Moral Messaging: Testing a Framing Technique During a Pandemic

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Abstract

We experimentally investigated whether appeals to moral principles – as operationalized by the theory of Morality-as-Cooperation, increase pandemic-related public health behaviour. Participants (USA and India) were presented with persuasive messages, asked about their intentions to follow the restrictions, were asked to donate to a charity fighting COVID-19, and completed the Morality-as-Cooperation Questionnaire. We found that moral messages were more effective than non-moral messages in increasing Donations and Prosocial Intentions, especially messages appealing to Heroism. In the US sample, the effect of moral messages was larger when they were concordant with participants' moral values. We also found that some moral messages were effective only in a particular population. This paper outlines the necessary next steps for using Morality-as-Cooperation for evidence-based communication.

During the COVID-19 outbreak, governments and public health authorities required citizens to comply with a variety of onerous regulations – such as lockdowns and compulsory mask-wearing – designed to protect the lives of themselves and others (World Health Organization, 2021; Kenyon, 2020). Here we investigate the effect of appeals to citizens' moral values on their intention to comply with these regulations.

Previous research has shown that well-designed messages can change peoples' behaviour (Armanasco et al., 2017), including health behaviours (Gallagher & Updegraff, 2012), environmental practices (Gifford & Comeau, 2011), and dietary choices (Elbert & Ots, 2018; Palomo-Vélez et al., 2018). Previous research has also shown that more prosocial individuals are more likely to engage in health behaviours during the COVID-19 pandemic (Campos-Mercade et al., 2021) and there is some evidence showing that prosocial messages are effective at increasing intentions to engage in preventive behaviours such as wearing a face mask and practising social distancing (Capraro & Barcelo, 2020; Lunn et al., 2020; Pfattheicher et al., 2020).

However, recent research suggests there is not just one moral value, there are many (Curry, Jones Chesters, et al., 2019; Curry, Mullins, et al., 2019). According to the theory of Morality-as-Cooperation (MAC), morality is a collection of rules that promote different types of cooperation (Curry, 2016). There are many types of cooperation, and so the theory predicts that there will be many types of morality, including *Family, Loyalty, Reciprocity, Heroism, Deference, Fairness, and Property*. Briefly, *Family* refers to the obligation to love and care for family members, especially children. *Loyalty* refers to the obligation to pursue projects of mutual interest with others and to provide preferential help to members of the one's

groups (for example clubs, coalitions, communities). *Reciprocity* refers to the obligation to return favours (and punish those who do not). *Heroism* refers to the (supererogatory) obligation to display costly signals of power, status, and prestige, such as bravery and generosity. *Deference* refers to the obligation to show respect to powerful, prestigious, heroic individuals. *Fairness* refers to the obligation to divide disputed resources, rather than trying to monopolise them. And *Property* refers to the obligation to respect prior possession of resources and refrain from theft. Previous research suggests that these seven types of morality are evolutionarily ancient (Curry, 2016), genetically-based (Zakharin et al., in prep.), early-developing (Dawkins et al., 2020)., psychometrically-distinct (Curry, Jones Chesters, et al., 2019), and cross-culturally universal (Curry, Mullins, et al., 2019). Research has also shown that people who endorse the values of *Family, Loyalty, Reciprocity, Heroism, Deference, and Property* are more likely to endorse policies mandating physical distancing (Boggio, et al., in prep.).

It follows that appeals to the specific moral values identified by Morality-as-Cooperation might better catalyse cooperative dispositions and persuade more people to 'do the right thing' and follow COVID-19 related public health guidelines. It is possible that moral messages that appeal to a wide range of moral values, or that target the most relevant moral values, might be more effective in mobilising the public. Does appealing to specific moral principles make people change their behaviour in the face of the pandemic?

Current Study

The present study is the first to use MAC, a novel theoretical framework, to design persuasive moral messages. It investigates four main questions: a) Are MAC moral messages more effective than non-moral messages? b) Are any MAC moral messages more effective than others? c) Does the effectiveness of MAC moral messages depend on (are they moderated by) the corresponding moral values of the participant? and d) Do these effects hold across cultures? To answer these questions, we preregistered[1] and conducted an experimental study in which we presented people with a variety of health

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[1] The pre-registration was updated as we substantially changed our initial plan. We started conducting the study according to the early pre-registration (anonymized for peer review: preregistration was added as supplementary material). We noticed, however, that the measure aimed at estimating the intention to cooperate during the pandemic reached a ceiling effect (most of the participants declared an extraordinarily strong intention to cooperate). Also, we were not able to recruit our participants at a sufficient rate to observe the effect of time on the change of intentions to cooperate. Our pre-registration was updated (anonymized for peer review: preregistration was added as supplementary material). We decided to expand the intentions scale and to avoid the ceiling effect, we reformulated the cooperative behaviours to be more challenging. Additionally, we dropped the time variable and included a behavioural variable—a donation. The sample consisted of USA and India citizens, instead of the citizens of Poland.

messages and gathered data on their pandemic-related behavioural intentions, willingness to donate to a charity fighting the consequences of the pandemic, and their moral values.

Our sample consisted of participants from the USA (data gathered in April 2020) and from India (data gathered in May 2020). The time of conducting our research was in the early stages of the pandemic. The outbreak was discovered in Wuhan in November 2019, and in March 2020 the WHO declared the outbreak a global pandemic (World Health Organization, 2020). To give some situational context, there were more than 171,000 confirmed cases in the US in March (the month before the study; World Health Organization, 2023). In addition, throughout March, several state, city, and county governments implemented *stay at home* policies in their communities to slow the spread of the virus. In India, there were more than 13,000 confirmed cases in April (the month before the study; World Health Organization, 2023). In March, India's Prime Minister announced that India would be placed under *total lockdown*. A ban on leaving the house for non-essential purposes was imposed and public transport was suspended.

Methods

Participants

Participants were recruited via Qualtrics.com. Our final sample consisted of 313 participants from USA (156 men, 157 women, mean age = 45.96, SD = 16.70, range = 18 - 80) and 302 participants from India (154 men, 148 women, mean age = 42.69, SD = 15.70, range = 18 - 80).[2] We decided to sample these particular populations as they both use English fluently and yet are culturally different (for example, people from India, on average, are more likely to follow social norms than people from USA; Gelfand, et al., 2011). The study was approved by the institutional review board of the University of Wroclaw.

Procedure

The participants were first asked about their age, gender, and the perceived threat of COVID-19 to their health. Next, they were presented with one of ten health messages and asked questions about their behavioural intentions regarding social distancing (block 1). After that, they completed the Morality as Cooperation Questionnaire (block 2; we presented these two blocks randomly, to minimise order effects.) Finally, the participants were invited to the lottery and asked whether they would donate part of

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[2] We collected responses from 627 participants in total. A few respondents in the Indian sample, however, reported to be over 100 years old, while the oldest US participant reported to be 82 years of age. We have decided to discard all participants above the age 80 to work with two samples with comparable age range (the results are, however, virtually identical if we retain full samples regardless of participants 'age). All responses took more than 240 seconds, which was set as a reasonable minimal threshold for honest questionnaire completion and all participants indicated an exact middle point in the attention check question.

their potential prize to a COVID related charity (CDC Emergency Respond Fund).

To test the effect of moral messages on health intentions and donation behaviour, we prepared a set of seven messages that appealed to MAC moral principles: *Family, Loyalty, Reciprocity, Heroism, Deference, Fairness,* and *Property*. We also prepared three categories of control messages: Blank, Prudential, and General Moral. To increase the participants' attention, we asked them to rate the clarity of the message on a 100-point scale. Each message began with an excerpt based on the WHO briefing on COVID-19 (World Health Organization, 2020). The second part of the message was based on one of the seven MAC moral principles, Blank message, Prudential message, and General Morality message. All the messages used in the study are presented in Table 1.

Table 1

The list of moral and control messages persuading to follow social distancing used in the study

The first part of the message
Please read the following information carefully:
According to the World Health Organization, the COVID-19 outbreak can now be described as a pandemic. This assessment reflects the speed and the scale of transmission. Despite frequent warnings, the World Health Organization is deeply concerned that people are not taking the necessary steps to combat this serious threat.

The second part of the message		
Type of message		Message
Morality as Cooperation messages	Family	People who follow the guidelines and take precautions are being loving. You have a special obligation to help your family. People who DO NOT follow the guidelines and take precautions are being uncaring. They are putting their families at risk.
	Loyalty	People who follow the guidelines and take precautions are being civic-minded. We are all in this together and have to stand strong. People who DO NOT follow the guidelines and take precautions are being unpatriotic. They are putting their community at risk.
	Reciprocity	People who follow the guidelines and take precautions are being trustworthy. You help others, and they will help you. People who DO NOT follow the guidelines and take precautions are being untrustworthy / cheats. They are harming others who are helping them.
	Heroism	People who follow the guidelines and take precautions are being brave. The strong have a duty to protect the weak. People who DO NOT follow the guidelines and take precautions are being cowardly. Their weakness is putting others at risk.

	Deference	People who follow the guidelines and take precautions are being respectful. We ought to follow the advice of those in authority. People who DO NOT follow the guidelines and take precautions are being hubristic. Their disobedience puts others at risk.
	Fairness	People who follow the guidelines and take precautions are being fair. We all have to equally share the burdens of solving this problem. People who DO NOT follow the guidelines and take precautions are being unfair. They are expecting others to do all the work to solve this problem.
	Property	People who follow the guidelines and take precautions are being mindful of others' space. We have no right to infringe upon the health of others. People who DO NOT follow the guidelines and take precautions are being like thieves. They are robbing others of their health.
	Blank	–
Control messages	Prudential	People who follow the guidelines and take precautions are being sensible. You have to do what you can to help yourself. People who DO NOT follow the guidelines and take precautions are being foolish. They are putting themselves at unnecessary risk.
	General moral	People who follow the guidelines and take precautions are being ethical. You have to do what you can to help others. People who DO NOT follow the guidelines and take precautions are being bad. They are putting others at unnecessary risk.

Measures

Pandemic Health Measures Intentions Scale. To assess peoples' intentions during the pandemic, we developed a short scale, which listed a set of intentions that reflected potential health-related behaviours. In our pilot analyses, we found out that the scale has two underlying factors: *Precautious Intentions* and *Prosocial Intentions* (Supplementary Material, Table S1).

MAC-Q Relevance Scale. To assess seven moral values defined by MAC (Family, Loyalty, Reciprocity, Heroism, Deference, Fairness, Property) we used the MAC-Q Relevance Scale (Curry, Jones Chesters, et al., 2019). People were asked to rate the relevance of 21 different cooperative criteria when making moral judgments (100-point scale, from 1 - not at all relevant, to 100 - extremely relevant). Sample items include Family: *Whether or not someone helped a member of their family;* Loyalty: *Whether or not someone acted in a way that helped their community;* and Heroism: *Whether or not someone was brave.* We also included additional question to control for inattentive participants (*Please, move the slider to the middle, if you are reading this*). In our study we did not conduct confirmatory factor analyses, as the questionnaire has already been validated on a much larger sample (Curry, Jones Chesters, et al., 2019). Each of the

seven categories of moral values was measured with three items and the scales demonstrated sufficiently high reliability (Family α = .83; Loyalty α = .84; Reciprocity α = .82; Heroism α = .78; Deference α = .63; Fairness α = .75; Property α = .88).

Donation. The participants were also entered into a lottery where they could win $100 and given the option of donating a portion of their winnings (0-100%) to the Emergency Respond Fund, organised by the CDC (CDC Foundation, 2021). The participant who agreed to take part in the lottery and shared their email was drawn and the prize was then divided according to their declared preference.

Data Analysis

First, we conducted a confirmatory factor analysis (CFA) to evaluate the applicability of the two-factor structure yielded by previous exploratory factor analysis (EFA) on the incomplete USA sample. Second, to assess the effect of the messages, we created a structural Bayesian model, with separate index intercepts for each message, and slopes for the corresponding MAC score, predicting Precautious and Prosocial Intentions, and the donation, with MAC dimensions as moderators between demographic variables (gender and age) and the outcomes. All continuous variables were standardized before the analysis to have mean = 0 and SD = 1. The relative sizes of effects (slopes from the multiple regressions) can be easily compared between dependent variables. Raw correlations between continuous variables can be found in supplementary figures S5-S7. The details of

the statistical model and its representation as a set of equations can be found in Supplementary Material S1 and the graphical representation of the model in Supplementary Material Figure S1.

CI in the Results section stands for Compatibility Interval. In line with the BASP guidelines, we do not report NHSTP results, including Confidence Intervals (Trafimow & Marks, 2015). Compatibility Intervals were based on HMC sampling, and they are not used to make inferential decisions based on their overlap with point 0. We also provide a whole distribution of likely parameter values. In Bayesian approach, the 89% Compatibility Interval indicates the range in which the parameter lies with 89% probability.

We have used the *rethinking* R package to address the underlying Stan's Hamiltonian Monte Carlo sampler (McElreath, 2020). All data and code can be accessed online (anonymized for peer review: the link to data and code was included in the Cover Letter).

Results

The CFA analysis confirmed the structures of *Precautious Intentions* and *Prosocial Intentions*. Measures RMSEA (USA: 0.08, India: 0.10, together: 0.07) and CFI (USA: 0.93, India: 0.95, together: 0.96) indicate a good model fit. Parallel analysis suggested two underlying factors in both samples which were extracted using EFA with oblimin rotation to allow for correlation between the factors. Factor loadings were similar in both samples (see Figure 1) and the factors were correlated more in the Indian (r = 0.65) than the complete USA sample (r = 0.18).

Figure 1

Results of the exploratory factor analysis with oblimin rotation in the US (N = 313) and Indian (N = 302) sample revealing consistently two underlying factors predicting 9 items of Pandemic Health Measures Intentions Scale
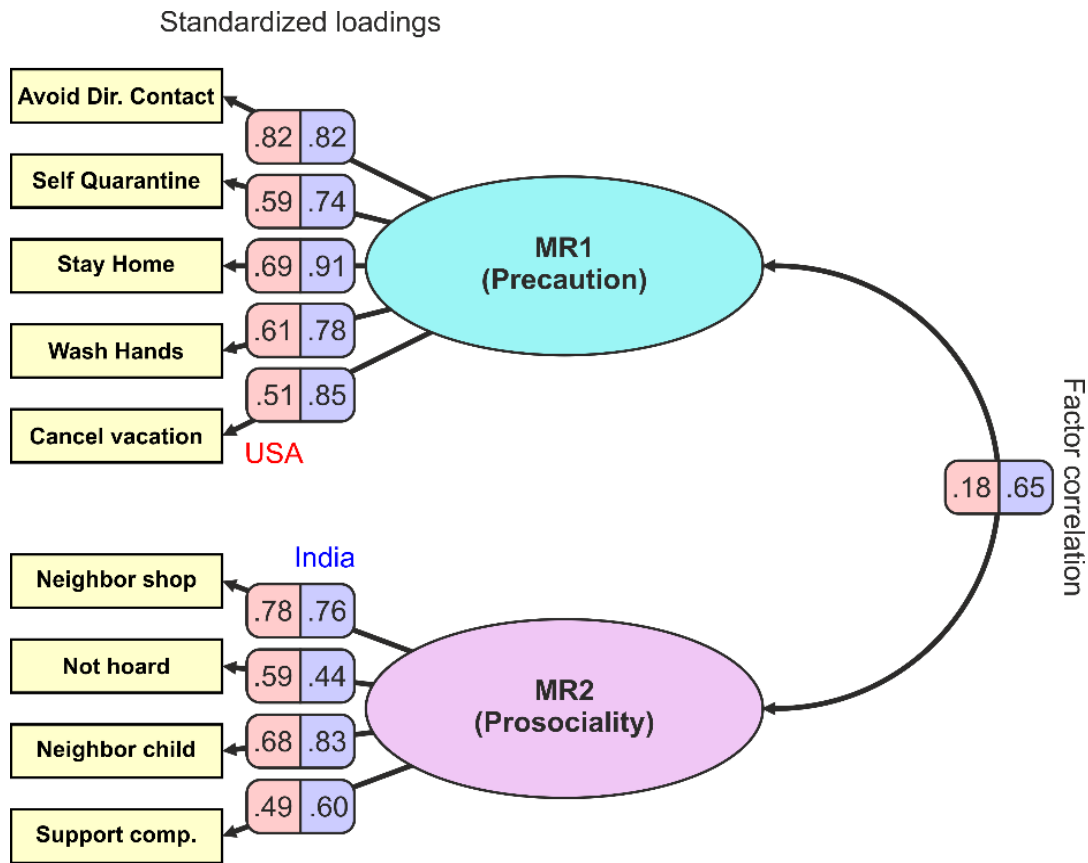
People in both countries were willing to donate similarly (USA mean = 51.43, SD = 35.75, range = 0 – 100, Indian mean = 50.39, SD = 31.22, range = 0 – 100, overall mean = 50.92, SD = 33.55). Higher score of prosociality seems to elevate the donation slightly in both samples [β = 0.07, 89% CI: –0.00, 0.14, β_US = 0.07, 89% CI: –0.03, 0.17, β_In = 0.11, 89% CI: –0.01, 0.23].

Models comparison, according to WAIC, favoured the parsimonious single sample model (WAIC = 1743.6, SE = 24.75). More detailed model comparisons are presented in Supplementary Material S2. The calculated WAIC is not influenced by the differences in correlations between dimensions yielded from separate factor analysis. Hence the difference in correlation between Prosocial and Precautious Intentions in the Indian (strong correlation) and USA (weak correlation) sample is still worth attention.

Do Moral Messages Have a Greater Effect on Intentions and Donations than Non-moral Messages?

Moral messages did not increase Precautious Intentions in comparison to Prudential message [δ = –0.10, 89% CI: –0.27, 0.06] or a Blank message [δ = –0.08, 89% CI: –

0.23, 0.08]. They also did not increase the Prosocial intentions in comparison to Prudential message [δ = –0.03, 89% CI: –0.20, 0.14]. However, in comparison to the Blank message, moral messages increased Prosocial intentions [δ = 0.13, 89% CI: –0.03, 0.29]—this estimate was likely driven by a large impact of Heroism message (see below). Moral messages induced higher Donation than the Prudential message [δ = 0.22, 89% CI: 0.04, 0.40], but not much more than the Blank message [δ = 0.10, 89% CI: –0.08, 0.28].

Do Some Moral Messages Have a Greater Effect on Intentions and Donation than Others?

We found out that Heroism message positively increased Prosocial Intentions in both samples [β = 0.24, 89% CI: 0.07, 0.41]. At the same time Heroism message had a negative impact on the Precautious Intentions [β = –0.12, 89% CI: –0.28, 0.05].

Are these Effects Moderated by Moral Values?

Descriptive statistics for the results of the MAC-Q scale for each sample are presented in Table S2 in the Supplement. The effect of the MAC score concordant with the message increased the Precautious Intentions in the US sample [β_{US} = 0.14, 89% CI: 0.00, 0.27], but the overall effect does not hold [β = 0.00, 89% CI: –0.09, 0.09] due to its absence in the Indian sample [β_{In} = –0.06, 89% CI: –0.18, 0.05]. (See Supplementary figure S2, or table S5 for the full posterior that includes this effect.)

Do these Effects Vary Across Cultures?

We found some effects of messages specific to the USA sample. Messages referring to Reciprocity elevated Precautious Intentions [β_{US} = 0.18, 89% CI: –0.03, 0.38]. Conversely, messages referring to Deference decreased the Precautious intentions [β_{US} = –0.27, 89% CI: –0.48, –0.05]. Also, messages referring to Property decreased Donations [β_{US} = –0.14, 89% CI: –0.37, 0.09].

We also found that the control Blank message decreased the amount of donated money in the Indian sample [β_{In} = –0.16, 89% CI: –0.39, 0.06]. The effects of messages on Precautious Intentions, Prosocial Intentions and Donation are presented in Figure 2.

Figure 2

Posterior distribution of parameter values in the part of the structural model that predicts Donation, Precautious Intentions, and Prosocial Intentions
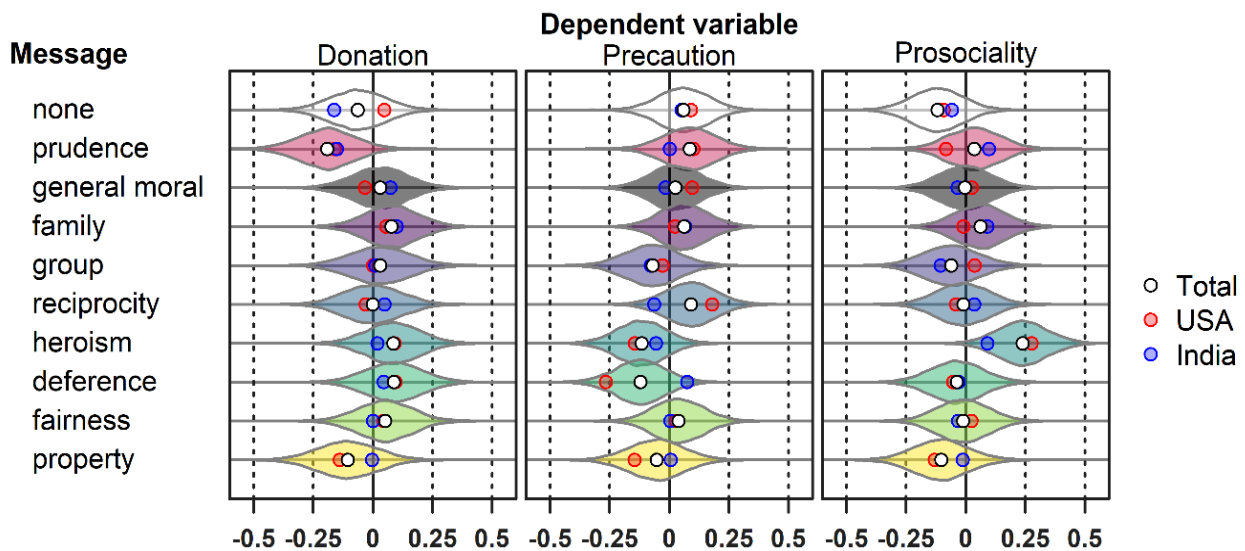
Note. Density diamonds outline distributions of plausible parameter values in the model without contrasts between national samples. White points mark means of these distributions and coloured points mark distribution means estimated separately for each national sample. Prosociality and Precaution Intentions were extracted as dimensionless factor scores, so their mean is naturally 0, and SD is 1. Before standardization variable Donation had mean = 50.92, SD = 33.55. The slopes were estimated on the standardizes scale for comparison of the effect sizes between Donation and the factor scores.

Exploratory analyses

The results of additional analyses, which explored the associations between MAC-Q scores, demographic factors, Precautious Intentions and Prosocial Intentions as well as Donation are presented in the Supplementary material (S2).

Discussion

The present study investigated the effects of moral messages, based on the Morality-as-Cooperation framework, on people's pandemic-related intentions and behaviours. It contributes through verifying the effectiveness of different types of moral messages from a new theoretical perspective

that takes into account domains not addressed previously, for example, Heroism and Property (Curry, Mullins, et al. 2019). We aimed at verifying (1) whether moral messages are more effective than non-moral messages, (2) whether some moral messages are more effective than other types of moral messages, (3) whether the effectiveness of moral messages are moderated by the corresponding moral values of the individual, and (4) whether these effects hold across cultures.

Regarding the first question, we found that, compared to non-moral messages, moral messages increased peoples' donations

to a fund aimed at fighting COVID-19, and compared to a lack of message, moral messages increased people's Prosocial Intentions. Regarding the second question, we found that the only category of moral messages that had an effect in both samples was the category of Heroism—messages referring to these values increased people's Prosocial Intentions, but at the same time, decreased peoples' Precautious Intentions. Also, displaying Prudential message decreased the amount of Donation. Regarding the third question, we found that messages concordant with people's own moral values increased their Precautious Intentions, but only in the US sample. Finally, regarding the fourth question, we found differences between the US sample and the Indian sample in their reactions to particular moral messages, including backfiring effects. In the US sample, Reciprocity messages increased the Precautious Intentions, Deference messages decreased the Precautious Intentions and Property messages decreased the amount of Donation. In the Indian sample, we found that the lack of a message decreased the amount of Donation.

When compared to Prudential message, moral messages increased peoples' Donations to a fund aimed at fighting COVID-19, and compared to a Blank message, moral messages increased people's Prosocial Intentions. This result supports our hypothesis only partially—it suggests that references to morality may generally have some effect, but it is not clear why these differences were observed only in these particular comparisons. However, the results get clearer when we look at specific conditions.

Heroism was the only moral message that had a similar effect in both samples. Message capitalizing on Heroism emphasized that people who follow the health guidelines are being brave, that the strong must protect the weak and that those who do not follow guidelines are being cowardly and are putting others at risk. On the one hand, in response to the Heroism-based message, people increased their Prosocial Intentions (for example, taking care of neighbour's children if they must be hospitalised due to the virus), but on the other hand, they decreased their Precautious Intentions (for example, washing hands with soap for at least 30 seconds). Both of these effects reflect one of the fundamental aspects of the Heroism category—heroic (hawkish) behaviours act as signals of superior power and status (Curry, 2007). They benefit others, but at the same time, they are risky, and costly (Kraft-Todd & Rand, 2019). Similarly, prosocial behaviours during the pandemic benefit others, but might be risky and costly. Precautious behaviours, contrarily, are focused on securing one's own health, therefore might be interpreted as selfish and cowardly. It could be that messages glorifying heroism triggered the intention for risky, or costly behaviours and at the same time suppressed the intention for behaviours that could be interpreted as a sign of weakness, as they focused on preserving one's own health. This result demonstrates that some moral messages may have a backfiring effect—this effect is already known in the literature on vaccine hesitancy (Nyhan et al., 2014).

Tailoring persuasive messages in accordance with peoples' personal moral values also might be a valid approach, but only in a certain culture (Joyal-Desmarais et al., 2022). People who received messages concordant with their moral values increased their Precautious Intentions—however, this effect was found only in the US sample. It could be that this populational difference was due to the cultural differences between Indian and US populations associated with the "tightness" and "looseness" of behavioural norms (Gelfand et al., 2011). Tight cultures, such as Indian, developed strong behavioural norms that they adhere to and are more likely to restrict the range of permissible behaviours. By contrast, loose cultures, such as the USA, have a much lower need for order and are more tolerant of deviant behaviours. It could be that messages referring to peoples' personal moral values had a better effect on their intentions in the 'loose' culture, as it is more permissible to realise personal motivations, rather than motivations that align with the group interest. This finding is in line with the recent observation that the link between personal values and behaviour is much more prominent in loose cultures, as in these cultures people are less restricted by social norms and are more likely to be driven by their personal norms (Elster & Gelfand, 2021).

We observed populational differences regarding particular moral messages as well. Reciprocity increased the Precautious Intentions in the United States sample. It may be because compliance with health precautions was voluntary in the USA, and

people's behaviour may have been more dependent on what others were doing; whereas in India compliance was mandatory by law (on March 24, the Indian government imposed a nationwide lockdown (Sarkar et al., 2020; Trivedi, 2020). It could be that people in India did not interpret behaviours preventing COVID-19 as favours to others, but rather as behaviours aimed at avoiding legal costs.

We also found backfiring effects in the United States. Deference messages decreased peoples' Precautious Intentions. Perhaps, the importance of 'freedom' in the USA led people to react negatively to these messages, whereas deference is more salient in Hindu culture, which stresses the importance of the concepts like *dharma* (meaning duty, righteousness, merit). Indeed, DeFranza and colleagues (2020) demonstrated that restricting social gatherings during the pandemic could result in reactance and an *increase* in social gatherings. Consistent with previous work, showing differences in tightness-looseness in the US and India (Gelfand et al., 2011), respecting authority is more critical for the citizens of India than for the citizens of the United States (Khan & Stagnaro, 2015). Finally, we found that people donated less money when they received a Property-based message (US) and when they did not receive any message at all (India). It might be that people from a more individualistic population, the USA, see possessions as part of their own self (Morrison & Johnson, 2011), therefore framing a moral message in the context of possessions could increase individualists perceived value of their money and discourage them from

donating. In India, however, any type of message had a positive effect on Donation.

Differences between USA and Indian samples, and our post-hoc explanations, should be treated with caution. We demonstrated that some population-level factors influence peoples' response to COVID-19 moral messages, but we do not know whether these factors are associated with culture, or circumstances associated with the pandemic, like the response strategy employed by each government. Nevertheless, we want to stress that population differences might be crucial in using moral messaging to change behaviours limiting the spread of the virus—especially because they can have a backfiring effect.

Limitations and Future Directions

It is important to interpret our results with caution. Our sample included participants from two populations, and it does not allow us to extrapolate the results on a wider group of people. In our study, we wanted to verify whether these effects hold across cultures. We were able to show that while some of the results, such as the effect of Heroism, are found in both India and the United States, these are still only two cultures and a much larger study that considers a more diverse set of cultural backgrounds is needed to talk about cultural universalism and variability. It is also important to note, that our study was conducted during the early stages of the pandemic, and we are not able to predict how these messages would work under different circumstances — whether they would be more or less effective in the later stages of the pandemic. In the early

stages of the pandemic, for example, the media repeatedly praised health workers for their heroism (Cox, 2020). It is possible that people were more susceptible to messages that portrayed following directions as an act of heroism — they may have thought it would bring them the admiration of others, as it did for health workers. furthermore, we conducted our study concerning peoples' intentions and behaviours during the COVID-19 pandemic. We do not know to what extent the results would apply to different situations and different kinds of behaviours. Finally, our messages appealed to both positive and negative versions of the same moral ('by following health guidelines you are acting morally' and 'by breaking health guidelines you are acting immorally'). As such, we don't know whether messages with different valence (positive or negative), perhaps interacting with moral type, might have different effects. It has been shown recently, for example, that negative messages regarding social distancing increased peoples' defiance (Legate et al., 2021). Finally, there is a risk that the messages we designed tapped into other factors that may have had some persuasive effect. For example, the Property message was the only one that mentioned health, and referring to it could potentially have some additional impact. This risk, however, was unavoidable as we wanted to design theoretically valid messages, but also wanted these messages to look like they could actually appear in the public space.

Application

Appealing to morality can improve the effectiveness of communication (Feinberg &

Willer, 2019; Joyal-Desmarais et al., 2022). For example, in the field of preventive health care like vaccination — it has been demonstrated that vaccine hesitancy is associated with moral values (Amin et al., 2017) and that a carefully designed communication strategy, that includes appeals to morality, is an important aspect of whether people will vaccinate (Attwell & Navin, 2022; Nyhan et al., 2014). Also, authors of the recent studies exploring social determinants of COVID-19 vaccine hesitancy have argued that peoples' social attitudes might lead to a delay in the vaccination process and future studies should investigate how to design effective communication (for example, Bilewicz & Soral, 2021). In this context, using Morality-as-Cooperation to support morality-based communication has a great application potential. Our study, however, is an early step on the road from scientific evidence to practice. Below, in the spirit of Trafimov and Osman's postulates (2022), we outline the necessary next steps to use Morality-as-Cooperation for evidence-based communication.

- Our study was set in the context of a pandemic. Future research must also consider communication in the context of other issues fundamental to the human condition. One such key context may be the issue of climate change. A reason to start with this particular context is that despite being one of humanity's key problems, psychological research on communication about climate change has not sufficiently covered appeals to morality (for review see: Maibach, et al.,

2023). Examining how the appeal to morality works in different contexts can, on the one hand, show us the contextual factors that influence the effectiveness of appeals to specific moral values, but may also prove to have very broad communicative potential (our results suggest that the Heroism is a good candidate; Curry et al., 2020).

- Another issue that must be clarified is the expected outcome of appeals to cooperation. In our study, we tried to influence people's intentions and the amount of donated money. Effective communication can also potentially influence other aspects of psychological functioning, like attitudes (for example, support for certain policies; Hurlstone et al., 2014), emotional response (Bilandzic et al., 2017), or knowledge (for example, it can neutralize misinformation; Cook et al., 2017). MAC-based research may influence all of these aspects, also counterproductively — we need to know specific consequences before using MAC-based messages on a large scale.

- Finally, the last step would be to validate the effectiveness of MAC-based messages in ecologically valid experiments — in real-life communication with real behaviours. Basic research carried out in controlled laboratory conditions may not translate to the noisy world. In practice, communication involves a myriad of unpredictable factors that can ruin communication strategies based solely on basic research. We, therefore, recommend that this approach should be tested in

actual communication campaigns and interventions. To do so, it may be necessary for researchers to work with NGOs, politicians or commercial companies on the use of MAC to pursue their interests. A solid theoretical grounding does not guarantee MAC's effectiveness outside the lab (Trafimow and Osman, 2022).

The advantage of our experimental approach over correlational studies is that we can infer cause-and-effect relationships, and hence provide some communication tips. Above all, those designing moral messages need to pay attention to the cultural context. Most effects did not generalise easily to both populations. In addition, one must be wary of backfiring — we have shown that the application of certain messages can be counterproductive. However, these tips are protective in nature: we hint at what to do to avoid making the persuasion less effective. Further research is needed to develop proactive guidance on what to do to improve morality-based communication.

Wherever people interact with each other on a cooperative basis, cooperation appeals can be relevant. Politicians, activists, educators, health professionals or people working in advertising should be aware that appeals to morality may not be effective in contexts disconnected from cooperation. In such contexts, it would be impossible or unconvincing to design cooperative appeals (for example, to promote beauty products or to sell cigarettes). For this very reason, one must also be careful in advising the application of MAC to *any* health-promoting behaviour. Reducing the spread of the virus is more grounded in a cooperative context than, for example, healthy eating or regular exercise, where by far the main beneficiary is the person undertaking the activity. We believe that the research pathway proposed in this section will resolve these issues and provide proactive guidance on appeals to cooperation. Even if the effects of framing the messages this way will be proven to have very small effects, it is still important as large-scale communication strategies may reach enormous numbers of people and even small effects can become practically significant. More importantly, if future research proves that some kind of messages may have consistent backfiring effects, this could save a lot of energy, time and money for people planning the communication strategy — it is better to avoid messaging if it is counterproductive.

Conclusion

The present study investigated the role of a wide range of morals on behaviour in the pandemic. The findings highlight the utility of adopting MAC's comprehensive account of moral values in messaging. We found that messages referring to *Heroism* increased people's intentions to act prosocially both in US and Indian samples. In addition, we found that other messages did not uniformly change people's behaviour, and some of them backfired. Future work should build on this novel theoretical framework, to better understand the role of moral values in real-world behaviour.

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