




Social Psychology

# Caring About (COVID-19 Related) Social Issues Signals Trustworthiness: Direct and Conceptual Replication of Zlatev (2019)

Angela R. Dorrough<sup>1</sup> <sup>a</sup>, Nathalie Bick<sup>2</sup> <sup>b</sup>, Lukas Bring<sup>1</sup>, Caroline Brockers<sup>1</sup>, Charlotte Butz<sup>1</sup>, Iris K. Schneider<sup>1</sup> <sup>c</sup>

<sup>1</sup> Department of Psychology, University of Cologne, North-Rhine Westphalia, Germany, <sup>2</sup> University of Hagen, North-Rhine Westphalia, Germany

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With three convenient samples ( $n = 1,087$ ) and one sample representative for the German population in terms of age and gender ( $n = 210$ ), we replicate research by Zlatev (2019) showing that perceived benevolence-based and perceived integrity-based trustworthiness increase with a target's level of caring about a social issue. We show that these results generalize to various issues ranging from environmental issues (i.e., installation of wind turbines in the North Sea) to issues related to the COVID-19 pandemic (i.e., online teaching to prevent the spread of the virus). Furthermore, we provide initial behavioral evidence for this effect by showing that transfers in a trust game increase with a target's caring about a social issue. All results are robust for age, gender, and social issue. To provide best estimates for the effect of a target's level of caring on perceived trustworthiness, we report results of three mini meta-analyses including our findings as well as the findings of the original research. Policy implications are discussed.

In every-day life, much is a matter of trust – selecting our child's day care center, voting for a certain political party, and forming friendships. Given this relevance, it is not surprising that a wealth of research has dealt with the question of who and when people trust (see De Jong et al., 2016; Dunning et al., 2019; Thielmann et al., 2020; van den Akker et al., 2020 for recent meta-analyses and reviews). The current (2019-today) COVID-19 pandemic has made the question of trust more important than ever. In Germany, virologist Prof. Christian Drosten was declared a figure of trust (Kupferschmidt, 2020). In March 2021, the former German chancellor Dr. Angela Merkel was advised to ask for a vote of trust following several instances of allegedly poor crisis management (Deutsche Welle, 2021).

Empirical research conducted after the outbreak of COVID-19 suggests that trust can even save lives. With two studies conducted in Germany, for example, Dohle and colleagues (Dohle et al., 2020) show that trust in politics and science predicted the acceptance and adoption of behavioral measures intended to combat the spread of the virus. Similarly, Jovančević and Milićević (2020) show that general trust in other people is positively associated with preventive behavior. Furthermore, people with lower levels of trust in reputable sources of information were more likely to be vac-

ination opponents than supporters (Murphy et al., 2021).

Trust depends on beliefs of trustworthiness and unconditional kindness (Ashraf et al., 2006). Due to its relevance, it is important to learn more about who we trust and what makes someone a trustworthy target. Zlatev (2019) showed that one factor that influences whether people are perceived to be trustworthy is the extent to which someone cares about an issue. Irrespective of agreement on an issue, people who care more are rated higher on two important dimensions of trustworthiness: integrity-based (i.e., a target's honesty or virtuousness) and benevolence-based (i.e., a target's kindness or positive intentions) trustworthiness. In addition, Zlatev's (2019) work provides initial behavioral evidence for the effects by showing that participants relied more on information provided by a high caring vs. low caring target and indicated that they would trust high caring targets more in a trust game.

We extend these findings in five important ways: First, the original work included only highly politically debated social issues that were rather abstract to participants. For instance, capital punishment is a controversial issue, but few people have direct experience in that area. To investigate whether the effects generalize to issues that are more directly relevant to the general audience, we include social

a Richard-Strauss-Str. 2, 50931 Köln, Germany, [angela.dorrough@uni-koeln.de](mailto:angela.dorrough@uni-koeln.de)  
<https://soccoo.uni-koeln.de/angela-dorrough>

b <https://www.fernuni-hagen.de/forschung/schwerpunkte/d212/team/nathalie.bick.shtml>

c <https://irisschneider.nl/>

issues with varying degrees of perceived controversy (e.g., freedom of speech, human cloning) and issues related to the COVID-19 pandemic (e.g., hand washing, privileges for the vaccinated), that have direct consequences for the individuals on a practical level. Second, to further extend the generalization of the effect, and in contrast to the original research, we use a sample representative for (German) society in terms of age and gender. Third, we include an incentivized behavioral standard measure of trust. Specifically, we measured participants' transfers in a trust game toward targets that had expressed varying degrees of caring about the installation of wind turbines in the North Sea. Fourth, to provide the best estimates of the effects, we also present three mini meta-analyses based on both the studies reported in Zlatev (2019) and the studies reported here. Finally, with participant caring and perceived controversy of an issue, we report preliminary results on potential moderating effects.

### Overview of Studies

We conducted four studies (total  $N = 1,297$ ) in Germany. Study 1 serves as a direct replication of Study 2 by Zlatev (2019), Studies 2-4 are conceptual replications and extensions. In Studies 1-3, we used convenient samples with a high percentage of students. For Study 4 we recruited a sample representative for the German population in terms of age and gender. All sample sizes were determined a priori, and all studies reported in the following have a power of  $> 80\%$  to detect the effects of target's caring about a social issue on perceived benevolence-based and perceived integrity-based trustworthiness observed in Study 2 by Zlatev (2019). All studies were pre-registered (Study 1: <https://osf.io/qha3e>; Study 2: <https://osf.io/c25s7>; Study 3: <https://osf.io/6w9dj>; Study 4: <https://osf.io/bdv8u>) and all materials, data, and analyses scripts are available (<https://osf.io/zagkd>). For Study 4, which was a replication and extension of the other studies, we received ethical approval from the ethical committee of the University of Cologne. All studies were programmed in Qualtrics (Qualtrics, Provo, UT). We report all excluded observations, independent variables/manipulations, and dependent variables/measures. For all studies, we expected to replicate the original findings that perceived integrity-based trustworthiness and perceived benevolence-based trustworthiness increase with a target's level of caring about a social issue. Furthermore, for Study 4 we expected that transfer behavior in the trust game increases with perceived trustworthiness of the target (trustee). We specified an additional hypothesis for trust game beliefs which is reported in SOM B together with the respective findings. Hypotheses and results for perceived controversy of a social issue are reported in the main paper in a separate section on moderators. As pre-registered, we report results of one-sided tests for directional hypotheses and two-sided tests for exploratory analyses.

## Study 1

### Method

Study 1 is a direct replication of Study 2 by Zlatev (2019) except for the following changes: In the original study, which was conducted with a US sample, a target's caring and opinion concerning the social issue of capital punishment was presented. Since capital punishment is no longer applied in Germany, we replaced it with the issue of abortion. This issue produced similar results as capital punishment in Study 1 by Zlatev and is socially relevant and highly debated in Germany (Wuermeling, 2020; see also Table S1 in the SOM for actual and perceived controversy of this and all other social issues presented in this article). Second, rather than presenting a target with the name "Jamie", we used the neutral framing "Person A", since names are associated with different personal characteristics that may be related to trustworthiness (e.g., warmth; Nett et al., 2019) – this becomes particularly relevant when presenting multiple targets (see Studies 2-4 of this project).

**Participants.** The smaller of the two relevant effects reported in Study 2 by Zlatev (2019;  $\beta/r = .11$  for perceived benevolence-based trustworthiness) was used as a basis for the a priori power analysis in G\*Power (Faul et al., 2007). Assuming a t-test (difference between independent groups; one-tailed) and a power of 0.80, a sample size of  $N = 517$  was determined and pre-registered.<sup>1</sup> We recruited participants from social networks through posts on social media and a university internal notice board as well as via an email distribution list of the University of Cologne. We restricted participation to people who were at least 18 years of age and had sufficient knowledge of German. A total of 521 participants completed the study. According to the participant code (combination of letters and numbers), eight participants took part twice – in such cases, we excluded the second participation, resulting in  $N = 513$  participants (377 female, 130 male, 4 non-binary, 2 not specified; 18-75 years of age). Data collection took place in June 2020. Students of the University of Cologne received course credit (0.25 hours) for participation. In addition, all participants had the opportunity to take part in a raffle for multiple Amazon gift cards (3x 10€; 1x 20€).

**Procedure.** Following a short definition of abortion taken from a German dictionary (i.e., Duden, n.d.), and as in Study 2 by Zlatev (2019), participants received information about one hypothetical target's thoughts on a social issue (i.e., abortion). Participants were told that Person A thinks abortion should be either legal or illegal. Participants were then told, "On a scale of 1 (caring very little) to 100 (caring very much), Person A thinks the issue of abortion is a \_\_\_." Participants were then shown a randomly generated number between 1 and 100 (see SOM A1 for additional information on the selection of targets). Accompanying this number was a description of what it represented: "In other words, Person A cares [very little/a little/moderately/quite a bit/very

<sup>1</sup> Please note that, in the pre-registration of this study, we referred to an original effect size of  $d = .11$  rather than  $\beta = 0.11$  due to a copying error.

**Table 1. OLS regressions predicting integrity-based trustworthiness (Model 1) and benevolence-based trustworthiness (Model 2) by target caring about a social issue and participant-target agreement in Study 1.**

	(Model 1)	95% CI	(Model 2)	95% CI
	Integrity-based trustworthiness		Benevolence-based trustworthiness	
Target caring	0.31*** (8.15)	[0.23, 0.38]	0.19*** (5.01)	[0.12, 0.26]
Agreement	0.41*** (10.82)	[0.33, 0.48]	0.47*** (12.39)	[0.40, 0.54]
Observations/ Participants	513		513	
R <sup>2</sup>	0.276		0.268	

Note. The table reports standardized beta-coefficients (all variables z-standardized), t-statistics in parentheses, and 95% CIs for beta, \*\*\* $p < .001$ .

much] about this issue.” The number determined which label was displayed: 1 to 20 was “very little,” 21 to 40 was “a little,” 41 to 60 was “moderately,” 61 to 80 was “quite a bit,” and 81 to 100 was “very much.” After seeing this description, participants answered questions about Person A’s integrity and benevolence (see *Measures* for the exact wording of these questions). Participants then answered whether they themselves thought abortion should be legal or illegal as well as how strongly they cared about the issue (using a 5-point Likert-type scale from very little to very much). If both the participant and the target thought the issue should be legal or both thought the issue should be illegal, then that was coded as agreement. Finally, participants indicated how controversial they perceived the issue of abortion to be in society (1 = not at all controversial; 10 = very controversial) for exploratory purposes.

**Measures.** Perceived integrity-based trustworthiness was measured using a German translation of three items ( $M = 4.29$ ,  $SD = 1.43$ ,  $\alpha = .78$ ) taken from Zlatev (2019): “This person has a great deal of integrity,” “I can trust this person’s word,” and “This person cares about honesty and truth.” Perceived benevolence-based trustworthiness was measured using a German translation of three items ( $M = 4.01$ ,  $SD = 1.48$ ,  $\alpha = .79$ ; correlation between perceived integrity- and perceived benevolence-based trustworthiness:  $r = .67$ ) taken from Zlatev (2019): “This person is kind,” “This person is nice” and “This person is selfish” (reverse-coded). All items used a 7-point Likert-type scale (1 = strongly disagree; 7 = strongly agree).

At the end of the questionnaire, we assessed demographics (i.e., age, gender) and participants had the opportunity to comment on the study. Finally, participants created a participant code that allowed us to check if someone took part in more than one of the Studies 1-3 (for more information see SOM B1).

## Results

As pre-registered and in accordance with Zlatev (2019), we ran two linear regression models predicting perceived integrity-based trustworthiness (Table 1, Model 1) and perceived benevolence-based trustworthiness (Table 1, Model 2) by a target’s level of caring about a social issue (1-100) and agreement (yes = 1 vs. no = 0) between participant and

target on the social issue. Replicating the original results by Zlatev (2019), we find that, irrespective of participant-target agreement, both dimensions of perceived trustworthiness increase with a target’s level of caring about a social issue (i.e., abortion). In addition, also replicating the original findings, a main effect of agreement between target and participant on the social issue can be observed for both dimensions. As a robustness check, we reran both models additionally controlling for participant age and gender. All conclusions remain unchanged in these analyses (for the detailed analyses, see SOM Table S2).

## Discussion

Study 1 replicates the original findings by Zlatev (2019) using the issue of abortion (rather than capital punishment) and a German sample and finds that perceived integrity-based and perceived benevolence-based trustworthiness of a target increase with a target’s level of caring about a social issue. However, abortion, like the other social issues included in the original research by Zlatev (2019), arguably is a highly debated social issue with which few participants would have direct experience. Thus, with Study 2 we go a step further by also including social issues that are associated with consequences for the individual and are less strongly politically debated (e.g., freedom of speech).

## Study 2

### Method

Study 2 is an extension of Study 1 using a variety of social issues (i.e., abortion, freedom of speech, marijuana consumption, human cloning, and euthanasia) varied within participants. Each social issue was presented with a different target (Person A-E) and participants were informed that they were always presented with a new person. The social issue of abortion was always presented first. This gave us the opportunity to examine the first trial only as a direct replication of Study 1.

**Participants.** In addition to the generalizability of the previous findings, a potential interaction with perceived controversy was tested in Study 2. For the power analysis, a repeated measurement ANOVA was assumed as the closest approximation for the regression analyses with the clus-

**Table 2. Clustered OLS regressions predicting perceived integrity-based trustworthiness (Model 3) and perceived benevolence-based trustworthiness (Model 4) by target caring about a social issue and participant-target agreement in Study 2.**

	(Model 3)	95% CI	(Model 4)	95% CI
	Integrity-based trustworthiness		Benevolence-based trustworthiness	
Target caring	0.17*** (6.52)	[0.12, 0.22]	0.11*** (4.12)	[0.06, 0.16]
Agreement	0.37*** (13.41)	[0.32, 0.43]	0.43*** (15.46)	[0.37, 0.48]
Observations/ Participants	1415/283		1415/283	
$R^2$	0.166		0.195	

Note. The table reports standardized beta-coefficients (all variables z-standardized), t-statistics in parentheses, and 95% CIs for beta, \*\*\*  $p < .001$ .

ter correction we intended to run. Assuming a small interaction effect of  $f = .10$  and a power of 0.80, a sample size of  $N = 280$  was determined and pre-registered. With this sample size, the power for detecting the original effects of target caring about a social issue on perceived integrity-based and perceived benevolence-based trustworthiness was  $> 0.99$ . We recruited participants from social networks and through posts on social media. We used the same compensation methods as in Study 1. A total of 284 participants completed the study. According to the participant code, one participant took part twice. Thus, we excluded the second participation, resulting in  $N = 283$  participants (196 female, 87 male; 18-81 years of age; 41.7% students). Data collection took place in June 2020.

**Procedure and Measures.** We used the same procedures and measures (perceived integrity-based trust:  $M = 3.75$ ,  $SD = 1.22$ ,  $\alpha = 0.78$ ; perceived benevolence-based trust:  $M = 3.82$ ,  $SD = 1.25$ ,  $\alpha = 0.75$ ; correlation between perceived integrity- and perceived benevolence-based trustworthiness:  $r = .64$ ) as in Study 1 with the exception that we used multiple trials/targets with different social issues. We assessed additional demographics for participants in Study 2 (i.e., level of education, current occupation, whether they studied psychology).

## Results

We again conducted two linear regression models predicting perceived integrity-based trustworthiness (Table 2, Model 3) and perceived benevolence-based trustworthiness (Table 2, Model 4) by target caring about a social issue (1-100) and agreement (yes = 1 vs. no = 0) between participant and target on the social issue. To account for dependencies in error terms due to the repeated measurement design, we clustered standard errors at the participant level. As can be seen from Table 2, both dimensions of perceived trustworthiness again significantly increase with a target's level of caring about a social issue. Also, the effect of participant-target agreement on the social issue is again observed in Study 2. When only analyzing the social issue of abortion, the effects of target caring about a social issue are still significant for both dimensions of perceived trustworthiness (perceived integrity-based trustworthiness:  $\beta =$

0.137,  $p = .005$ ; perceived benevolence-based trustworthiness:  $\beta = 0.110$ ,  $p = .022$ ), thus replicating the finding of Study 1. All conclusions remain unchanged when controlling for participant age and gender as well as social issue using dummy variables (see SOM Table S2).

## Discussion

Study 2 replicates the findings by Zlatev (2019) as well as our findings in Study 1. We show that the effects of a target's caring about a social issue on perceived integrity-based and perceived benevolence-based trustworthiness generalize to a set of various social issues that have implications for society to different degrees. With Study 3, we go a step further and include social issues of immediate practical interest that are relevant to every member of society in the current COVID-19 pandemic. Whereas most of the issues Zlatev (2019) used are applicable to a minority of people, recommendations to combat the spread of COVID-19 concern all members of society. Including these issues can strengthen conclusions concerning the generalizability of the effects (to social crises) and potentially identify boundary conditions. In addition, examining the effects using these issues can have implications for policy.

## Study 3

### Method

In Study 3, we aimed to test whether the effect of caring on trustworthiness generalizes to a different domain, namely the recommendations of the German government to combat the COVID-19 pandemic. The five COVID-19 issues that we used for Study 3 ("regular and thorough handwashing", "closing borders", "restrictions on visits to hospitals and nursing homes", "digitalization of teaching at universities in the upcoming winter semester", and "smartphone app for tracking chains of infection") were selected based on a pretest with 30 participants (16 female, 14 male; 19-50 years of age) and represented restrictions or recommendations that were publicly debated or in place at the time of data collection. More information on the pretest can be found in SOM A2.

**Participants.** The sample size for Study 3 was determined the same way as the sample size of Study 2. Partici-

**Table 3. Clustered OLS regressions predicting perceived integrity-based trustworthiness (Model 5) and perceived benevolence-based trustworthiness (Model 6) by target caring about a social issue and participant-target agreement in Study 3.**

	(Model 5)	95% CI	(Model 6)	95% CI
	Integrity-based trustworthiness		Benevolence-based trustworthiness	
Target caring	0.19*** (6.70)	[0.14, 0.25]	0.21*** (6.99)	[0.15, 0.27]
Agreement	0.17*** (6.40)	[0.12, 0.23]	0.24*** (8.61)	[0.18, 0.29]
Observations/ Participants	1455/291		1455/291	
R <sup>2</sup>	0.066		0.098	

Note. The table reports standardized beta-coefficients (all variables z-standardized), t-statistics in parentheses, and 95% CIs for beta, \*\*\*  $p < .001$ .

pants were recruited and compensated as in Study 1. A total of 294 participants completed the study. Three participants participated twice – again we excluded the second participation, resulting in  $N = 291$  participants (208 female, 80 male, 3 non-binary; 18-65 years of age; 60% students). Data collection took place from June to October 2020.

**Procedure and Measures.** Study 3 followed the same procedure as Study 2 but with recommendations to combat the spread of COVID-19 rather than general social issues. Instead of using brief descriptions (see Studies 1-2), we introduced the COVID-19 related issues as “[issue] is one possible measure to contain the COVID-19 pandemic”. All issues/targets were varied within participants and presented in randomized order. Instead of telling participants that the target thinks an issue should be legal vs. illegal, we informed them that the target is for vs. against the issue/recommendation. The same measures as in the other two studies (perceived integrity-based trustworthiness:  $M = 3.80$ ,  $SD = 1.14$ ,  $\alpha = .83$ ; perceived benevolence-based trustworthiness:  $M = 3.92$ ,  $SD = 1.14$ ,  $\alpha = .72$ ; correlation between perceived integrity- and perceived benevolence-based trustworthiness:  $r = .64$ ) were used.

## Results

We conducted the same analyses as in Study 2 (Table 3). As displayed in Table 3, both dimensions of perceived trustworthiness again significantly increase with a target’s level of caring about a social issue. In addition, we again observed the effects of participant-target agreement on the social issue. All conclusions remain unchanged when controlling for participant age and gender as well as social issue using dummy variables (Table SOM S2).

## Discussion

Using COVID-19 related issues, Study 3 shows that targets that were presented as caring about recommendations to combat the spread of the virus (e.g., closing of borders)

were rated higher on perceived integrity-based and perceived benevolence-based trustworthiness. Thus, our studies show that the effect of a target’s level of caring about a social issue on perceived trustworthiness (Studies 1-3; Zlatev, 2019) is a robust phenomenon and extends to issues that are directly and acutely relevant to people’s lives.

Thus far, our studies were based only on hypothetical instances of perceived trustworthiness. Research shows that participants’ trust levels differ when presented with real targets and actual (financial) consequences of their actions (Holm & Nystedt, 2008). Thus, we now turn to the trust game as a valid standard measure of trust toward non-close others (Weiss et al., 2020). A second potential limitation of the studies reported so far is that most of our samples consisted primarily of students. One might argue that such samples differ from the general population in that they are younger and mostly female. Previous work shows that such demographics might matter for (incentivized) trust (e.g., Buchan et al., 2008; Greiner & Zednik, 2019). Thus, in Study 4 we turn to a representative sample of German citizens. In sum, Study 4 will give us more insight into the generalizability of the effect over populations and situations.

## Study 4

### Method

With Study 4, which was conducted with a broader sample, we aimed to combine and extend Studies 1-3 by using general and COVID-19 related issues as well as real targets (i.e., other participants of the study). In addition, the second aim was to provide behavioral evidence for the link between a target’s level of caring about a social issue and trust by using the trust game. Study 4 consisted of a pretest for selecting the issues (for more information see SOM A2) and two parts administered with a time lag of approximately one week.

**Participants.** Again, sample size estimation was conducted with G\*Power (Faul et al., 2007). Again, assuming a repeated measurement ANOVA and a power of .80, we

aimed to collect a sample size of  $N = 260$  (for 10 observations per participant).<sup>2</sup> Please note that the actual power to detect the effect was  $>.99$ . Recruitment for this study was done via the panel provider Respondi (<https://www.respondi.com/>). For Part 1 of the study, 330 participants were recruited, 210 of whom also completed Part 2 (106 female, 104 male; 18-74 years of age). All dependent variables were measured in Part 2. As pre-registered, our analyses only included participants who completed both parts. Data collection took place in March 2021. Participants received a fixed amount for their participation according to the guidelines of Respondi. In addition, they received a bonus payment depending on their behavior and the behavior of a randomly chosen other participant in the trust game. This bonus payment ranged between 0 and 1.80€ ( $M = 0.94€$ ). More information concerning the bonus calculation is provided in SOM A3.

**Procedure.** Study 4 consisted of two parts: In Part 1, participants indicated their own level of caring (very little / a little / moderately / quite a bit / very much) about the 10 pretested social issues. Five issues (general social issues) concerned a broad spectrum of socially and environmentally relevant issues (i.e., freedom of speech, abortion, installation of wind turbines in the North Sea, euthanasia, and human cloning). The remaining social issues concerned the current COVID-19 pandemic (i.e., hand washing in the COVID-19 pandemic, digitalization of school and university teaching, home office due to the COVID-19 pandemic, restrictions on visiting senior residences and hospitals, privileges for vaccinated people). In addition to level of caring, participants' opinion on each issue (general social issues: "legal vs. illegal", COVID-19 issues: "for vs. against") was measured. The general social issues were presented first (in randomized order) followed by the COVID-19 issues (in randomized order) to make sure that participants did not evaluate all issues in the context of the pandemic (e.g., freedom of speech during the pandemic). Finally, participants again indicated how controversial they perceived the different social issues to be in society and how familiar they were with them (1 = not at all familiar; 10 = very familiar).

In Part 2, participants rated 10 different targets (i.e., other participants of this study), named "Person A" to "Person J" (one for each social issue) on integrity-based and benevolence-based trustworthiness. For each of these targets, participants viewed information about their thoughts on a social issue indicated in Part 1. Specifically, participants were provided with this target's level of caring about the social issue as well as his or her opinion on the issue. For every social issue, observed combinations of caring and opinions were presented in such a way that each participant was presented with each caring level at least once. Please note that the range of caring varied between studies: In Studies 1-3, participants were presented with caring levels between 0 and 100. In Study 4, the level was restricted to 1 to 5 to increase the likelihood that most of the possible combinations between options and levels of caring would be

observed at least once in Part 1 (see Zlatev, 2019 for comparable results when using these five categories compared to the continuous measure). Again, the general social issues were presented first (in randomized order) followed by the COVID-19 issues (again in randomized order; see also SOM A1 on more details concerning the presentation of targets). Following the trustworthiness ratings, participants answered four comprehension questions on the trust game, which had to be answered correctly before proceeding with the study. Then, participants played the trust game with 10 different targets (i.e., other participants of this study selected from Part 1; called "Person B1" to "Person B10") with all possible combinations of caring (1-5) \* opinion (legal vs. illegal) but only one social issue (i.e., installation of wind turbines in the North Sea). A short definition of wind turbines was taken from <https://www.offshore-windindustrie.de/windparks/deutschland>. To avoid deception, 20 participants were recruited in the role of the trustee (two for each combination of opinion \* caring) in Part 2 and were matched with the trustors after termination of the study to calculate the bonus payments. Twelve of the invited trustees actually participated. As pre-registered, these participants were excluded from the trust game analyses.

**Measures.** For perceived integrity-based trustworthiness and perceived benevolence-based trustworthiness, we used the same measures as in Study 1-3 (perceived integrity-based trust:  $M = 3.87$ ,  $SD = 1.54$ ,  $\alpha = .92$ ; perceived benevolence-based trustworthiness:  $M = 4.01$ ,  $SD = 1.27$ ,  $\alpha = .64$ ; correlation between perceived integrity- and perceived benevolence-based trustworthiness:  $r = .77$ ). Furthermore, as a behavioral measure of trust, we used transfers in a trust game. Specifically, participants were endowed with 3 Talers (i.e., the experimental currency; 1 Taler = 0.30 €) and could decide which amount (0, 1, 2 or 3 Talers) they wanted to transfer to the respective target. They were informed that the transfer was tripled by the experimenter and that the target could transfer back any amount between 0 and the received amount. For each target, they were also asked to estimate the expected return (between 0 and the amount that the trustee received). In the following, we will only present results for trust game transfers, results for trust game beliefs are provided in SOM B2.

## Results

We conducted the same analyses as in Study 3 (Table 4, Models 7 & 8). For behavioral trust, we predicted trust game transfer (Table 4, Model 9) by a target's level of caring and participant-target agreement on the issue of wind turbines in an OLS regression with cluster corrected standard errors. As displayed in Table 4, we find the effect of target caring for all three outcomes. All conclusions remain unchanged when controlling for participant age and gender as well as social issue using dummy variables (SOM Table S2). The conclusions for behavioral trust remain unchanged when excluding transfers of zero or using a binary outcome

<sup>2</sup> Due to a copying error, for Study 4, the sample size was based on an effect of  $d = .11$  rather than  $\beta/r = .11$ .

**Table 4. Clustered OLS regressions predicting integrity-based trustworthiness (Model 7), benevolence-based trustworthiness (Model 8), and trust game transfer (Model 9) by target caring and participant-target agreement in Study 4.**

	(Model 7)	95% CI	(Model 8)	95% CI	(Model 9)	95% CI
	Integrity-based trustworthiness		Benevolence-based trustworthiness		Trust game transfer	
Target caring	0.16*** (7.51)	[0.12, 0.20]	0.13*** (6.21)	[0.09, 0.17]	0.17*** (7.83)	[0.13, 0.21]
Agreement	0.24*** (8.50)	[0.19, 0.30]	0.27*** (8.88)	[0.21, 0.33]	0.20*** (7.13)	[0.14, 0.26]
Observations/ Participants	2100/210		2100/210		1980/198	
R <sup>2</sup>	0.086		0.091		0.067	

Note. The table reports standardized beta-coefficients, t-statistics in parentheses, and 95% CIs for beta, \*\*\*  $p < .001$ .

(transfer yes vs. no).

### Moderator Analyses for all Reported Studies

In the studies reported in this article we included additional measures for (in part exploratory) moderator analyses. The results of these analyses are reported in what follows.

### Perceived Controversy

The first potential moderator we examined is the perceived controversy of a social issue in society. Research in other domains examining the effect of perceived attitudes or attitude involvement has shown that the type of topic matters for the social judgment people make about the attitude holder. For example, discussing a controversial topic provokes anxiety and discomfort and can result in negative evaluation of the interaction partner (Simons & Green, 2018). Furthermore, when people express their opinion on a social issue, controversy of the topic influences how they are perceived on various dimensions (e.g., Beall et al., 2017). For example, expressing strong feelings about a controversial topic makes people seem more competent than expressing strong feelings about trivial topics (Pillaud et al., 2018). Thus, it seems that the degree to which a topic is controversial matters for the degree to which caring about a topic and expressing an attitude about a topic influences perception of the interaction partner or the attitude holder.

Thus, for Studies 2-4, we pre-registered two additional hypotheses – namely, that the effects of a target's level of caring about a social issue on perceived integrity-based trustworthiness and perceived benevolence-based trustworthiness are moderated by perceived controversy of the social issue. To test these hypotheses, perceived trustworthiness was predicted by a target's level of caring about a social issue, perceived controversy of the social issue as well as the interaction of perceived controversy of the social issue with a target's level of caring about a social issue controlling for participant-target agreement on the social issue. For Study 1, this analysis was conducted on an exploratory basis. For perceived integrity-based trustworthiness, such an effect has been observed for Study 1 only ( $\beta =$

0.08,  $p = .037$ ;  $p > .227$  for all other studies), whereas for perceived benevolence-based trustworthiness we did not observe such an effect (all  $p > .072$ ). Thus, due to the small effect size and its inconsistency, we cannot make strong claims concerning such a moderation until further studies provide more evidence.

Besides perceived controversy, we explored two additional potential moderators – perceived familiarity of an issue and participant caring – as indicators of the relevance of a topic for participants.

### Perceived Familiarity

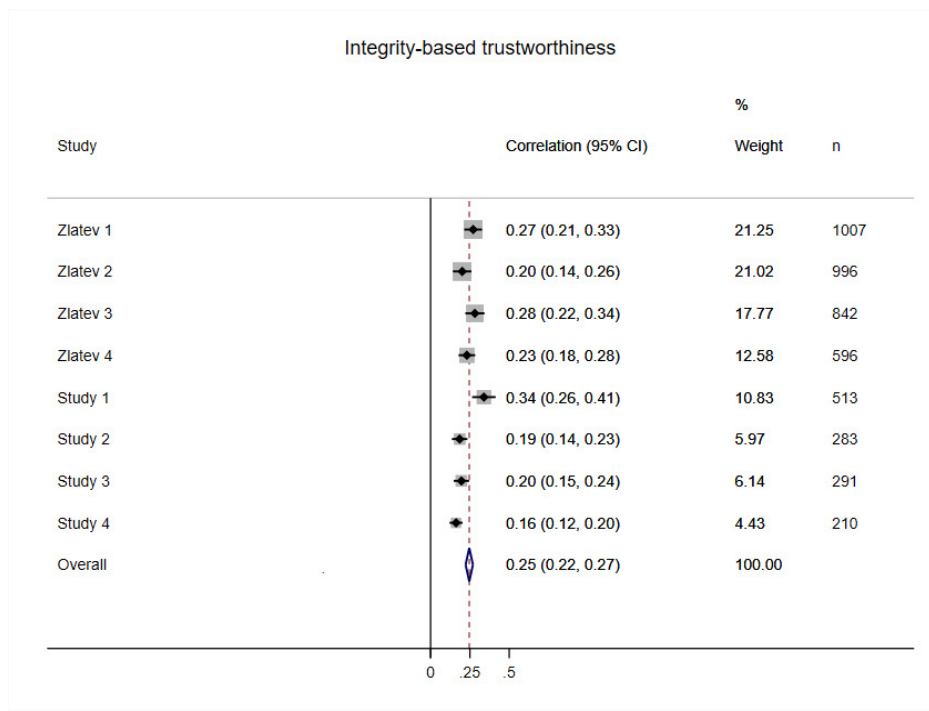
In Study 4 we assessed perceived familiarity of a social issue as an additional potential moderator. In exploratory analyses, we predicted perceived integrity-based trustworthiness and perceived benevolence-based trustworthiness by a target's level of caring about a social issue, perceived familiarity of the social issue as well as their interaction controlling for participant-target agreement on the social issue. These analyses did not reveal significant interaction effects (both  $p > .075$ ).

### Participant Caring

We ran additional exploratory analyses concerning a potential moderating effect of participant's level of caring about the social issue. For perceived integrity-based trustworthiness, we observed such an effect in three out of four studies (Study 2:  $\beta = 0.10$ ,  $p < .001$ ; Study 3:  $\beta = .08$ ,  $p = .001$ ; Study 4:  $\beta = .06$ ,  $p = .006$ ). For perceived benevolence-based trustworthiness, the interaction also became significant in three studies (Study 2:  $\beta = 0.08$ ;  $p < .001$ ; Study 3:  $\beta = 0.09$ ;  $p < .001$ ; Study 4:  $\beta = 0.05$ ;  $p = .022$ ). Although not significant in all cases, it seems that the effect of a target's level of caring about a social issue on perceived trustworthiness is increased for participants who care about the respective social issue themselves.

### Participant-Target Agreement

In the original article, Zlatev (2019) reported rather inconsistent findings concerning the interaction between tar-



**Figure 1. Pooled evidence for perceived integrity-based trustworthiness**

Note. Figure 1 reports all effect sizes (Zlatev's and our studies) for a target's level of caring about a social issue on perceived integrity-based trustworthiness, confidence intervals, standard errors, sample size, and the weight (based on the sample sizes) that has been given to the study in calculating the overall evidence.

get-participant agreement on a social issue and a target's level of caring about the social issue in predicting perceived trustworthiness. In contrast, we find that the influence of a target's level of caring about a social issue on perceived integrity-based trustworthiness (Study 1:  $\beta = .09$ ;  $p = .023$ ; Study 2:  $\beta = .14$ ;  $p < .001$ ; Study 3:  $\beta = .17$ ;  $p < .001$ ; Study 4:  $\beta = .07$ ;  $p = .002$ ) and perceived benevolence-based trustworthiness (Study 1:  $\beta = .12$ ;  $p = .002$ ; Study 2:  $\beta = .11$ ;  $p < .001$ ; Study 3:  $\beta = .12$ ;  $p < .001$ ; Study 4:  $\beta = .06$ ;  $p = .006$ ) consistently increased with participant-target agreement on the social issue.

### Mini Meta-Analyses across All Studies

We conducted three mini meta-analyses (one for perceived integrity-based trustworthiness, one for perceived benevolence-based trustworthiness, and one for behavioral trust) including all our studies and the original studies by Zlatev to provide best estimates for the effect (see Goh et al., 2016, for a discussion and the exact procedure; see SOM C for our analytic strategy). All effect sizes were transformed into Pearson's  $r$ . Analyses reveal small effects for perceived integrity-based (weighted mean effect size of  $r_M = .24$ ) and perceived benevolence-based ( $r_M = .20$ ) trustworthiness as well as behavioral trust ( $r_M = .16$ ). Thus, pooled evidence across all studies points to a small effect of a target's level of caring about a social issue on perceived trustworthiness.

Note that our mini meta-analyses closely follow best practices for such analyses (Vosgerau et al., 2019). First, we included each of our studies and all measures of benevolence-based and integrity-based trustworthiness as well as behavioral trust. Furthermore, all studies and sample

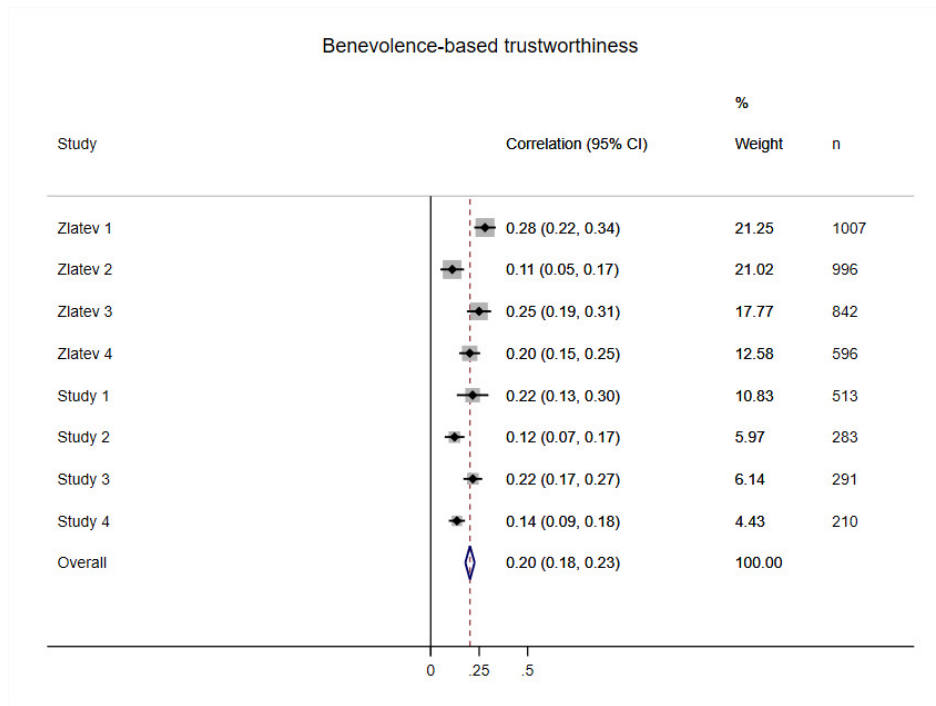
sizes were pre-registered and all analyses were conducted in accordance with the pre-registered analysis plans. Importantly, we included all the studies our research team conducted, and, to the best of our knowledge, all original studies (Zlatev, 2019), on the effect of caring on perceived benevolence-based and integrity-based trustworthiness as well as behavioral trust. These additional studies conducted by the original author were also pre-registered and analyses were conducted in line with the pre-registrations (see the original paper, Zlatev, 2019). As such, we believe that the findings of our mini meta-analyses are likely to be informative on the true and average effect size. We deviated from the best practice approach in only one way: we did not pre-register the mini meta-analyses themselves by specifying all studies and effects to be included. This practice is recommended to avoid potential file-drawer problems (Vosgerau et al., 2019). However, we believe that this might be a lesser concern in our case, because 1) we included all studies of this project (see above) and 2) we did not use the meta-analyses to demonstrate statistical significance (all included effects were significant in the first place).

### General Discussion

Trust plays an essential role in the functioning of interpersonal relationships and society. Especially in challenging times such as the COVID-19 pandemic, successful crisis management largely depends on trust in other people (e.g., adherence to the official recommendations to combat the virus), researchers (e.g., development of reliable vaccines), and politicians (e.g., implementation of effective measures).

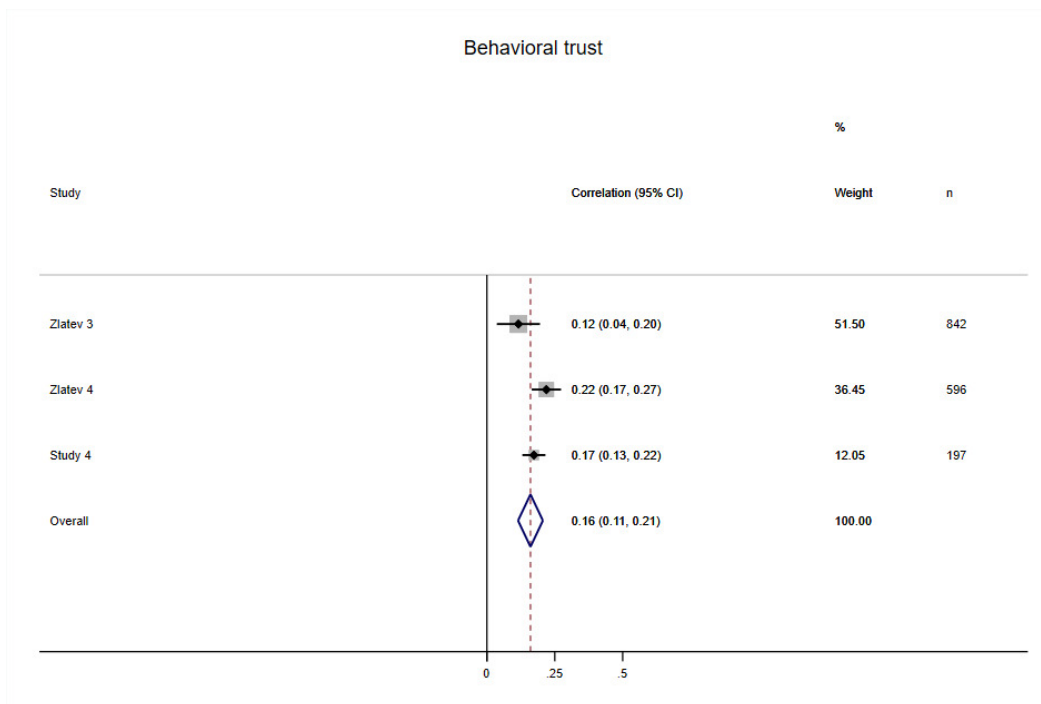
Zlatev (2019) identified a target's level of caring about a





**Figure 2. Pooled evidence for perceived benevolence-based trustworthiness**

*Note.* Figure 2 reports all effect sizes (Zlatev’s and our studies) for a target’s level of caring about a social issue on perceived benevolence-based trustworthiness, confidence intervals, standard errors, sample size, and the weight (based on the sample sizes) that has been given to a study in calculating the overall evidence.



**Figure 3. Pooled evidence for behavioral trust**

*Note.* Figure 3 reports all effect sizes (Zlatev’s and our studies) for a target’s level of caring about a social issue on trust, confidence intervals, standard errors, sample size, and the weight (based on the sample sizes) that has been given to a study in calculating the overall evidence.

social issue as an important cue for perception of two dimensions of trustworthiness – integrity-based and benevolence-based trustworthiness. One limitation of the original work however might have been that the social issues

that were used were highly polarized and partisan in the U.S. (e.g., abortion; Karol & Thurston, 2020). Additionally, on their face, some of the issues might have been quite removed from participants’ personal experience (e.g., eu-

thanasia). With our work, we aimed to extend and generalize the effect by using a wider variety of social issues, presumably in part less controversial (e.g., freedom of speech), as well as topics that had direct relevance for participants' day to day life (i.e., recommendations to combat COVID-19, such as frequent hand washing). This approach resulted both in a successful direct replication of the original findings in a non-US sample (a sample representative for the German population in terms of age and gender) as well as a conceptual replication with issues different from those in the original work. As such, our work shows that the effects found in the original work are not specific to abstract partisan, controversial issues, but generalize to issues that affect people's everyday attitudes and experiences, as well as to different samples. Moreover, we also provide behavioral evidence for the effect of caring. Using an incentivized trust game, we show that the amount trustors transfer in the trust game increases with perceived trustworthiness of the trustee. As such, our work adds strong evidence for the idea that expressed caring about a social issue can lead to more trust in perceivers. With three mini meta-analyses that combine our findings with re-analyses of the original data (Zlatev, 2019), we provide best estimates for both dimensions of perceived trustworthiness and behavioral trust. Furthermore, all results were robust to additionally controlling for participant age and gender. We conclude that the association between a target's level of caring about a social issue and trust is small but highly robust.

We find the effects to be independent of the agreement between participant and target on the issue, in line with the findings by Zlatev (2019). That is, both caring and agreement affect trust in a positive way, and mostly the effect of agreement was larger than the effect of caring (see beta coefficients in [Tables 1-4](#)) suggesting agreement carries more weight than caring for perceivers when assessing trust. However, this was not the case for Study 3, where the effect of caring seemed at least as strong as the effect of agreement. This difference seems mostly due to a smaller effect of agreement in Study 3 compared to the other studies. This difference between studies might have emerged as a result of random variation of effect sizes across studies (Kenny & Judd, 2019). However, it is also possible that the difference is more systematic and due to conceptual differences between our studies. Recall that the social issues in Study 3 were about COVID-19 related recommendations to prevent the spread of the virus. We selected these topics because we were interested in whether effects of caring would extend to issues with direct relevance to people's daily lives. Indeed, during the time of the study (June to October 2020) all these issues were directly related to the pandemic crisis situation in the German population. Switching topics for Study 3 (and 4 for the COVID-19 related social issues) also meant that we slightly changed the target descriptions. Specifically, for the COVID-19 related issues, instead of giving information about whether the target thought the issue should be legal vs. illegal, we gave information about whether the target was for or against the recommendation. Possibly this difference played a role. Presumably, agreement on whether one supports an issue might be less important than agreeing on legality. Thus, perhaps agreement played a smaller role in Study 3, because it was related to support, not legality.

One reason for this might be interdependence between people: other people being for or against something might not matter so much to a person, but making judgments of whether something is legal or not, might imply restrictions on others. Study 4 allowed us to directly compare issues in the same design. These exploratory analyses revealed a significant interaction between agreement and COVID issue (yes vs. no) on integrity-based trustworthiness (but not benevolence-based trustworthiness) in that the effect of agreement was less pronounced for the COVID issues. One interesting avenue for future research is to examine whether topics that relate to interdependence between people might moderate the effect of caring on trust as well as agreement on trust. Another difference between studies is that in Study 3, caring predicted both integrity- and benevolence-based trustworthiness to roughly equal degree, while in the other studies, caring seemed to be more predictive of integrity-based trustworthiness than of benevolence-based trustworthiness (see beta coefficients in [Tables 1-4](#)). Someone who cares about a recommendation to reduce the spread of a virus including recommendations that require prosocial acts by everyone (e.g., to stay at home) might be perceived as being kind and as having good intentions (i.e., benevolent). Future studies could investigate these patterns of results in more detail.

Our findings have important political implications. We observed the effect of a target's level of caring on perceived trustworthiness in a sample that represents the broader German population and with issues that everyone dealt with (i.e., recommendations to combat the spread of COVID-19). Remarkably, the effect is independent of whether the participant and the target agree on the issue. For example, a target that cares about home office during the pandemic is rated higher concerning integrity-based and benevolence-based trustworthiness even if the participant does not share the opinion on whether home office should be required. Given that politicians rely on perceptions of trust, one implication might be that politicians would do well to communicate a high level of caring about the recommendations that they want to implement. Higher trust in politicians and scientists in turn has been shown to increase adherence to recommendations (e.g., Dohle et al., 2020) and willingness to get vaccinated (e.g., Murphy et al., 2021) – ultimately saving lives.

Although our research provides a thorough and robust examination of the effect of caring on perceived trustworthiness and even behavioral trust, we should mention that there is also a limitation. Although the effects of a target's caring on perceived trustworthiness appears to be quite robust, the size of the effect appears to vary across studies and issues. This suggests that the effect of a target's level of caring about a social issue on perceived trustworthiness is partially moderated by other factors. We tested perceived controversy of a social issue as a moderator in all studies but due to the inconsistent findings, we cannot make strong claims concerning such a moderation until further studies provide more evidence. However, in exploratory analyses we identified two other moderators that showed quite consistent results across the studies, namely participant's level of caring about a social issue and participant-target agreement on the social issue. Specifically, the effect of a target's

level of caring about a social issue on perceived trustworthiness increased if the participants cared about the issue. Furthermore, the effect of a target's level of caring about a social issue on perceived trustworthiness also increased when participant and target had the same stance on the issue (i.e., supported vs. not supported the issue). Future research could investigate additional circumstances under which the effects are more or less pronounced. One idea is to include economic issues instead of, or in addition to, social issues in future research. It is conceivable that if someone cares about the issue of (not) cutting taxes for rich people for example, this has a negative effect on benevolence-based (since benevolence for example conveys a target's kindness or positive intentions), but not so much on integrity-based trustworthiness (i.e., a target's perceived honesty or virtuousness).

In sum, in the current work, we extend research showing that people use the degree to which others care about an issue as a cue on which they base perceived trustworthiness (Zlatev, 2019). Specifically, we demonstrate that these findings are not restricted to contentious social issues such as abortion, but rather also hold for issues that are directly relevant to people's lives and that are more or less controversial. Moreover, these findings apply directly to COVID-19 related issues as well, providing direct societal relevance. Our findings also show that this effect generalizes over samples, emerging both in student samples, as well as representative (for gender and age) German samples. Finally, we provide evidence that these perceptions of trustworthiness influence actual trust behavior in a trust game in which participants respond to real participants and where their trust has direct consequences for their outcomes.

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### Author Contributions

We conducted Studies 1-3 as part of an undergraduate experimental psychology course at the University of Cologne. Angela R. Dorrough is the author who taught the course. Lukas Bring, Caroline Brockers, and Charlotte Butz

were undergraduate students in the course, listed alphabetically. The undergraduate authors designed the studies under the supervision of Angela R. Dorrough and Iris K. Schneider, collected the data, and wrote their own empirical report in fulfillment of course requirements. Nathalie Bick contributed to the project as part of her internship in partial fulfillment of her master's degree at the University of Cologne under the supervision of Angela R. Dorrough and Iris K. Schneider. She co-supervised the undergraduate students. Formal contributions to this work according to the Contributor Roles Taxonomy (CRediT; <https://casrai.org/credit>) were as follows: All authors conceptualized the ideas and provided resources. Angela R. Dorrough and Iris K. Schneider acquired funds; Angela R. Dorrough curated the data, conducted formal analyses, visualization (preparation of figures), and validation (verification of analytical reproducibility). Angela R. Dorrough wrote the original manuscript draft with input from all student authors. Iris K. Schneider reviewed and edited the manuscript. All the listed authors approved the final manuscript for submission.

### Competing Interests

Authors have no competing interests to declare.

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### Data Accessibility Statement

All studies were pre-registered [Study 1: <https://osf.io/qha3e>; Study 2: <https://osf.io/c25s7>; Study 3: <https://osf.io/6w9dj>; Study 4: <https://osf.io/bdv8u>] and all materials, data, and analysis scripts are openly available (<https://osf.io/za-gkd>).

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## SUPPLEMENTARY MATERIALS

### Supplementary Material

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