



Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Prosocial responses to COVID-19: Examining the role of gratitude, fairness and legacy motives

Stylianos Syropoulos^{*}, Ezra M. Markowitz

Department of Psychological & Brain Sciences, University of Massachusetts Amherst, United States of America

ARTICLE INFO

Keywords:

Gratitude
Fairness
Legacy motives
Prosociality
COVID-19

ABSTRACT

The COVID-19 pandemic has produced an unprecedented collective action problem. Individuals must make a variety of decisions that influence both their own well-being and the health of those around them. Achieving the collective best-interest depends on most individuals responding in socially optimal ways, which includes remaining familiar with the current status of the pandemic, adhering to health guidelines relevant to the pandemic, and having a constructive emotional response to the pandemic. We sought to examine how individual differences in core moral motivators of collective action (i.e., fairness and gratitude) relate to individuals' COVID-19 responses. In a two-wave study (T1: $N = 254$; T2: $N = 135$) conducted in May and June 2020, we find that individual differences in fairness and gratitude were associated with more adaptive (i.e. positive emotions) and prosocial (i.e. remaining familiar with the pandemic, adhering to public health guidelines, prioritizing saving lives) responses to the pandemic. These effects are mediated through differences in impact legacy motives (i.e. being concerned about the impact one leaves behind once they have passed). Understanding the links between gratitude, fairness and legacy motives, and their impact on prosociality, could promote both current and intergenerational prosocial decision making.

1. Introduction

Towards the end of 2019 and throughout 2020, a new coronavirus (SARS-CoV-2) quickly spread across the globe, leading to a pandemic that upended nearly every facet of daily life for billions of people. As of October 2020 the COVID-19 pandemic has infected tens of millions of people and killed more than 1,000,000 people (Johns Hopkins University, 2020), and it has generated unprecedented uncertainty in the global economy by increasing unemployment across the globe (Wagner, 2020) and destabilizing the global order.

Beyond immediate and direct health impacts, the pandemic has also led to soaring levels of stress, anxiety and loneliness among many individuals (Zaidi & Ali, 2020). Delayed and inconsistent political responses to the crisis in many countries have highlighted the critical role that individuals have to play in combating the virus and, more broadly, in contributing to public goods such as public health and sustainable ecosystems. Moreover, weak government responses have occurred regardless of nations' wealth, leadership quality and form of government (for a commentary see Chater, 2020).

Various factors influence prosocial decision-making in the face of collective action problems, including informational and situational uncertainty, social norms, risk perceptions, and the costs (real or imagined) of personal action (Ostrom & Walker, 2003). One feature of the current public health crisis that is particularly important in shaping how individuals respond is the direct threat of personal harm and death. The COVID-19 pandemic not only acts to increase many people's personal health- and mortality-related risk perceptions, but it may also activate a slew of psychological mechanisms (productive or counter-productive) that are perhaps less obvious drivers of action in response to threat. In the current investigation, we examine the relative effect of two such factors as they relate to various behavioral, affective and attitudinal responses to the pandemic: fairness and gratitude. Since the pandemic is likely to increase mortality salience, we sought to further the extant research by also examining whether the effects of fairness and gratitude on COVID-19 responses might be mediated by a previously identified mechanism involved in promoting prosocial, and especially intergenerational, decision-making (i.e. making decisions for the sake of future generations), namely, personal legacy motives (often defined as wanting

^{*} Corresponding author at: University of Massachusetts Amherst, Psychological & Brain Sciences, Tobin Hall, 135 Hicks Way, Amherst, MA 01003, United States of America.

E-mail address: ssyropoulos@umass.edu (S. Syropoulos).

<https://doi.org/10.1016/j.paid.2020.110488>

Received 27 July 2020; Received in revised form 24 October 2020; Accepted 28 October 2020

Available online 4 November 2020

0191-8869/© 2020 Elsevier Ltd. All rights reserved.

to leave a lasting legacy after one has passed). We draw upon extant research to explore how fairness, gratitude and legacy motives might drive prosociality during the COVID-19 pandemic.

1.1. Gratitude and prosociality

Gratitude (in its trait form) is often described as “appreciation felt after one has been the beneficiary of an altruistic act” (Emmons & Crumpler, 2000, pp. 56–57). Past research shows that higher levels of dispositional gratitude predict better personal well-being (e.g., satisfaction with life, vitality, subjective happiness, optimism and hope) and decreased emphasis on materialistic attitudes (McCullough, Emmons, & Tsang, 2002). Scholars have also shown that gratitude motivates prosocial behavior in multiple ways. Emotions such as gratitude evolved as a mechanism to help promote cooperation and group coordination (Stellar et al., 2017). Recent studies have found that perceiving past generations as prosocial motivates prosociality towards others and future generations (Barnett, Van Vleet, & Cantu, 2019). Studies have also shown that gratitude often acts in an altruistic manner, promoting prosocial helping behaviors even when it comes with costs to the actor (Bartlett & DeSteno, 2006). Increased gratitude, both as a disposition (i.e., trait) and as a transient, experienced emotion (i.e., state), predicts greater prosociality (Ma, Tunney, & Ferguson, 2017). What is perhaps less known is whether gratitude can act as a force for prosociality during times of high uncertainty, such as the conditions brought forward by the COVID-19 pandemic. Based on extant findings, we investigated whether gratitude would be positively associated with different prosocial tendencies within the context of the COVID-19 pandemic.

1.2. Fairness and prosociality

Fairness is a moral foundation which pertains to altruism and reciprocity (Haidt & Joseph, 2008). Researchers have found that people who more strongly endorse fairness as a core moral value are also more dispositionally positive towards unfortunate others (Low & Wui, 2015). Studies have shown that even people who are more individualistic in their personality care about equality and fairness and will forego personal gain to achieve these goals (Van den Bergh, Dewitte, & De Cremer, 2006). In fact, researchers have found robust associations between fairness and unbiased allocation of resources, as well as charitable giving (Nilsson, Erlandsson, & Västfjäll, 2020). Other recent studies have also highlighted that fairness is positively correlated with how acceptable it is to engage in self-sacrificial actions (Crone & Laham, 2015). Thus, we would expect that greater endorsement of the moral value of fairness would be positively correlated with greater prosociality in the face of the pandemic. Those who endorse fairness, and are thus concerned with justice, reciprocity and altruism (e.g., Abbate & Ruggieri, 2011), should be more likely to both prioritize saving people even at significant economic cost and to adhere to public health recommendations so as to help others. Despite previous research linking fairness with prosociality (e.g., Haidt & Joseph, 2008), it is noteworthy to consider that the COVID-19 pandemic is a unique case in some ways. Prosociality in this context is defined more by actions that are self-focused (e.g., social distancing, wearing a mask, adhering to government guidelines, staying informed with the recent developments of COVID-19) as opposed to what might traditionally be thought of as other-focused actions (e.g., providing aid and care to people in need). Therefore, the current investigation extends past research on fairness and prosociality by explicitly examining whether the well-established link between the two concepts extends to less traditional (i.e., more self-focused) forms of prosocial behavior.

1.3. Personal legacy motives: linking gratitude, fairness and prosocial behavior under conditions of increased mortality salience

The COVID-19 pandemic has imposed significant economic, social

and physical costs on people around the world; the psychological impacts have also been immense (Zaidi & Ali, 2020). These impacts are the result of the very real fact that the pandemic has increased the chances of dying for large swaths of the population (CDC, 2020). As a result, the pandemic has likely increased many people’s sense of mortality in a way that may have widespread yet heterogeneous effects on how they engage with the issue. For example, research highlights that when faced with credible threats to one’s own survival, some people react by denigrating messengers and denying the threat whereas others become more focused on living a good life with the time they have remaining (Zaleskiewicz, Gasiorowska, & Kesebir, 2013).

Researchers have found that one way in which individuals engage productively with their own mortality is to think about the positive legacies they can leave behind (Wade-Benzoni, 2019). Broadly, legacies are defined as “an enduring meaning attached to one’s identity” (Wade-Benzoni & Tost, 2009, pp. 183). A legacy motive, therefore, is the motivation to build a legacy that will last the test of time. Research has shown that so-called “legacy motives” may be a particularly powerful motivator of prosocial behavior, particularly when individuals are making decisions with long-lasting effects on future others (Wade-Benzoni & Tost, 2009). Extant research has highlighted that being concerned about one’s legacy predicts increased prosocial intergenerational decision making across different fields, such as the environment (Zaval, Markowitz, & Weber, 2015) and in social dilemmas (Wade-Benzoni & Tost, 2009). It is important to note, however, that most extant work on legacy motives tends to be either very theoretical, as most social dilemmas tend to focus on theoretical allocation of resources to a future agent (e.g., Wade-Benzoni & Tost, 2009), or within a very specific sphere, such as the domain of intergenerational environmental concern. We posit that the uncertainty and mortality salience the COVID-19 pandemic has generated provides a more realistic and real-world test of prosociality, as individual actions (e.g., social distancing, staying informed about what one should/should not do) can go a long way in ensuring that the spread of COVID-19 is contained.

Building on this past work, we posit that legacy motives—particularly those focused on the impacts our actions have on others (as opposed to more self-oriented reputational concerns)—may play an important yet previously underappreciated role in motivating prosocial behavior in the context of the COVID-19 pandemic. When faced with a potential threat to their own survival as well as the survival of the people around them (including family, friends and neighbors), individuals who are relatively higher in legacy motives should, all else being equal, be more likely to engage in behaviors that could help build their positive legacies (in case they do in fact become a victim of the virus).

Individual differences in the salience of legacy motives seem poised to help explain the proposed linkages between dispositional fairness and gratitude on the one hand and whether people make socially optimal decisions in response to the pandemic on the other. Research has revealed that those who emphasize fairness as a core moral value are more likely to be concerned with altruism and reciprocity (e.g., Abbate & Ruggieri, 2011) and other work shows that people who have engaged in reciprocal exchange express more dispositional gratitude (e.g., Barnett et al., 2019). Further, theoretical claims in the field of intergenerational reciprocity consider beneficence by previous generations to be a factor that promotes legacy motives (see Wade-Benzoni & Tost, 2009). In line with these claims, we consider legacy motives to be an individual difference that is affected by two key factors: how dispositionally grateful people are in their lives and how much they value fairness. When presented with evidence that previous generations have acted in a manner that benefited them, individuals tend to perceive a greater obligation to help future others (Graham et al., 2011; Kertzer, Powers, Rathbun, & Iyer, 2014). Moreover, fairness is an individual difference concerned with altruism and prosociality, and therefore, we hypothesized that scoring higher in fairness would be associated with greater legacy motives, particularly ones that are concerned with having a positive impact on the lives of others.

Consequently, we theorize that those who are dispositionally more grateful as well as those who place a greater emphasis on the role of fairness as a moral value will be more concerned about the impact they have on others, which we operationalize as their motivation to leave a positive legacy. Personal legacies become even more relevant when threat and mortality becomes highly salient, as is the case during the COVID-19 pandemic. This theoretical argument is presented as a conceptual model in Fig. 1.

This conceptual model, which draws on extant research on intergenerational concern (see Wade-Benzoni & Tost, 2009), presents a novel framework for understanding the proposed association between gratitude, fairness and motivations to leave a lasting legacy as correlates of prosociality. Although these constructs have been discussed alongside one another, to our knowledge, no empirical research to date has examined these three factors (gratitude, fairness, legacy motives) concurrently. Further, most studies focusing on these factors tend to focus on issues high on intertemporal discounting (e.g., for legacy motives see: Hurlstone, Price, Wang, Leviston, & Walker, 2020; for gratitude see: Watkins & Goodwin, 2020) or on outright acts of prosociality (e.g., donating to charity; Nilsson et al., 2020), rather than issues that are salient in the present, and for which daily actions and behaviors are the agents of prosociality through their direct impacts on others' well-being. Further, most research on legacy motives has considered the construct to be a unidimensional one (e.g., Zaval et al., 2015), rather than one that can be meaningfully disentangled into two separate motives, which can differentially impact prosocial intentions.

1.4. Prosociality and the COVID-19 pandemic

In a recent paper, Bavel, Baicker, Boggio, et al. (2020) suggested that the social and behavioral sciences have a large role to play in combatting the COVID-19 pandemic. Among the different research avenues that the social sciences can address, two are directly relevant to the purpose of the current investigation: moral decision making and cooperation within groups. Moral decision making, Bavel and colleagues argue, is crucial as individuals will have to act selflessly and sacrifice personal resources (e.g., spend more time isolated, engage in less social interactions with others). At the same time, widespread cooperation (e.g., with mandated restrictions) will be essential to keeping the virus contained over time. Both moral decision making (e.g., Turiel, 2015) and cooperation (e.g., Simpson & Willer, 2015) fall under the umbrella of prosociality. Therefore, by better understanding the individual differences that promote prosocial decision making in the context of the pandemic, researchers and public health officials stand much to gain with respect to identifying potential leverage points for promoting greater adherence to necessary ameliorative practices. At the same time, studying these factors in the context of a real-world, quickly evolving collective action problem provides a novel opportunity for further developing theoretical and empirical models of prosociality under conditions of uncertainty.

1.5. The current study

We sought to test our hypothesis that individual differences in fairness and gratitude would be related to greater prosocial intentions during the COVID-19 pandemic. We predicted that this effect would be mediated by personal legacy motivations in a cross-sectional study. We

hypothesized that although both forms of legacy motives (i.e. impact and reputation-based motives) might initially relate to greater prosociality during the COVID-19 pandemic, when controlling for their shared variance, only impact legacy motives would be associated with more prosocial responses relevant to the pandemic.¹ To test our aforementioned hypothesis in a rigorous design, one that accounts for the uncertainty that COVID-19 generates, we conducted a one-month longitudinal study. This design allowed us to test our hypotheses at two separate points in time, and across time, thus allowing us to make an argument about directionality in our hypothesis. It also allowed us to explore for possible changes over time.

In the United States, the COVID-19 pandemic has quickly become politically polarized, with ideological conservatives reporting significantly lower risk perceptions as well as weaker adherence to mandated and voluntary public health behaviors (e.g., wearing masks; Conway III, Woodard, Zubrod, & Chan, 2020). Thus, to ensure that our findings are generalizable, we also included political conservatism as a covariate in our proposed analyses. Ultimately, better understanding the linkages between gratitude, fairness, and personal legacy motivation is important both for theory development as well as for efforts aimed at leveraging these mechanisms to promote prosocial behavior in response to the pandemic.

2. Methods

2.1. Participants

Based on an a-priori power analysis, computed with G*Power Version 3.1.9.2 (Faul, Erdfelder, Lang, & Buchner, 2007), for an expected correlation of $\rho = 0.20$ (for a two tailed test), alpha set to 0.05, and power set to 0.80, a sample of 191 participants was required. Thus we aimed to recruit an additional 100 participants more than needed, to account for the longitudinal design of the study and potential attrition across time.

We recruited participants online via Amazon Mechanical Turk (MTurk). Previous studies have shown that MTurk can provide reliable and valid data for psychological research (e.g., Buhrmester, Talaifar, & Gosling, 2018). To ensure good data quality we operated our study via TurkPrime (Litman, Robinson, & Abberbock, 2017). Consequently, we collected data from experienced survey takers (as they had an established 95% H.I.T. completion rate).² Surveys in both timepoints lasted approximately 15 min, and participants received \$0.40 as remuneration for their participation in each timepoint (\$0.80 total). For timepoint 1 (T1), we collected responses during the first week of May (May 5–6). Initially the sample had 309 participants. Fifty-five participants were excluded for missing an attention check,³ leaving a final sample of 254 participants. Data for timepoint 2 (T2) were obtained one month later (June 2–11). The starting sample had 140 respondents. After excluding participants who missed an attention check ($N = 5$) the final sample was comprised by 135 participants. Demographic information for both timepoints are presented in Table 1.

¹ Extant research (masked for review) suggests that legacy motives can be separated into two distinct categories: impact and reputation legacy motives. Impact motives suggest that individuals are motivated to leave a legacy because they want to positively impact others. Reputation motives suggest that individuals are motivated to leave a legacy by maintain a good reputation from future generations. Impact legacy motives have been associated with greater intergenerational concern and were thus expected to be a predictor of prosociality during the pandemic.

² H.I.T. stands for Human Intelligence Tasks. This acronym refers to the tasks that people can complete for remuneration on MTurk. Psychological studies are considered to be H.I.T.

³ For both timepoints, the attention checks asked participants to move the slider to the left most side to the scale, indicating that they strongly disagree with the statement.

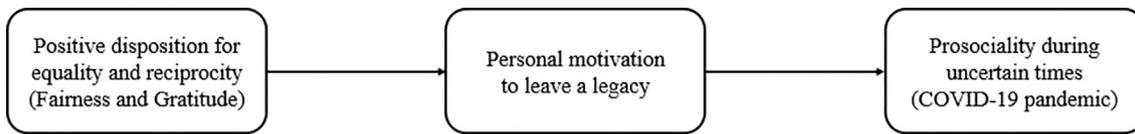


Fig. 1. Conceptual model tested in the cross-sectional study.

Table 1

Demographic information for both timepoints of the study.

Descriptive statistics	T1 (May 2020)	T2 (June 2020)
N_{total}	254	135
N_{male}	138	61
N_{female}	116	74
N_{White}	190	107
N_{BIPOC}	57	27
M_{age} (SD)	39.25 (12.29)	41.25 (13.09)
$M_{education}$ (SD; 1–8 scale)	4.87 (1.18)	4.80 (1.31)
M_{income} (SD; 1–7 scale)	3.82 (1.60)	3.83 (1.79)
$M_{conservatism}$ (SD; 1–9 scale)	5.34 (2.40)	4.82 (2.51)

Note: for education level the score is indicative of a 4-year college degree. For income level the score is indicative of annual income of \$50,000 - \$70,000. BIPOC = Black, Indigenous and People of Color. Some people gave nonsensical or uncodable responses for the question: “What is your race?” which resulted in the number of respondents not fully corresponding to our final sample.

2.2. Measures

All continuous variables in the study were displayed on 1–9 slider scales. Measures relevant to fairness, gratitude and legacy motives were presented first, in a randomized order, followed by our COVID-19 outcomes, presented in a randomized order. Descriptive statistics (Means and SDs) and reliability estimates for each measure for both timepoints can be found in Table 2. All measures were subjected to EFAs with an oblique rotation and Principal Axis Factoring extraction to ensure that they had a valid factor structure. For the measures that were created by

Table 2

Descriptive statistics and reliability estimates for all measures in timepoints 1 and 2.

Measure	T1 (May 2020): N = 254		T2 (June 2020): N = 135	
	M (SD)	Cronbach’s α	M (SD)	Cronbach’s α
Trait gratitude	6.41 (0.87)	0.80	6.44 (1.00)	0.84
Trait fairness	7.13 (1.13)	0.76	7.38 (1.30)	0.87
Impact legacy motives	6.91 (1.53)	0.96	6.71 (1.62)	0.96
Reputation legacy motives	6.44 (1.68)	0.94	6.09 (1.87)	0.96
Negative emotions about COVID-19	5.41 (2.12)	0.88	4.90 (2.19)	0.89
Positive emotions about COVID-19	5.66 (1.96)	0.88	5.78 (1.88)	0.88
Exposure to COVID-19 information	6.33 (1.90)	0.86	5.28 (2.27)	0.89
Following COVID-19 health recommendations	7.54 (1.27)	0.88	7.47 (1.38)	0.86
Adhering to stricter governmental COVID-19 orders	6.59 (1.92)	0.86	6.52 (2.18)	0.89
Prioritizing saving lives	6.45 (2.29)	–	6.28 (2.42)	–
Prioritizing saving the economy	5.52 (2.54)	–	4.87 (2.54)	–

Note: “–” indicates that the measure had only one item and therefore reliability estimates cannot be calculated.

the research team unique to this study, we provide the results of these EFAs for both timepoints in the Online Supplementary materials.

2.2.1. Trait fairness

We measured trait fairness by using the fairness sub-scale of the MFQ-30 (6 items, Graham, Haidt, & Nosek, 2009; e.g., “Justice is the most important requirement for a society”).

2.2.2. Trait gratitude

We measured individual differences in gratitude by using the GQ-6 (McCullough et al., 2002; e.g., “I have so much in life to be thankful for”).

2.2.3. Legacy motives

We measured personal legacy motives by using the recently introduced dual legacy motives scale (masked for review). This novel measure differentiates between legacy motives that are driven by one’s desire to leave a positive impact on the lives of others (8 items, i.e. Impact Legacy Motives; ILM, e.g., “It is important for me to leave a legacy of benefiting others”), or by one’s motivation to be remembered by future generations as someone with a good reputation (8 items, i.e. Reputation Legacy Motives; RLM, e.g., “I want to be remembered as someone with a good reputation.”).

2.2.4. Personal behaviors during COVID-19

We generated a measure capturing adherence to suggested health behaviors pertinent to reducing the spread of COVID-19 (7 items, e.g., “I covered my mouth whenever I coughed and sneezed.”). Adherence to health behaviors is perhaps the most prosocial personal behavior that individuals from all backgrounds can engage in. Since this pandemic has been characterized by a rapid spread of cases due to the airborne nature of the virus, we posited that adherence to health recommendations mandated by the government reflect an aspect of prosocial behavior.

We also constructed a measure of exposure to COVID-19 related information to investigate how much information relevant to the pandemic individuals had consumed (4 items, e.g., “In the past week how much have you searched for information relevant to coronavirus online?”). Although not directly reflective of prosociality, staying up to date with the development of the COVID-19 pandemic highlights that individuals care about the impact of the pandemic. Further, those who are more aware of COVID-19 related information are also those who are more willing to help prevent the spread of the virus (this claim is supported by the positive correlations with adherence to health behaviors and stricter orders by the government in Table 3).

We measured fear, anger, anxiety, sadness, calmness and optimism in response to COVID-19. Each emotion was measured with either one or two face valid items. In detail these were: for fear: I feel afraid, scared; for anger: I feel angry; for anxiety: I feel anxious; for sadness: I feel sad, gloomy; for optimism: I feel optimistic, hopeful; for calmness: I feel peaceful, calm. Exploratory factor analyses (see Supplementary materials) suggested that two factors, positive (comprised by optimism and calmness) and negative (comprised by fear, anger, sadness and anxiety) emotional responses to COVID-19, should be retained. These measures focused more on individual responses to the pandemic rather than prosociality. Our rationale for including these measures was that we consider emotional reactions to the pandemic as influential for decision-making, since emotions can play a key role in personal health decisions (DuPont et al., 2020).

Table 3

Bivariate correlations coefficients, for T1 (below the diagonal) and T2 (above the diagonal). Numbers in the diagonal are test-retest reliability estimates.

	1	2	3	4	5	6	7	8	9	10	11
1. Trait gratitude	(0.64 ^{***})	0.25 ^{**}	0.51 ^{***}	0.40 ^{***}	0.01	0.25 ^{**}	0.07	0.30 ^{***}	0.24 ^{**}	0.08	0.02
2. Trait fairness	0.36 ^{***}	(0.76 ^{***})	0.49 ^{***}	0.36 ^{***}	0.11	0.01	-0.01	0.32 ^{***}	0.23 ^{**}	0.28 ^{***}	-0.10
3. Impact legacy motives	0.52 ^{***}	0.33 ^{***}	(0.81 ^{***})	0.75 ^{***}	0.18 [*]	0.33 ^{***}	0.34 ^{***}	0.34 ^{***}	0.32 ^{***}	0.39 ^{***}	0.01
4. Reputation legacy motives	0.30 ^{**}	0.24 ^{***}	0.65 ^{***}	(0.77 ^{***})	0.24 ^{**}	0.35 ^{***}	0.41 ^{***}	0.26 ^{**}	0.29 ^{***}	0.23 ^{**}	0.21 [*]
5. Negative emotions about COVID-19	0.12 [*]	0.11	0.26 ^{***}	0.27 ^{***}	(0.78 ^{***})	-0.18 [*]	0.35 ^{***}	0.16	0.19 [*]	0.24 ^{**}	0.05
6. Positive emotions about COVID-19	0.27 ^{***}	0.12 [*]	0.32 ^{***}	0.41 ^{***}	-0.03	(0.74 ^{***})	0.37 ^{***}	-0.11	0.06	0.13	0.38 ^{***}
7. Exposure to COVID-19 information	0.18 ^{**}	0.12	0.36 ^{***}	0.41 ^{***}	0.38 ^{***}	0.32 ^{***}	(0.74 ^{***})	0.17	0.21 [*]	0.39 ^{***}	0.18 [*]
8. Following COVID-19 health recommendations	0.36 ^{***}	0.29 ^{***}	0.35 ^{***}	0.23 ^{***}	0.15 [*]	0.01	0.25 ^{***}	(0.77 ^{***})	0.47	0.38 ^{***}	-0.32 ^{***}
9. Adhering to stricter governmental COVID-19 orders	0.30 ^{***}	0.29 ^{***}	0.28 ^{***}	0.19 ^{**}	0.23 ^{***}	0.26 ^{***}	0.39 ^{***}	0.50 ^{***}	(0.68 ^{***})	0.51 ^{***}	-0.15
10. Prioritizing saving lives	0.28 ^{***}	0.24 ^{***}	0.36 ^{***}	0.26 ^{***}	0.33 ^{***}	0.19 ^{**}	0.40 ^{***}	0.44 ^{***}	0.66 ^{***}	(0.80 ^{***})	-0.38 ^{***}
11. Prioritizing saving the economy	-0.03	-0.07	0.11	0.21 ^{***}	0.22 ^{***}	0.35 ^{***}	0.24 ^{***}	-0.20 ^{**}	-0.13 [*]	-0.25 ^{***}	(0.71 ^{***})

Note: After correcting for the number of tests run, values at $p < .01$ are significant, based on a Bonferroni correction. For coefficients below the diagonal, $N = 254$; for coefficients in/above the diagonal, $N = 135$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

A debate has sparked with regards to whether the government should strive to save people's lives or the economy (e.g., [The New York Times, 2020](#)). We measured people's attitude towards each priority with one item (saving the people: "We should sacrifice the nation's economy by maintaining the quarantine to ensure that as many people as possible survive."; saving the economy: "We should be willing to sacrifice ourselves by stopping the quarantine to ensure that the nation's economy does not suffer."). These measures captured prosociality (or lack thereof) in a more externally valid way, as it captured support for the sacrifice of resources in order to save people's lives.

In a more exploratory fashion, we were interested in determining whether fairness and gratitude would be correlated with accepting stricter and mandatory measures enforced by the government to deal with the spread of COVID-19 (4 items, e.g., "If the U.S. government enacted mandatory quarantine for everyone, would you comply with this decision?"). Although in many nations quarantine has been a mandatory and federally enforced process, in the US this is not the case. Therefore, we considered willingness to adhere to such potential future orders to be an indication of personal sacrifice for the greater good of the nation, and consequently, an indicator of prosociality.

2.2.5. Political conservatism

We captured political conservatism with two items: (1) Regarding economic issues (e.g., taxation, public spending), I am...; (2) Regarding social issues (e.g., gay rights, multiculturalism), I am... Responses were recorded on a 1–9 scale, with 1 = liberal/left and 9 = conservative/right. This measure was highly reliable in both timepoints ($\alpha_{T1} = 0.87$; $\alpha_{T2} = 0.86$).

3. Results

3.1. Statistical analysis

All reported analyses were computed in SAS version 9.4. We first computed correlations within each timepoint, to test whether in each month, the hypothesized associations would be observed. Then, we computed path models examining the outcomes of the study simultaneously, while controlling for political ideology.

3.2. Correlations within timepoints

Gratitude was positively correlated within each timepoint with positive emotions in response to COVID-19, adhering to COVID-19 health behaviors and also adhering to potentially stricter governmental measures (see [Table 3](#)). Trait fairness was also positively correlated with both adhering to COVID-19 health behaviors and stricter governmental measures in both timepoints. Further, it was also positively associated with prioritizing saving people over the economy.⁴ Both types of legacy motives were correlated positively with all COVID-19 outcomes at both timepoints (except for the prioritization of saving the economy for ILM in T2).

3.3. Correlations across timepoints

Higher fairness and gratitude at T1 was positively correlated with adhering to health recommendations to prevent the spreading of COVID-19 at T2. Further, for gratitude a positive correlation was observed with positive emotional reactions to COVID-19. Both fairness ($r = 0.23$, $p = .007$) and gratitude ($r = 0.46$, $p < .001$) at T1 were positively correlated with ILM, but only gratitude ($r = 0.45$, $p < .001$) was correlated with RLM at T2. Both legacy motives remained positively correlated with positive emotional reactions to COVID-19, accessing information relevant to COVID-19, and prioritizing saving lives during COVID-19. Only ILM were correlated with adhering to health recommendations and also with adhering to potential mandatory governmental measures to help combat the spread of COVID-19 (see [Table 4](#)). All these findings remained significant after controlling for political conservatism.

3.4. Indirect effects of fairness and gratitude on personal behaviors during COVID-19

To conduct the most stringent test of our proposed mediation model, we estimated a path model. In this model, we accounted for the effect of political conservatism on the outcome variable by inserting it as a

⁴ Although many have argued that the choice between saving lives and saving the economy is a false dichotomy, we chose to measure beliefs about this choice in such a fashion as it is a dominant narrative in media coverage of COVID-19 in the US.

Table 4

Bivariate (top) and partial (bottom) correlation coefficients for the two legacy motives, trait fairness and gratitude, and political conservatism at T1 with the COVID-19 outcomes at T2. Partial correlation coefficients have political conservatism partialled out.

	Negative emotions T ₂	Positive emotions T ₂	Accessing information T ₂	Following health recommendations T ₂	Adhering to future government orders T ₂	Prioritizing lives T ₂	Prioritizing the economy T ₂
Bivariate correlations							
Impact legacy motives T ₁	0.13	0.27**	0.24**	0.25**	0.22*	0.22*	0.11
Reputation legacy motives T ₁	0.18*	0.26**	0.22*	0.11	0.10	0.15	0.17
Fairness T ₁	0.10	-0.08	-0.09	0.24**	0.07	0.04	-0.10
Trait gratitude T ₁	0.01	0.23**	0.06	0.20*	0.12	0.02	0.10
Conservatism T ₁	0.05	0.25**	0.08	-0.21*	-0.11	-0.28**	0.55***
Partial correlations							
Impact legacy motives T ₁	0.15	0.28**	0.24**	0.27**	0.21*	0.21*	0.11
Reputation legacy motives T ₁	0.19*	0.22*	0.20*	0.16	0.11	0.18*	0.10
Fairness T ₁	0.07	-0.04	-0.06	0.23**	0.09	0.05	-0.07
Trait gratitude T ₁	-0.09	0.21*	0.05	0.23**	0.13	0.04	0.06

Note: After correcting for the number of tests run, values at $p < .01$ are significant, based on a Bonferroni correction.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

predictor to all COVID-19 outcomes. This models had fairness and gratitude at T1 as exogenous variables, ILM and RLM at T1⁵ as mediating pathways, and the following variables as outcomes: (1) positive and negative emotional reactions in response to COVID-19 (i.e. emotional responses); (2) accessing relevant information to COVID-19 and adhering to health recommendation for COVID-19 (i.e. personal behaviors to reduce the spread of COVID-19).⁶ To evaluate our model we primarily used a Chi Square test, since our sample was relatively small ($N = 135$); in such cases, researchers have suggested it as the most appropriate test (e.g., Barrett, 2007). However, we also report the fit indexes that are commonly used to indicate acceptable fit (i.e. $CFI > 0.90$, $RMSEA < 0.10$, $SRMR < 0.08$; e.g., Kenny, 2020; Kline, 2011).

Given our small sample size, we computed a power analysis to get a better understanding of our sample's capacity to detect an effect. We used the online RMSEA power calculator (quantpsy.org) operated by Preacher and Coffman (2006). Our N was set to 132, with an alpha set to 0.05, a null RMSEA set to 0.00, and an alternative RMSEA set to 0.08. The resulting power was 0.45 which suggested that our sample was not adequately powered for this analyses and should be interpreted with caution.

The model tested met the norms set for evaluating model fit, suggesting that the data fit the model adequately $\chi^2(10) = 18.06$, $p = .054$, $CFI = 0.96$, $RMSEA = 0.08$, $SRMR = 0.05$ (Barrett, 2007; Kenny, 2020; Kline, 2011). Fairness was significantly positively correlated with ILM, but not with RLM. Gratitude was significantly correlated with both ILM and RLM. In turn, RLM was not significantly correlated with any of the COVID-19 outcomes, while ILM was significantly associated with greater expression of positive emotions towards COVID-19, and greater adherence to health recommendations relevant to COVID-19. Detailed

⁵ Since scores in T1 and T2 did not significantly differ for either ILM and RLM, with scores remaining relatively high (see Table 4) we used the scores from T1.

⁶ Inserting the measures of support for prioritizing people or the economy (i.e. ethical considerations for COVID-19) in this model significantly worsens the model fit. We theorize that this could be because emotional responses to COVID-19, as well as exposure to COVID-19 information and adherence to health recommendations for COVID-19, are actual reported behaviors, while the measures capturing ethical considerations for COVID-19 are more abstract in their nature. When testing each set of outcomes individually, each model provided acceptable fit. These models can be found in the Supplementary materials.

information for each path coefficient of the model can be found in Fig. 2.

4. Discussion

The current investigation supports the hypothesis that stronger endorsement of fairness as a core value and higher levels of dispositional gratitude both positively relate to prosocial reactions and behavioral intentions during the COVID-19 pandemic. The association between gratitude and fairness on the one hand and COVID-19 responses on the other operates through individual differences in legacy motives, particularly those focused on having a lasting, positive impact on the lives of others and not those that are focused how one will be remembered by future others. In a setting such as the COVID-19 pandemic, where individuals avoid social interactions with others at the fear of contracting the virus, we defined prosociality in our study in several alternative ways: (1) preferences for prioritizing saving people's lives over the economy during the COVID-19 pandemic; (2) consumption of information relevant to COVID-19; (3) adherence to public health recommendations to prevent the spread of the pandemic. This final measure usually comes at the expense of the individual, as social isolation and loneliness could be increased by staying at home and quarantining.

Although these effects were significant as individual outcomes, and after controlling for an individual's political ideology (see Tables 3 and 4, and Figs. S1–S3 in the Supplementary materials), when testing all outcomes concurrently (except for the measure of support for prioritizing saving lives), only the association between impact legacy motives and adherence to COVID-19 health recommendations remained significant. Our measure of adherence to health recommendations aimed at reducing the spread of COVID-19 (e.g., items included among others: avoiding contact with others, washing one's hands, covering one's mouth when being outside/wearing a facemask) captures self-reported behavior. These results provided the most extensive support for our conceptual model and highlight that personal legacy motivation, when guided by an intention to positively impact other people's lives, is potentially an avenue to increased behavioral intentions to help prevent the spread of the pandemic. Those who more highly value fairness and those who experience gratitude to a greater degree in their lives tend to be more predisposed to think about their legacy as a means to positively impact others, and subsequently are more likely to act in a way that can help contain the spread of the pandemic (i.e. adhere to health recommendations).

Those who were more favorably dispositioned towards fairness and

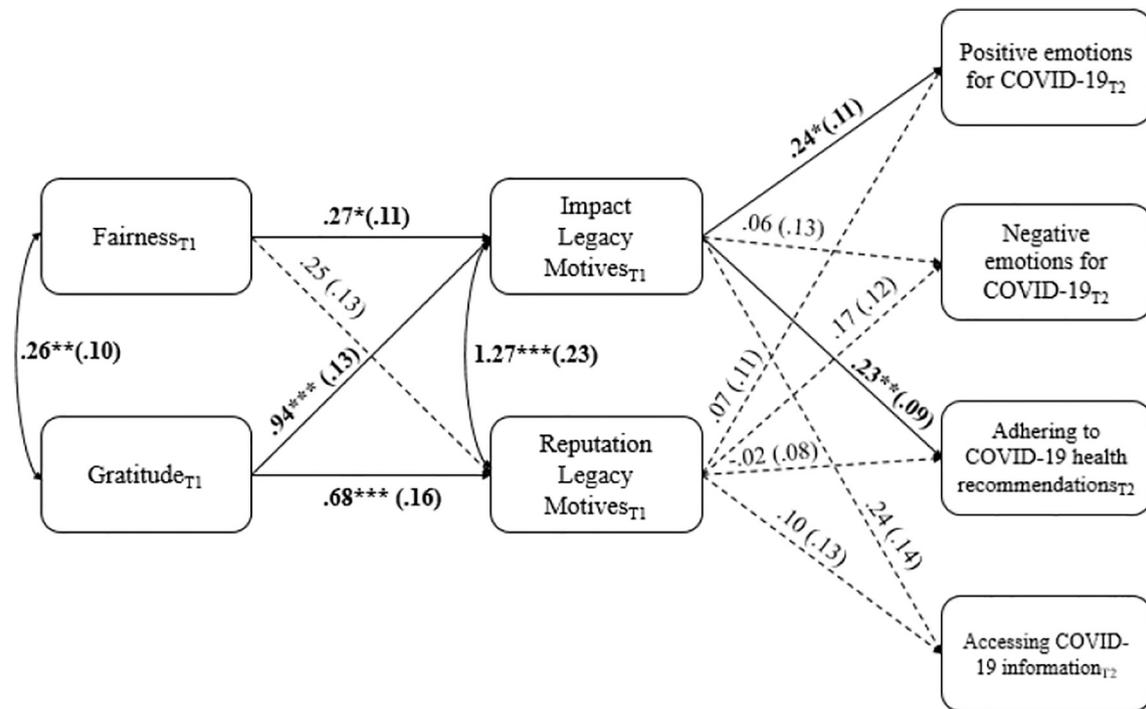


Fig. 2. Path model for the indirect effect of gratitude and fairness on emotional responses to and behavioral intentions relevant to COVID-19, controlling for the association of political conservatism with the outcomes. Coefficients are unstandardized weights. Dashed arrows depict non-significant paths. * $p < .05$, ** $p < .01$, *** $p < .001$.

gratitude were also more likely to feel better emotionally during the pandemic. This effect was again mediated by impact-based and not reputation-based legacy motives. One explanation as to why this phenomenon occurs may be that those who care about fairness and who feel more gratitude, and who are therefore more likely to be motivated to leave a positive impact on the lives of others, consequently see the pandemic as an opportunity to help others, which in turn leads to an increase in their levels of calmness and optimism (i.e. positive emotions). Our measure of positive emotions was comprised by feelings of optimism and calmness, both of which constitute constructive responses to a stressor that is characterized with uncertainty (i.e. the COVID-19 pandemic). Maintaining higher levels of optimism and calmness could potentially help regulate the negative impacts that COVID-18 might have on individuals' mental health and personal relationships.

Our proposed conceptual model of the linkages between gratitude, fairness, legacy motives and prosocial COVID-19 responses was partially validated. Thus we conclude that gratitude, and fairness to a lesser degree, seem to generate beneficence in the present and near future, even when the future is characterized by high levels of uncertainty.

4.1. Limitations

Our study was not without limitations. Our sample for T2 was smaller than the sample that we expected to have based on our a-priori power analysis (sample based on power analysis: $N = 191$; sample at T2: $N = 135$). Perhaps in no analysis was this evident than the power that our path analysis had. However, even with an underpowered sample our hypotheses and our conceptual model were partially confirmed. Nevertheless, these findings could benefit from replication efforts with a larger sample size. The findings at hand could also be extended to include other measures of prosociality that are not relevant to COVID-19, but instead focus on personal relationships. Further, our sample was primarily White American, failing to capture the racial and ethnic diversity of the United States. Given the fact that COVID-19 has disproportionately impacted people of color (e.g., the percentage of Blacks

who were infected by or died due to COVID-19 is disproportionately higher than their actual population; Millett et al., 2020), the associations observed in the current investigation could be stronger for individuals who are more impacted by COVID-19. Finally, another potential avenue worth considering is the use of gratitude or fairness primes to increase legacy motivations (or a direct experimental manipulation of legacy motives), with the aim of establishing a causal relationship between legacy motives and prosocial intentions during a time of high uncertainty. Outside the scope of COVID-19, legacy motives appear to be associated with greater intergenerational concern both to near and distant future others. Exploring the intersection of future self-continuity, legacy motives, and how this intergenerational prosociality could be extended in other fields (e.g., political participation) could be crucial in dealing with issues that require active civil participation.

4.2. Implications

How individuals choose to respond to the COVID-19 pandemic will play a major role in determining the ultimate impacts and duration of the virus on society. Small individual actions such as wearing a mask, employing self-quarantine and practicing social distancing could go a long way in helping contain the number of COVID-19 cases. Therefore, it is critical that social scientists learn as much as possible about factors that both inhibit and promote cooperation and coordination in response to this massive, novel collective action problem. We identify previously unstudied factors that play an important role in promoting adherence to public health best-practices and prosocial responses to COVID-19, namely, gratitude, fairness and legacy motives. Thus, the current evidence supports existing theoretical models of intergenerational beneficence, which speculate that beneficence from previous generations as well as norms of reciprocity are predictors of intergenerational concern (e.g., Wade-Benzoni & Tost, 2009, Fig. 1). It also extends such work, by showcasing that a disposition towards feeling grateful and valuing fairness also promote specific forms of beneficence, through the pathway of impact-based legacy motives. By doing so, this work suggests

that pandemic-specific public health communication and behavioral intervention efforts should incorporate moral language that can help activate these strong, pre-existing motivators of prosocial behavior. From a theoretical perspective, the current investigation also serves as a reminder of the potential for personal legacies to act as powerful motivators for acts of beneficence. Future research should investigate how impact-based legacy motives can be increased and made more salient at the point of COVID-19 related decision-making given that they appear to be relatively stable correlates of prosocial behavior and constructive emotional reactions to the pandemic.

CRedit authorship contribution statement

Stylianios Syropoulos: Conceptualization, Formal analysis, Methodology, Visualization, Software, Validation, Writing - original draft, Writing - review & editing. **Ezra M. Markowitz:** Funding acquisition, Conceptualization, Methodology, Project administration, Supervision, Writing - original draft, Writing - review & editing.

Acknowledgements

The authors have no conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2020.110488>.

References

- Abbate, C. S., & Ruggieri, S. (2011). The fairness principle, reward, and altruistic behavior. *Journal of Applied Social Psychology, 41*(5), 1110–1120. <https://doi.org/10.1111/j.1559-1816.2011.00749.x>.
- Barnett, M. D., Van Vleet, S. C., & Cantu, C. (2019). Gratitude mediates perceptions of previous generations' prosocial behaviors and prosocial attitudes toward future generations. *The Journal of Positive Psychology, 14*(3), 17439760.2019.1676459. Advance online publication.
- Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences, 42*(5), 815–824. <https://doi.org/10.1016/j.paid.2006.09.018>.
- Bartlett, M. Y., & DeSteno, D. (2006). Gratitude and prosocial behavior: Helping when it costs you. *Psychological Science, 17*(4), 319–325. <https://doi.org/10.1111/j.1467-9280.2006.01705.x>.
- Bavel, J. J. V., Baicker, K., Boggio, P. S., et al. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour, 4*, 460–471. <https://doi.org/10.1038/s41562-020-0884-z>.
- Buhrmester, M. D., Talaifar, S., & Gosling, S. D. (2018). An evaluation of Amazon's mechanical Turk, its rapid rise, and its effective use. *Perspectives on Psychological Science, 13*(2), 149–154. <https://doi.org/10.1177/1745691617706516>.
- Center for Disease Control and Prevention. (2020). Excess deaths associated with COVID-19. Retrieved from https://www.cdc.gov/nchs/nvss/vsrr/covid19/excess_deaths.htm.
- Chater, N. (2020). Facing up to the uncertainties of COVID-19. *Nature Human Behaviour, 4*. <https://doi.org/10.1038/s41562-020-0865-2>. Advance Online Publication.
- Conway, L. G., III, Woodard, S. R., Zubrod, A., & Chan, L. (2020). *Why are conservatives less concerned about the coronavirus (COVID-19) than liberals? Testing experiential versus political explanations.* Working paper. <https://doi.org/10.31234/osf.io/fgb84>.
- Crone, D. L., & Laham, S. M. (2015). Multiple moral foundations predict responses to sacrificial dilemmas. *Personality and Individual Differences, 85*, 60–65. <https://doi.org/10.1016/j.paid.2015.04.041>.
- DuPont, C. M., Weis, T. M., Manuck, S. B., Marsland, A. L., Matthews, K. A., & Gianaros, P. J. (2020). Does well-being associate with stress physiology? A systematic review and meta-analysis. *Health Psychology, 39*(2). <https://doi.org/10.1037/hea0000979>. Advance Online Publication. (Supplemental).
- Emmons, R. A., & Crumpler, C. A. (2000). Gratitude as a human strength: Appraising the evidence. *Journal of Social and Clinical Psychology, 19*(1), 56–69. <https://doi.org/10.1521/jscp.2000.19.1.56>.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191. <https://doi.org/10.3758/BF03193146>.
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology, 96*(5), 1029–1046. <https://doi.org/10.1037/a0015141>.
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology, 101*(2), 366–385. <https://doi.org/10.1037/a0021847>.
- Haidt, J., & Joseph, C. (2008). The moral mind: How five sets of innate intuitions guide the development of many culture-specific virtues, and perhaps even modules. In P. Carruthers, S. Laurence, & S. Stich (Eds.), *Evolution and cognition. The innate mind vol. 3. Foundations and the future* (pp. 367–391). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195332834.003.0019>.
- Hurlstone, M., Price, A., Wang, S., Leviston, Z., & Walker, I. (2020). Activating the legacy motive mitigates intergenerational discounting in the climate game. *Global Environmental Change-Human and Policy Dimensions, 2019.102008*. Advance online publication.
- Johns Hopkins University. (2020). Coronavirus Resource Center. Retrieved from <https://coronavirus.jhu.edu/map.html>.
- Kenny, D. A. (2020). Measuring model fit Accessed via <http://davidakenny.net/cm/fit.htm>.
- Kertzer, J. D., Powers, K. E., Rathbun, B. C., & Iyer, R. (2014). Moral support: How moral values shape foreign policy attitudes. *The Journal of Politics, 76*(3), 825–840. <https://doi.org/10.1017/S0022381614000073>.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York: Guilford Press.
- Litman, L., Robinson, J., & Abberbock, T. (2017). TurkPrime.com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods, 49*(2), 433–442. <https://doi.org/10.3758/s13428-016-0727-z>.
- Low, M., & Wui, M. G. L. (2015). Moral foundations and attitudes towards the poor. *Current Psychology, 35*(4), 650–656. <https://doi.org/10.1007/s12144-015-9333-y>.
- Ma, L. K., Tunney, R. J., & Ferguson, E. (2017). Does gratitude enhance prosociality? A meta-analytic review. *Psychological Bulletin, 143*(6), 601–635. <https://doi.org/10.1037/bul0000103>.suppl (Supplemental).
- McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*(1), 112–127. <https://doi.org/10.1037/0022-3514.82.1.112>.
- Millett, G. A., Jones, A. T., Benkeser, D., Baral, S., Mercer, L., Beyrer, C., ... Sullivan, P. (2020). Assessing differential impacts of COVID-19 on black communities. *Annals of Epidemiology, 2020.05.003*. Advance Online Publication.
- Nilsson, A., Erlandsson, A., & Västfjäll, D. (2020). Moral foundations theory and the psychology of charitable giving. *European Journal of Personality, 2020.04.003*. Advance online publication.
- A vol. in the Russell Sage Foundation series on trust. In Ostrom, E., & Walker, J. (Eds.), *Trust and reciprocity: Interdisciplinary lessons from experimental research*, (2003). Russell Sage Foundation.
- Preacher, K. J., & Coffman, D. L. (2006, May). Computing power and minimum sample size for RMSEA [computer software]. Retrieved from <http://quantpsy.org/>.
- Simpson, B., & Willer, R. (2015). Beyond altruism: Sociological foundations of cooperation and prosocial behavior. *Annual Review of Sociology, 41*(1), 43–63. <https://doi.org/10.1146/annurev-soc-073014-112242>.
- Stellar, J. E., Gordon, A. M., Piff, P. K., Cordaro, D., Anderson, C. L., Bai, Y., ... Keltner, D. (2017). Self-transcendent emotions and their social functions: Compassion, gratitude, and awe bind us to others through prosociality. *Emotion Review, 9*(3), 200–207. <https://doi.org/10.1177/1754073916684557>.
- The New York Times. (2020). Restarting America means people will die. So when do we do it? Retrieved from <https://www.nytimes.com/2020/04/10/magazine/coronavirus-economy-debate.html>.
- Turiel, E. (2015). Morality and prosocial judgments and behavior. In D. A. Schroeder, & W. G. Graziano (Eds.), *Oxford library of psychology. The Oxford handbook of prosocial behavior* (pp. 137–152). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780195399813.013.022>.
- Van den Bergh, B., Dewitte, S., & De Cremer, D. (2006). Are prosocials unique in their egalitarianism? The pursuit of equality in outcomes among individualists. *Personality and Social Psychology Bulletin, 32*(9), 1219–1231. <https://doi.org/10.1177/0146167206289346>.
- Wade-Benzoni, K. A. (2019). Legacy motivations & the psychology of intergenerational decisions. *Current Opinion in Psychology, 26*, 19–22. <https://doi.org/10.1016/j.copsy.2018.03.013>.
- Wade-Benzoni, K. A., & Tost, L. P. (2009). The egoism and altruism of intergenerational behavior. *Personality and Social Psychology Review, 13*(3), 165–193. <https://doi.org/10.1177/1088868309339317>.
- Wagner, A. F. (2020). What the stock market tells us about the post-COVID-19 world. *Nature Human Behaviour, 4*, 440. <https://doi.org/10.1038/s41562-020-0869-y>.
- Watkins, H. M., & Goodwin, G. P. (2020). Reflecting on sacrifices made by past generations increases a sense of obligation towards future generations. *Personality and Social Psychology Bulletin, 46*(7), 995–1012. <https://doi.org/10.1177/0146167219883610>.
- Zaidi, A., & Ali, A. Z. (2020). Living under the shadow of a pandemic: The psychological challenges underlying social distancing and awareness raising. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(5), 508–510. <https://doi.org/10.1037/tra0000815>.
- Zaleskiewicz, T., Gasiorowska, A., & Kesebir, P. (2013). Saving can save from death anxiety: Mortality salience and financial decision-making. *PLoS One, 8*(11). <https://doi.org/10.1371/journal.pone.0079407>.
- Zaval, L., Markowitz, E. M., & Weber, E. U. (2015). How will I be remembered? Conserving the environment for the sake of one's legacy. *Psychological Science, 26*(2), 231–236. <https://doi.org/10.1177/0956797614561266>.