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The emotional path to action: Empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic

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Abstract

The COVID-19 pandemic presents a major challenge to societies all over the globe. To curb the spread of the disease, two measures implemented in many countries are minimizing close contact between people ("physical distancing") and wearing face masks. In the present research, we tested the idea that physical distancing and wearing face masks can be the result of a prosocial emotional process—empathy for those most vulnerable to the virus. In four preregistered studies (N=3,718, Western population), we show that (i) empathy indeed relates to the motivation to adhere to physical distancing and to wearing face masks, and (ii) inducing empathy for those most vulnerable to the virus promotes the motivation to adhere to these measures (whereas merely providing information about the importance of the measures does not). In sum, the present research provides a better understanding of the promoting factors underlying the willingness to follow two important measures during the COVID-19 pandemic.

Keywords: COVID-19; Empathy; Face masks; Physical distancing; Prosociality

Introduction

The COVID-19 pandemic presents a unique challenge to societies all over the globe. In recent history, most major societal crises (e.g., the financial crisis of 2008) could be successfully addressed through political interventions. At these times, citizens were guided to essentially "keep calm and carry on." An epidemic crisis, however, is different. To hinder an accelerating growth in infections, changes in the core social habits of citizens are necessary and these behavioral changes are required to happen exceptionally fast. The present contribution examines the psychological motivation behind two behavioral measures implemented during the COVID-19 pandemic: physical distancing, that is, the minimization of close contact with others, and second, wearing face masks.[1] Both physical distancing and wearing face masks reduce the probability that an infected person spreads the virus SARS-CoV-2 to those not infected (Dehning et al., 2020; Feng et al., 2020; Leung et al., 2020; Zhang et al., 2020) and, hence, both measures aim to reduce the excessive demands on health systems and thus allowing effective treatment of the most vulnerable (Emanuel et al., 2020).

Physical distancing is recommended and promoted by national and international institutions (Centers for Disease Control and Prevention; World Health Organization) as well as national governments around the globe. To enforce physical distancing, many health institutions and authorities have opted for a combination of encouragement and the implementation of strong regulations such as limiting social life in public spaces or shutting down public institutions and private companies to strict curfews. Policy implementations regarding *face masks* have differed across countries and over the course of the pandemic. Whereas in mid-March 2020 only about ten countries recommended wearing masks, by late July 2020, the majority of countries around the world require wearing masks, at least in certain public places (Initiative Masks4all, 2020).

To understand psychological motivations related to these behaviors, it is important to note that both come at considerable personal cost. In fact, physical distancing implies reducing social contact with valued close others. At the same time, however, practicing physical distancing does not only protect oneself but has clear prosocial aspects in the sense that it helps

[1] The World Health Organization initially referred to "physical distancing" as "social distancing" but now recommends the use of the present term. The reason is that it is important to encourage continued social interaction (e.g., via telecommunication) during epidemic isolation periods. We use the term "face masks" to refer to simple cloth (non-surgical grade) face masks.

to protect *other* individuals, especially those most vulnerable to the virus. A similar reasoning applies to wearing face masks. Personal costs are present when wearing face masks since they alter one's appearance and breathing, and some people find it (initially) strange to wear a face mask in public (Capraro & Barcelo, 2020; Carbon, 2020). It is important to note that simple cloth (non-surgical grade) face masks are likely to have a greater effect on protecting other individuals (vs. the wearer) from virus infection by retaining most of the respiratory droplets released from the wearer (Cheng, Wong, et al., 2020; Greenhalgh et al., 2020). From this perspective, wearing a face mask is a clear prosocial act (Cheng, Lam, et al., 2020).

Building on these notions, we tested the idea that physical distancing and wearing face masks can reflect and can be encouraged through the activation of a prosocial emotion—empathy for those most vulnerable to the virus (Batson, 2011). In four studies that include samples from the US, the UK, and Germany, we test whether (i) empathy is related to the motivation for physical distancing, and (ii) whether inducing empathy for those most vulnerable to the virus causally increases the motivation to adhere to physical distancing and to wearing a face mask. In this way, the present studies identify the emotional basis for the motivation to adhere to crucial measures to fight the COVID-19 pandemic. Even more importantly, the present research provides direct evidence for policymakers on how to tailor their communication to achieve greater public compliance, and ultimately to save lives.

Empathy, prosociality, and health behaviors

Empathy can be defined as an umbrella term capturing the range of a person's responses to another individual's experience (Hodges & Myers, 2007). Past research has convincingly demonstrated the beneficial consequences of both affective as well as cognitive empathy for the welfare of others. Specifically, cognitive empathy (i.e., taking the perspective of others) has been linked to reductions of inter-group conflicts and prejudice, while affective empathy (i.e., a concern for and an understanding of vulnerable others) has been shown to promote altruism and caring (Batson et al., 1981; Sassenrath et al., 2016; Todd & Burgmer, 2013).

Anthropologist Margaret Mead considered caring about vulnerable (harmed) others—who would, as is in the animal kingdom, die without the help of a caring individual—to be the first sign of civilization in a culture (Byock, 2013). In the modern health context, affective empathy in particular has been shown to improve health outcomes. For instance, physicians'

affective empathy levels have been positively associated with reduced metabolic complications and better self-care in diabetic patients (Hojat et al., 2011; Del Canale et al., 2012). Affective empathy has further been shown to promote healthcare professionals' adherence to handwashing compliance to protect others in hospitals (Sassenrath et al., 2016; Grant & Hofmann, 2011).

Overall, past research suggests that empathy motivates a variety of behavioral outcomes aimed at helping and protecting vulnerable others. Here, we test, first, whether empathy for those most vulnerable to the virus (e.g., the elderly, who are more likely to suffer from severe symptoms and have a higher mortality; Centers for Disease Control and Prevention, 2020) is associated with increased physical distancing (Studies 1 and 2) and, second, whether experimentally induced (affective) empathy promotes the motivation to adhere to physical distancing (Study 3) and to wear a face mask (Study 4).

Ethics statement

All studies were conducted in line with the Declaration of Helsinki and the guidelines of the American Psychological Association (APA). Participants gave informed consent before starting the study. There was no deception of participants. All studies were preregistered. Data, materials, and the preregistrations are available on the Open Science Framework (https://osf.io/pq3ky/). All results remain robust in terms of significance levels and effect sizes when controlling for participants' gender and age. We applied attention checks to secure high data quality; less than 2.4% of participants failed the attention checks in each study (see OSF for the exact numbers per study). All results hold when all subjects are included.

Study 1

Method

Study 1 consists of three non-representative samples (each $N > 300$) from Western countries being affected by the COVID-19 pandemic: The US, the UK, and Germany. The sample in the US was collected on March 17, 2020 (UK and Germany: March 18). At that time, none of the countries was completely locked down; in fact, it was possible to still go to bars and shops; home office was promoted but not implemented nationwide (this status also holds for Studies 2 and 3 reported in this article).

Participants. Participants were recruited via the crowdsourcing platform Prolific to complete a short survey on "coronavirus (COVID-19)" in exchange for 0.40£ (~0.47 US Dollar). Sample size for all samples was based on an *a priori* power analysis to detect effects of $r > .20$ with high statistical power (Power = .95; alpha-level .05, two-tailed). Based on this analysis, we aimed to collect at least 314 participants in each sample (final samples Study 1: 322 participants from the US, 45.7% female, $M_{age} = 33.33$, $SD = 13.00$; 317 from the UK, 59.3% female, $M_{age} = 38.05$, $SD = 12.20$; 326 from Germany, 46.6% female, $M_{age} = 29.44$, $SD = 9.31$).

Measures. We measured affective empathy for those most vulnerable to the virus with three items, adapted from Pfattheicher et al. (2019; in all samples, Cronbach's $\alpha > .81$). The items read, "I am very concerned about / I feel compassion for / I am quite moved by what can happen to … those most vulnerable to coronavirus (COVID-19)." If not indicated otherwise, labels in the studies always ranged from 1 = "strongly disagree" to 5 = "strongly agree." The items measuring empathy were mixed with three filler items to reduce demand characteristics. We observed relatively high levels of empathy, with some variability (US: $M = 4.46$, $SD = 0.74$; UK: $M = 4.56$, $SD = 0.61$; Germany: $M = 4.02$, $SD = 0.93$).

In each sample of Study 1, individuals indicated their physical distancing practice via self-report on a 5-point Likert scale (possible range 1–5); the item reads, "Because of coronavirus (COVID-19), I am massively curtailing social contact (so-called 'social distancing')."[2] We used the term "social distancing" instead of "physical distancing" because "social distancing" was much more common in the media and news at the time data was collected. We observed relatively high levels of physical distancing in each country, with some variability (US: $M = 4.30$, $SD = 0.99$; UK: $M = 4.12$, $SD = 1.01$; Germany: $M = 4.04$, $SD = 1.11$).[3]

[2] We also measured the item "Because of coronavirus (COVID-19), it is very important that others massively curtail their social contact (so-called 'social distancing')"; we preregistered that we will compute the average of the self-related and the other-related item if they are correlated $r > .60$. We deviate here from the preregistration, keep separate the self-related and the other-related item (due to conceptual reasons), and report in the main text only the results including the self-related item. Results including the other-related item are equivalent (cf. https://osf.io/pq3ky/).

[3] We additionally measured "motivation to stay in self-quarantine [isolation] if infected", "motivation to follow major rules imposed by the government", and political orientation. Motivation was positively correlated with empathy; higher empathy scores were negatively correlated with conservatism (cf. https://osf.io/pq3ky/ for the results).

Results

In line with the idea that physical distancing is motivated by empathy, we document in all three countries a positive relation between empathy and physical distancing (US: $r = .54$, 95% confidence interval (CI) = [.41, .65], $p < .001$; UK: $r = .34$, 95% CI = [.22, .45], $p < .001$; Germany: $r = .42$, 95% CI = [.31, .51], $p < .001$; see Figure 1).

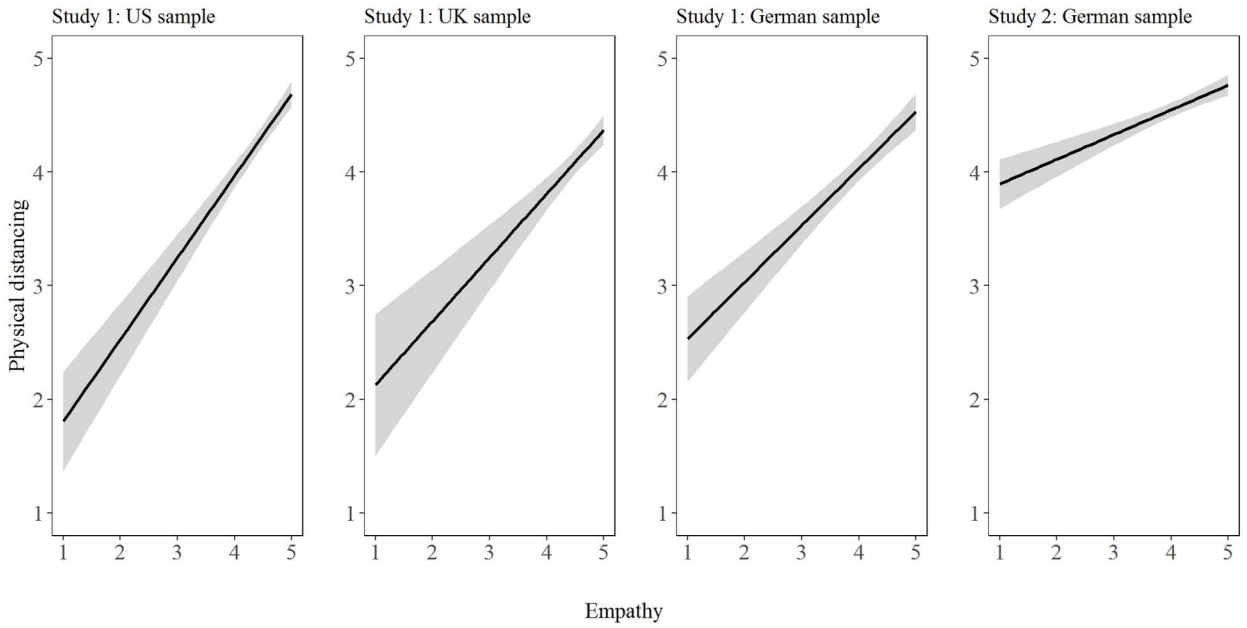

Figure 1. Physical distancing predicted by empathy in Studies 1 and 2. The shaded areas represent 95% confidence intervals; the full possible range of both scales is displayed (1-5).

Study 2

In Study 2, conducted on March 19, 2020, we replicated the findings of Study 1 in a different German sample, and assessed physical distancing in a different way.

Method

Participants. Participants were recruited via the crowdsourcing platform Clickworker to complete a short survey on "coronavirus (COVID-19)". Power analysis was the same as for Study 1; we collected $N = 361$ participants from Germany (48.5% female, $M = 29.75$, $SD = 9.40$).

Measures. We applied the same measurement of empathy as in Study 1 (possible range 1-5, $M = 4.06$, $SD = 0.94$, $\alpha = .89$) but assessed physical distancing in a more concrete and

prospective way (five items; overall $M = 4.56$, $SD = 0.65$, $\alpha = .76$); two sample items read, "In the coming days, I will visit elderly people (e.g., parents, grandparents, elderly friends) during my leisure time" and, "In the coming days, I will likely be at places where other people will also be (e.g., ice cream parlor, café, church) during my leisure time." Item labels ranged from 1 = "very unlikely" to 5 = "very likely." The items were re-coded for the analyses of Study 2 so that higher values reflect more physical distancing.

Results

In Study 2, we also found that empathy relates to physical distancing ($r = .31$, 95% CI = [.21, .42], $p < .001$; see Figure 1), replicating Study 1 (cf. Supplementary Material for a discussion of Studies 1 and 2).

Study 3

Study 3 was built on the knowledge gained from Studies 1 and 2 and sought to test whether we can *use* empathy to promote physical distancing.

Method

Participants. Sample size for Study 3 was based on an *a priori* power analysis to detect at least effects of $f > .13$ with high statistical power (Power = .90; alpha-level .05, two-tailed). Based on this analysis, we aimed to collect 800 participants. Study 3 ($N = 868$; 43.8% female, $M_{age} = 35.09$, $SD = 12.44$) was run in Germany on March 19 and 20, 2020. Participants were recruited as in Study 2, but could not participate in Study 3 if they had already participated in Study 2.

Experimental conditions. Participants were randomly assigned to one of three conditions: the *information only condition* ($n = 305$); the *information + empathy condition* ($n = 258$); and, the *control condition* ($n = 305$). We had a slightly higher dropout in the *information + empathy condition,* possibly because of the additional video that participants had to watch in the information + empathy condition (this issue is absent in Study 4); of note, conditions did not significantly differ in terms of the assessed demographics: gender, $\chi^2(2, N = 864) = 1.08$, $p = .582$), age, $F(2, 865) = 0.58$, $p = .558$, $\eta^2 = .00$, 95% CI = [.00, .01], (all tests reported are two-

sided), and household size, $F(2, 865) = 1.09$, $p = .337$, $\eta^2 = .00$, 95% CI = [.00, .01].[4]

Participants in the *information only condition* read (translated from German), "At the time of the COVID-19 pandemic: Researchers emphasize that reducing contact between persons is an effective tool for slowing the spreading of the virus. A slowed spread of the virus relieves pressure from the hospitals. A collapse of hospitals would be particularly dangerous for those most vulnerable in our society, in particular elderly and sick people. Therefore, it is important to reduce contact between persons." In the *information + empathy condition*, in addition to the information that was presented in the information only condition, we showed participants a one-minute video where a 91-year-old man sadly reports that he stops visiting his chronically sick wife due to the virus (see https://osf.io/pq3ky/ for the video). Participants could not proceed with the study before the video ended. The video was pretested in an independent study ($N = 51$; detailed results are available at https://osf.io/pq3ky/) and elicited high levels of affective empathy. In the *control condition*, no information and video were given. As the central dependent variable, we measured adherence to physical distancing with the same items as in Study 2 ($\alpha = .76$).

Results

A one-way ANOVA shows that the motivation to adhere to physical distancing differed between conditions, $F(2, 865) = 6.06$, $p = .002$, $\eta^2 = .01$, 95% CI = [.002, .03], (see Figure 2). Additional analyses revealed that the motivation to adhere to physical distancing did *not* significantly increase by information only, *control condition*: $M = 4.30$, $SD = 0.76$, *information only condition*: $M = 4.39$, $SD = 0.74$; $t(608) = 1.58$, $p = .115$, Cohen's $d = 0.13$, 95% CI = [-0.04, 0.28]. In contrast, the motivation to adhere to physical distancing increased significantly by inducing empathy; the *information + empathy condition* had a significantly higher mean of 4.51 ($SD = 0.66$) compared to the *control condition*, $t(561) = 3.52$, $p < .001$, Cohen's $d = 0.30$, 95% CI = [0.13, 0.46]. The *information + empathy condition* and the *information only condition* also did differ significantly from each other, $t(561) = 1.97$, $p = .049$, Cohen's $d = 0.17$, 95% CI = [0.01, 0.33]. In sum, the results of Study 3 suggest that inducing empathy for those most

[4] Despite the fact that the measured demographics do not differ across conditions, we want to acknowledge that the differential dropout may still undermine random assignment and causal inference in Study 3. Please note that this issue is absent in Study 4.

vulnerable to the virus promotes the motivation to adhere to physical distancing. In the next study, we tested the role of empathy in following another important measure: wearing face masks.

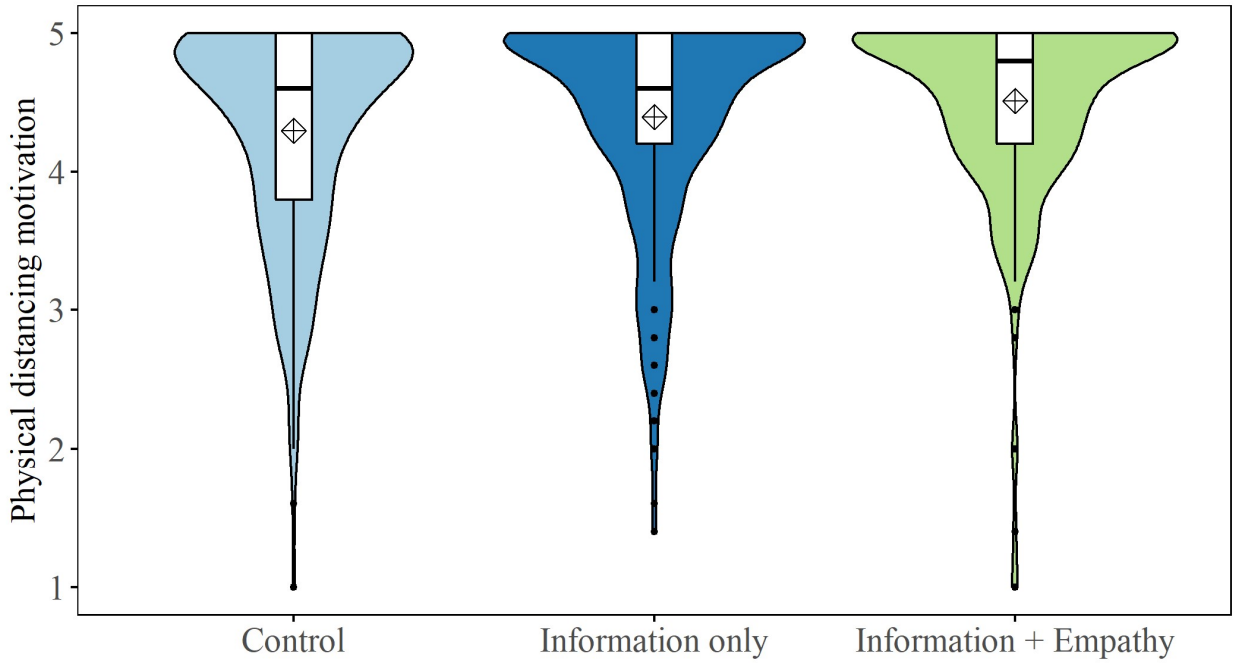

Figure 2. Physical distancing motivation depending on the experimental conditions (Study 3). The vertical box indicates the interquartile range from the 25th to the 75th percentile, including the median (line) and the mean value (diamond); displayed outliers (black dots) are observations that are 1.5 times the interquartile range below the 25th percentile; the shaded areas indicate the density of observations.

Study 4

The fourth study addresses several limitations of Study 3. First, given that physical distancing protects not only other individuals but also oneself, an alternative explanation of the findings obtained in Studies 1 to 3 is that affective empathy makes one sensitive for one's own vulnerability, which in turn increases physical distancing for egoistic (rather than prosocial) reasons. In fact, the motivation for physical distancing includes other- and self-concerns (Wise et al., 2020). Thus, in Study 4, we shifted to a different measure in the context of the COVID-19 pandemic that is clearly other-oriented and prosocial—wearing simple cloth (non-surgical grade)

face masks (Cheng, Lam, et al., 2020). At the time of this study, these masks were generally believed to have a greater effect on protecting other individuals (vs. the wearer) from virus infection (Cheng, Wong, et al., 2020; Greenhalgh et al., 2020). That these face masks protect other people is known by the vast majority of the population from which the sample in Study 4 was recruited (German citizens; Betsch et al., 2020). At the time the study was conducted, only research showing that face masks protect *other* people was promoted by public health institutions in Germany and covered by mass media, but not that face masks have a protective function for the wearer; that is, the prosocial effects of face masks were clearly in focus and highlighted at that time.

Second, to further rule out the alternative explanation that affective empathy makes one sensitive for one's own vulnerability, which in turn promotes one's (egoistic) motivation to adhere to COVID-19 measures, we assessed individuals' objective vulnerability (whether one is in a high-risk group or not) as well as individuals' subjective vulnerability. We tested whether those objectively being vulnerable or subjectively considering themselves as vulnerable (vs. not) would be more likely to adhere to the assessed COVID-19 measure after an empathy-induction (to protect themselves).

Third, in Study 3, the empathy condition differed from the other conditions in regard to the mode of presentation; in Study 4, we hold the mode of presentation (i.e., reading a text) constant. Fourth, in Study 4, we assessed state empathy after participants were either assigned to an *empathy condition*, an *information only condition*, or a *control condition*. In this way, we are able to show empirically that higher levels of state empathy are directly related to the motivation to adhere to COVID-19 measures. Fifth, and importantly, we generalize the effect of affective empathy on a different important measure in the context of the COVID-19 pandemic: wearing a face mask.

Method

Participants. We aimed to collect 1500 participants for Study 4 (three between-subjects conditions). With this sample size, we are able to detect effects of $f > .09$ with high statistical power (Power = .90; alpha-level .05, two-tailed). Study 4 (final $N = 1526$; 47.2% female, $M_{age} = 34.71$, $SD = 12.09$) was run in Germany between June 23 and June 26, 2020. At the time the study was conducted, it was mandatory in Germany to wear a face mask in public places (e.g., in

shops and in public transport). Participants were recruited as in Studies 2 and 3, but could not participate in Study 4 if they had already participated in the previous studies.

Experimental conditions. Participants were randomly assigned to one of three conditions: the *information only condition* (n = 492); the *empathy condition* (n = 500); and, the *control condition* (n = 534). Conditions did not significantly differ in terms of the assessed demographics: gender, $\chi^2(2, N = 1516) = 3.49$, $p = .175$, age, $F(2, 1523) = 0.48$, $p = .618$, $\eta^2 = .00$, 95% CI = [.000, .004] and household size, $F(2, 1523) = 0.77$, $p = .463$, $\eta^2 = .00$, 95% CI = [.00, .01].

Participants in the *information only condition* read an informative text from the Robert Koch Institute (Germany's national public health institute) about the coronavirus, how it is transmitted (aerosols), and that face masks can prevent the spread of the disease. Full material of the conditions can be found on the OSF (https://osf.io/pq3ky/). Participants in the *empathy condition* read a text of approximately similar length, in which a woman with a rare immune disease (Membranoproliferative Glomerulonephritis Type III) reports having gone through a coronavirus infection and details how seriously affected she was (comatose; intensive care unit), and that she does not like it when people meet others without wearing a face mask. Before the respective text in the *information only condition* and in the *empathy condition* was presented, participants read that they should read the entire text in order to qualify for payment for the study; the "next" button to proceed with the study was displayed only after 75 seconds. In the *control condition*, no text and information were given, resembling a situation of no intervention.

State empathy. After the conditions, participants responded to three items assessing state empathy, as in previous research (Batson et al., 1997; Pfattheicher et al., 2019). The items read, "Right now, I am … compassionate," "… moved," "… touched" ($\alpha = .94$).

Motivation to wear a face mask. As the central dependent variable, we then measured the motivation to wear a face mask with one item: "During the coming days, I will wear a face mask as often as possible when I meet other people."

Additional measures. We further measured participants' objective vulnerability—whether a participant is in a high-risk group (n = 551, 36.1%) or not (n = 973, 63.8%), according to the criteria of the Robert Koch Institute (e.g., whether one is above 50 years old; smoker; chronically ill). We also measured participants' subjective own vulnerability with one item ("How dangerous do you consider you being infected with the new coronavirus?") and the subjective vulnerability

of others ("How dgerous do you consider other people being infected with the new coronavirus?"). Labels ranged from 1 = "very harmless" to 5 = "very dangerous." We additionally explored whether empathy can change policy acceptance of wearing masks; the results are reported in detail on the OSF (https://osf.io/pq3ky/) and basically show that participants in the *empathy condition* report significantly higher policy acceptance of wearing masks compared to those in the *control condition* (Cohen's $d = 0.20$, 95% CI = [0.08, 0.33], $p = .001$) but not compared to those in the *information only condition* (Cohen's $d = 0.07$, 95% CI = [-0.05, 0.20], $p = .258$).

Results

We first tested whether the three conditions differed in state empathy. This was the case, $F(2, 1523) = 649.36$, $p < .001$, $\eta^2 = .46$, 95% CI = [.43, .49]. Participants in the *empathy condition* reported significantly higher state empathy levels ($M = 4.03$, $SD = 0.90$) compared to the *information only condition* ($M = 2.14$, $SD = 1.00$, $t(990) = 31.22$, $p < .001$, Cohen's $d = 1.99$, 95% CI = [1.84, 2.14]; and compared to the *control condition* ($M = 2.10$, $SD = 1.01$), $t(1032) = 32.41$, $p < .001$, Cohen's $d = 2.01$, 95% CI = [1.86, 2.16]. The *information only* and the *control condition* did not differ significantly, $t(1024) = 0.76$, $p = .449$, Cohen's $d = 0.04$, 95% CI = [-0.08, 0.16].

A one-way ANOVA shows that the motivation to wear a mask also differed between conditions, $F(2, 1523) = 8.97$, $p < .001$, $\eta^2 = .01$, 95% CI = [.003, .02], (see Figure 3). Additional analyses revealed that the motivation to wear a mask was significantly higher in the *empathy condition* ($M = 4.00$, $SD = 1.12$) compared to the *control condition* ($M = 3.69$, $SD = 1.24$), $t(1032) = 4.25$, $p < .001$, Cohen's $d = 0.26$, 95% CI = [0.14, 0.38], and significantly higher than in *the information only condition*, ($M = 3.83$, $SD = 1.20$); $t(990) = 2.43$, $p = .015$, Cohen's $d = 0.15$, 95% CI = 0.02, 0.27]. The motivation to wear a mask also increased in the *information only condition* compared to the *control condition*, but failed to reach conventional levels of statistical significance, $t(1024) = 1.76$, $p = .079$, Cohen's $d = 0.12$, 95% CI = [-0.01, 0.24].

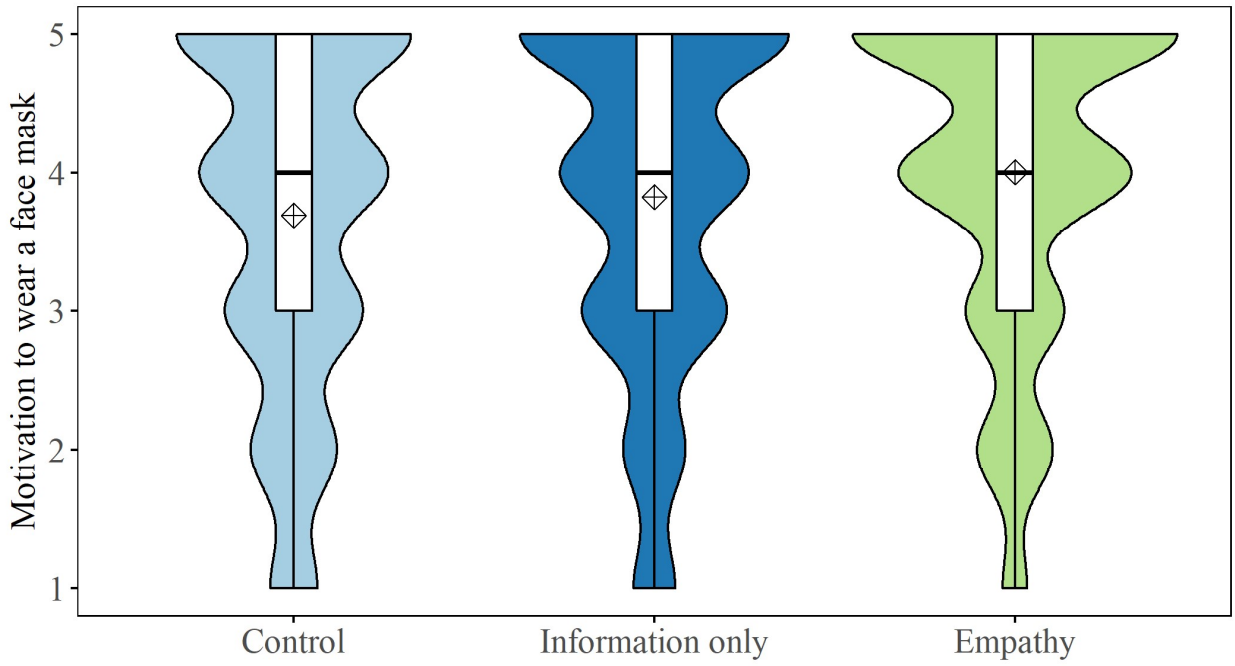

Figure 3. Motivation to wear a face mask depending on the experimental conditions (Study 4). The vertical box indicates the interquartile range from the 25th to the 75th percentile, including the median (line) and the mean value (diamond); the shaded areas indicate the density of observations.

Next, we tested whether higher levels of state empathy are directly related to the motivation to wear a face mask. In fact, state empathy was positively correlated with the motivation to wear a mask across conditions: $r = .27$, 95% CI = [.22, .31], $p < .001$, which was especially the case in the *empathy condition*, $r = .45$, 95% CI = [.34, .53], $p < .001$ (*information only condition*: $r = .25$, 95% CI = [.16, .33], $p < .001$; *control condition*: $r = .16$, 95% CI = [.08, .24], $p < .001$). That is, with higher levels of state empathy the motivation to wear a mask increased. We further tested two indirect effect models (non-preregistered) to test whether state empathy explains the effect of the empathy condition on the motivation to wear a face mask. In fact, controlling for state empathy significantly reversed the effect of the empathy condition (model 1: empathy condition vs. control condition, total effect $B = 0.31$, 95% CI = [.17, .46], $p < .001$, direct effect $B = -0.36$, 95% CI = [-.56, -.16], $p < .001$, 95% CI indirect effect [0.52, 0.84]; model 2: empathy condition vs. information only condition, total effect $B = 0.09$, 95% CI = [.02, .16], $p = .015$, direct effect $B = -0.30$, 95% CI = [-.40, -.20], $p < .001$, 95% CI indirect effect

[0.31, 0.47]; see OSF for detailed reporting of the indirect effect models). As such, these analyses further support the conclusion that state empathy drives the effect of the empathy condition on the motivation to wear a face mask.

Finally, we tested whether those objectively being vulnerable or subjectively considering themselves (or others) being vulnerable (vs. less so) would be more likely to adhere to the assessed COVID-19 measures after the empathy-induction. We found that subjective vulnerability increased in both the *empathy condition* (Cohen's *d* own vulnerability = 0.11, 95% CI = [-0.01, 0.24], *p* = .061; others' vulnerability *d* = 0.17, 95% CI = [0.05, 0.29], *p* = .004) and the *information only condition* (*d* = 0.15, 95% CI = 0.03, 0.28], *p* = .010 and *d* = 0.14, 95% CI = [0.02, 0.26], *p* = .020) compared to the *control condition*. By contrast, the *empathy* and the *information only condition* did not significantly differ (*d* = -0.04, 95% CI = -0.17, 0.08], *p* = .464 and *d* = 0.03, 95% CI = [-0.10, 0.15], *p* = .621; see Supplementary Material on the OSF for means, *SD*s, and test statistics). In addition, none of the vulnerability measures significantly moderated the effect of the *empathy condition* on wearing masks (all *p*s of the interaction terms > .17). Also, the indirect effect models (non-preregistered) of the *empathy condition* (vs. *control condition*; vs. *information only condition*) on the motivation to wear a mask via considering oneself subjectively vulnerable were non-significant, and the *empathy condition* (vs. *control condition*; vs. *information only condition*) remained as a significant predictor (both *p*s < .01) when objective and subjective vulnerability (both self and other) were controlled for. Overall, these findings speak against the alternative interpretation that affective empathy makes one sensitive for one's own vulnerability, which in turn promotes one's (egoistic) motivation to adhere to COVID-19 measures.

General Discussion

The present investigation has two major findings. First, empathy for those most vulnerable to the virus represents an emotional basis regarding the motivation for physical distancing and wearing a face mask. Second, we can actually *use* empathy to promote the motivation in people to follow these two important measures. Importantly, providing individuals with *mere* background information about why it is important to adhere to physical distancing or to wear a mask was not enough to significantly increase the behavioral motivation; only if empathy was added did motivation increase.

The present research has important policy implications. Specifically, in the effort to reach high numbers of people following measures that curb the spread of the virus, it might not be sufficient to provide only basic information about why the measures are important. Basic information certainly is important, and we do want to emphasize that the non-significant effects of providing mere information in Studies 3 and 4 do not provide evidence against the usefulness of information. However, in addition to basic information, it seems that affective empathy is an emotional ingredient that further increases the motivation to adhere to measures during the COVID-19 pandemic. As such, when designing interventions and communication materials to change behavior during the COVID-19 pandemic, policymakers should consider enriching mere informational content with emotional content. As shown in the present investigation, empathy for those most vulnerable to the virus might be a promising candidate here. Likewise, the present research points to the prosocial effects of empathy-related information shared on social media (where the material from Study 3 originated) and news outlets (where the material from Study 4 originated). The present research supports the efforts of continuing with such practices.

The findings of the present studies are remarkable from four points of view. First, the finding that empathy promotes the motivation to engage in protective measures during the COVID-19 pandemic is particularly noteworthy given the already high motivation (in the control groups) to engage in physical distancing and to wear a face mask. In this regard, we contribute to the existing literature by showing that empathy can even increase motivation given very high baseline levels. In fact, such an effect is relevant in the context of a pandemic, in which every single behavioral change increases the chances of preventing the spread of the disease.

Second, and related, we want to refer to other well-powered studies that have found null-effects when testing how messages should be framed to increase adherence to measures during the pandemic (e.g., Barari et al., 2020; but see Lammers et al., 2020; Kitamura & Yamada, 2020). Worth mentioning is the preliminary result that a short empathy-related message appealing to protect the people in one's life whom one typically cares about the most (close friends and family) could not significantly increase the motivation for physical distancing (Favero & Pedersen, 2020). Likewise, highlighting in a short statement the risk of the virus to older and vulnerable adults did not significantly alter individuals' motivation to adhere to several measures such as handwashing, covering their mouth when they sneeze or cough, and working from home (Utych & Fowler, 2020). These null-findings are an important contribution to the

literature, as we might learn under which conditions empathy unfolds its prosocial potential, and under which conditions a positive effect of empathy is less likely to emerge. We speculate that the studies by Favero and Pedersen (2020) and Utych and Fowler (2020) differ from our studies in the strength of the experimental manipulation. In the present experimental studies, we used strong manipulations (in terms of effect size) that elicited high levels of state empathy. As shown in Study 4, increasing levels of state empathy were then related to the motivation to follow one recommended measure (i.e., wearing a face mask). Overall, finding an effective way to improve adherence to measures seems of particular importance for societies all over the globe (Habersaat et al., 2020; Van Barvel et al., 2020). In this regard, strong affective information might be one key to motivate people to follow recommended measures.

Third, it is an interesting finding that the level of subjectively considering oneself (or others) as vulnerable to the virus was rather similar in the empathy condition and in the information only condition (Study 4). In fact, we show that empathy promotes the motivation to wear a face mask beyond vulnerability perceptions. In this regard, we contribute to the empathy literature by showing that threat perceptions to the coronavirus are unlikely to be altered in an empathic state.

Fourth, the present work (i) offers some of the largest preregistered experiments testing the effect of empathy on prosocial tendencies (cf. the meta-analysis by McAuliffe et al., 2020), and (ii) offers an alternative account to the idea (as put forward in McAuliffe et al., 2020) that prosocial effects of empathy in past studies are driven by reduced prosociality in the "control" condition rather than increased prosociality in the empathy condition (for an in-depth discussion of these points, see the Supplementary Material at https://osf.io/pq3ky/).

In discussing the findings, we finally want to acknowledge limitations of the present research and point to future directions. First, we want to mention that the present work remains silent on whether pure psychological altruism (i.e., the *ultimate* goal to increase the welfare of another individual; Batson et al., 2002) underlies the shown effects of empathy in the present work. Although previous research by Batson and colleagues has ruled out several egoistic explanations, concluding that empathy is a genuine altruistic emotion (for an overview, see Batson, 2011), we cannot in the present study rule out potential egoistic explanations, such as the desire to develop a good reputation or to avoid social sanctions. Second, we want to note that although we show in Study 4 that empathy promotes the motivation to wear a face mask, we do

not find that empathy significantly promotes policy acceptance of wearing masks beyond providing mere information. As such, we show a boundary condition of the effectiveness of empathy; it thus remains inconclusive about which *other* measures or attitudes empathy may or may not promote. Third, we want to acknowledge that the observed effect sizes in the experimental studies were small (especially when tested against the mere information conditions). We argue, however, that small effect sizes matter in the context of a pandemic (cf. Funder & Ozer, 2019). We furthermore want to acknowledge that the present set of studies was conducted in Western countries only, and the samples were not representative of the entire population in these countries. The studies were conducted online using self-reports. The intervention (inducing empathy) was applied and tested on only a short-term scale. As such, it might be useful to replicate the present studies' findings using different stimuli as well as representative samples; to conduct the studies in other (non-)Western countries; and, to measure the long-term consequences of (repeated) induction of empathy.

Nonetheless, we argue that these shortcomings do not limit the basic conclusions and the potential of the findings in mitigating the COVID-19 pandemic. In fact, the present research highlights the potential of using empathy as a tool to promote physical distancing and wearing a face mask and, thus, to save lives, especially of the most vulnerable members of our societies.

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Supplementary information:

Datasets and supplementary material are available on the OSF (https://osf.io/pq3ky/)

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