30.3.249).
- Bell, R., 2020. How do I compensate hourly workers during the coronavirus pandemic? Workforce.com, March 17. <https://www.workforce.com/news/how-do-i-compensate-hourly-workers-during-the-coronavirus-pandemic>.
- Bauer, M., Cassar, A., Chytilová, J., Henrich, J., 2014. War's enduring effects on the development of egalitarian motivations and in-group biases. *Psychol. Sci.* 25 (1), 47–57. doi:[10.1177/0956797613493444](https://doi.org/10.1177/0956797613493444).
- Bénabou, R., Tirole, J., 2006. Belief in a just world and redistributive politics. *Q. J. Econ.* 121 (2), 699–746. doi:[10.1162/qjec.2006.121.2.699](https://doi.org/10.1162/qjec.2006.121.2.699).
- Benjamin, D.J., Choi, J.J., Strickland, A.J., 2010. Social identity and preferences. *Am. Econ. Rev.* 100 (4), 1913–1928. doi:[10.1257/aer.100.4.1913](https://doi.org/10.1257/aer.100.4.1913). <http://www.aeaweb.org/articles.php?doi=10.1257/aer.100.4.1913>
- Bradley, J., 2020. In scramble for coronavirus supplies, rich countries push poor aside. *The New York Times*, April 9. <https://www.nytimes.com/2020/04/09/world/coronavirus-equipment-rich-poor.html>.
- Brandt, A., Chan, S. M., Dewar, M., DiMari, C., Koch, S. A., Johns, F. M., 2020. The heroism of health workers in the coronavirus crisis. *The New York Times*, March 26. <https://www.nytimes.com/2020/03/26/opinion/letters/coronavirus-health-care.html>.
- Cappelen, A.W., Drange Hole, A., Sørensen, E.O., Tungodden, B., 2007. The pluralism of fairness ideals: an experimental approach. *Am. Econ. Rev.* 97 (3), 818–827. doi:[10.1257/aer.97.3.818](https://doi.org/10.1257/aer.97.3.818).
- Cappelen, A. W., Falch, R., Tungodden, B., 2020. United in the midst of crisis? Experimental evidence on how the coronavirus changes our moral perspectives. *AEA RCT Registry*, March 31. doi:[10.1257/rct.5613-1.0](https://doi.org/10.1257/rct.5613-1.0).
- Cappelen, A.W., Moene, K.O., Sørensen, E.O., Tungodden, B., 2013. Needs versus entitlements: an international fairness experiment. *J. Eur. Econ. Assoc.* 11 (3), 574–598. doi:[10.1111/jeea.12000](https://doi.org/10.1111/jeea.12000).
- Cappelen, A.W., Tungodden, B. (Eds.), 2019. *The Economics of Fairness*. Edwar Elgar.
- Cassar, A., Healy, A., von Kessler, C., 2017. Trust, risk, and time preferences after a natural disaster: experimental evidence from Thailand. *World Dev.* 94, 90–105. doi:[10.1016/j.worlddev.2016.12.042](https://doi.org/10.1016/j.worlddev.2016.12.042).
- Dong, E., Du, H., Gardner, L., 2020. An interactive web-based dashboard to track COVID-19 in real time. *Lancet Infect. Dis.* 20 (5), 533–534. doi:[10.1016/S1473-3099\(20\)30120-1](https://doi.org/10.1016/S1473-3099(20)30120-1).
- Dworkin, R., 1981. What is equality? Part 1: equality of welfare. *Philos. Public Aff.* 10 (3), 185–246.
- Emanuel, E.J., Persad, G., Upshur, R., Thome, B., Parker, M., Glickman, A., Zhang, C., Boyle, C., Smith, M., Phillips, J.P., 2020. Fair allocation of scarce medical resources in the time of Covid-19. *N. Engl. J. Med.* 382 (21), 2049–2055. doi:[10.1056/NEJMs2005114](https://doi.org/10.1056/NEJMs2005114).
- Engel, C., 2011. Dictator games: a meta study. *Exp. Econ.* 14 (4), 583–610. doi:[10.1007/s10683-011-9283-7](https://doi.org/10.1007/s10683-011-9283-7).
- Fehr, E., Schmidt, K.M., 1999. A theory of fairness, competition and cooperation. *Q. J. Econ.* 114 (3), 817–868. doi:[10.1162/003355399556151](https://doi.org/10.1162/003355399556151).
- Brañas Garza, P., Jorrat, D., Alfonso, A., Espín, A., Muñoz, T. G., Kovářik, J., 2020. Exposure to the Covid-19 pandemic and generosity. *PsyArXiv*. 10.31234/osf.io/6ktuz
- Fisman, R., Jakiela, P., Kariv, S., 2015. How did distributional preferences change during the Great Recession? *J. Public Econ.* 128, 84–95. doi:[10.1016/j.jpubeco.2015.06.001](https://doi.org/10.1016/j.jpubeco.2015.06.001).
- Gintis, H., Bowles, S., Boyd, R., Fehr, E., 2003. Explaining altruistic behavior in humans. *Evol. Hum. Behav.* 24 (3), 153–172. doi:[10.1016/S1090-5138\(02\)00157-5](https://doi.org/10.1016/S1090-5138(02)00157-5).
- Giuliano, P., Spilimbergo, A., 2014. Growing up in a recession. *Rev. Econ. Stud.* 81 (2), 787–817. doi:[10.1093/restud/rdt040](https://doi.org/10.1093/restud/rdt040).
- Goodman, P. S., Thomas, K., Wee, S.-L., Gettleman, J., 2020. A new front for nationalism: the global battle against a virus. *The New York Times*, April 10. <https://www.nytimes.com/2020/04/10/business/coronavirus-vaccine-nationalism.html>.
- Greene, J., 2014. *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them*. Penguin Books.
- Guterres, U. S.-G. A., 2020. Secretary-general remarks on COVID-19: a call for solidarity. United Nations, March 19. [https://www.un.org/sites/un2.un.org/files/sg\\_remarks\\_on\\_covid-19\\_english\\_19\\_march\\_2020.pdf](https://www.un.org/sites/un2.un.org/files/sg_remarks_on_covid-19_english_19_march_2020.pdf).
- Haidt, J., 2012. *The Righteous Mind: Why Good People Are Divided by Politics and Religion*. Vintage Books, New York, NY.
- Havdán, R., Trainor, J., Quarantelli, E.L., 2006. Rising to the challenges of a catastrophe: the emergent and prosocial behavior following Hurricane Katrina. *Ann. Am. Acad. Polit. Soc. Sci.* 604, 82–101. doi:[10.1177/0002716205284677](https://doi.org/10.1177/0002716205284677).
- Henrich, J., McElreath, R., Barr, A., Ensminger, J., Barrett, C., Bolyanatz, A., Cardenas, J.C., Gurven, M., Gwako, E., Henrich, N., Lesorogol, C., Marlowe, F., Tracer, D., Ziker, J., 2006. Costly punishment across human societies. *Science* 312 (5781), 1767–1770. doi:[10.1126/science.1127333](https://doi.org/10.1126/science.1127333).

- House, B.R., 2018. How do social norms influence prosocial development? *Curr. Opin. Psychol.* 20, 87–91. doi:[10.1016/j.copsyc.2017.08.011](https://doi.org/10.1016/j.copsyc.2017.08.011).
- Jensen, R., Oster, E., 2009. The power of TV: cable television and women's status in India. *Q. J. Econ.* 124 (3), 1057–1094. doi:[10.1162/qjec.2009.124.3.1057](https://doi.org/10.1162/qjec.2009.124.3.1057). <http://qje.oxfordjournals.org/content/124/3/1057.abstract>
- Jones, B., 2020. Increasing share of Americans favor a single government program to provide health care coverage. Pew Research Center. <https://pewrsr.ch/25bPw2e>.
- Kessler, J.B., Milkman, K.L., 2018. Identity in charitable giving. *Manage Sci* 64 (2), 845–859. doi:[10.1287/mnsc.2016.2582](https://doi.org/10.1287/mnsc.2016.2582).
- Kluger, J., 2020. The moral dilemma of coronavirus quarantines. *Time*, March 13. <https://time.com/5800379/coronavirus-quarantine-morality/>.
- Konow, J., 2000. Fair shares: accountability and cognitive dissonance in allocation decisions. *Am. Econ. Rev.* 90 (4), 1072–1091. doi:[10.1257/aer.90.4.1072](https://doi.org/10.1257/aer.90.4.1072).
- Kosse, F., Deckers, T., Pinger, P., Schildberg-Hörisch, H., Falk, A., 2020. The formation of prosociality: causal evidence on the role of social environment. *J. Polit. Econ.* 128 (2), 434–467. doi:[10.1086/704386](https://doi.org/10.1086/704386).
- Kupferschmidt, K., 2020. 'A completely new culture of doing research.' Coronavirus outbreak changes how scientists communicate. *Science*, February 26. <https://www.sciencemag.org/news/2020/02/completely-new-culture-doing-research-coronavirus-outbreak-changes-how-scientists>. 10.1126/science.abb4761
- Left, E. U. L. G., 2020. Grassroots solidarity in times of corona crisis. *European United Left/Nordic Green Left*, April 2. <https://www.guengl.eu/grassroots-solidarity-in-times-of-corona-crisis/>.
- La Ferrara, E., Chong, A., Duryea, S., 2012. Soap operas and fertility: evidence from Brazil. *Am. Econ. J. Appl. Econ.* 4 (4), 1–31. doi:[10.1257/app.4.4.1](https://doi.org/10.1257/app.4.4.1).
- Lerner, M.J., 1980. The belief in a just world. In: Lerner, M.J. (Ed.), *The Belief in a Just World. A Fundamental Delusion*. Springer, pp. 9–30. doi:[10.1007/978-1-4899-0448-5\\_2](https://doi.org/10.1007/978-1-4899-0448-5_2).
- Organization, W. H. (2020a). Coronavirus disease (COVID-19) advice for the public. World Health Organization, accessed April 17. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>.
- Organization, W. H. (2020b). Public statement for collaboration on COVID-19 vaccine development. World Health Organization, April 13. <https://www.who.int/news-room/detail/13-04-2020-public-statement-for-collaboration-on-covid-19-vaccine-development>.
- Mollerstrom, J., Reme, B.-A., Sørensen, E.Ø., 2015. Luck, choice and responsibility: an experimental study of fairness views. *J. Public Econ.* 131, 33–40. doi:[10.1016/j.jpubeco.2015.08.010](https://doi.org/10.1016/j.jpubeco.2015.08.010).
- Peysakhovich, A., Rand, D.G., 2016. Habits of virtue: creating norms of cooperation and defection in the laboratory. *Manage Sci* 62 (3), 631–647. doi:[10.1287/mnsc.2015.2168](https://doi.org/10.1287/mnsc.2015.2168).
- Pinsker, J., 2020. The pandemic will cleave America in two. *The Atlantic*, April 10. <https://www.theatlantic.com/family/archive/2020/04/two-pandemics-us-coronavirus-inequality/609622/>.
- Rand, D.G., Greene, J.D., Nowak, M.A., 2012. Spontaneous giving and calculated greed. *Nature* 489 (7416), 427–430. doi:[10.1038/nature11467](https://doi.org/10.1038/nature11467).
- Rawls, J., 2001. *The Law of Peoples*. Harvard University Press.
- Rees-Jones, A., D'Attoma, J., Piolatto, A., Salvadori, L., 2020. COVID-19 Changed Tastes for Safety-net Programs. NBER Working Paper 27865 doi:[10.3386/w27865](https://doi.org/10.3386/w27865).
- Rodríguez-Lara, I., Moreno-Garrido, L., 2012. Self-interest and fairness: self-serving choices of justice principles. *Exp. Econ.* 15 (1), 158–175. doi:[10.1007/s10683-011-9295-3](https://doi.org/10.1007/s10683-011-9295-3).
- Romano, J.P., Wolf, M., 2005. Exact and approximate stepdown methods for multiple hypothesis testing. *J. Am. Stat. Assoc.* 100 (469), 94–108. doi:[10.1198/016214504000000539](https://doi.org/10.1198/016214504000000539).
- Romano, J.P., Wolf, M., 2016. Efficient computation of adjusted *p*-values for resampling-based stepdown multiple testing. *Stat. Probab. Lett.* 113 (1), 38–40. doi:[10.1016/j.spl.2016.02.012](https://doi.org/10.1016/j.spl.2016.02.012).
- Sandel, M. J., 2020. Are we all in this together? *The New York Times*, April 13. <https://www.nytimes.com/2020/04/13/opinion/sunday/covid-workers-healthcare-fairness.html>.
- Schiffes, S., 2020. Will coronavirus be the turning point for globalisation? *The Conversation*, March 27. <https://theconversation.com/will-coronavirus-be-the-turning-point-for-globalisation-134739>.
- Singer, P., 2011. *The Expanding Circle: Ethics, Evolution, and Moral Progress*. Princeton University Press, Princeton, NJ.
- Sterba, M.-B., Harsanyi, S., 2020. Polarized or unified? - Solidarity and fairness views of liberals and conservatives during COVID-19. Mimeo, Max-Planck-Institute for Research on Collective Goods Bonn.
- Vallée, S., 2020. Coronavirus has revealed the EU's fatal flaw: the lack of solidarity. *The Guardian*, April 28. <https://www.theguardian.com/commentisfree/2020/apr/28/eu-coronavirus-fund-share-crisis-soul-european-parliament-fiscal>.
- Wood, J., 2020. China is sending medical experts and supplies to help Italy fight coronavirus. *World Economic Forum*, March 16. <https://www.weforum.org/agenda/2020/03/coronavirus-covid-19-italy-china-supplies/>.