

1 FRONT MATTER

2 Praise from peers can promote empathetic behavior

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4
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6 Abstract

7 Empathy is a powerful tool associated with market labor success, cooperative behavior
8 and warming attitudes towards climate change and migration. Yet, engaging in empathy is
9 costly and existing interventions to encourage it are themselves expensive and time-
10 consuming. Across five studies, we precisely estimate the magnitude of the costs to
11 engaging in empathy, propose and test an intervention to encourage greater empathy and
12 trace the causal process through which our treatment works. Specifically, we motivate and
13 test a light-touch and scalable intervention based on “peer praise” to encourage empathetic
14 behavior. Across our studies, we find that empathy is costly, that peer praise can
15 encourage greater empathy, and that one way it operates is by boosting positive emotions.
16 Supplementary analyses suggest further promise for the intervention, as we document its
17 ability to work broadly across race, gender, education and income, to encourage
18 empathetic behavior.

21 Teaser

22 Empathy, which has global and wide-ranging effects on behaviors and attitudes but is
23 costly, can be encouraged through praise from peers.

25 MAIN TEXT

27 Introduction

29 Empathy—the act of taking the perspective and understanding the experiences of others (1) (2)—
30 is a powerful tool for shaping policy preferences and improving attitudes towards others. It has
31 been linked to encouraging cooperative behavior to overcome collective action problems, and has
32 implications for human societies globally through its effects on fundamental and pressing issues
33 such as climate change mitigation strategies and labor market success (3; 4; 5). Taking the
34 perspective of others reduces prejudice, increases helping behavior and has the potential to
35 improve attitudes about even heavily stigmatized outgroups in regions of longstanding conflict (6;
36 7). Moreover, the support generated from empathy translates into both behavior and warmer
37 attitudes (8; 9). Taken together, this body of research suggests the importance of understanding
38 when and why people choose to engage in empathy.

39
40 Empathy has both cognitive and affective components, with the degree to which one is
41 emphasized over another related to whether scholars are more interested in the decision to engage

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42 in empathy—in which emotions are implicated—or in the act of thinking through another's
43 perspective (sometimes referred to as “perspective taking”, see (10); and (11)). Regardless, across
44 the different parts of the empathetic process, at least one significant gap in our understanding
45 remains: what can we do to *encourage* greater empathy? We have evidence that costly
46 perspective-taking interventions can yield benefits for subjects that participate (12), but that only
47 begs the question of how one might encourage greater “approach to empathy” in the first place.
48 Previous research on this problem has focused on manipulating feedback or framing empathy as
49 “important for moral character” and has either involved deception or been less successful than
50 one might hope (13; 14).

51
52 We propose and test an intervention to overcome the aversion to empathy that others have
53 found—and that we replicate—and encourage empathetic behavior using positive emotions. We
54 focus on emotions given the natural connection between empathy and affect more generally—
55 empathy is fundamentally “an affective response” (15)—as well as its more particular role in the
56 first part of the empathetic process, when individuals choose whether to engage in or avoid
57 empathy (16). We propose the use of peer praise as a non-invasive, light touch method to
58 encourage empathy (through an affective causal path): praise because of its established ability to
59 trigger positive emotions (17) and “peer” praise given the established benefits of peer influence
60 across many domains (18). Our causal model thus describes a process in which peer praise for
61 empathy leads to positive emotions (happiness) and those positive emotions in turn increase the
62 odds of choosing to engage in empathy. Our studies provide support for that model in whole and
63 in its components parts.

64
65 Ways to encourage empathy towards an outgroup or other person abound, but such
66 interventions are often expensive, hard to implement and difficult to scale up. Common
67 approaches include empathy-based exercises within intergroup contact scenarios ((19) offer a
68 recent review). For example, (12) and (20) successfully utilize face-to-face conversations that
69 incorporate variations of perspective-taking, a key component to empathy, to reduce exclusionary
70 attitudes towards outgroup members. More recent work has explored moving these interventions
71 online, either through relatively short interactive exercises (21) or more involved online role-
72 playing games (22) or even ones requiring specialized virtual reality hardware (23). A common
73 thread, however, is that these interventions typically require careful training of enumerators,
74 (almost always) additional costs in equipment, time and footwork, and do not tap into natural and
75 preexisting resources surrounding the population of study. Given the established benefits of
76 empathy, an eye towards encouraging it when it might otherwise be avoided, and the need for a
77 scalable and “light-touch” intervention, we propose harnessing a more naturally-occurring
78 phenomenon understood to have significant impact on individual behavior: peer praise.

79
80 Praise suggests itself as a useful intervention for encouraging empathy given its
81 documented role in motivating pro-social behavior more generally (particularly in the large
82 literature on child development; see (24)). Definitions of praise abound but generally agree that
83 the concept centers on “positive evaluations … of another’s products, performances or attributes”
84 ((25); see also (26)). Praise is sometimes distinguished from highly similar concepts such as
85 “encouragement” (often associated with tasks with which a person is currently struggling or in
86 which they performed negatively) and simple acknowledgement/feedback, which is inherently
87 neutral and non-judgmental (see (27) and (28)). Praise can be about behavior or personal
88 qualities, and can occur either ex-ante or ex-post whatever is being encouraged. In line with a
89 consensus that views behavior and effort-specific praise as more effective than “personal praise”
90 (29), we focus on praise for engaging in empathy randomly assigned to our respondents in

91 advance of their choice to engage in empathy or not (ex-ante in order to cleanly identify the
92 causal effects of the treatment on behavior).

93
94 Peer praise is a promising candidate for such an intervention given its documented effects
95 on pro-social behavior, but extant literature linking praise to positive emotions also suggests *how*
96 it might work to encourage greater empathy. An early review sums up the consensus view that
97 the “obvious and immediate outcome” of praise is “simple, positive affect” (17). In fact, the link
98 between praise and positive emotions is taken to be a baseline expectation in much of the
99 literature, its truth self-evident enough that most work focuses on conditions—such as obviously
100 insincere compliments—in which praise *fails* to lead to positive emotions (30). And while there
101 are strong links between praise and positive emotions, there are also links between positive
102 emotions and increased effort and motivation (31; 32), productivity (33), attention (34) and
103 generally improved cognition along multiple dimensions (35). In fact, recent observational work
104 suggests a link between positive mood and pro-social behavior (36) that might operate as a
105 feedback loop or “virtuous cycle” (37). As the most common positive emotion studied is
106 happiness, we focus our attentions here on happiness (38), though note the possibility of other
107 positive emotions at play in the causal effect chain.
108

109 And while praise itself is connected to positive emotions (which, in turn, might motivate
110 prosocial behavior), a related literature on the positive network effects of peers suggests further
111 how an effective intervention might be designed. Peer effects have been shown to occur across
112 contexts, from uptake of education, future planning and emotional happiness to economic and
113 welfare outcomes, and, to persist over time (39; 40; 41; 42; 43). That peers can substantially
114 influence one's behavior is unsurprising; a multidisciplinary literature on peer effect processes
115 portrays this group as increasingly important upon broaching adulthood, among respected peers,
116 and especially for peers with whom one shares values (44). Recent work has further emphasized
117 that peer influence is especially relevant to the development of prosocial behaviors (45; 46) for
118 which empathy is often considered a precursor (47). The peer-oriented motivation of our work
119 aligns well with that of (48), who also tap into peer networks to encourage anticonflict norms and
120 behavior in a middle school setting (though like many interventions described earlier, requires
121 extensive collection of network information and a large infrastructure for intervening). An
122 important mechanism that may be at play is the desire to maintain favorable evaluation from
123 admired peers, which can in turn support a positive sense of self (49). While our focus on the
124 connection between praise and pro-social behavior is not new, previous work has often centered
125 around child-parent relationships and/or with an emphasis on adolescent populations (44).
126

127 We field five studies—summarized in Fig. 1—using an incentive-compatible design that
128 allows us to verify a general preference towards avoiding empathy, propose and test a light-touch
129 intervention designed to encourage empathy through the use of peer praise, and investigate the
130 affective mechanisms through which praise works. Our first set of studies provide motivation for
131 our intervention by demonstrating a marked preference for avoiding empathy using a choice task
132 (“main choice task”) in which online respondents make decisions about whether to empathize
133 with (FEEL) or simply describe (DESCRIBE) the appearance of randomly presented photos of
134 peoples' faces. There—in keeping with many other studies (50; 13)—we find that the empathy
135 task was 39.7% less likely to be chosen by respondents than the descriptive task. Modifying the
136 choice task to include an incentive compatible reservation wage-elicitation stage (“wage task”),
137 we estimate that the empathy task required a 10% premium in wages compared to the descriptive
138 task to motivate our respondents. Our subjects also reported that empathy felt more demanding,
139 more costly and difficult and made them more anxious compared to pure description.
140

Studies 2–5 provide evidence for the beneficial effects of peer praise in encouraging empathy. Our (non-experimental) Study 2 sets the stage by eliciting naturalistic praise from online respondents that we use in subsequent studies, obviating the need to use deception and increasing the verisimilitude of our intervention. Study 3 uses the collected peer praise to encourage empathy in respondents—using the same choice task as Study 1—and we find here that the peer-praise group was 20% more likely to choose empathy compared to a control group that didn't receive praise. Studies 4 and 5 replicate the effectiveness of our praise intervention and extend our results through a focus on causal mechanisms. We focus on the link between peer praise → happiness → empathy. Ultimately, we find support across both studies for praise operating through an emotional pathway (happiness) to encourage greater empathy. We conclude with a discussion focusing on the scope conditions to the effectiveness of our peer praise intervention, highlighting its limits but also noting that it is broadly effective across demographic and ideological categories.

Results

Empathy is costly

Study 1 verifies that empathy is comparatively costly (or has fewer “benefits”) and provides a baseline against which to evaluate the effectiveness of our peer praise intervention. Preference against empathy is established in three ways. First, the empathy task had a lower likelihood of being chosen (39.7%) than the descriptive task. Second, the reservation pay for empathy was higher than for the descriptive task: if the description task pay is \$1.00, then the average respondent needed the empathy task to be raised to \$1.098 to shift to the latter ($p < 1e^{-13}$). Finally, our post-task questions (elicited post-treatment) verify that subjects perceived empathy as more difficult and more costly: they described the empathy task (on a scale from 1 to 5) as more demanding (0.234, $p = 0.02$), harder (0.377, $p = 0.0001$), felt more insecure/anxious (0.234, $p = 0.03$) about it and less successful at it (-0.19, $p = 0.04$) than the objective task and were more likely to report preferring the DESCRIBE task than the FEEL task (28.9% preferred DESCRIBE compared to 18.9% preferring FEEL). For details on task load summaries see Supplementary Materials.

Peer praise can encourage empathy

Having established that empathy is costly from both the subjective experience of our subjects and our estimates of the cost of incentivizing it, we turn to the question of how we might reduce those costs and encourage empathetic behavior. Using the elicited sincere praise from Study 2, Study 3 tests whether peer praise can overcome the costs of empathy and encourage people to choose to engage in empathetic behavior. Using the main choice task from Study 1, we find that respondents choose FEEL over DESCRIBE more frequently when exposed to the praise treatment (compared to a control condition of no praise). Specifically, the odds ratio of respondents choosing the FEEL task over the DESCRIBE task for peer-praised respondents was 0.128 ($p = 0.02$) higher than the control group. This translates to 1.20 times the odds of choosing the FEEL task for the control group. In other words, the peer-praised group had a 20% greater likelihood of choosing the empathy task over the objective task compared to the control group. See Supplementary Materials for table with log odds and odds ratio estimates. We find convergent evidence from the real wage task, where praise for empathy lowered respondents' reservation value compared to both control (no praise) and the placebo (praise for description), though the differences were not statistically significant. We conduct a similar peer praise intervention in Studies 2 and 3 for the DESCRIBE task, by eliciting naturalistic praise for objective behavior (see (a) in Fig. 3) and randomizing respondents to receiving the peer praise for objective behavior. If peer praise works similarly for objective behavior as it does for empathy,

191 we should see the likelihood of choosing the empathy task *drop* for respondents treated with
192 “praise for description” compared to their control counterparts. In Fig. 3b we see that the odds
193 increase by 0.05 and is not statistically significantly different ($p=0.37$).

194 **Peer praise increases (in the moment) happiness**

195 Studies 1-3 demonstrated that empathy was costly, and designed and tested a promising light-
196 touch intervention to encourage empathy. We turn now to the question of *how* peer praise
197 encourages empathy. Several candidate mechanisms are possible—none mutually exclusive—
198 though they can be grouped into two “families” of explanations. The first family of mechanisms
199 focuses on cost, while the second focuses on norms. The “norms explanation” for how praise
200 encourages empathy is that it may do so by changing respondents’ beliefs about what is
201 normatively “good” behavior (behavior valued by others). Evidence from Study 3 suggests that a
202 broad interpretation of the norms mechanism is unlikely to be at play: if praising a behavior
203 worked simply by changing respondents’ beliefs about how valued that behavior is by others, our
204 placebo condition (“peer praise for description”) should have led to a higher likelihood of
205 choosing objective description relative to our control (no praise) condition. That it did not (the
206 change in odds of choosing the empathy task over the objective task was 0.05 ($p=0.37$); see Fig.
207 3b) despite adequate power, suggests the utility of focusing on the “costs” family of potential
208 mechanisms instead.

209 We focus our efforts on the cost/benefit mechanisms, beginning with suggestive evidence
210 from Studies 1 and 3 that respondents do in fact see empathy as more costly relative to objective
211 description. Our evidence for this comes from our task difficulty questions administered to
212 respondents after they completed the choice task (odds for the empathy task are lower, reservation
213 wage is higher, and the task is more demanding, harder, and more anxiety-inducing than the
214 objective task). Additionally, Study 3 showed that respondents had a higher reservation price for
215 empathy compared to description. However, those results suggest only that there may be a cost to
216 empathy, not what the cost is or how it operates. Since we have evidence from other work on the
217 relationship between affect and empathy, we focus in Study 4 on the emotional pathway and,
218 specifically, the extent to which praise causes happiness. In Study 4, we show that peer praise
219 increases respondents’ reported happiness, as one would expect if peer praise encouraged empathy
220 through an emotional pathway. Fig. 2c presents the distribution of the measured happiness index
221 for respondents who received peer praise for empathy and respondents in control; peer praise is
222 associated with a 0.417 ($p=0.01$) bump upwards in a five point happiness scale, or more than a
223 one third standard deviation increase in happiness. While our focus throughout is on happiness,
224 we also test and find similar results for a related dimension of positive affect, pride, and present
225 results in Supplementary Materials Fig. S17. We note that pride may be a promising related
226 positive affect to explore for future work.

227 **Happiness mediates how peer praise affects empathy**

228 Further corroboration for the argument that peer praise encourages empathy *through an emotional*
229 *pathway* is provided by Study 5, in which subjects participated in the same choice task as earlier
230 studies—for either 3 or 20 trials (Study 5 design was calibrated based on power calculations
231 designed to reduce trials and increase overall observation sample size directly from findings in
232 Study 3 which suggested some tapering off of peer praise effects over many trials)—combined
233 with measurement of happiness described earlier. We follow (51) and conduct a mediation
234 analysis to find that the effect of peer praise on choosing an empathetic task is mediated by how
235 happy the receiver feels. The average causal marginal effect (ACME) of respondent happiness is
236 0.009 for the log-odds of the choice task, or 16.4% of the total effect of the peer praise treatment
237 as presented in Fig. 2d.

239

240 **Discussion**

241

242 Though empathy is widely recognized as normatively and instrumentally important, significant
 243 gaps remain in understanding *why* empathy is difficult and what we can do to encourage it. Most
 244 extant work on encouraging empathy involves resource-intensive perspective taking exercises,
 245 often requiring trained interlocutors or complicated online simulations. Our innovation was to
 246 introduce a low-cost, light-touch intervention based on praise from peers. Across five studies, we
 247 were able to first verify and precisely estimate the cost of empathy and then demonstrate the
 248 utility of a novel “peer praise” intervention that lowers the barriers to empathetic behavior. We
 249 also provided evidence suggesting that norms may not be the main mechanism through which this
 250 process operates, instead showing that praise works through an affective pathway by boosting
 251 happiness in our treated respondents. In our discussion below, we focus on several scope
 252 conditions to the effectiveness of our intervention. Among the limiting factors, we note that peer
 253 praise does not work as well for other behaviors as it does for motivating empathy, that it works
 254 best for the most attentive respondents and that its effectiveness seems to decline over time in the
 255 longer versions of our experiments. We conclude on an optimistic note by highlighting broad
 256 evidence that peer praise does motivate empathy across demographic and ideological categories.

257

258 **Limits of peer praise**

259 We offer evidence of peer praise working (through happiness) to lower barriers to empathetic
 260 behavior; but does peer praise work to move behaviors on whatever is praised? Our findings in
 261 Studies 2 and 3, presented in Fig. 3, suggest that peer praise for objective behavior is not an
 262 effective intervention for increasing respondents’ willingness to choose the objective task. This
 263 suggests something about the potential limits of a peer praise intervention—it does not necessarily
 264 shape any and all categories of behavior—as well as helping us to pinpoint why praise *does*
 265 motivate empathetic behavior.

266

267 Above, we note that peer praise is not a universal motivator of behavior, but our results also
 268 suggest specific boundaries for how it motivates empathy. Two factors seem to shape the efficacy
 269 of the intervention: attentiveness and repetition. In Study 5, subjects were asked to participate in
 270 either 3 or 20 trials of the choice task. From this, we can see the efficacy of peer praise in the first
 271 three trials across both versions of the study, but also clearly see in the longer choice task that the
 272 effect of praise declines over trials (Fig. S23 in Supplementary Materials), such that after the first
 273 four or five trials the total effect of peer praise and the ACME of peer praise through happiness
 274 become indistinguishable from zero. In Supplementary Fig. S24, we examine subgroup effects by
 275 respondent attentiveness in Study 5, as measured by our two sets of attention checks (a
 276 combination of grid and multiple choice questions, as suggested by (52)). We find that peer praise
 277 works least well for the small number of our least attentive respondents: the 6% of our sample
 278 who “failed” both types of attention checks. The two most plausible (though not mutually
 279 exclusive) explanations for this are either that subjects who are least attentive in online survey are
 280 also least responsive to peer praise, or that our intervention requires some minimal amount of
 281 focus or attention in order to work.

282

283 **Peer praise works broadly across sociodemographic groups**

284 A concern that might arise is whether specific subgroups of the population are simply more likely
 285 to be susceptible to the effects of peer praise. For instance, it is relatively old-hat to note that
 286 individuals differ in their levels of baseline empathy (53) and that there is a distinction to be made
 287 between ability—or, empathic accuracy (54) and proclivity to engage in empathy (55).

We consider a battery of sociodemographic subgroup categories that might align with such susceptibility, including education and income levels, racial identity, sex, as well as political party affiliation and differences in baseline empathy and find that peer praise appears to work across categories of each sociodemographic dimension in similar (and positively oriented) ways (see Fig. 4). Though (56) and (57) suggest income and education differentiate baseline levels of prosocial behavior, we find that respondents in higher income brackets and education have similar treatment effect magnitudes—are similarly likely to respond to peer praise in choosing the empathy task—as those in lower income and education categories (Fig. 4A). Of note is that pre-treatment differences in baseline empathy—our respondents’ “taste for empathy”—do *not* predict susceptibility to our praise treatment (Fig. 4B). In other words, our intervention does not seem to be simply working by motivating people already inclined to engage in empathy.

More recent work has suggested that liberals and conservatives might differ in baseline empathy, with one notable study concluding that “liberals wanted to feel more empathy and experienced more empathy than conservatives did” (58, see also (59,60)). The raft of similar findings (59,60) suggest some consensus on this point, though we note that these studies are by and large premised on measurement of *baseline* empathy that is self-reported by respondents, not empathetic behavior. Given that empathic accuracy and proclivity seem to be largely orthogonal, it is worth considering if the gulf in empathy between liberals and conservatives is as wide as it seems. In fact, subgroup analyses in Fig. 4D and Supplementary Materials Figs. S25-27 show that peer praise works to encourage empathetic behavior broadly across ideological boundaries, whether measured as Party ID, or support for President Trump or Biden. Finally, respondents “peer-praised into empathy” show no evidence of shortcircuiting or using less effort compared to those who chose empathy under the control condition (Supplementary Materials Table S10) We take the sum of these results to show both the overall effectiveness of the proposed peer praise intervention, but also evidence suggesting that we may have been too quick to categorize ideological groups as more or less empathetic.

While we establish a general effect of peer praise in this work, and introduce a light-touch intervention that can be integrated into many survey settings, we leave for follow-up research the important question of whether the identity of the praiser (e.g. a co-race or co-partisan) might differentially affect the recipient's willingness to engage in empathetic behavior. In addition, we have also set aside explorations of the, likely meaningful, impact of the *target* of empathy for future work; we do not experimentally manipulate these targets prior to our respondents' choosing whether to engage in the objective or empathetic task in lieu of focusing here on the first order question of whether peer praise for empathy can, in general, motivate empathetic behavior.

Materials and Methods

All studies in this research comply with relevant ethical regulations and was approved by the University of Wisconsin Madison Institutional Review Board. Informed consent was obtained from all participants, and participants in any of the studies described in the paper were prevented from re-enrolling in any other empathy-related study run by authors. All studies were conducted on the Amazon Mechanical Turk “MTurk” online platform. We focus on adult U.S. citizens. In establishing pay scales for each study, we conducted pilots to establish average times for pre-treatment, task and post task portions of each study design and paid based on the state with the highest minimum wage in the U.S. in mid 2020 (Washington, at \$13.50 per hour). Our intention was to offer fair wages especially in the context of work showing the median wage of MTurk workers is ~\$2/hour (61). This approach may also have directly contributed to low levels of participant attrition across all five studies (an average of 14.6%).

338 **Experimental Design**

339 We measure the aversion to empathy, the effects of peer praise for encouraging it, and the extent
340 to which peer praise is mediated by positive emotions, with a series of five online randomized
341 controlled survey experiments on over two thousand adults from August 2020 to January 2021.
342 Overall, attrition was low across all studies and uncorrelated with assignment to treatment
343 condition (see discussion in Supplementary Materials for details). We avoided negative affect as
344 much as possible (by designing our studies without negative peer feedback or eliciting of negative
345 emotions), did not use deception and established wages via the highest current minimum wage per
346 hour in the U.S. at the time the studies were fielded (see Ethics discussion in Supplementary
347 Materials for more on ethical considerations). Studies 1 and 2 lay the groundwork for our
348 contribution by establishing a baseline cost to empathy and eliciting naturalistic peer praise from
349 online respondents. Study 3 provides the first evidence that peer praise (designed from collected
350 peer praise in Study 2) encourages empathetic behavior. Studies 4 and 5 explore mechanisms for
351 our peer praise intervention, focusing on how peer praise reduces the barriers to empathy by
352 increasing positive affect (happiness, specifically).

353 **Study 1:** Study 1 asked respondents to do a main experimental task adapted from (13)
354 which is designed to explicitly measure motivated empathy avoidance with behavior-based
355 revealed preferences. This type of forced-choice scenario mimics many everyday occurrences of
356 empathy regulation, where people might similarly choose to scroll quickly past charity-based ads
357 or opt for walking around non-profit volunteers on the street. Respondents were asked to choose
358 to do a task of either empathizing with or describing a person, and then proceed to do their chosen
359 task. Notably, in our design (and across all studies that utilize the main experimental task), all
360 respondents completed a practice round in which they engaged in both empathy and description,
361 so that our experimentally-assigned praise was for something they had already done and could
362 choose to do more of in the future. They also completed an incentivized wage-elicitation version
363 of the task where they were asked for different pairs of wages what they would prefer to do
364 (empathize/describe). This is referred to throughout as the “main choice task” and is featured in
365 all studies. We conducted power calculations off of conservative assumed effects from (13)
366 studies 3 and 5, which suggested a minimum of 250 respondents to achieve a power of 0.8. We
367 requested a sample size of 300 from MTurk and allowed for some trailing observations given
368 initial concerns that some respondents might attrite within the survey. We recruited a total of 318
369 adult U.S. respondents (mean age, 36.45; SD 11.4; range, 20-77). The demographic breakdown of
370 the sample was: 30.5% female, 48.7% male, 20.8% unknown gender; 61.3% white, 0.3% Asian,
371 10.4% African American, 4.1% Native Hawaiian or Pacific Islander, 23.9% unknown or other.
372 78.6% completed at least high school, 61.1% had graduated at least from college. Full summary
373 statistic tables for each study's sample as well as information on attrition are provided in the
374 Supplementary Materials.

375 **Study 1 Procedure:** Each study immediately began with a consent form describing the
376 study as interested in American attitudes and opinions generally. All studies are described with
377 consort diagrams in the SI. The main choice task that appears throughout Studies 1, 3, 4 and 5,
378 entails a practice round, where respondents practice both FEEL and DESCRIBE activities.
379 Respondents were presented with the below text of instructions, followed by an image of two
380 decks of cards:

381 In the following, you will complete a task. You will first complete a practice trial,
382 which will help you become familiar with the task.

383 On the trial, you will see two decks of shuffled cards: the deck on the left will
384 always be labeled DESCRIBE and the deck on the right will always be labeled
385 FEEL You should choose between these decks. Once you choose a deck, you will
386 then see an image of a person. The decks include the same images. Depending on

387 which deck you have chosen, you will be given one of two possible sets of
388 instructions. If you choose from the deck labeled DESCRIBE, you will be told to
389 be objective and focus on the external features and appearances of the person in
390 the image. When completing this kind of trial, try to be as objective as possible.
391 To be objective, do not let yourself get caught up in imagining what this person
392 feels. On these trials, describe the **age**, **gender** and **race** of the person.

393 If you choose from the deck labeled FEEL you will be told to have empathy and
394 focus on the internal feelings and experiences of the person in the image. When
395 completing this kind of trial, try to feel as much empathy as possible. To be
396 empathetic, let yourself get caught up in imagining what this person feels. On
397 these trials, describe the **feelings** and **experiences** of the person. You are free to
398 choose from either deck on any trial, and should feel free to move from one deck
399 to the other whenever you choose. If one deck begins to seem preferable, feel free
400 to choose that deck more often. Overall, this task will take the same amount of
401 time regardless of which deck you choose.

402 Now you will complete a practice trial of the task; later on, you will turn over to
403 the task. Please click on one of the decks.

404 Respondents were then presented with two decks to pick from, presented in Fig. 5. Respondents
405 then chose a deck and answered the corresponding questions to that deck, and are then asked to
406 choose the other deck and answer its corresponding questions -- ensuring practice with both
407 decks. Upon choosing a deck (for practice, main choice and reservation wage tasks), images are
408 drawn from the Chicago Faces Database (62) randomized within-respondent among the following
409 features: Race=Black/White, Gender=Male (no variation), Valence=Angry/Fearful; images are
410 randomized *without replacement* within respondent. See the Supplementary Materials for
411 example draws of faces.

412 The corresponding questions for the FEEL deck are an open-ended question, three short word
413 answers, and a feeling thermometer, as follows:

414 Please write a sentence describing the **feelings** and **experiences** of this person.

415 Please write three words that describe the **feelings** and **experiences** of this person.

416 How do you feel about this person?

417 The corresponding questions for the DESCRIBE deck are an open-ended question, three short
418 word answers, and a feeling thermometer, as follows:

419 Please write a sentence describing the **age**, **gender** and **race** of this person.

420 Please write three words that describe the **age**, **gender** and **race** of this person.

421 How do you feel about this person?

422 The above main choice task was given three times (3 trials), before turning to an across-and-
423 within subject randomized reservation wage task, where each respondent was equally likely to be
424 randomized into a group that did an incentive-compatible wage elicitation for the FEEL versus
425 DESCRIBE tasks first (referred to throughout as “real wage task”, REAL) followed by its
426 hypothetical equivalent (“hypothetical wage task”, HYPOTHETICAL) or reverse-ordered.

427 The REAL/HYPOTHETICAL task was simply a modification of the main choice task.

428 Respondents completed an incentivized wage-elicitation version of the task in which 12 pairs of
429 decks were presented sequentially on one page, each with wages associated with them—
430 DESCRIBE task was pegged at \$1.00 and FEEL deck ranged from \$0.90 to \$2.00. Later studies
431 adapted this range to a maximum of \$1.30 based off of the observed variation in this outcome in
432 previous or pilot studies. For each pair, subjects chose which wage-task they would prefer; the

433 incentivized aspect of the task manifested in a random draw of one of the pairs of wage-task
434 choices, and respondents were paid the associated wage to conduct the associated task. The
435 HYPOTHETICAL version of the task simply asked subjects their preferred deck for under each
436 pair of wage options, without needing to actually do the task. Subjects were randomly assigned to
437 either a REAL or HYPOTHETICAL version of the wage elicitation task. Previous studies such
438 as (13) use hypothetical settings to elicit wage preference, but the literature on wage elicitation
439 suggests that often hypothetical scenarios can lead to under or over-stating of true preferences,
440 whereas incentive-compatible designs that credibly tie respondents to real wage payouts do not
441 suffer from such bias (45). As such, we chose to measure reservation wage with both types of
442 designs first; while we find suggestive evidence that there is no statistically significant difference
443 in reported wage preferences in REAL or HYPOTHETICAL settings in Study 1, our findings
444 differ from a similar hypothetical scenario posed in (13) as the literature might predict, and so, as
445 a conservative approach, we continue in Studies 3-5 to follow to use the REAL design whenever
446 wage preferences are measured.

447 Following the wage elicitation tasks, subjects answered questions about: 1) how they chose
448 between decks, 2) questions about task load (adapted from (61) NASA task load index) and 3)
449 empathy, adapted from Interpersonal Reactivity Index (collectively referred to as “post task
450 questions”) (53); and finally filled out demographic information.

451 **Study 2:** Study 2 asked respondents to review the main choice task, which was described
452 in full, and offer motivating praise to real peers on the MTurk platform to encourage more
453 empathetic behavior such as is exhibited in the FEEL portion of the main choice task. Emphasis
454 was placed on the real peers who would receive such praise and encouragement, on the task itself
455 being tied to empathetic behavior, and the survey itself periodically asked respondents to review
456 and edit their own answers to assess genuineness as perceived by peers. A similar approach was
457 taken to solicit natural and genuine peer praise for descriptive/objective behaviors. No statistical
458 methods were used to predetermine Study 2 sample size, rather we guided sample size based off
459 of a large enough sample to qualitatively have variation in gathered peer praise answers. As such,
460 we set the sample size for the study at 100 at the beginning and allowed for trailing participants
461 based off of ex ante concerns of attrition. Study 2 had a total of 115 respondents on MTurk (mean
462 age, 34.6; SD 10.9; range 19 to 72). Other demographics of the sample were: 33.9% female,
463 66.1% male; 70.4% white, 1.7% Asian, 13% African American, 7.8% Native Hawaiian or Pacific
464 Islander. 76.5% of the sample had graduated at least from college or an associate degree.

465 **Study 2 Procedure:** Respondents were asked to provide feedback on the main choice task
466 that real adult peers on the platform performed (FEEL and DESCRIBE), and walked through an
467 actual example of the task instructions as well as what the task entailed. They were then presented
468 with the following text and accompanying questions (three words, a sentence, feeling
469 thermometer):

470 If the participant chose from the deck labeled FEEL, the participant was told to
471 have empathy and focus on the internal feelings and experiences of the person in
472 the image and to write a sentence imagining the feelings and experiences of the
473 person, as well as a few words about the feelings of the person.

474 Think of language that would encourage or admire the participant for choosing and
475 doing the FEEL task. What are some positive things you can say about people who
476 choose to empathize with another person that can encourage them?

477 What are three words you might use to admire and encourage **empathetic** behavior
478 in the participant?

479 Please write a sentence that admires/encourages choosing and engaging in
480 **empathetic** behavior in the participant.

481 How do you feel about people who choose and engage in **empathetic** behavior?
482 Please place your attitudes on a feeling thermometer. According to the
483 thermometer, higher numbers indicate more positive feelings. Please indicate your
484 feelings where 0 means extremely negative, 10 means extremely positive, and 5 is
485 neutral.

486 Respondents were then reminded that sometimes praise might be seen as genuine and
487 other times not. They were asked to evaluate their own written peer praise, asked how
488 others might view it, and given the opportunity to go back and update their answers. A
489 similar procedure is conducted to elicit peer praise for the DESCRIBE task. The survey
490 concluded with demographic questions.

491 **Study 3:** Study 3 tested whether praise from peers on the same platform (taken
492 from Study 2) could encourage respondents to choose the empathy task FEEL more often
493 in the main choice task. The methods were identical to Study 1, except that prior to
494 presenting the FEEL and DESCRIBE decks in each of the three trials, respondents were
495 randomly, with equal probability to receive the treatment arms (1) peer praise for
496 empathy, (2) peer praise for objectivity, (3) or a pure control for 2-3 seconds before they
497 could choose their preferred deck. We conducted power calculations on a single
498 hypothesis of whether peer praise affects choice of the FEEL deck, based off of a
499 estimated baseline likelihoods taken from Study 1 and assuming a treatment effect of
500 $\tau=0.25$ with $SD=0.2$, which suggested a minimum of 250 respondents and 15 trials to
501 achieve a power of 0.8. We requested a sample size of 300 from MTurk and allowed for
502 some trailing observations given initial concerns that some respondents might attrite
503 within the survey. There were a total of 328 respondents in Study 3 (mean age, 36.3; SD
504 10.5; range 21 to 71). Other demographics of the sample were: 30.1% female, 46.6%
505 male, 23.1% preferred not to say or ticked other; 54.9% white, 0.3% Asian, 14.6% African
506 American, 3.1% Native Hawaiian or Pacific Islander, 0.6% Hispanic or Latino, and 26.5%
507 preferred not to say or other. 61.3% of the sample had graduated at least from college or
508 an associate degree.

509 **Study 3 Procedure:** Like Study 1, respondents were provided with instructions and
510 a practice round for the main choice task; this was then followed by 15 trials of the main
511 choice task, where the difference was that for each trial respondents were randomly
512 assigned to arms (1), (2) or (3) prior to choosing which deck exercise they preferred. After
513 the 15 main choice task trials, respondents were presented with the real wage task as well
514 as one more randomized assignment of treatment prior to choosing their preferred wages
515 for each deck pair. This was followed by post task questions and demographic questions.
516 Study 3 also asked respondents to rate their emotional state following the treatment and
517 the task using a modified version of the Discrete Emotions Questionnaire (64).
518 Specifically, we removed items relating to “desire” and “relaxation”, lowered the number
519 of items per emotion from 4 to 3 to ease burden on respondents and added items clustering
520 around the emotion of “pride” based on work by (65,66).

521 **Study 4:** Study 4 considered whether there was evidence for our hypothesized
522 affective emotional mechanism. It tested whether peer praise for empathy leads to
523 increased *in the moment* respondent happiness. The methods were identical to Study 3
524 with the exception that between randomization of treatment and the choice of deck task,
525 respondents were asked about their current happiness via a happiness index. We
526 conducted power calculations for a single hypothesis of whether peer praise affects

527 respondent happiness, based off of estimated baseline likelihoods taken from Studies 1
528 and 3, and assuming a treatment-on-mediator effect of $\tau=0.1$ with SD=0.2 which
529 suggested a minimum of 200 respondents and a single trial to achieve a power of 0.8. We
530 sampled a total of 223 respondents for Study 4 (mean age, 37.04; SD 10.05; range 20 to
531 69). These respondents were explicitly randomized into the sample for which we tested
532 the happiness mediator hypothesis. Other demographics of the sample were: 43.0%
533 female, 56.5% male, 0.4% preferred not to say or ticked other; 70% white, 0.9% Asian,
534 13% African American, 6.7% Native Hawaiian or Pacific Islander, 4% preferred not to
535 say or other. 80% of the sample had graduated at least from college or an associate degree.

536 **Study 4 Procedure:** Respondents were asked about their happiness *only* developed
537 from an emotion scale by (64). We specifically focus on the measurement of respondent
538 emotion *in the moment*, so as to avoid conflating emotions across the experience of the
539 overall survey with the emotions related to the treatment. Below is the phrasing of the
540 happiness measure:

541 This scale consists of a number of words that describe feelings and emotions. Read
542 each item and then mark the appropriate answer in the space next to the word.
543 Indicate to what extent you feel this way RIGHT NOW.

544 Scale: very slightly or not at all/ a little/ moderately/ quite a bit/ extremely

545 Emotions: happy/enjoyment/liking

546 The happiness index scale was constructed from the above by taking the mean score of the
547 three words associated with happiness in the emotions scale. After measuring deck choice,
548 respondents were then asked post-task questions and demographic questions such as in
549 Studies 1 and 3.

550 **Study 5:** Study 5 investigates our posited causal mediated pathway of peer
551 praise → happiness → empathy. Our measurement approach to the mediation effect of
552 happiness does not include randomization of both the treatment (peer praise) and the
553 mediator (happiness) in a parallel design, but rather only randomization of the treatment
554 and direct measurement of the mediator after treatment. This is after careful consideration
555 of the well-known difficulties of meaningful and valid experimental manipulation of
556 mediators (67) (and for which emotions can be particularly tricky). We conduct sensitivity
557 analyses of our mediation approach in the Supplementary Materials. Study 5's design
558 closely mirrored that of Study 4, though respondents repeated the main choice task
559 multiple times. We conducted power calculations for a single hypothesis of whether peer
560 praise increases the likelihood of choosing the empathy task through increased respondent
561 happiness (an average causal mediation effect, ACME), based off of estimated baseline
562 likelihoods taken from Studies 1, 3 and 4; assuming a treatment-on-outcome effect taken
563 from Study 3, and a proportion of total effect mediated of 0.8, which suggested a
564 minimum of 300 respondents with 3 trials to achieve a power of 0.8. We conducted two
565 sub designs for Study 5, whereby for Study 5A we favored a higher trial vs respondent
566 ratio (20 trials, 300 respondents) to additionally explore treatment differences as trials
567 increase, and for Study 5B we favored a higher respondent to trial ratio (3 trials, 600
568 respondents), all sampled from MTurk. We sampled a total of 338 respondents for Study
569 5A (mean age, 37.2; SD 10.5; range 20 to 73) and 624 respondents for Study 5B (mean
570 age, 37.6; SD 10.5; range 19 to 73), for a total of 962 respondents for Study 5. Other
571 demographics of Study 5A's sample were: 35.5% female, 63.3% male, 1.2% preferred not
572 to say or ticked other; 64.5% white, 22.2% African American, 4.1% Native Hawaiian or
573 Pacific Islander, 9.2% preferred not to say or other. 75.7% of the sample had graduated at
574 least from college or an associate degree. For 5B these were: 36.4% female, 62.7% male,

575 1% preferred not to say or ticked other; 72.9% white, 0.8% Asian, 15.4% African
576 American, 4.0% Native Hawaiian or Pacific Islander, 6.9% preferred not to say or other.
577 75.0% of the sample had graduated at least from college or an associate degree.

578 **Study 5 Procedure:** Study 5 mirrored Study 4 in allowing respondents to conduct a
579 practice main choice task with instructions, then were equally likely to be randomized into
580 peer praise for empathy or a control arm. This was followed by our measure of respondent
581 happiness, and then the deck choice (and related deck questions). The main choice task
582 was repeated for 20 trials in 5A, and 3 trials in 5B; this was followed by post-task
583 questions and demographic questions, much like Study 4. We focus on measuring only
584 respondent happiness (rather than a battery of different emotions) as the positive emotion
585 of interest for mediation given our hypothesized causal pathway, as well as design
586 concerns over creating overly long timing between treatment and outcome measures and
587 the nuisance costs to respondents of continuously answering the same emotion index
588 questions over the multiple trials of the main choice task.

589 **Statistical Analysis**

590 Our estimating model of choice for the binary main task choice outcome is a logistic regression,
591 and for numeric continuous outcomes—such as reservation wage or (mediator) happiness index
592 value—we estimate ordinary least squares models, both with robust standard errors and clustered
593 at the respondent level in the cases of multiple observations per respondent. Fig. 1 provides an
594 overview of our studies.

595 **Study 1 Analysis:** We ran a logistic regression that predicted respondent choice of the FEEL
596 (always coded as 1) or DESCRIBE deck (coded as 0) with respondent-clustered robust errors. The
597 FEEL task had a 39.7% lower likelihood of being chosen (odds ratio -0.51, $p=1.7e-8$). We
598 conduct a two-sided t-test on the real elicited reservation wage for the FEEL task, with a null
599 hypothesis of the comparison wage \$1.00, and find further evidence of FEEL as more costly with
600 a reservation wage of \$1.10, ($p=1.3e-13$). Finally we conduct two-sided t-test differences in the
601 NASA task load questions for FEEL and DESCRIBE and find that subjects find the empathy task
602 more demanding (0.234, $p=0.02$), harder (0.377, $p=0.0001$) and felt more insecure/anxious
603 (0.234, $p=0.03$) about it and less successful at it (-0.19, $p=0.04$) than the objective task and were
604 more likely to report preferring the DESCRIBE task than the FEEL task.

605 **Study 2 Analysis:** We utilized the open-source **R** package **quanteda** to collect respondent
606 sentence and word answers to the peer praise questions, stem and remove stopwords, and create a
607 wordcloud of the fifty top occurring tokens. We then calculated the mean of the thermometer
608 question (7.9) and generated the main peer praise treatment for the subsequent studies (see Fig.
609 2A). For more details on the types of words and phrases that constitute Study 2 respondents'
610 praise, see Supplementary Materials.

611 Our peer praise intervention was designed with two features in mind. First, we sought to intervene
612 as lightly as possible, both to avoid demand effects as well as to satisfy the requirement that our
613 treatment be low-cost and scalable. Second, we designed the intervention to accord with extant
614 theories and empirical guidance that provide scope conditions for *when* praise is an effective
615 motivator. Prime among those conditions are that the praise is perceived as sincere, that it
616 encourages something that is controllable by the recipient (effort, rather than ability or personal
617 attributes, for example; (27)) and that it conveys information about norms and/or social
618 comparisons (65). In order to satisfy the first requirement, the praise intervention was as “light-
619 touch” as possible, consisting merely of a word cloud of praise and a favorability rating for those
620 that engage in it, displayed for only a few seconds, presented in Fig. 2A. The second set of
621 requirements was satisfied by Study 2, designed to elicit actual praise and verify that it was
622 perceived as genuine by online respondents. Indeed, after eliciting the praise for others in Study 2,
623

respondents rated how genuine it seemed to them and were given the option to go back and edit their praise to make it more sincere. Respondents were asked to rate the praise they gave for how sincere they believed it would be perceived by others receiving the praise on a scale from 0 (not genuine at all) to 100 (very genuine); average ratings for the peer praise for empathy was 71.90 ($SD=20.90$) and for objectivity it was 72.32 ($SD=21.14$). Combining the language elicited from respondents, we created a “peer praise empathy” wordcloud that presents the most commonly used unique words sized by their likelihood of usage, presented in Fig. 2A. We similarly create a “peer praise for objective behavior”, found in Fig. 3A. Supplementary Materials Fig. S8 presents words that are most likely to differentially occur for empathy and objective tasks. Moreover, the phrasing of our intervention (in Studies 3-5) emphasized the social norm aspect of the praise (“peers of yours...”). Finally, in all studies in which peer praise for empathy was administered as an intervention, we included an additional placebo treatment arm in which peer praise for *description* was treated as well.

Study 3 Analysis: We conducted a logistic regression that predicted respondent choice of the FEEL or DESCRIBE deck with the peer praise for empathy treatment (baseline control) and using respondent-clustered robust standard errors. As hypothesized, there was a significant effect of peer praise (log odds was 0.182, $p=0.023$ 95% CI=(0.025,0.339)). This translates to an odds ratio in the control group of 0.643, versus 0.771 in the peer praise treatment group, a difference of 0.128 ($p=0.02$), as presented in Fig. 2b. We also conducted a similar analysis for the treatment effect of peer praise for the objective task compared to the control; there is no similar effect found for peer praise for the objective task (log odds was 0.076, $p=0.370$).

For completeness, we report the estimated reservation wage difference under an ordinary least squares (OLS) model of the reservation wage regressed on the peer praise for empathy treatment (baseline control) and find that the reservation wage is lower under peer praise than under control arms (-0.02) though the estimate is not statistically significantly different from zero ($p=0.37$).

Study 4 Analysis: We estimated an ordinary least squares model with the outcome as the happiness index value and the main regressor the randomized treatment of peer praise versus control. The estimated coefficient on peer praise is 0.4175 ($p=0.00774$) (or more than a one third standard deviation increase in happiness), as expected from our hypothesis, and presented in Fig. 2c.

Study 5 Analysis: We conducted a mediation analysis using the mediation approach presented in (51), where we first run an OLS regression of the happiness index on the peer praise treatment, and then run a separate logistic regression of choosing the empathy task on both the peer praise treatment and happiness mediator. Both models are stored and incorporated into the **mediate** function in the associated **R** package for (51) **mediation**, with errors clustered at the respondent level and with 10,000 simulations. Study 5, in both sub-studies and pooled samples (where samples focused on trials 1-3, following Study 3's design and power calculations), confirms a peer praise effect (Total effect =0.055, $p=0.0058$), and further provides evidence that this total treatment effect can be broken into a direct effect (0.04558, $p=0.0238$) and indirect, mediated effect (0.009, $p<2e-16$) through respondent happiness; this is presented in Fig. 2D. For sensitivity tests conducted on the mediation analyses, see Supplementary Materials.

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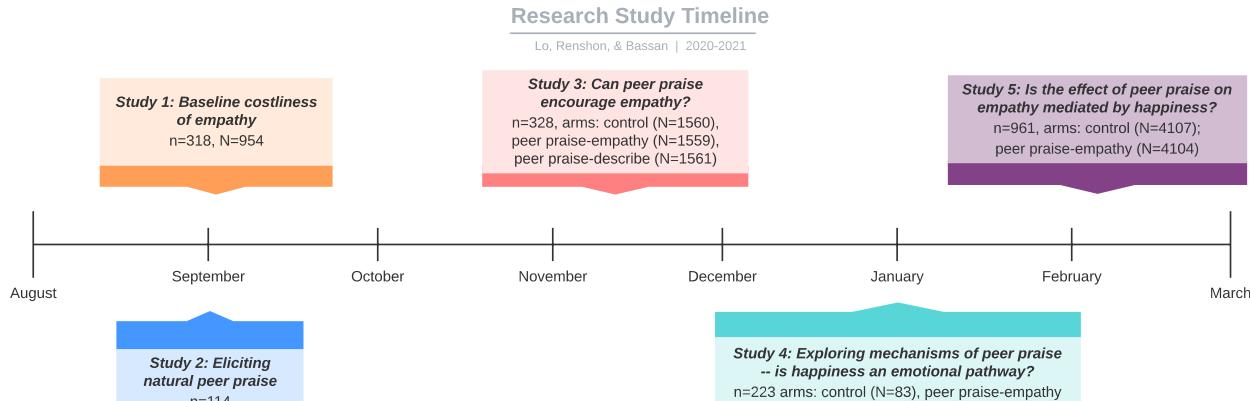
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841 Conceptualization: AL, JR
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844 Visualization: AL, JR, LBN
845 Supervision: AL, JR
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849 **Data and materials availability:** Data of all participants included in the samples for all
850 studies, and custom code that supports the findings in this manuscript are publicly
851 available on the Github repository: <https://github.com/adelinelo/Praise-and-Empathy>.

Figures and Tables

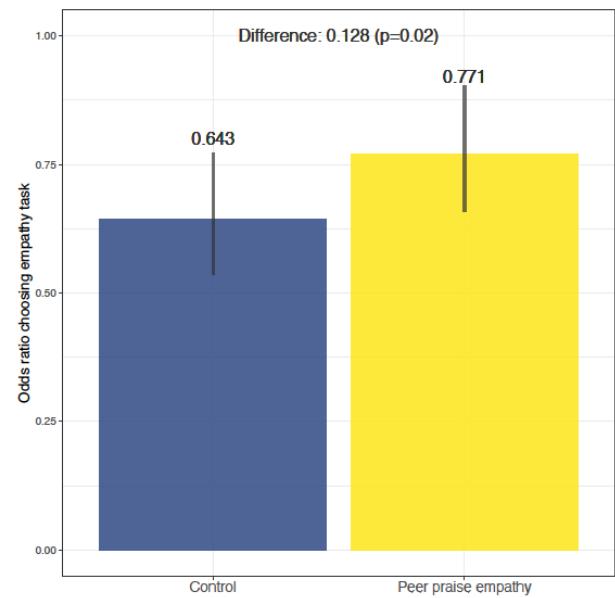
861
862 **Fig. 1. Research study timeline.** *n* denoted refers to # of sampled respondents, *N* refers to
863 the # of respondent-trial observations. For a table summarizing respondent sample
864 size, numbers of trials and observations by experimental arms see Supplementary
865 Materials.
866

Peers of yours on this platform have said they hold favorable feelings towards people who engage in **empathetic behavior**, with an average “feeling thermometer” score of 7.9, on a scale of 0 (least favorable) to 10 (most favorable).

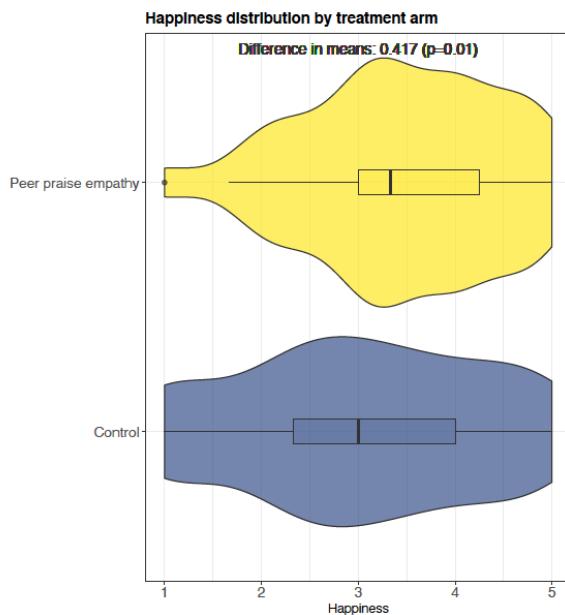
That same peer group provided real feedback for empathetic behavior, which is pictured in the word cloud below.



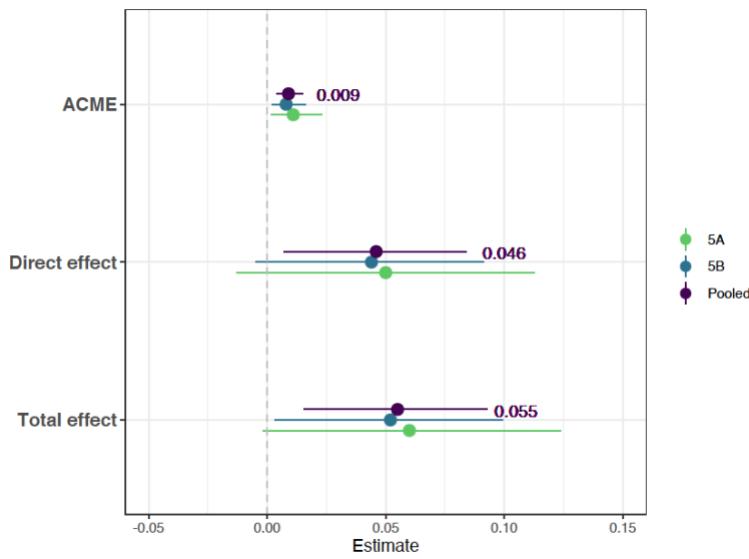
(A)



(B)



(C)



(D)

Fig. 2. Peer praise effect on empathy. (A) presents the main peer praise treatment, formed from eliciting naturalistic praise in Study 2. (B) plots the odds ratios (exponentiated log-odds) of choosing the empathy task for control and peer praise for empathy groups from Study 3. (C) plots distributions and barplots of the happiness index for control and peer praise for empathy groups from Study 4. (D) presents mediation estimates of interest (on log-odds of choice task) from Study 5 (which included two fielded days of surveys, referred to as 5A and 5B), including the average causal mediation effect (ACME) of respondent happiness.

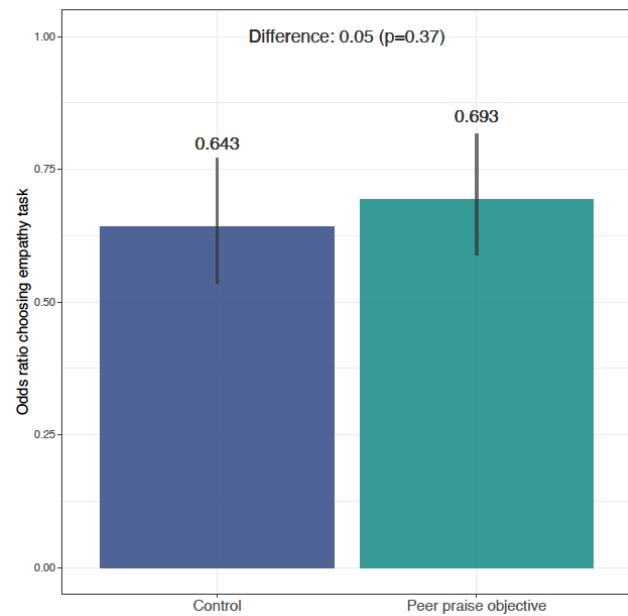
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Peers of yours on this platform have said they hold favorable feelings towards people who engage in **objective behavior**, with an average “feeling thermometer” score of 7.2, on a scale of 0 (least favorable) to 10 (most favorable).¹

That same peer group provided real feedback for **objective behavior**, which is pictured in the word cloud below.



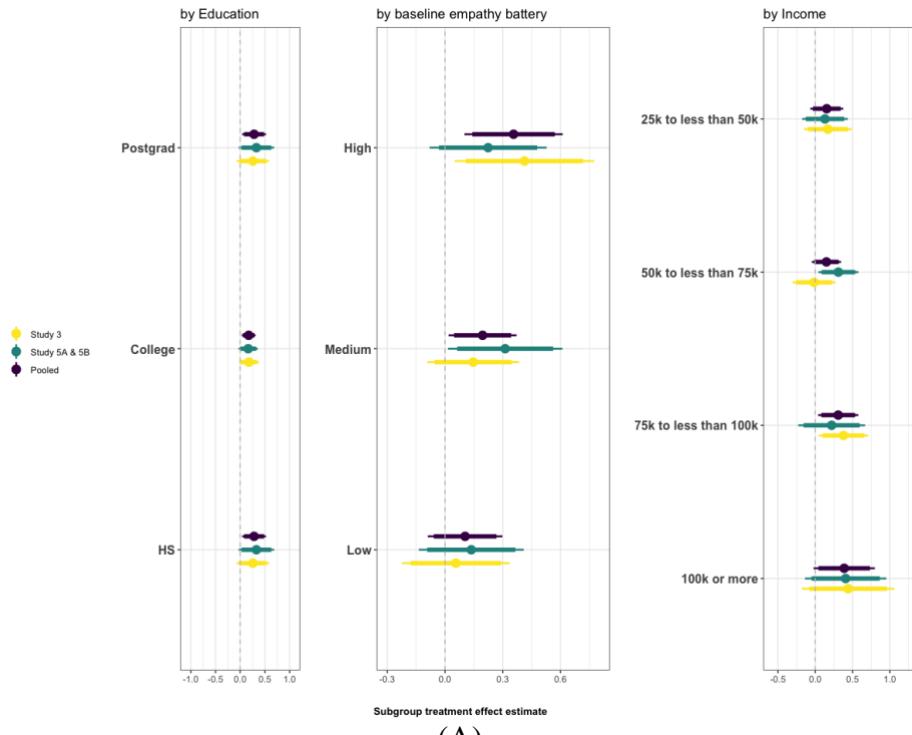
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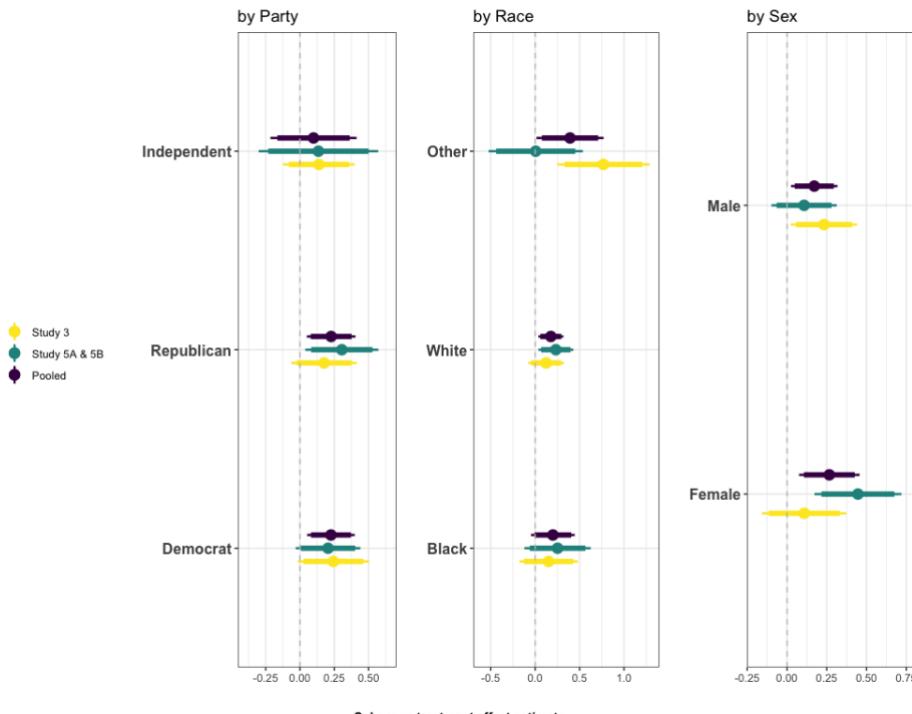
(B)

Fig. 3. Peer praise effect on objective behavior. (A) Peer praise for objective behavior.
(B) Odds of choosing the empathy task over the objective task under Control and Peer praise for objective behavior groups.

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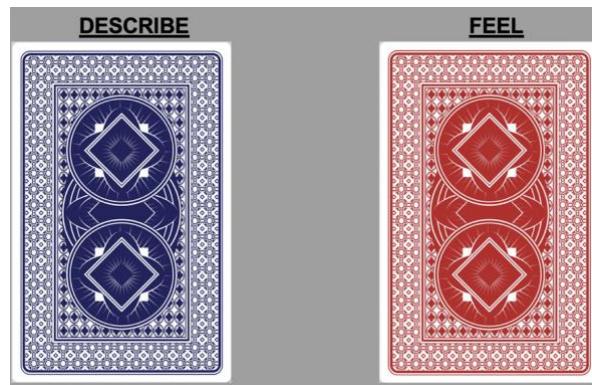
(A)



(B)

Fig. 4. Subgroup effects. (A) Subgroup effects by education, empathy, and income. (B) Subgroup effects by party, race, and sex. Race subgroups presented are Black or African American (“Black”), White, and a combined grouping of Asian, Hispanic, Latinx, Native Hawaiian, Pacific Islander and Other (“Other”) given the small sample sizes of the race subgroups.

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Fig. 5. DESCRIBE and FEEL cards presented to respondents.

Supplementary Materials for
Praise from peers can promote empathetic behavior

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This PDF file includes:

Supplementary Text
Figs. S1 to S27
Tables S1 to S15

A Summarizing information on studies

	Study goal	N	Trials	Total obs.
Study 1	Costliness of empathy	318	3	954
Study 2	Eliciting peer praise	114	-	114
Study 3	Peer praise on empathy	328	15	4680
Study 4	Happiness as mediator	223	1	223
Study 5A	Mediation analysis	337	20	6480
Study 5B	Mediation analysis	624	3	1731
Total	-	1944	-	14182

Table S1. Summarizing information on studies. *N* indicates number of consented respondents.

General handling of attrition

For all studies, we evaluated attrition and its possible effects on our results in the same manner. We present for each study an attrition evaluation plot, whereby the x-axis presents in order questions posed to the respondents in the survey experiment. The y-axis denotes the proportion of respondents who attrited (compared to the original starting sample). We indicate through colored vertical lines where Pre-Treatment, Treatment, Mediator (or Other), and Outcome variables are measured. Our visualizations make it obvious when large proportions of attrition occur at specific moments of the survey-- such as if treatment-induced attrition occurred, which would most directly and problematically affect estimation of average treatment effects. Throughout our studies we see very low attrition (an average of 5%) with no obvious correlations with introduction of treatment.

B Further details on Measurements

Treatments

Measurement of peer praise: We elicited naturalistic peer praise in Study 2 (see details on the Study in Methods section) in the following manner:

1. We ask respondents to provide feedback on two tasks a real adult has performed -- the FEEL and DESCRIBE tasks--- and explained what each task entailed and an example drawn image of a person.
2. Respondents are asked to think of language that would admire or encourage the participant for choosing and doing the FEEL/DESCRIBE, especially positive things that can be said to people who choose to empathize/be objective to others in order to encourage them. Respondents then are asked for three words, then a full sentence. Finally, respondents are asked to select how they feel about people who choose and engage in empathetic/objective behavior in a thermometer from 0-10 with zero as least warm and 10 as most warm.
3. To encourage respondents to think and write genuinely, we ask respondents in a series of follow up questions to tell us what the likelihood participants who are shown their words will believe that they are genuine, and give respondents the opportunity to return and edit their responses if they desire.

We collected the words used by respondents to praise empathetic behavior and created a word cloud, with a short sentence above indicating the average feeling thermometer value for that behavior, calculated from Study 2 participants. This constitutes the main peer praise for empathy treatment, replicated here and found in the main text as well. We similarly create a peer praise for describe treatment for our robustness checks. Both are found in Figure S1.



(a) Peer praise for empathy



(b) Peer praise for objectivity

Figure S1. Word clouds for peer praise and empathy. Left panel (a) main peer praise for empathy treatment; right panel (b) peer praise for objectivity.

Dependent variables

Measurement of main choice task: Our main dependent variable is a forced-choice task selection between FEEL and DESCRIBE, where the former is always coded as a 1 while the latter is coded as a 0 when conducting statistical tests; for more detail please see SI Section C.

Measurement of reservation wage: We also measure an incentivized reservation wage elicitation for the FEEL task; for more detail please see SI Section C.

Mediators

Happy: In Studies 4 and 5, immediately after the randomization of treatment, respondents were asked about their happiness developed from an emotion scale by (68). We specifically focus on the measurement of respondent emotion **in the moment**, so as to avoid conflating emotions across the experience of the overall survey with the emotions related to the treatment. Below is the phrasing of the happiness measure:

This scale consists of a number of words that describe feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word. Indicate to what extent you feel this way RIGHT NOW.

**scale: very slightly or not at all/ a little/ moderately/ quite a bit/ extremely
emotions: happy/enjoyment/liking**

Attention checks

Given concerns of greater online fatigue and inattentiveness during the COVID-19 global pandemic (see (69)) we follow Peyton et al.'s work, and the work of others on the usage of attention checks in online surveys (see for example (52)), and incorporate two pre-treatment attention check questions for Studies 4, 5A and 5B. The first attention check is styled in a multiple choice and the second via a grid question (see Figures S2-S3) to capture most attentive respondents as well as least (52). The multiple choice (*attentionMC*) and screening questions in the grid (*attentionG*) are drawn directly from (52), while the filler questions in the grid are designed to elicit non-politically oriented opinions from respondents so as to minimize possible priming effects downstream.

Respondent covariates

Each study asked a series of respondent-level covariates within the surveys; for ease we present information on the collection and timing of each of respondent covariates across studies in Table S2.

	Study 1	Study 2	Study 3	Study 4	Study 5 (A & B)
State of residence	Post DV	-	Post T/DV	Pre T	Pre T
Age	Post DV	Post DV	Post T/DV	Pre T	Pre T
Sex	Post DV	Post DV	Post T/DV	Pre T	Pre T
Education	Post DV	Post DV	Post T/DV	Pre T	Pre T
Race	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Income	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Religion	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Party	Post DV	Post DV	Post T/DV	Post T/DV	Pre T
Ideology	Post DV	Post DV	Post T/DV	Post T/DV	Post T/DV
Trump approval	Post DV	-	Post T/DV	Post T/DV	Post T/DV
Biden approval	-	-	-	-	Post T/DV
Baseline empathy	Post DV	-	Post T/DV	Post T/DV	Post T/DV

Table S2. Measurement of respondent covariates across studies. T indicates when treatment (peer praise) was measured, DV indicates when dependent variables are measured. In Studies 1 and 2 no treatments were manipulated.

C Task descriptions

Main choice task

The main choice task that appears throughout Studies 1, 3, 4 and 5, entails a practice round, where respondents practice both FEEL and DESCRIBE activities (Study 2 entails only describing the task, but does not ask respondents to practice it). Descriptions of the practice and main task can be found in the Methods section. For the practice, main task (and reservation wage task) images are drawn from the **Faces Data** in Chicago Faces (62), randomized among the following features: Race=Black/White, Gender=Male (no variation), Valence=Angry/Fearful; images are randomized *without replacement* within respondent. See Figure S4 for example draws of faces.

We are interested in what sections people like to read in the newspaper. This might affect what they learn from articles and how they feel about the issues discussed in them. We also want to see if people are reading the questions carefully. To show that you've read this much, please mark both the classified and none of the above options below. That's right, just select these two options only.

Regardless of how frequently you read the newspaper, what would you say are your favorite newspaper sections to read? (please check all that apply)

- National
- Local
- Real estate
- Comics
- Classified
- Style
- Sports
- Business
- Science and technology
- Opinion
- None of the above
- All of the above

Figure S2. MC attention check.

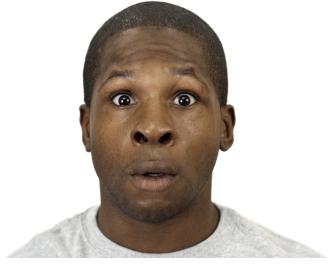
In the grid below, you will see a series of statements. Please tell us whether you agree or disagree with each statement.

	Agree strongly	Agree	Neither agree nor disagree	Disagree	Disagree strongly
The best sport to watch live is baseball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facebook is the best social media platform	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Two is greater than one	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Football is more interesting than basketball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please click the "neither agree nor disagree" response	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter is more engaging than Instagram	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soccer is more fun to play than hockey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure S3. Grid attention check.



(a) Race=Black, Valence=Angry



(b) Race=Black, Valence=Fearful



(a) Race=White, Valence=Angry



(b) Race=White, Valence=Fearful

Figure S4. Example faces from Chicago Faces Database.

Reservation wage task description

In the next task, you will be making choices between real amounts of money. You will see several choices to make between the two decks of cards, exactly like the tasks you completed earlier. For each choice between the decks, the FEEL deck asks you to be objective and write about the age and race of a person, and the DESCRIBE deck asks you to be empathetic and write about the internal experiences and feelings of a person. In all cases, the persons shown faces similar to those you saw earlier in the experiment. This time, you will see a real payment for completing a trial from each deck, for each choice. Please select the option that you prefer for each of the choices. There are no accurate or inaccurate answers. A random draw from one of the sets of choices will be enacted, and you will be directed to the deck you chose under that choice set, and paid the amount for that choice. These choices are thus **real decisions with real pay**.

[Present list of paired options of decks for respondent to click on.]

Wages for DESCRIBE are always \$1.00; wages for FEEL range from \$0.99 to \$1.13 in 1 cent increments. Each time an option for a pair is clicked on, the respondent will see the sentence below the pair “I would prefer to conduct task FEEL/DESCRIBE for Y amount, over task FEEL/DESCRIBE for Z amount.”

Recall your preferred choices for wages for DESCRIBE and FEEL.

[Randomly assign one of the paired options in the **Real Wage Task** to execute. Highlight the selected row.]

A random draw of the paired choices you have made has been selected: you will now conduct task X for Y amount. Your Y pay will be added to your survey pay at the end of this survey.

D Study 1: Costs of Empathy

Study 1 was fielded in September 2020, with a total of 318 respondents. The purpose of the study was to establish the baseline costliness of empathy. Figure S5 presents the consort diagram for Study 1. Descriptive statistics on respondent covariates are presented in Table S3. Respondents were also asked about their beliefs on how often other respondents on the platform chose the FEEL and DESCRIBE tasks, and what they thought others' beliefs about empathy and objectivity were (see Table S4). Other than measuring respondents' behavioral choices to establish baseline costs of empathy, we also directly asked respondents to rate the FEEL and DESCRIBE tasks for difficulty using the NASA task load; summary statistics for answers to these questions are presented in Table S5 and differences between the answers by task type are in Table S6.

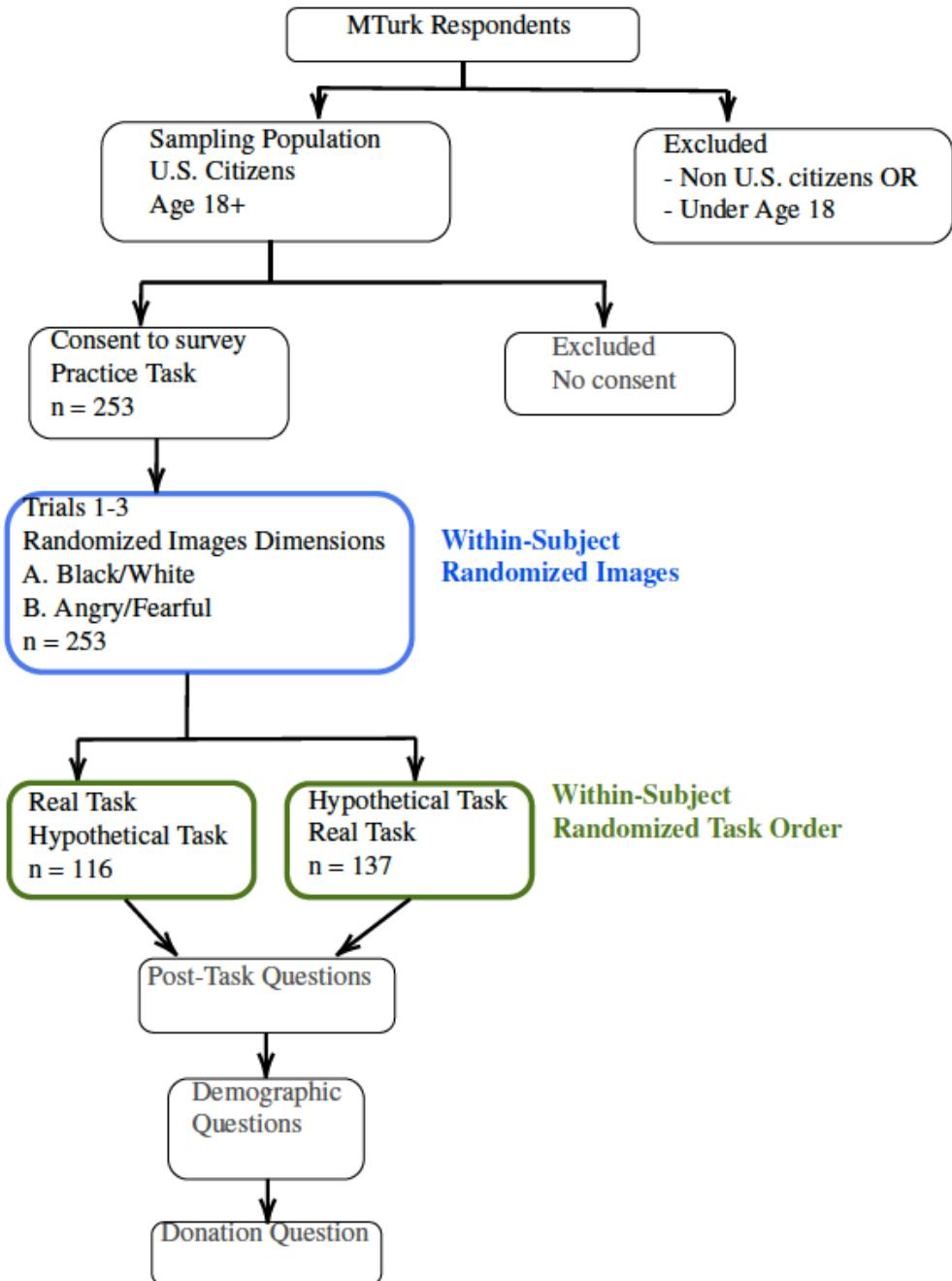


Figure S5. Study 1: Consort Diagram

	Level	N
Sex	Female	97
	Male	155
	<Missing>	66
Party	Democrat	62
	Independent	33
	Lean Democrat	21
	Lean Republican	13
	Republican	63
	Strong Democrat	34
	Strong Republican	26
	<Missing>	66
Ideology	Conservative	34
	Liberal	75
	Moderate	37
	Slightly conservative	24
	Slightly liberal	23
	Very conservative	25
	Very liberal	34
	<Missing>	66
Race	White	195
	Asian	1
	Black or African American	33
	Native Hawaiian or Pacific Islander	13
	Other	7
	<Missing>	69
Education	Associate degree	17
	Bachelor's degree (BA/BS)	149
	High school or equivalent (GED)	14
	Kindergarten to 8th grade	1
	Master's degree (MA/MS/MBA)	43
	Medical (MD), law (JD) or other doctoral degree (PhD)	2
	No schooling completed	1
	Some college, but did not complete a degree	25
	<Missing>	66
Income	100k or more	14
	25k to less than 50k	91
	50k to less than 75k	91
	75k to less than 100k	29
	Less than 25k	27
	<Missing>	66
Religion	Atheist/agnostic	45
	Buddhist	9
	Hindu	4
	Jewish	6
	Muslim	7
	Nothing in particular	24
	Orthodox (Greek or Russian)	1
	Protestant	53
	Roman Catholic	103
	<Missing>	66
N		
Age		
Missing		
Mean		
SD		
Min		
Q1		
Median		
Q3		
Max		

Table S3. Study 1 Respondents (Summarizing covariates). Total number of respondents 318.

Variable	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Belief people choose Feel task	252	57.421	23.959	3.000	39.750	79.000	100.000
Belief people choose Describe task	250	67.320	17.788	2.000	56.250	80.750	100.000
Belief people think empathy is good	250	72.396	18.783	1.000	58.500	86.000	100.000
Belief people think objectivity is good	250	72.128	16.948	1.000	63.000	85.000	100.000

Table S4. Descriptive Statistics - Empathy norms.

Variable	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Describe task mentally demanding	252	2.702	1.232	1.000	2.000	4.000	5.000
Feel task mentally demanding	252	2.937	1.043	1.000	2.000	4.000	5.000
Describe task hard to accomplish	252	2.385	1.037	1.000	2.000	3.000	5.000
Feel task hard to accomplish	252	2.762	1.085	1.000	2.000	3.000	5.000
Describe task raised insecurity	252	2.095	1.177	1.000	1.000	3.000	5.000
Feel task raised insecurity	252	2.329	1.170	1.000	1.000	3.000	5.000
Describe task done successfully	252	3.762	1.005	1.000	3.000	4.000	5.000
Feel task done successfully	252	3.575	1.048	1.000	3.000	4.000	5.000

Table S5. Descriptive Statistics - NASA task load.

Task	Demanding	Hard	Insecure	Successful
Objective (DESCRIBE)	2.702	2.385	2.095	3.762
Empathy (FEEL)	2.937	2.762	2.329	3.575
Difference	0.234 (p=0.0217)	0.377 (p=1e-04)	0.234 (p=0.0256)	-0.187 (p=0.042)

Table S6. Task load summary. Mean values reported (choices from 1-5).

Study 1 Attrition: Attrition evaluation plot for Study 1 is presented in Figure S6.

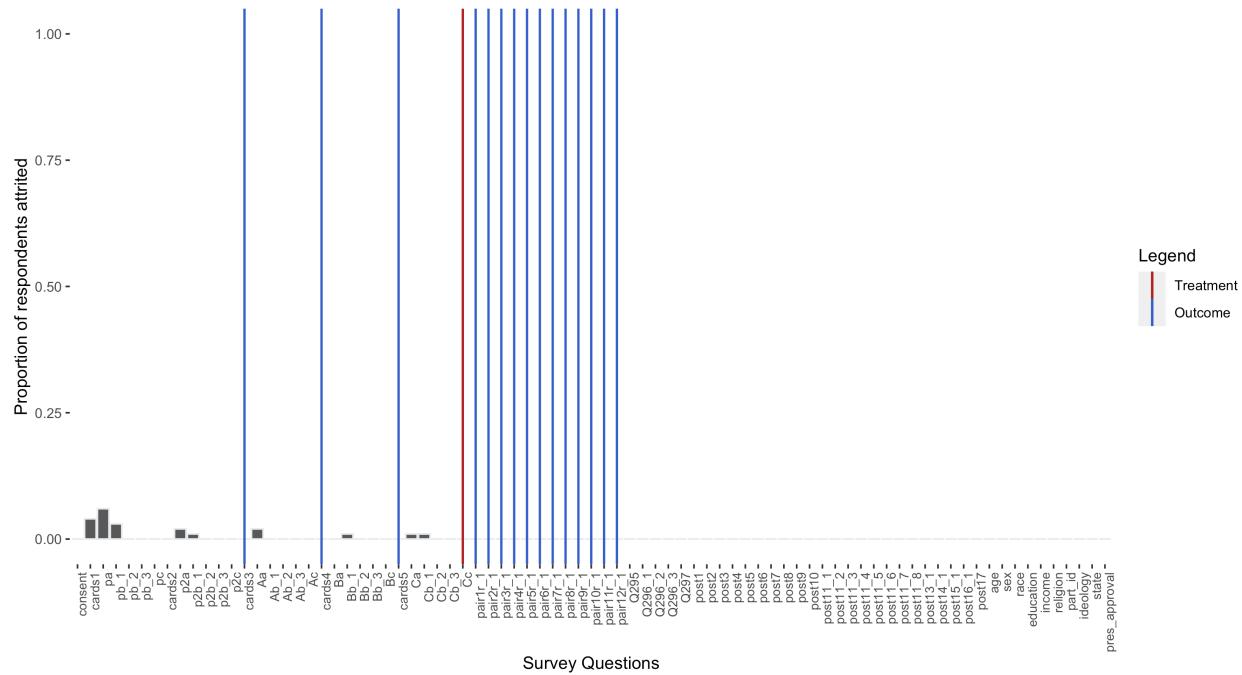


Figure S6. Attrition across survey questions: X axis denotes survey questions in chronological order. Blue vertical lines mark outcome questions: open-ended, three short words, and a feeling thermometer, which followed the choice tasks. Red vertical line represents randomization of hypothetical and real wage tasks. Y axis is the proportion of total n attrited, calculated as number of attrited respondents / total n.

E Study 2: Eliciting Naturalistic Praise (non-experimental)

Study 2 was fielded in September 2020 with a total of 114 respondents who consented to the survey. The purpose of the study was to elicit naturalistic peer praise for the empathy and objective tasks. The consort diagram for Study 2 is presented in Figure S7. Table S7 presents respondent covariate descriptives from the study. No attrition occurred in the study. Respondents were asked to write sentences and words that would praise peers who engaged in empathetic/objective behavior due to doing the FEEL and DESCRIBE tasks. Figure S8 presents a plot of the words that occur differentially across the words elicited for praising FEEL and DESCRIBE.

As a further check on whether positive feelings are held towards people who exhibit empathetic or observational behaviors, we asked respondents to provide thermometer ratings towards people who exhibited these types of behaviors. We calculate the positive and negative sentiments for praise texts respondents generated for people who display empathetic and objective behaviors respectively, using the Lexicoder Sentiment Dictionary and verify whether the thermometer ratings are positively correlated with positive text sentiments and negatively correlated with negative text sentiments. Figures S9 and S10 present linear association results that suggest the same.

Study 2 Attrition: As demonstrated in Figure S11, no attrition occurred in Study 2. See Figure S12.

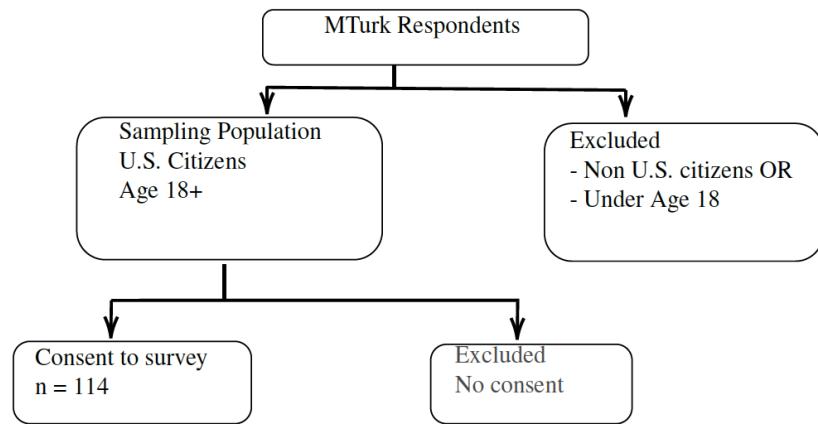


Figure S7. Study 2: Consort Diagram.

	Level	N						
Sex	Female	38						
	Male	76						
Party	Democrat	38						
	Independent	17						
	Lean Democrat	8						
	Lean Republican	7						
	Republican	23						
	Strong Democrat	11						
	Strong Republican	10						
Ideology	Conservative	19						
	Liberal	36						
	Moderate	20						
	Slightly conservative	8						
	Slightly liberal	9						
	Very conservative	8						
	Very liberal	14						
Race	Asian	2						
	Black or African American	15						
	Native Hawaiian or Pacific Islander	9						
	Other	8						
	White	80						
Education	Associate degree	11						
	Bachelor's degree (BA/BS)	53						
	High school or equivalent (GED)	9						
	Master's degree (MA/MS/MBA)	21						
	Medical (MD), law (JD) or other doctoral degree (PhD)	2						
	Some college, but did not complete a degree	18						
Income	100k or more	9						
	25k to less than 50k	32						
	50k to less than 75k	39						
	75k to less than 100k	17						
	Less than 25k	17						
Religion	Atheist/agnostic	36						
	Buddhist	1						
	Jewish	1						
	Mormon	1						
	Nothing in particular	17						
	Orthodox (Greek or Russian)	1						
	Protestant	22						
	Roman Catholic	35						
	N	Mean	SD	Min	Q1	Median	Q3	Max
Age	114	34.58	10.9	19	27	31	38	72

Table S7. Study 2 Respondents. Total number of respondents 114.

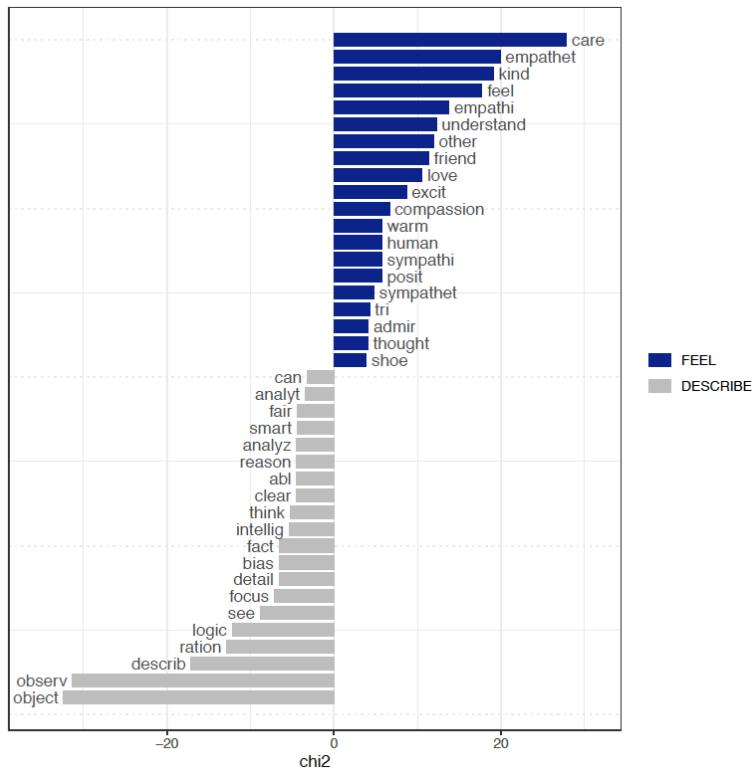


Figure S8. Keyness plot of words for empathy (FEEL) versus objective (DESCRIBE) tasks.
 Figure plots the results of a keyword of features comparing their differential associations with providing language in praise of peers who engage in empathy (FEEL) versus objective (DESCRIBE) tasks, after calculating “keyness”, a score for features that occur differentially across different categories. Here text for (FEEL) and (DESCRIBE) are the different categories.

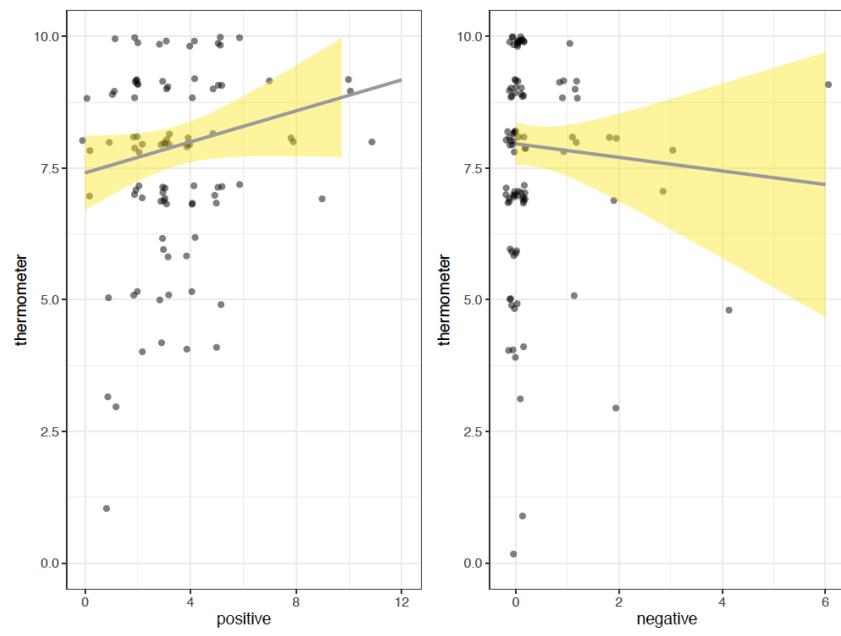


Figure S9. Correlation between positive and negative text sentiments for generated texts of praise for empathetic behavior with thermometer ratings for people who engage in empathetic behavior.

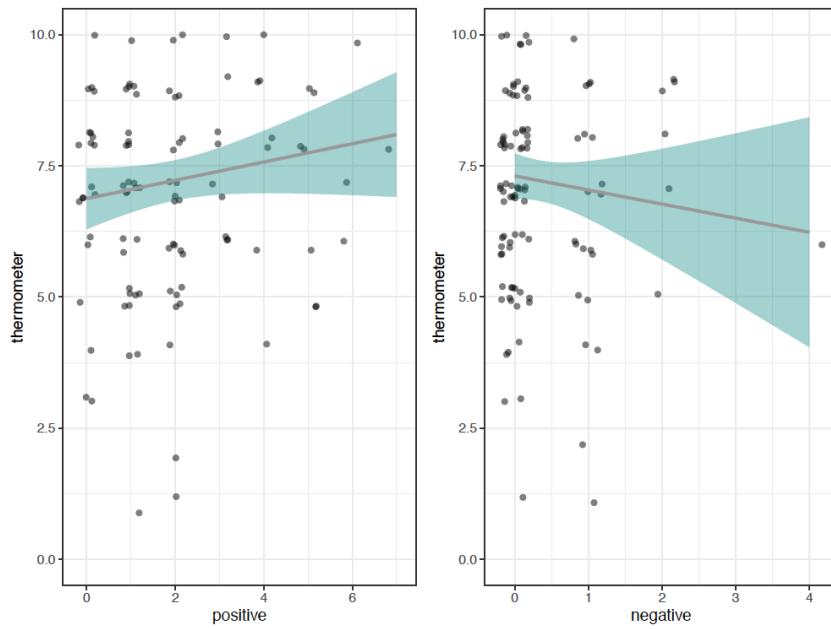


Figure S10. Correlation between positive and negative text sentiments for generated texts of praise for objective behavior with thermometer ratings for people who engage in objective behavior.

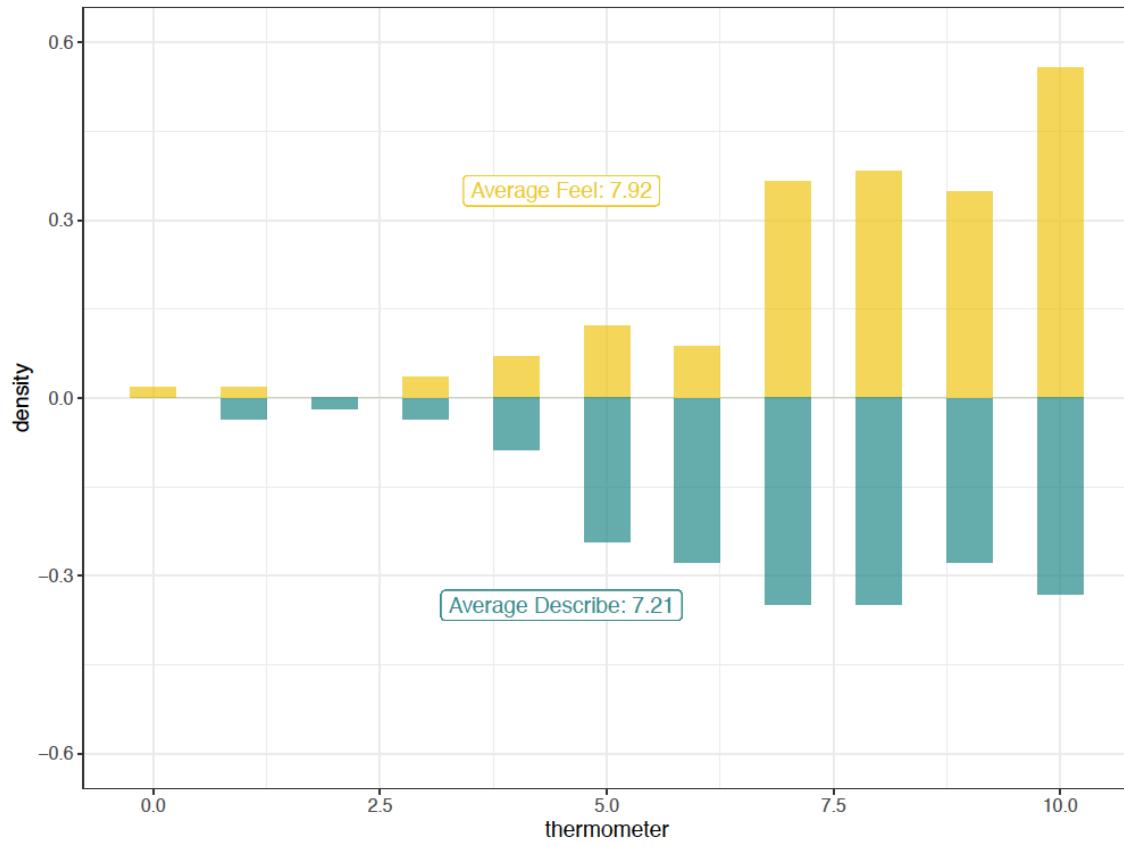


Figure S11. Distributions of thermometer ratings towards peers who exhibit empathetic behavior (top) and towards peers who exhibit objective behavior (bottom).

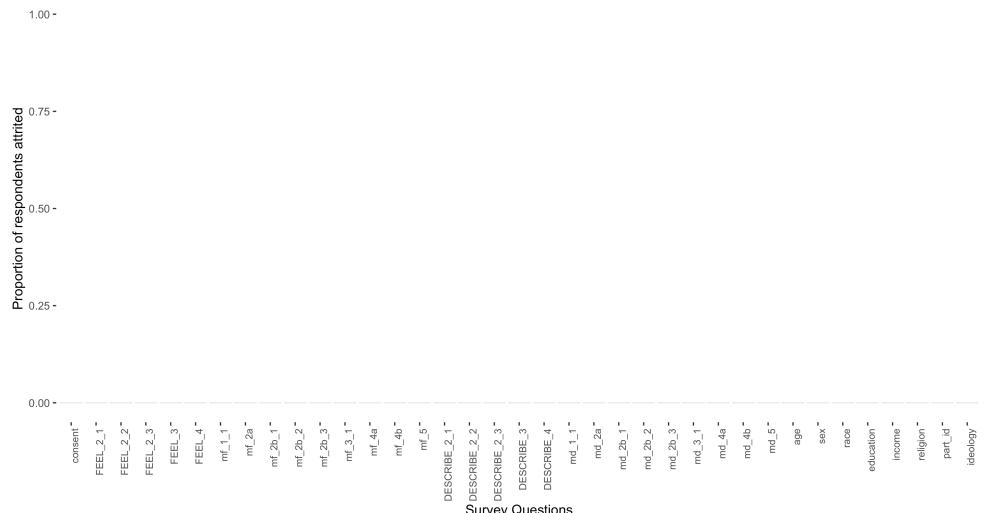


Figure S12. Attrition across survey questions. X axis denotes survey questions in chronological order. Y axis is the proportion of total n attrited, calculated as number of attrited respondents / total n. No attrition occurred in Study 2.

F Study 3: Praise Lowers the Cost of Empathy

Study 3 was fielded in November 2020 with 328 respondents. The primary purpose of the study was to establish whether peer praise (for empathy) could encourage empathetic behavior. We randomized peer praise for empathetic behavior, peer praise for objective behavior (taken from Study 2) and a control arm of no intervention and measured respondents' choice of task between FEEL and DESCRIBE. Secondarily, we were interested in evaluating whether peer praise might change reservation wages for the FEEL task. Figure S13 depicts the consort diagram for Study 3.

A total of 75 respondents attrited from the survey. See Figure S14 for details. Of those, 18.7% attrited during the first set of instructions, 34.7% attrited during the practice round, and 21.3% attrited during the post task questions. Attrition is not associated with praise treatment, or randomization of images. Respondents who randomly given the peer praise for empathy were 0.5% less likely to attrite (baseline is 0.01) than compared to respondents who received the Control. This finding is not statistically significant ($p=0.1$). Respondents who saw an image with a black person, were 1.8% less likely to attrite (baseline is 0.55) than compared to respondents who received an image with a white person. This finding is not statistically significant ($p=0.4$). Respondents who saw an image with an angry person, were 0.4% less likely to attrite (baseline is 0.517) than compared to respondents who received an image with a fearful person. This finding is not statistically significant ($p=0.8$).

Study 3 Robustness checks: It could be that respondents who are peer praised into selecting the empathy task are in fact simply doing a less good job (so responding to the peer praise and then selecting to do less work afterwards). Here, we conduct a few empirical (observational) tests to try to see if respondents are indeed taking “short cuts”. In our first test, we check if respondents who chose the empathy task under the peer praise treatment are similarly likely in using diverse (unique) words (“Unique tokens”) compared with respondents who chose the empathy task under the control treatment. In our second test, we consider if respondents who chose the empathy task under treatment are more likely to use words from the peer praise wordcloud (“Proportion of wordcloud”) –which would suggest short-cutting as well through simply applying words presented. In our last test, we check if the sentiment of words written in the empathy task is similar in the peer-praise group compared to the control group; if the former set of words are less positive, then it might suggest that respondents are actually not actually conducting the empathy task in the same manner. Our findings from the three tests are presented in Table S10 and suggest that there does not seem to be evidence of shortcutting.

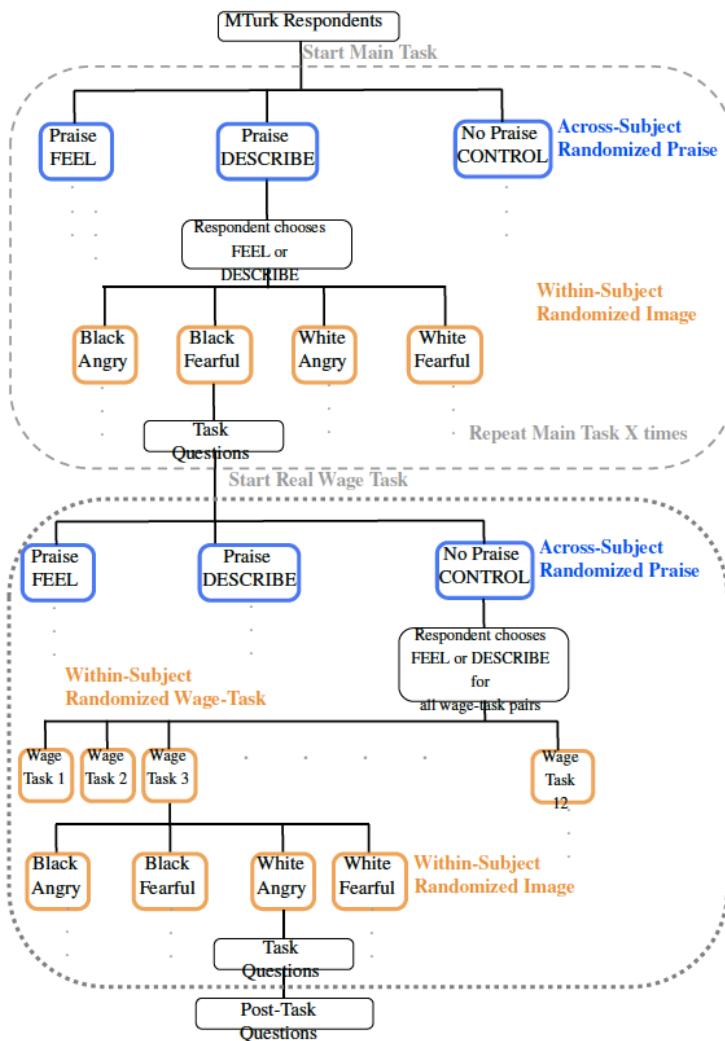


Figure S13. Consort Diagram. Peer praise for feel, peer praise for describe and control equally randomized throughout.

	Level	N							
Sex	Female	99							
	Male	153							
	other	1							
	<Missing>	75							
Party	Democrat	40							
	Independent	30							
	Lean Democrat	25							
	Lean Republican	21							
	Republican	60							
	Strong Democrat	32							
	Strong Republican	45							
	<Missing>	75							
Ideology	Conservative	32							
	Liberal	49							
	Moderate	42							
	Slightly conservative	26							
	Slightly liberal	28							
	Very conservative	33							
	Very liberal	43							
	<Missing>	75							
Race	White	180							
	Asian	1							
	Black or African American	48							
	Hispanic or Latino	2							
	Native Hawaiian or Pacific Islander	10							
	Other	9							
	<Missing>	78							
Education	Associate degree	23							
	Bachelor's degree (BA/BS)	122							
	High school or equivalent (GED)	23							
	Master's degree (MA/MS/MBA)	54							
	Medical (MD), law (JD) or other doctoral degree (PhD)	2							
	Some college, but did not complete a degree	25							
	Some high school, but did not graduate	4							
	<Missing>	75							
Income	100k or more	20							
	25k to less than 50k	75							
	50k to less than 75k	78							
	75k to less than 100k	49							
	Less than 25k	31							
	<Missing>	75							
Religion	Atheist/agnostic	42							
	Buddhist	2							
	Hindu	2							
	Jewish	6							
	Mormon	2							
	Muslim	4							
	Nothing in particular	33							
	Orthodox (Greek or Russian)	1							
	Protestant	52							
	Roman Catholic	108							
	<Missing>	76							
N Missing Mean SD Min Q1 Median Q3 Max									
Age	253	75	36.3	10.48	21	29	34	41	71

Table S8. Study 3 Respondents (Summarizing covariates). Total number of respondents 328.

	Log Odds	95% CI		Odds Ratio	95% CI
Intercept	-0.442	[-0.625,-0.259]		0.643	[0.535,0.772]
Peer praise for empathy	0.182	[0.025,0.339]		1.200	[1.025,1.404]

Table S9. Peer praise for empathy effect on choosing FEEL in main choice task.

Study 3 Attrition: Attrition evaluation plot for Study 3 is presented in Figure S14.

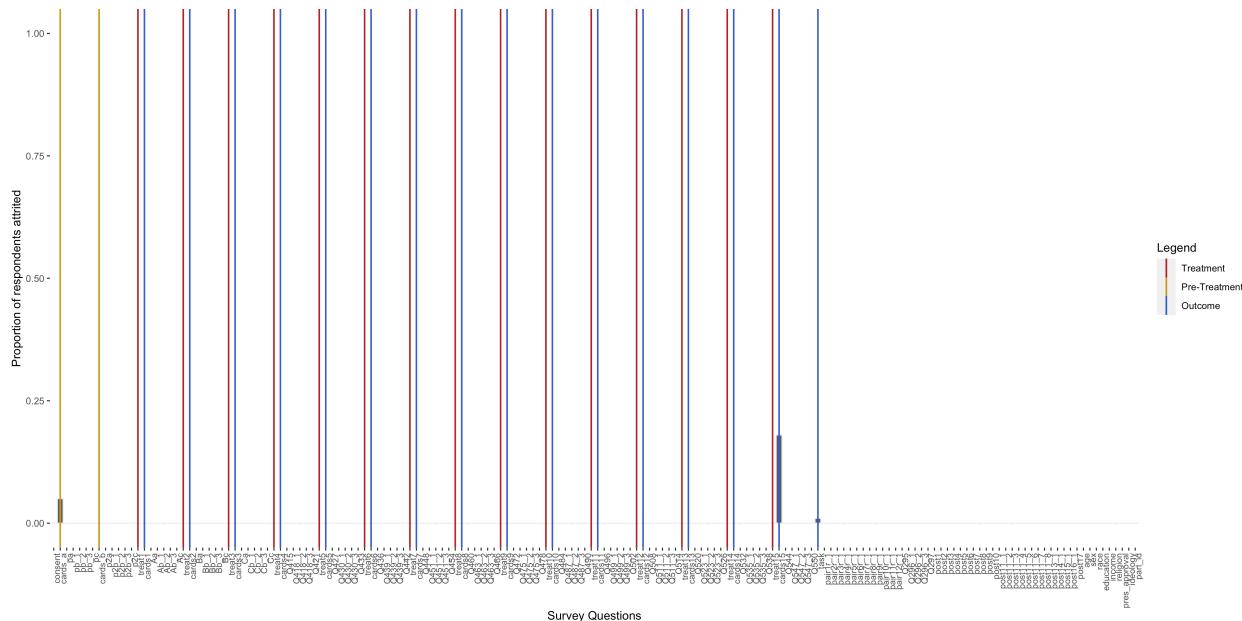


Figure S14. Attrition across survey questions. X axis denotes survey questions in chronological order. Blue vertical lines mark outcome questions: open-ended, three short words, and a feeling thermometer, which followed the choice tasks. Orange vertical line represents pre-treatment practice rounds, administered before the choice tasks. Red vertical lines mark randomization of peer praise. Y axis is the proportion of total n attrited, calculated as number of attrited respondents / total n.

	DV: Unique tokens			DV: Proportion of wordcloud			DV: Text sentiment		
	Estimate	s.e.	p	Estimate	s.e.	p	Estimate	s.e.	p
Intercept	5.438	0.165	7.56e-237	0.164	0.013	1.03e-35	-0.2	0.028	7.96e-13
Peer praise	0.102	0.142	0.473	0.009	0.013	0.48	-0.016	0.032	0.614

Table S10. Testing for shortcutting.

G Study 4: Peer praise increases reported happiness

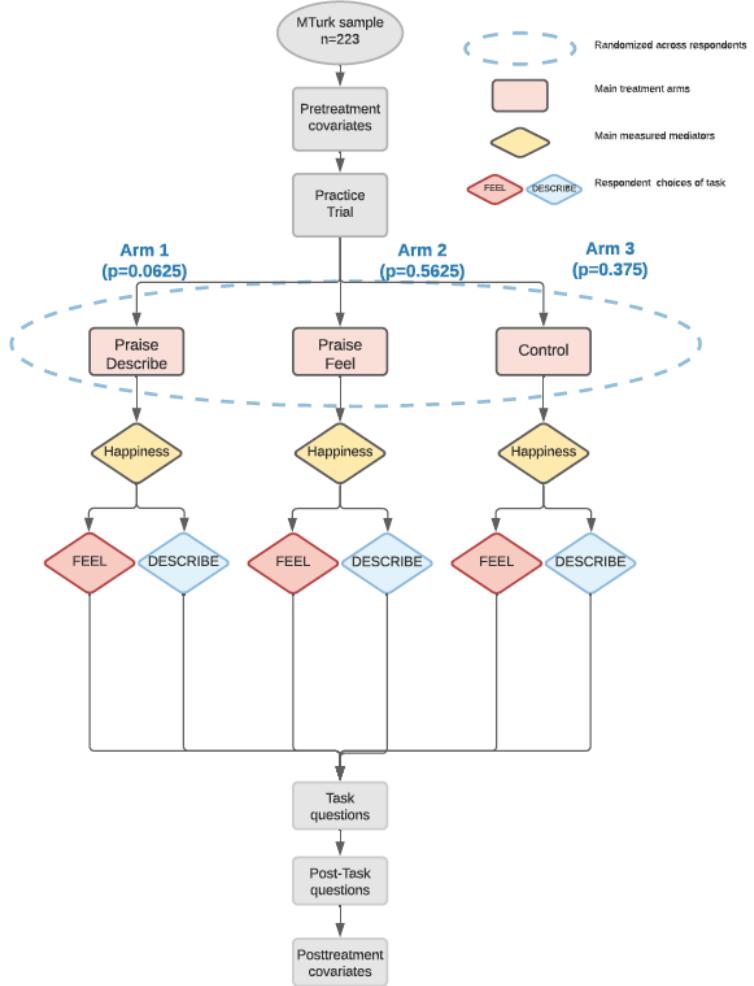


Figure S15. Study 4 Consort diagram. Main arms labeled with probability of assignment in parentheses (probability out of total assignment).

	Level	N	%					
Sex	Female	96	43.0					
	Male	126	56.5					
	other	1	0.4					
Party	Democrat	62	27.8					
	Independent	30	13.5					
	Lean Democrat	19	8.5					
Ideology	Lean Republican	9	4.0					
	Republican	35	15.7					
	Strong Democrat	33	14.8					
	Strong Republican	24	10.8					
	<Missing>	11	4.9					
Race	Conservative	31	13.9					
	Liberal	58	26.0					
	Moderate	34	15.2					
	Slightly conservative	14	6.3					
	Slightly liberal	21	9.4					
Education	Very conservative	14	6.3					
	Very liberal	40	17.9					
	<Missing>	11	4.9					
	White	156	70.0					
	Asian	2	0.9					
Income	Black or African American	29	13.0					
	Native Hawaiian or Pacific Islander	15	6.7					
	Other	9	4.0					
	<Missing>	12	5.4					
	Associate degree	14	6.3					
Religion	Bachelor's degree (BA/BS)	126	56.5					
	High school or equivalent (GED)	21	9.4					
	Master's degree (MA/MS/MBA)	38	17.0					
	Some college, but did not complete a degree	22	9.9					
	Some high school, but did not graduate	2	0.9					
Religion	100k or more	10	4.5					
	25k to less than 50k	66	29.6					
	50k to less than 75k	78	35.0					
	75k to less than 100k	33	14.8					
	Less than 25k	25	11.2					
Religion	<Missing>	11	4.9					
	Atheist/agnostic	41	18.4					
	Buddhist	4	1.8					
	Hindu	1	0.4					
	Jewish	3	1.3					
Religion	Mormon	3	1.3					
	Muslim	3	1.3					
	Nothing in particular	29	13.0					
	Protestant	38	17.0					
	Roman Catholic	90	40.4					
Age	<Missing>	11	4.9					
	N	Mean	SD	Min	Q1	Median	Q3	Max
Age	223	37.04	10.05	20	30	35	42	69

Table S11. Study 4 Respondents (Summarizing covariates). Total number of respondents 223.

Study 4 Attrition: Attrition evaluation plot for Study 4 is presented in Figure S16.

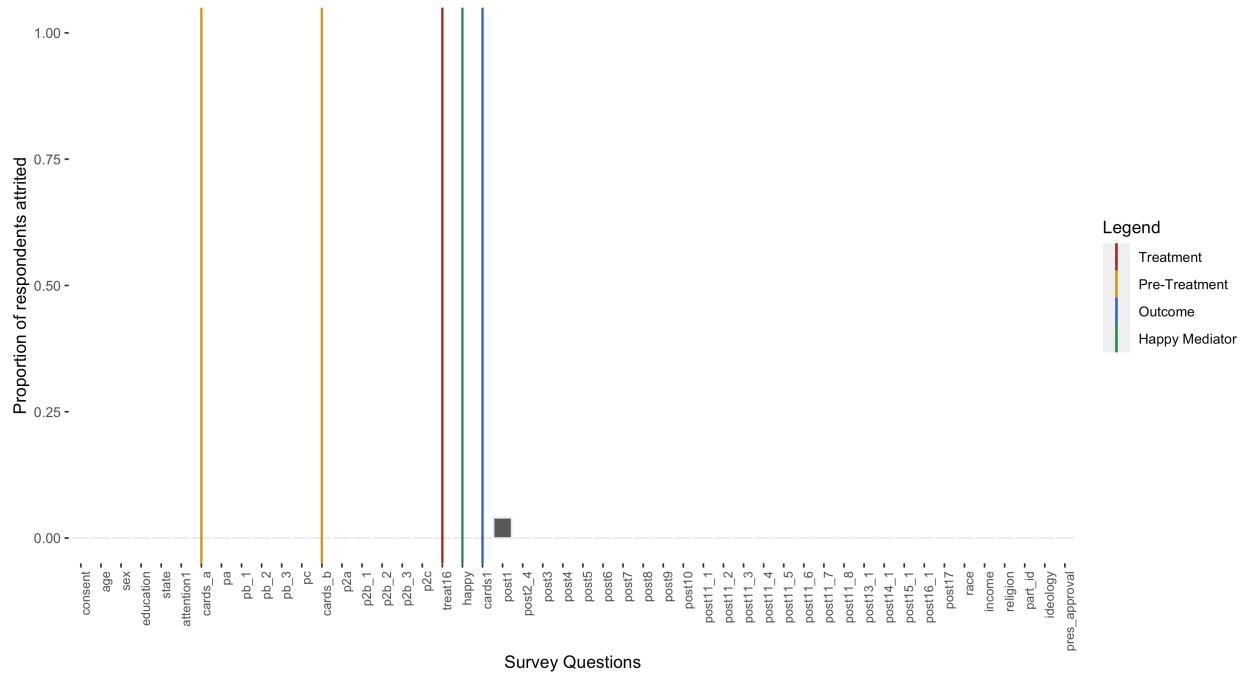


Figure S16. Attrition across survey questions. X axis denotes survey questions in chronological order. Orange vertical lines mark pre-treatment practice rounds of choice tasks. Red vertical line marks peer praise treatment. Green vertical line marks the Discrete Emotions Questionnaire questions on happiness. Blue vertical line marks outcome questions: open-ended, three short words, and a feeling thermometer, which followed the choice tasks. Y axis is the proportion of total n attrited, calculated as number of attrited respondents / total n.

Study 4 collected information on respondent happiness as well as pride (one after the other in the survey). To measure pride, respondents were asked the following set of questions also from the PANAS scale:

- (Emotions) This scale consists of a number of words that describe feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word. Indicate to what extent you feel this way RIGHT NOW.

[scale: very slightly or not at all/ a little/ moderately/ quite a bit/ extremely]

[emotions: satisfied/ proud/ accomplished/ fulfilled]

A similar index for pride is created as in the happiness index; Figure S17 presents the distribution of the pride index for peer praise for empathy versus control groups, along with their difference in means. Respondents in the peer praise for empathy group had an average of 0.487 units bump upwards in the pride index compared to the control group respondents.

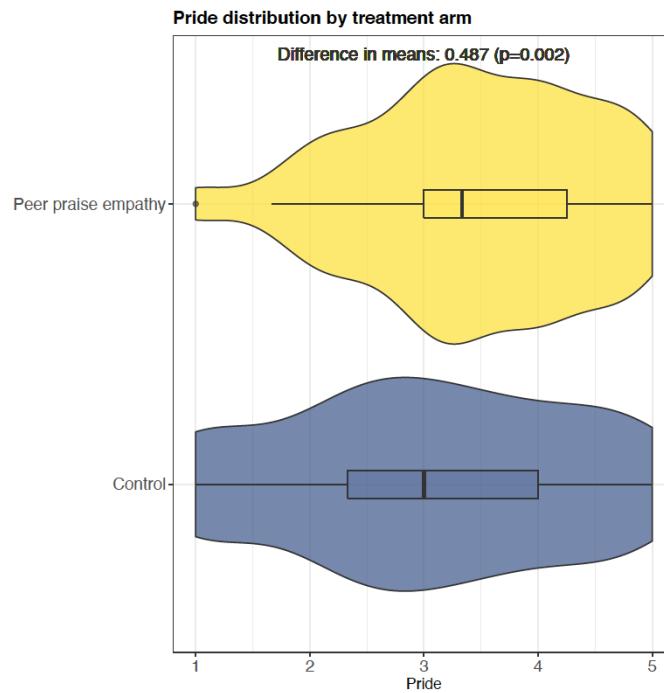


Figure S17. Pride of respondents in peer praise (for empathy) and control groups.

H Study 5: Peer praise increases likelihood of empathy task through increased happiness

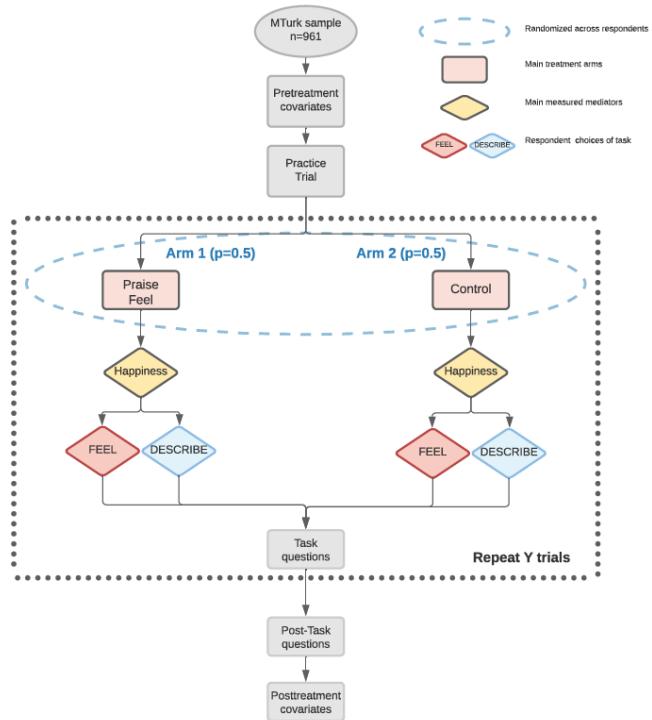


Figure S18. Study 5 Consort diagram. Main arms labeled with probability of assignment in parentheses (probability out of total assignment). Dotted gray space encapsulates the main task, which is repeated for Y trials for each respondent, where for Study 5A Y is 20, while for Study 5B Y is 3.

	Level	N							
Sex	Female	120							
	Male	213							
	other	1							
	<Missing>	3							
Party	Democrat	101							
	Independent	49							
	Lean Democrat	39							
	Lean Republican	23							
	Republican	35							
	Strong Democrat	55							
	Strong Republican	32							
	<Missing>	3							
Ideology	Conservative	39							
	Liberal	66							
	Moderate	53							
	Slightly conservative	21							
	Slightly liberal	36							
Race	Very conservative	32							
	Very liberal	29							
	<Missing>	61							
	Black or African American	74							
	Native Hawaiian or Pacific Islander	14							
Education	Other	20							
	White	218							
	<Missing>	11							
	Associate degree	23							
	Bachelor's degree (BA/BS)	164							
Income	High school or equivalent (GED)	26							
	Master's degree (MA/MS/MBA)	66							
	Medical (MD), law (JD) or other doctoral degree (PhD)	2							
	Some college, but did not complete a degree	52							
	Some high school, but did not graduate	1							
Religion	<Missing>	3							
	100k or more	37							
	25k to less than 50k	94							
	50k to less than 75k	127							
	75k to less than 100k	38							
	Less than 25k	38							
	<Missing>	3							
	Atheist/agnostic	75							
	Buddhist	4							
	Hindu	1							
	Jewish	11							
	Mormon	1							
	Muslim	2							
	Nothing in particular	39							
	Orthodox (Greek or Russian)	3							
	Protestant	54							
	Roman Catholic	137							
	<Missing>	10							
	N	Missing	Mean	SD	Min	Q1	Median	Q3	Max
Age	334	3	37.23	10.16	22	30	35	42	72

Table S12. Study 5A Respondents (Summarizing covariates). Total number of respondents 337.

	Level	N
Sex	Female	227
	Male	391
	other	3
	<Missing>	3
Party	Democrat	111
	Independent	99
	Lean Democrat	80
	Lean Republican	60
	Republican	84
	Strong Democrat	109
	Strong Republican	78
	<Missing>	3
Ideology	Conservative	76
	Liberal	103
	Moderate	86
	Slightly conservative	47
	Slightly liberal	61
	Very conservative	55
	Very liberal	67
	<Missing>	129
Race	Asian	5
	Black or African American	96
	Native Hawaiian or Pacific Islander	25
	Other	23
	White	455
	<Missing>	20
Education	Associate degree	48
	Bachelor's degree (BA/BS)	290
	High school or equivalent (GED)	61
	Master's degree (MA/MS/MBA)	121
	Medical (MD), law (JD) or other doctoral degree (PhD)	9
	No schooling completed	1
	Some college, but did not complete a degree	87
	Some high school, but did not graduate	4
	<Missing>	3
Income	100k or more	61
	25k to less than 50k	191
	50k to less than 75k	187
	75k to less than 100k	95
	Less than 25k	87
	<Missing>	3
Religion	Atheist/agnostic	129
	Buddhist	8
	Hindu	5
	Jewish	11
	Mormon	2
	Muslim	16
	Nothing in particular	84
	Orthodox (Greek or Russian)	4
	Protestant	117
	Roman Catholic	237
	<Missing>	11
<hr/>		
N		
Age	621	3
		Mean
		SD
		Min
		Q1
		Median
		Q3
		Max
<hr/>		
Age	621	37.62
		10.49
		19
		30
		35
		42
		73

Table S13. Study 5B Respondents (Summarizing covariates). Total number of respondents 624.

Study 5 Attrition: Attrition evaluation plots for 5A and 5B are presented in Figures S19 and S20.

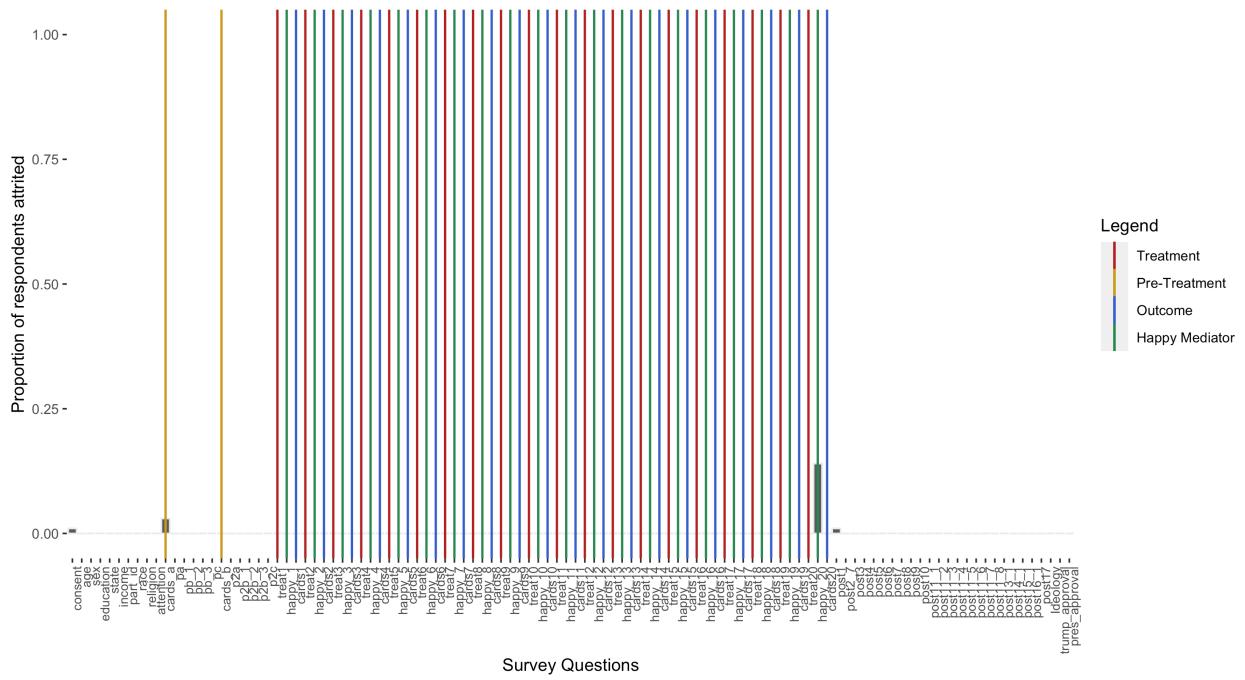


Figure S19. Study 5A: Attrition across survey questions. X axis denotes survey questions in chronological order. Orange vertical lines mark pre-treatment practice rounds of choice tasks. Red vertical line marks peer praise treatment. Green vertical line marks the Discrete Emotions Questionnaire questions on happiness. Blue vertical line marks outcome questions: open-ended, three short words, and a feeling thermometer, which followed the choice tasks. Y axis is the proportion of total n attrited, calculated as number of attrited respondents / total n.

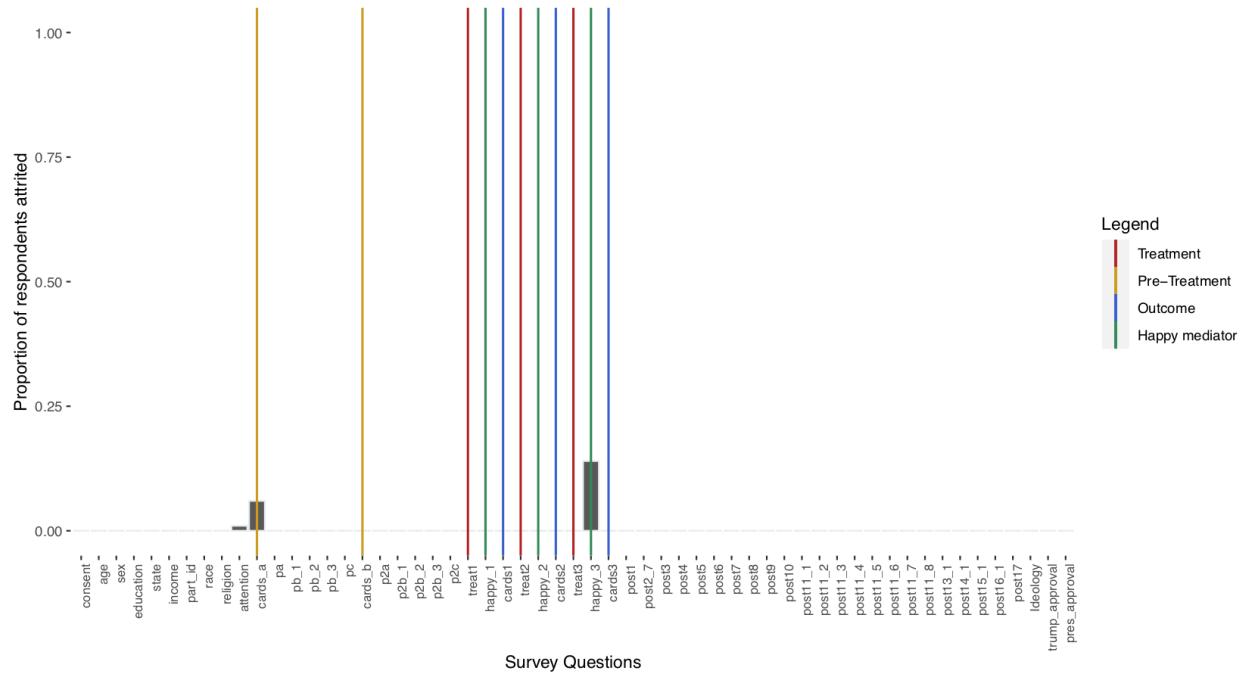


Figure S20. Study 5B: Attrition across survey questions. X axis denotes survey questions in chronological order. Orange vertical lines mark pre-treatment practice rounds of choice tasks. Red vertical line marks peer praise treatment. Green vertical line marks the Discrete Emotions Questionnaire questions on happiness. Blue vertical line marks outcome questions: open-ended, three short words, and a feeling thermometer, which followed the choice tasks. Y axis is the proportion of total n attrited, calculated as number of attrited respondents / total n.

Sensitivity analysis of mediation: We analyze the mediating effect of happiness on the choice task variable using (51)'s approach for model-based causal mediation analysis; the key assumption required is sequential ignorability. Thus we focus on the sensitivity parameter $\rho = \text{Corr}(\epsilon_{i2}, \epsilon_{i3})$; sequential ignorability implies $\rho=0$. We set ρ at different values and see how our ACME changes for our Study 5 (pooled) sample. This requires the following assumed usual equations relating outcome (Y), treatment (T) and mediator (M) variables:

- (1) $Y_i = \alpha_1 + \beta_1 T_i + \epsilon_{i1}$
- (2) $M_i = \alpha_2 + \beta_2 T_i + \epsilon_{i2}$
- (3) $Y_i = \alpha_3 + \beta_3 T_i + \gamma M_i + \epsilon_{i3}$

We estimate that when ρ is around 0.12 the ACME becomes 0. Assume the unobserved (pre-treatment) confounder formulation:

$$(4) \epsilon_{i2} = \lambda_2 U_i + \epsilon'_{i2}$$

and

$$(5) \epsilon_{i3} = \lambda_3 U_i + \epsilon'_{i3}$$

How much does U_i have to explain for our results to go away? Figure S21 presents the proportion of original variance explained by U_i .

We can re-parameterize ρ using $(\tilde{R}_M^2, \tilde{R}_Y^2)$:

$$\frac{\text{sgn}(\lambda_2 \lambda_3 \tilde{R}_M^2 \tilde{R}_Y^2)}{\sqrt{(1 - \tilde{R}_M^2)(1 - \tilde{R}_Y^2)}}$$

where \tilde{R}_M^2 and \tilde{R}_Y^2 are from the original mediator/outcome models. We can set $(\tilde{R}_M^2, \tilde{R}_Y^2)$ to different values and see how mediation effects change.

Figure S22 assumes that the confounder influences both the mediator and outcome variables in the same direction.¹ The bold line represents the various combinations of R^2 statistics where the ACME would be 0. In this case the product would have to be 0.014 for the ACME to become 0. Another way to say this is that when the product of the original variance explained by the omitted confounding is 0.014 the point estimate for ACME would be 0.

¹ This matters because the sensitivity analysis is in terms of the product of R^2 statistics; we assume positive because it seems more likely that something positively affecting the Mediator and the Outcome is happening to create the positive finding for the ACME).

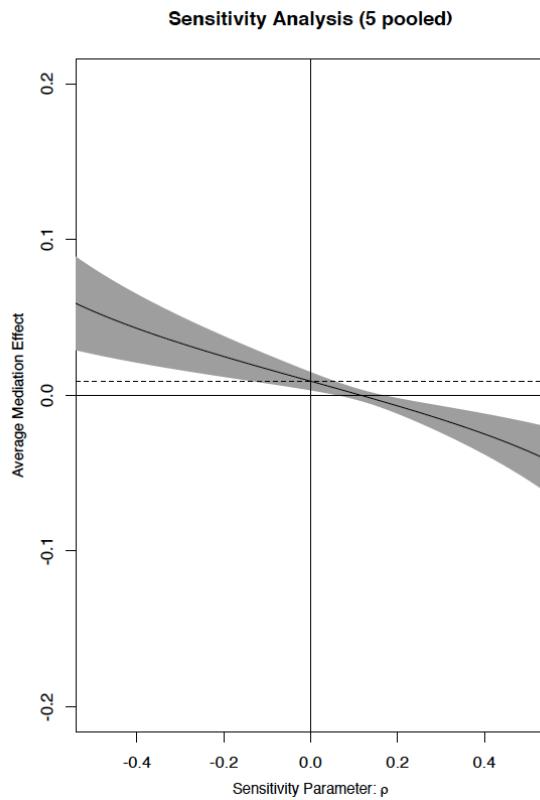


Figure S21. Proportion of original variance explained by U_i .

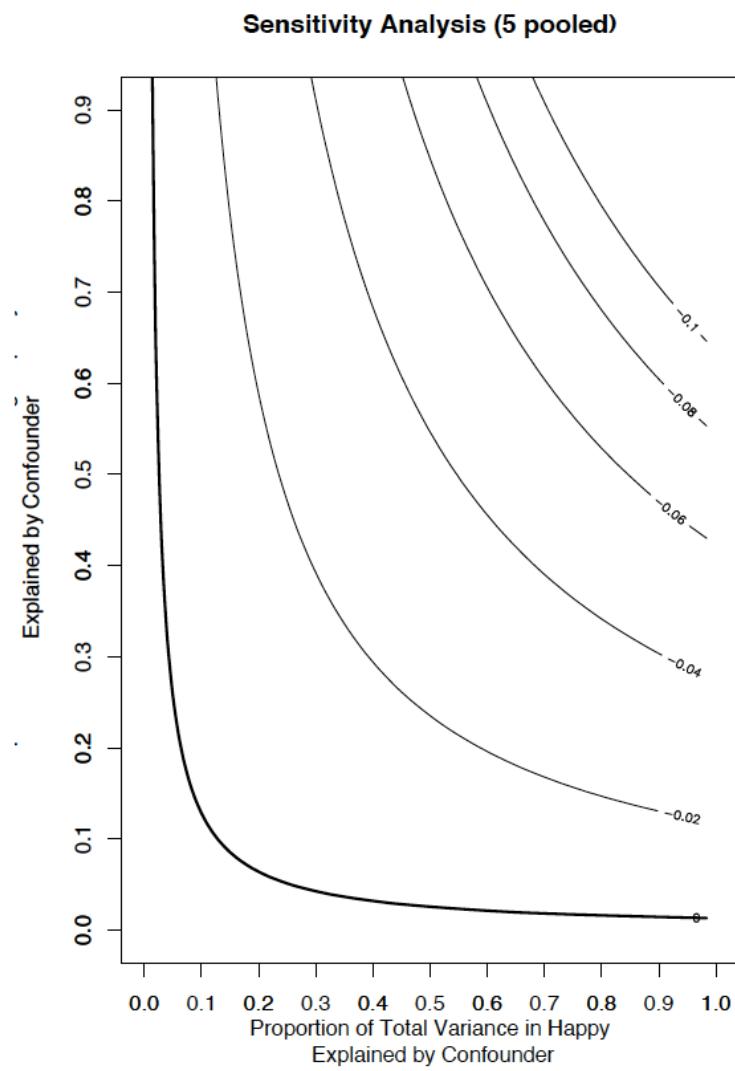


Figure S22. R^2 statistics for which ACME would be 0.

I Scope of peer praise for empathy

Estimated standard errors are clustered at respondent levels and robust, and 90 and 95% confidence intervals are plotted throughout.

Fading effects of peer praise:

Figure S23 presents estimated average causal marginal effects (ACME) and total effects (TE) or peer praise for empathy (through happiness) over successive main task trials.

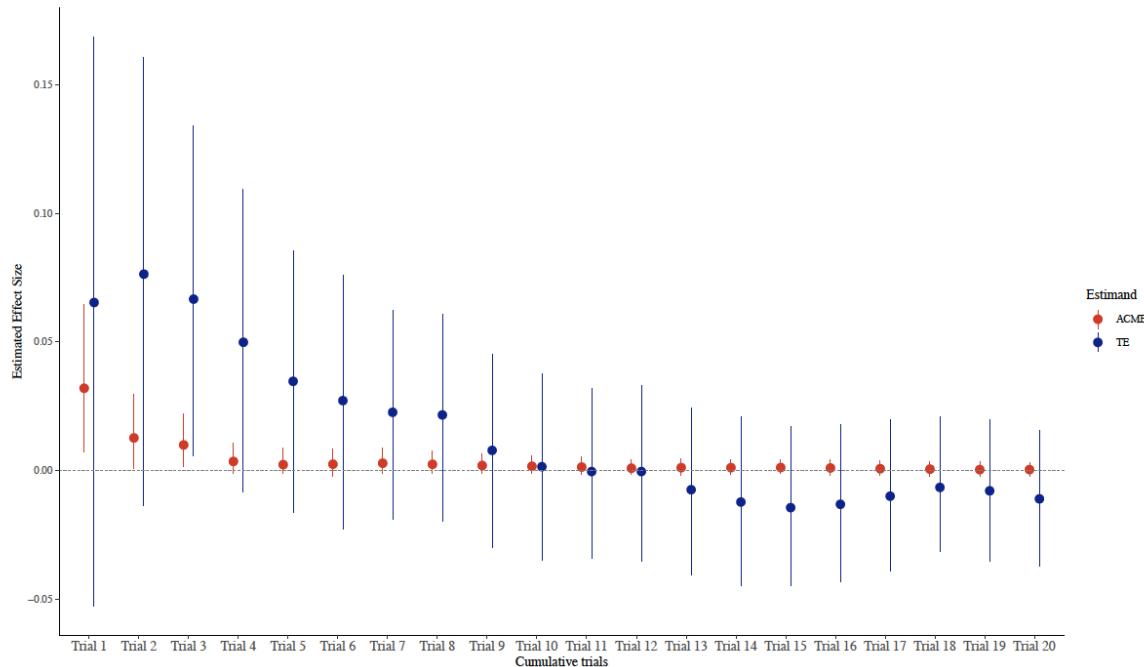


Figure S23. ACME and TE effects of peer praise (through happiness) over successive trials.

Further subgroup analyses

by Attentiveness: We look at subgroup effects by respondent attentiveness in Studies 5A and 5B (where the peer praise and task choice outcome are both measured for respondents over several trials) and look at attentive (respondents who pass the multiple choice attentionMC and grid attentionG attention checks), somewhat attentive (pass only attentionMC or attentionG but not both) and inattentive respondents (pass neither check). See Appendix Section B for details. Figure S24 presents estimated treatment effects of peer praise for empathy on choosing the empathy task within each of these subgroups.

Study 5 was composed of two days' worth of survey experiments, which we refer to throughout as 5A and 5B. 5A included 20 trials of the main task for all respondents, while 5B included 3.

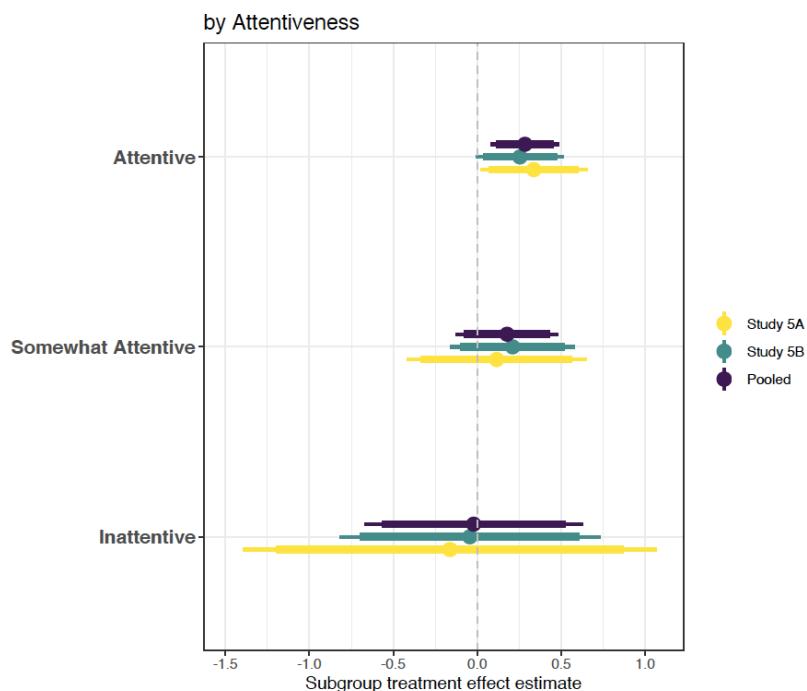


Figure S24. Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by respondent attentiveness.

by Party: Democrats comprise of respondents who reported themselves as “Lean Democrat”, “Democrat” and “Strong Democrat” while Republicans are respondents who reported themselves as “Lean Republican”, “Republican” and “Strong Republican”; Independents are those who reported themselves as “Independent”.

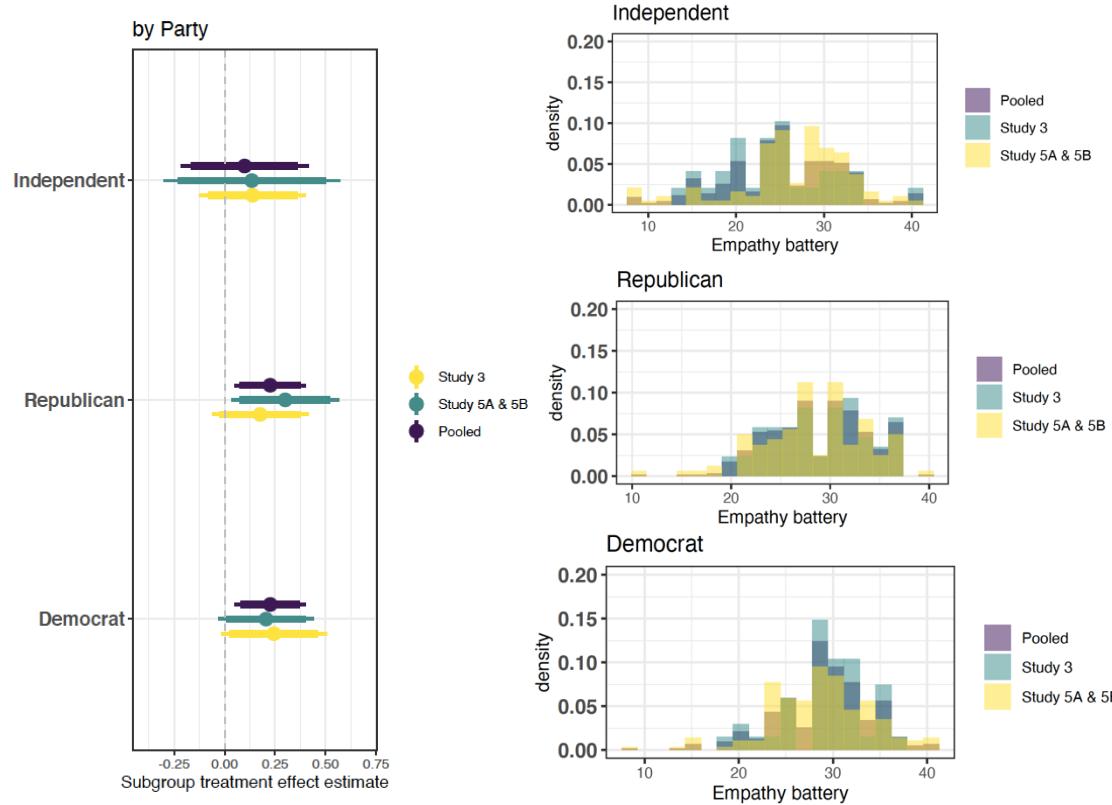


Figure S25. Left panel: Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by party subgroup. Right panel: density distribution of baseline empathy battery score by party subgroup.

by Trump and Biden approval: Trump approval was measured in Study 3 under the question of presidential approval as Donald Trump was the then president-in-office; in Studies 5A and 5B to follow Joe Biden had taken office and so two questions were asked -- one for presidential approval for Joe Biden, and a second on approval for former President Donald Trump. Figure S24 presents subgroup analyses for Trump approval while Figure S25 presents subgroup analyses for Biden approval.

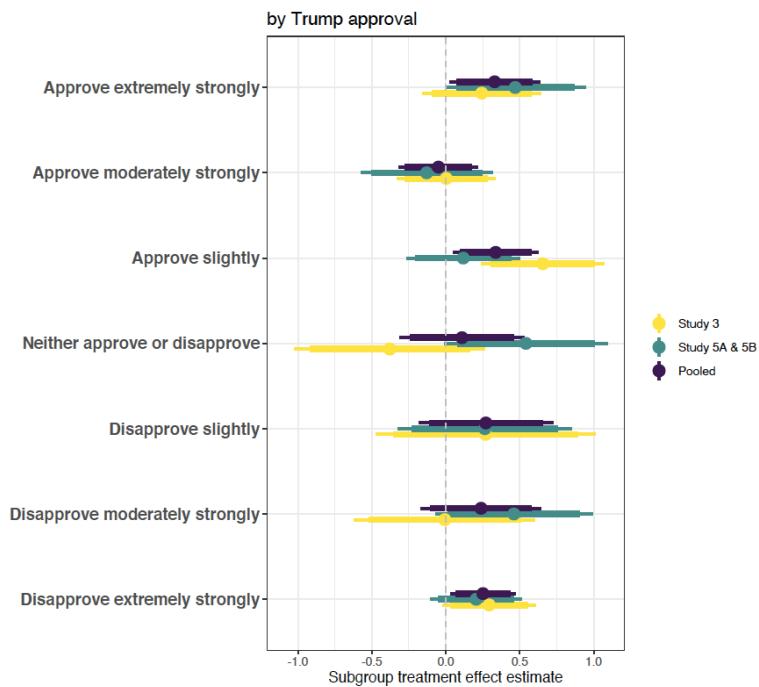


Figure S26. Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by Trump approval subgroup.

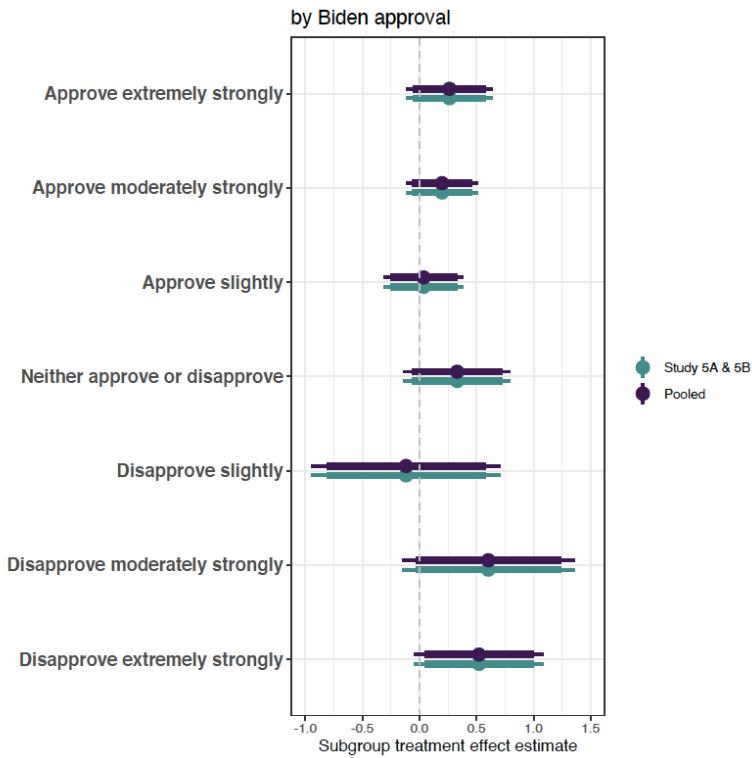


Figure S27. Logistic regression estimated peer praise for empathy treatment effect on log likelihood of choosing empathy task, by Biden approval subgroup.

by Income: There are four income categories: 25k to less than 50k, 50k to less than 75k, 75k to less than 100k, and over 100k income annually. No respondents chose the fifth category, less than 25k. Figure S26 presents subgroup analyses by income.

J Explorations of other mechanisms for peer praise on empathy

In a short follow up study to Study 3 we also measured respondent reported anxiety randomly either before or after the tasks (one main task, one reservation wage task). We consider the difference in measured anxiety for control group respondents who chose the empathy task each time with the respondents who chose the objective task each time. If respondents become more anxious after choosing the empathy task then we should see that their change in anxiety values should be higher than their colleagues who chose the objective task each time (change in anxiety was measured as pre minus post). As this is an observational exploration, we further control for respondent sex, age, education, race and party. Table S14 reports this analysis, and suggests that there is no evidence in support of the empathy task correlating with an increase in anxiety (coefficient on “Choose Empathy over Objective” is not significantly different from zero).

	Estimate	s.e.	p
Intercept	0.8892	0.1896	0.0000
Choose Empathy over Objective	-0.0224	0.0732	0.7593

Table S14. Change in anxiety after choosing Empathy or Objective

To see if respondents alleviate anxiety of empathy through peer praise, we further explored changes in reported anxiety among respondents who received either peer praise for empathy or control and who only **chose the empathy task** (comparing treatment effects on changes in anxiety while holding the task chosen constant). If it were the case that peer praise alleviates anxiety around the empathy task, we should see the peer praised group report higher changes in anxiety values compared to the second control. Again, this is an observational exploration, so we control for respondent sex, age, education, race and party. Table S15 reports these findings, and suggests no evidence towards such a pathway.

	Estimate	s.e.	p
Intercept	0.5604	0.1623	0.0006
Peer praise	0.0589	0.0516	0.2536

Table S15. Change in anxiety after peer praise for empathy

K Ethical considerations

All of the studies conducted in this project received IRB approval and exemption through the University of Wisconsin Madison Educational and Social/Behavioral Science IRB (# 2020-0843-CP002).

Fair wage: In establishing pay scales for each study, we conducted pilots to establish average times for pre-treatment, task and post task portions of each study design and paid based on the state with the highest minimum wage in mid 2020 (Washington, at \$13.50 per hour). Our intention was to offer fair wages especially in the context of work showing the median wage of MTurk workers is \$2/hour (61).

Negative treatments and distress: In our studies we intentionally avoided negative affect in interactions as much as possible, by not providing negative peer feedback or emphasizing negative emotions when exploring mediators.

No deception: Our studies incorporated a strict no-deception of respondents rule throughout, which in part motivated and necessitated Study 2—garnering real peer praise and validating its authenticity.