Misjudgment Exacerbates Collective Action Problems

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Abstract

In collective action problems, suboptimal collective outcomes arise from each individual optimizing their own wellbeing. Past work assumes individuals do this because they care more about themselves than others[1–3]. Yet, other factors could also contribute. We examine the role of empirical beliefs. Our results suggest people underestimate individual impact on collective problems. When collective action seems worthwhile, individual action often does not, even if the expected ratio of costs to benefits is the same. It is as if people believe "one person can't make a difference." We term this the *collective action bias*. It results from a fundamental feature of cognition: people find it hard to appreciate the impact of action that is on a much smaller scale than the problem it affects[4]. We document this bias across nine experiments. It affects elected policymakers' policy judgments. It affects lawyers' and judges' interpretation of a climate policy lawsuit. It occurs in both individualist and collectivist sample populations and in both adults and children. Finally, it influences real decisions about how others should use their money. These findings highlight the critical challenge of collective action problems. Without government intervention, not only will many individuals exacerbate collective problems due to self-interest, but even the most altruistic individuals may contribute due to misjudgment.

Main

Humans often behave to the detriment of the greater good, resulting in a variety of global challenges such as declining fish populations, climate change, nuclear arms races, and the spread of disease. In general, this behavior arises in *collective action* problems: situations in which everybody would be better off if they all cooperated than if they all acted self-interestedly, but acting self-interestedly always achieves a better personal outcome at the individual level[1,2]. These problems take many forms. In public good provision, a self-interested agent will contribute insufficiently to the public good because they will ignore how their contribution benefits others[5,6]. In the tragedy of the commons, a self-interested agent will overuse common resources, since the costs of resource depletion fall mostly on others [3]. In general, collective action problems are one of the most pressing issues in social science.

Behavioral science has largely examined collective action problems through the lens of self-interest vs. prosociality[7,8]. It has explored prosocial motivations[7,9–12] and also how to harness self-interested motives for the greater good, e.g., via rewards[13], reciprocity[14] or punishment[15,16]. In the field, myriad behavioral interventions promote altruism via prosocial messaging[17,18], nudging[19], costly signals of sincere advocacy[20], and more. But collective action problems have generally proved resistant to such interventions[21–24]. To make more progress on collective action problems, it would help to understand whether self-interest is their sole cause.

This article introduces an additional factor: individuals might underestimate their impact on collective outcomes. Why has this factor been overlooked by past work? Typically, economic models assume that people know the consequences of their actions—or at least their probabilities[25]. If people act in their own interests, it is due to their preferences, not lack of knowledge. But in practice, people rarely know their impact on others. In fact, our

evidence suggests people often underestimate it. We term this tendency the *collective action bias*. Thus, in addition to the barrier based on motivations and preferences, there is a further barrier based on judgment.

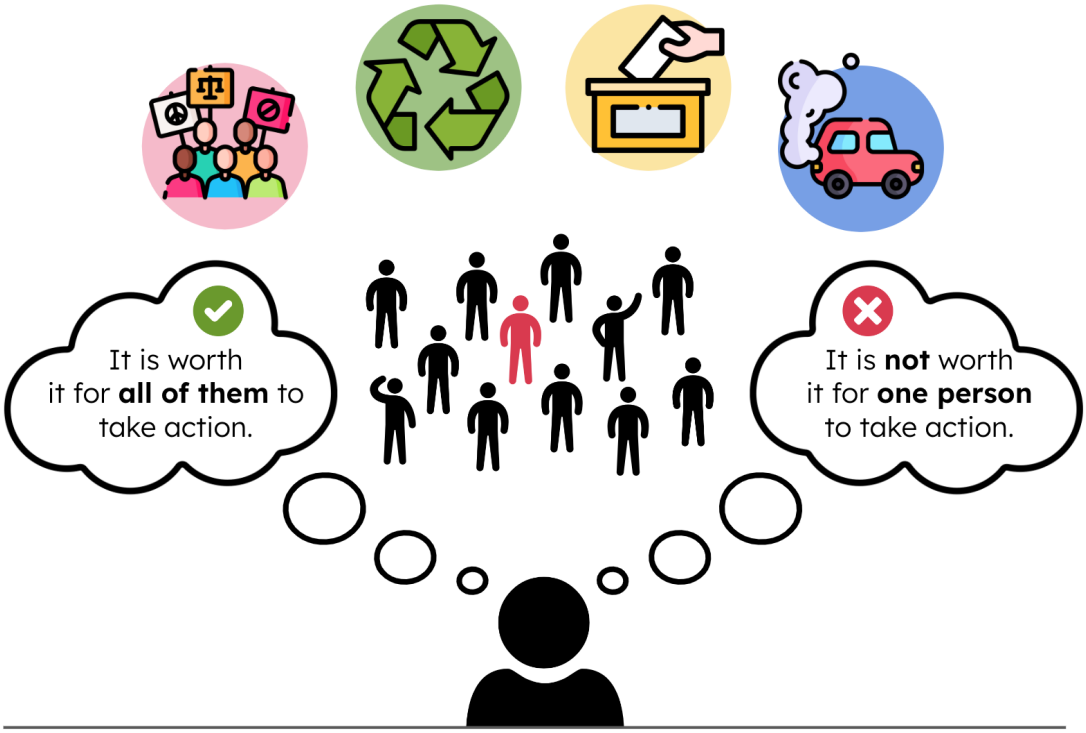
According to the collective action bias, people systematically underappreciate the impact of individual action on collective problems, as if "one person can't make a difference." When the benefits of collective action seem to outweigh the costs, the costs of individual action often seem to outweigh the benefits. Importantly, it can appear this way even when the ratio of costs to benefits is identical in both cases. Sometimes, this perception reflects reality. Sometimes, there are tipping points such that an extra prosocial action is useless without a critical mass[26–28]. But such justifications only apply *sometimes*. Other times, each individual action has about the same expected impact on the collective outcome[29]. Even when there are tipping points, the tipping point is often just as likely to be triggered by the first action as the hundredth, thousandth, or millionth[29]. People perceive some actions worthwhile for collectives but not for individuals, even when this perception is wrong.

For an illustrative example, suppose an individual could walk to work instead of driving, contributing an expected benefit worth $8 to the environment at a personal inconvenience worth $4 to themselves. For a 100,000-person collective of similar individuals, the total benefits and costs would be multiplied by about 100,000, leading to a total benefit of $800,000 and a total cost of $400,000. In this case, there is a 2-to-1 ratio of benefits to costs for both the 100,000 collective and any individual within it. It is inconsistent to claim it is worthwhile for all 100,000 to walk, but not for one. Yet even in circumstances like this one, this claim is widely believed. In other words, there is a collective action bias, illustrated in Figure 1.

We propose that this bias arises from how cognitive processes interact with the fundamental features of collective action problems. In collective action problems, the costs of

prosocial action are incurred at the individual level, while the benefits accrue to collectives. For example, forgoing a plane journey has a clear personal cost, but the climate effects concern everybody. In general, people can more easily evaluate the impact of action when it is commensurate with the scale of the problem[4]. An individual's contribution is small-scale in comparison to the collective problem. That contribution is thus hard to evaluate or appreciate[30–32], while the personal implications are concrete, vivid, and relatable[33]. When people consider prosocial action at the individual level, they must compare unintuitive benefits with intuitive costs. They will be biased against deeming it worthwhile[34]. In contrast, when people consider prosocial action at the collective level, the potential impact is more commensurate with the scale of the problem. They thus find both benefits and costs worth considering.

Figure 1 | Illustration of the collective action bias.



Note. Self-interest can be a barrier to individuals engaging in prosocial behaviors such as protesting, recycling, voting, and reducing CO_2 emissions. We show an additional barrier in the form of misjudgment: the *collective action bias*. When people succumb to this bias, they underestimate the impact of a single individual's actions. In cases where they believe that action is worthwhile for a collective, they tend to believe that action is *not* worthwhile for a single individual. They hold these beliefs simultaneously even when they are inconsistent, e.g., when the expected cost-benefit ratio for the collective and the individual are the same.

Experiments

The Collective Action Bias

We present evidence for the collective action bias across nine experiments (and one supplemental experiment) with designs including realistic scenarios, controlled hypothetical vignettes, and an incentive-compatible economic game, and with sample populations

including lay-people from collectivist and individualist cultures, children, local government officials, and judges and lawyers.

In Experiment 1A ($N = 397$), U.S. and U.K. participants read a scenario about commuters who were considering whether to walk to work instead of driving. Driving would be less convenient but would help reduce air pollution in the city. We told participants that many commuters had decided to walk and others were still deciding whether to follow suit. Thus, we could test the collective action bias in a conservative way. Do people underappreciate individual action even when that action is to join a broader collective effort? We asked participants to consider both 10,000 randomly selected people and also one randomly selected individual (order counterbalanced). For each, we asked whether the expected benefits of joining the walkers would outweigh the expected costs on 3-point scales (1 = yes, 0 = neither, -1 = no). We gave them no reason to think the answer should differ across the two cases. Yet, participants agreed more that the benefits outweighed the costs for the 10,000-person collective (69% yes, 7% no, 25% neither) than for a single individual (37% yes, 11% no, 52% neither, $t(396) = -9.91$, $p < .001$, $d = 0.57$). In a supplemental experiment, we replicated this result in judgments about being vegetarian, boycotting Amazon, protesting child labor, and refraining from driving (Supplementary Information Sections 1.S and 2.S).

Our proposed explanation implicates fundamental cognition so we would expect it to apply universally. An alternative explanation would be that, in an individualistic culture, people generally think that individuals need *not* concern themselves with broader societal issues[35]. In this alternative case, the bias might not occur in more collectivist samples. However, we successfully replicated Experiment 1A in an identical commuting scenario translated into Mandarin with a sample of Chinese participants (Experiment 1B, $N = 129$). Again, participants agreed more that the benefits outweighed the costs for the 10,000-person

collective (64% yes, 33% no, 3% neither) than for a single individual (47% yes, 47% no, 5% neither, $t(128) = 2.89$, $p = .005$, $d = 0.32$).

If the collective action bias involves fundamental cognition, we would expect it to arise in children. Alternatively, if it is something that people learn from those around them, it may be absent in children and only start to arise in teenagers. We explored this in Experiment 1C, in which we recruited children between 5 and 11 years old from Edinburgh Zoo ($N = 50$). Participants responded to a survey about two scenarios. One scenario involved cleaning up litter, the other involved walking to work to reduce traffic jams. In line with the collective action bias, participants agreed more that benefits were greater than costs for both everybody in Scotland walking to work (42% yes, 22% no, 36% unsure) and picking up rubbish (62% yes, 8% no, 30% unsure) than for one person walking (32% yes, 46% no, 28% unsure, $t(49) = 2.31$, $p = .025$, $d = 0.41$) or picking up rubbish (28% yes, 46% no, 26% unsure, $t(49) = 4.98$, $p < .001$, $d = 0.95$).

As well as cost-benefit judgments, the collective action bias manifests in real decisions about mandating prosocial behavior in others. Experiment 2 ($N = 798$) demonstrates this result with an incentive-compatible economic game in a sample of U.S. participants. To this end, we told participants (truthfully) that their decisions could actually determine whether other participants received a bonus payment. Their decisions did not affect themselves in any way. Participants made one decision on behalf of another individual participant who had been awarded a $5 bonus. Participants decided whether that participant got to keep the bonus or had to donate it to World Vision, a charity that provides farm animals to impoverished families. Participants made a separate decision on behalf of a group of 10 other participants who had each been awarded a $5 bonus. Participants decided whether the group members all got to keep their bonuses or all had to donate it to World Vision. 56%

of participants decided that the group's bonuses should be donated to World Vision but only 48% decided an individual's bonus should be donated ($\chi^2(1, N = 798) = 22.22, p < .001$).

We have so far considered judgments about the actions of private citizens. However, the collective action bias could apply when the "individual" agents are localities or even nation states. That is, small-scale, local-level action might seem trivial relative to large-scale, global problems. Accordingly, Experiment 3 ($N = 516$) demonstrates the collective action bias in a sample of elected U.S. local government policymakers collected in partnership with the non-profit Civic Pulse. Policymakers were randomly assigned to consider one of three policy scenarios: (i) procuring solely from U.S. suppliers to support the national economy, (ii) using local police resources to reduce a national drug problem, and (iii) reducing their local government's energy consumption to tackle global warming. Participants answered whether total benefits outweighed total costs on three-point scales (1 = yes, 0 = equal, -1 = no). They agreed more that benefits were greater than costs when all local governments would implement the policy (40% yes, 37% no, 23% equal) than just their own local government (28% yes, 50% no, 23% equal, $t(515) = -6.81, p < .001, d = 0.29$.

As well as affecting policymakers directly, the collective action bias could also affect legal decisions about government policy on both a national and international level. We explored this possibility in Experiment 4 with a sample of legal decision makers ($N = 300$) including U.S. lawyers and 37 judges, predominantly from the U.S. Participants imagined there was a series of lawsuits challenging the efforts of developed country governments to mitigate climate change. We then asked them about the relative importance of climate benefits and economic costs for deciding the case (1 = yes, benefits are more important, 0 = equal, -1 = no, costs are more important). Participants answered this question for policies implemented at each of two levels: a small individual country and coalition of countries. They agreed more that the total expected benefits were more important than the total costs for

the coalition of countries (49% yes, 14% no, 37% equal) than for one individual country (31% yes, 35% no, 34% equal; $t(299) = 6.37$, $p < .001$, $d = 0.51$).

The Relative Intangibility of Individual Action

To explain the collective action bias we propose that, when considering large-scale problems, people find it difficult to appreciate the benefits of individual action[4] but easy to appreciate the personal costs[33]. We test predictions of this hypothesis in Experiments 5-7. To do so in a controlled way, we designed abstract vignettes conveying a prosocial action's costs, potential payoffs, and payoff likelihoods.

We first confirmed the collective action bias using such a vignette in Experiment 5 ($N = 989$). The Experiment 5 vignette encapsulates the key features of many real-world collective action problems: the societal benefits of individual action are uncertain but nonetheless exceed the individual costs in expectation. It stipulated 4 million individuals who could all donate $5 to help achieve an outcome with a societal benefit worth $60 million. The $60 million benefit would arise if and only if the total number of donations reached some threshold number that triggered it. Crucially, however, the exact threshold was uncertain: participants knew only that it was equally likely to be any number from one to 4 million. Thus, no matter how many individuals donated overall, each extra donation would have the same chance (1 in 4 million) of triggering the $60 million benefit. This situation justified both individual and collective action. Each extra donation would provide an expected benefit of $15 ($60 million divided by 4 million) and would cost the donor $5, yielding the same expected benefit-cost ratio of 3:1 no matter how many of the 4 million people acted (to see how this design compares to the conditions in Experiments 6 and 7, see Table 1). As an extra precaution in Experiment 5, we informed participants that the final number of donations was 1,966,632 in both the individual and collective cases, just in case participants' judgment of

the *marginal* expected benefit of one *extra* donation was influenced by the *total* expected benefit of the *final number* of donations[36].

Table 1 | Stimuli for Experiments 5-7.

Experiment *condition*	**Description**	**Individual Expected Benefit : Cost**	**Number of People in Collective**	**Collective Expected Benefit : Cost**	**Effect Size (Cohen's *d*)**
Experiment 5	A $60m benefit requiring between 1 $5 contribution and 4 million $5 contributions	$15:$5	400,000	$6,000,000:$2,000,000 = $15:$5	0.39
Experiment 6 *small-benefit*	A "small" $1m benefit requiring between 1 and 1 million $5 contributions	$1:$5	500,000	$500,000: $2,500,000 = $1:$5	0.06
Experiment 6 *large-benefit*	A "large" $9m benefit requiring between 1 and 1 million $5 contributions	$9:$5	500,000	$4,500,000:$2,500,000 = $9:$5	0.24
Experiment 7 *incremental*	Each $5 contribution yields a $6 benefit.	$6:$5	750,000	$4,500,000:$3,750,000 = $6:$5	0.19
Experiment 7 *50/50*	Each $5 contribution yields a 50/50 chance of a $12 benefit.	$6:$5	750,000	$4,500,000:$3,750,000 = $6:$5	0.24
Experiment 7 *threshold*	A $6m benefit requiring between 1 and 4 million $5 contributions	$6:$5	750,000	$4,500,000:$3,750,000 = $6:$5	0.43

Note. We calculate "expected benefits" by multiplying the value of positive outcomes by the expected number of positive outcomes that the individual or collective action would cause (in the threshold cases, the *expected number of positive outcomes caused* was equivalent to the probability of causing a positive outcome). The ratio of expected benefits to costs was the same for the individual and collective cases in all scenarios.

Even in this controlled setting, the collective action bias persisted. To test it, we asked participants if the expected benefits outweighed personal costs for 400,000 extra actors vs. one extra actor each on three-point scales (1 = yes, 0 = equal, -1 = no). Participants agreed more that benefits outweighed costs for a 400,000-person collective (bringing the total number of donations from 1,566,632 to 1,966,632) (52% yes, 19% no, 29% equal) than for

one individual (bringing the total number from 1,966,631 to that same final number of 1,966,632) (35% yes, 33% no, 32% equal), $t(988) = 9.04$, $p < .001$, $d = 0.39$.

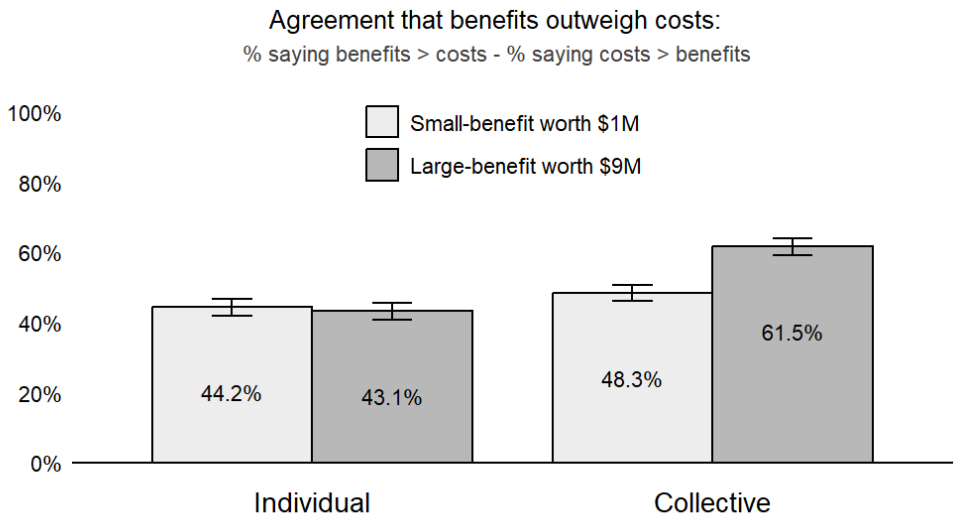
This effect appeared to be driven by participants finding the benefits of action hard to appreciate when the action is on a smaller scale than the problem it addresses. To test this mechanism, we measured whether participants were more confident in their assessments of costs or benefits on a three-item 1-6 scale (greater numbers indicating more confidence in costs, see Methods). In the individual case, participants were more confident in evaluating the costs than the expected benefits ($M = 4.04$, $SD = 1.44$, greater than scale midpoint of 3.5; $t(988) = 11.85$, $p < .001$), but this imbalance was fully attenuated ($t(988) = -1.22$, $p = .224$) for collectives ($M = 3.44$, $SD = 1.44$). This measure mediated the collective action bias (indirect effect = .06, 95% CI [.03, .08]).

To recap, the collective action bias appears to arise from people's struggle to appreciate the impact of individual action on collective problems. They thus dismiss its value, rather than deliberately weighing its costs and benefits. If this explanation is correct, we would expect people to be less sensitive to the balance of costs and benefits when judging individual action than collective action. To test this prediction, we manipulated the expected value of prosocial action in Experiment 6 ($N = 872$) using a similar vignette to that in Experiment 5. In all cases, the vignette stipulated one million individuals who could all donate $5 to help achieve an outcome with a societal benefit. The benefit would arise only if the total number of donations reached or exceeded some threshold number, which was equally likely to be any amount from one donation to one million donations. We manipulated the expected benefit of donating between subjects. Specifically, we varied the dollar value of the societal benefit that the donations could trigger. In the large-benefit condition, the societal benefit would be worth $9 million to the world. In the small-benefit condition, it would be worth only $1 million. Because of the uncertainty about the required threshold number of

donations, there was always a one-in-a-million chance of each extra $5 donation triggering the benefit. Thus, the expected societal benefits exceeded the cost of donating when the potential societal benefit was $9 million ($9 expected benefit vs. $5 cost) but not when the potential societal benefit was $1 million ($1 expected benefit vs. $5 cost). To see how this design compares to those in Experiments 5 and 7, see Table 1.

The results supported our hypothesis that people dismiss individual impact on collective problems without weighing costs and benefits. In fact, when judging an individual, participants agreed a similar amount with benefits outweighing costs in both the large-benefit condition (57% yes, 14% no, 30% equal) and the small-benefit condition (56% yes, 12% no, 32% equal, $t(869) = -0.04$, $p = .970$). By contrast, when judging a 500,000-person collective, participants agreed more in the large-benefit condition (69% yes, 8% no, 23% equal) than the small benefit condition (61% yes, 13% no, 26% equal, $t(869) = 2.97$, $p = .003$). This difference in sensitivity between judgments about individuals and collectives was supported by a statistically significant interaction ($t(871) = 2.67$, $p = .007$, see Supplementary Information Section 1.8 for full regression analysis). These results suggest that, indeed, people rely less on weighing costs and benefits for judgments of individual action than for collectives. Accordingly, the collective action bias was greatest in the large-benefit condition ($t(442) = 4.77$, $p < .001$, $d = 0.27$), when dismissing the benefits of individual action is most misguided. It was not significant in the small-benefit condition ($t(428) = 1.08$, $p = .279$, $d = 0.06$, see Figure 2). Thus, the collective action bias is particularly evident when action is worth the costs—that is, when it is most harmful.

Figure 2 | The proportion of participants in each condition reporting that the expected benefits of one person/a 500,000-person collective each donating $5 to the charity would outweigh the costs, minus the proportion reporting that the costs would outweigh the benefits.



Note. In the small-benefit condition, the expected benefits did not *in fact* outweigh the costs ($1 vs. $5), but in the large-benefit condition they did ($9 vs. $5).

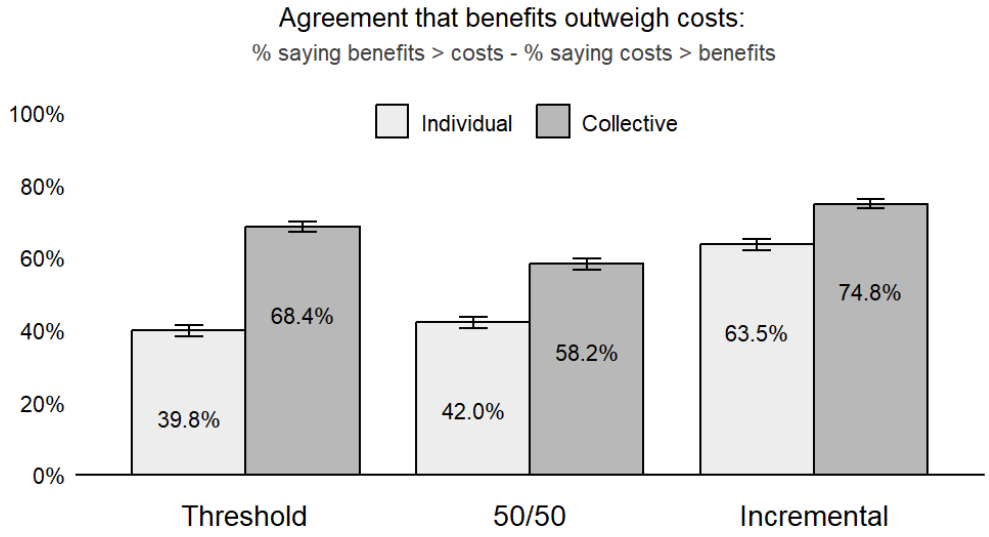
If the bias arises from people failing to appreciate action on a small scale relative to the collective outcome, then the bias should attenuate when it is easier to perceive each individual's impact as a separate outcome in and of itself (e.g., refraining from littering) than as a contribution to a larger outcome (e.g., flying less to reduce climate change).

We confirmed these predictions in Experiment 7 (N = 2,904) in which participants were randomly assigned to see one of three vignettes about donating to achieve positive outcomes for people in need. The donations in each vignette had the same implied cost-benefit ratio (5:6). One vignette was similar to that in Experiment 6. $6 million benefits were triggered at an unknown threshold between one and one million $5 donations (threshold condition). In this threshold case, each individual's contribution cannot be seen as a separate outcome, analogous to how incremental carbon emissions primarily matter for the overall problem of climate change. In contrast, in the remaining two vignettes, each $5 donation

either triggered an incremental $6 benefit with certainty (incremental condition) or a twice-as-large $12 benefit with a 50% probability (50/50 condition). In these conditions, the contributions could be perceived as being separate, small-scale outcomes rather than as contributions to the overall wellbeing of people in need. They are more analogous to how a single act of littering creates a distinct environmental harm. The incremental condition represents cases in which the distinct harm is predictable, the 50/50 condition represents cases in which the extent of the distinct harm is uncertain. To see how this design compares to those in Experiments 5 and 6, see Table 1.

Accordingly, the collective action bias was stronger in the threshold condition ($t(981) = 11.30$, $p < .001$, $d = 0.43$) than in the 50/50 condition ($t(953) = 6.93$, $p < .001$, $d = 0.24$) or the incremental condition ($t(967) = 5.16$, $p < .001$, $d = 0.19$). These differences in strength were confirmed by statistically significant interactions between the threshold condition and both the 50/50 condition ($t(1935) = 3.63$, see Supplementary Information Section 1.9 for full regression analysis) and the incremental condition ($t(1949) = 5.20$, $ps < .001$). This experiment further informs the psychology of the collective action bias. First, it rules out risk attitudes as its sole explanation. Although the collective action bias is greatest in the threshold condition, it is still present even in the incremental condition where each individual's impact is predictable. Second, the greater bias in the threshold condition also elucidates when the bias most undermines individual action. Specifically, large-scale societal problems for which it is hard to separate individual contributions, like climate change.

Figure 3 | The proportion of participants in each condition believing the expected benefits of one person/a 500,000-person collective each donating $5 to the charity would outweigh the costs, minus the proportion believing the costs would outweigh the benefits.



Note. In all conditions, the expected value of donating was always $6 per $5 donation. The collective action bias is strongest in the threshold condition, in which it is hardest to view the benefits of each prosocial action as distinct from the overall, collective benefits.

Discussion

Collective action problems are ubiquitous and represent the greatest challenges to humankind, from nuclear arms races to climate change. Previous literature has focused on self-interest as a barrier to prosocial behavior in these situations[1,3,5,7,10,11]. This article reveals an additional barrier. In the real world, the value of prosocial action is ambiguous. Individual action seems relatively inconsequential relative to large-scale collective problems[4,30–32]. For example, one person's energy use seems insignificant relative to the scale of climate change. Likewise, one person social distancing seems insignificant relative to the scale of a global pandemic, one person voting seems insignificant in a country-wide election, and so on. Yet the personal costs of these actions are relatable[33]. Cost-benefit analysis might seem to justify

many people acting. But for one individual, the costs seem to matter more. We termed this phenomenon the *collective action bias*.

The collective action bias has clear policy implications. Campaigns that merely try to persuade people to care more about the relevant issue will often prove unsuccessful. Even if people care enough to overcome their self-interest, it will not overcome their misjudgment of the benefits. Instead, policymakers may have more success with other policies such as incentives or regulations[24]. Indeed, even when many people believe individual action is not worthwhile, our findings suggest that they still support action at the collective level, giving scope for policymakers to incentivize or mandate it. In Barack Obama's words, "We won't solve climate change because I fucking changed lightbulbs in my house … it's because of something collective."[44]

Sometimes, the implications of the collective action bias might be more modest. Individuals can behave prosocially despite it. For example, consider voting. The collective action bias should apply in this case. Indeed, until recently, economists largely overlooked how it can be rational to vote on altruistic grounds[37–39]. Yet, in many elections, most of the electorate votes despite no direct incentive to do so[40]. This is probably because voting is a vehicle to express social identity[41]. Whole communities participate in elections at the same time. Voting is a discrete, observable action[42,43]. Some (but not all) people will thus vote regardless of whether they judge the costs to outweigh the benefits.

However, unlike with voting, many prosocial behaviors are a poor vehicle for self-expression. In particular, they often involve consistently *abstaining* from doing something, like with numerous environmentally unfriendly activities. The absence of a behavior is hard for others to observe and judge[43]. In these contexts, people are less likely to use prosocial behavior to self-express and may only act if they deem the societal benefits greater than their

personal costs. Because of the collective action bias, most individuals will find the societal benefits insufficient.

Finally, our findings also have personal implications for us as individuals. Even if collective action problems are best addressed with incentives or regulations, persuading policymakers to implement those policies is in itself a collective action problem[2]. Indeed, we find that policymakers themselves exhibit the collective action bias. In the end, appropriate policies will only take effect if individuals campaign for, vote for, and ultimately implement them. The collective action bias suggests that, in a globalized world, we may all underappreciate the individual case for acting to precipitate change. You might think it is a waste of your time to participate in activism, vote in elections, and influence organizations to take collective outcomes into account. If so, our evidence suggests you might be wrong.

Methods

We preregistered all the experiments on aspredicted.org except Experiment 1A and 1B, and we post data, code, survey files, and preregistrations on https://researchbox.org/1114&PEER_REVIEW_passcode=EQHOGC. The full materials for each experiment are in the Supplementary Information, Section 2. All the analyses that we preregistered are reported in the Supplementary Information, Section 1, with some non-preregistered analyses that we clearly identify as such. The Experiments section includes all preregistered analyses with a few exceptions that we reported in the supplement instead for streamlining purposes. These exceptions either supported our predictions (the analysis pooled across scenarios in Experiment 1C, the analysis with the non-incentive compatible judgment in Experiment 2, and the analyses with a secondary dependent variable in Experiments 6 and

7, *p*s < 0.001) or were orthogonal to our theory such that we had no strong predictions (the analyses with the confidence dependent variable in Experiments 6 and 7).

We report two-sided *p* values. We report all conditions, measures, and data exclusions in the Supplementary Information. Research protocols were approved by the Institutional Review Board at New York University. Participants consented to participate in all experiments. We did not use deception.

Sample size determination and randomization

We determined our sample sizes and exclusion rules before data collection and these were preregistered (except for in the non-preregistered Experiments 1A and 1B). All participants were recruited using Prolific, except for Experiments 1B (WenJuanXing, a Chinese participant recruitment platform), 1C (in person at Edinburgh Zoo), 3 (Civic Pulse, a non-profit researching local government), and 4 (by email). We manually excluded participants for repeat responses (except in Experiments 1C and 3), we manually excluded participants for failing to complete the whole experiment (except in Experiments 1C and 4) and we set the survey to automatically exclude participants for using a mobile device or for incorrectly answering an attention check question (except in Experiments 1C, 3, and 4). We used additional exclusions for some experiments which we detail in their respective sections below. We determined sample sizes using informal rules of thumb for all experiments.

All experiments randomized participants to condition in a similar way. Except for in Experiment S1, we varied whether participants judged an individual or a collective on a within-subjects basis, meaning each participant made both judgments in a counterbalanced order. In Experiment S1, we varied it on a between-subjects basis, meaning each participant made only one judgment that was either for an individual or for a collective. In Experiments

3, 6 and 7, we randomized other features of the scenario on a between-subjects basis. We used Qualtrics survey software to implement randomization and counterbalancing.

Experiment 1A

We collected 397 valid responses from U.K. and U.S. participants (269 female, 123 male, M_{age} = 42.91, SD_{age} = 15.13) online via Prolific. In an *individual* vs. *collective* within-subjects design, participants were asked to imagine 100,000 people who lived in the same city and who generally commuted to work by driving in their own car. Each of these commuters was considering whether to walk to work instead. Walking would be less convenient but would help reduce air pollution in the city. We told participants that many commuters (but not all) had decided to walk, and some additional commuters were deciding whether to join the effort. We then asked whether the expected benefits (to the world) of joining the effort would outweigh the expected costs for both an extra randomly selected 10,000-person subset of the 100,000 commuters (*collective* condition) and also for an extra randomly selected individual (*individual* condition). Here is what participants saw for the cost-benefit questions in the *collective* [*individual*] condition:

Do you think that the expected benefits (to the world) from these 10,000 people [from this one person] walking to work would outweigh the costs (to all of those 10,000 people [to that one person])?

- *Yes* {coded 1}
- *No* {coded -1}
- *Neither* {coded 0}

These *collective* and *individual* condition cost-benefit questions were always presented on the same page in counterbalanced order.

We also asked whether a 10,000-person subset and a single individual *should* walk to work. Here is an example of what participants saw for these "should" questions in the *collective* condition (with the same "yes"/"no"/"neither" response options):

Assuming that these 10,000 people are making the decision together without knowing what others outside the group are doing, should those 10,000 people walk to work?

And in the *individual* condition:

Assuming that this one person is making the decision without knowing what others are doing, should that one person walk to work?

These *collective* and *individual* condition "should" questions were always presented on the same page in counterbalanced order. We also counterbalanced whether the cost-benefit questions or the "should" questions were presented first. The "should" questions were exploratory and we analyze them in the Supplementary Information Section 1.1.

Experiment 1B

We replicated Experiment 1A with a Chinese sample. We used the same commuting scenario with the same questions, translated into Mandarin. We collected 129 valid responses from Chinese participants (55 female, 74 male, M_{age} = 34.13, SD_{age} = 7.57) online via the Chinese recruitment platform WenJuanXing. In addition to the standard exclusions described above, we manually excluded participants who submitted nonsensical free responses (n = 50), see Supplementary Information Section 1.2 for examples.

The survey was translated by a research assistant. Another research assistant re-translated the Mandarin survey back to English. The two research assistants then resolved any differences we identified from the original English version.

We made one addition to the content from Experiment 1A. On the page after the cost-benefir and "should" questions, participants completed 6-item scales for individualism and collectivism, adapted from Oyserman (1993)[45].

Experiment 1C

We conducted a conceptual replication of Experiments 1A and 1B with a sample of 50 children from 5-11 years old (29 female, 21 male, M_{age} = 7.06, SD_{age} = 1.77). Participants were tested in person by trained experimenters at the Edinburgh Zoo between April and July 2023. See Supplementary Information Section 1.3 for precise details regarding recruitment and testing.

Each child was presented with two stories. In one story, the experimenter explained that Scotland had a problem with traffic jams. There would be fewer traffic jams if people walked to work. However, most people find walking to work boring. In the other story, the experimenter explained that Scotland had a problem with litter (rubbish). There would be less litter if people picked it up. However, most people find cleaning litter boring. After hearing each story, the children were asked two content questions (see Supplementary Information Section 2.2 for exact text), and we excluded all data from children who answered either question incorrectly for either story.

After answering the content check questions, children were asked the *individual* and *collective* condition questions. Here is an example of what participants saw for the rubbish questions in the *individual [collective]* condition:

Imagine that only one person [everyone] in Scotland is going to clean up rubbish, and they cannot talk to or play with anyone else while they do it. Do you think one person [everyone] could clean up enough of Scotland's rubbish that this one person [everyone] should do some cleaning, even if it means this one person [everyone] has a boring time?

- *Yes* {coded 1}
- *No* {coded -1}
- *Not sure* {coded 0}

And for the walking questions in the *individual [collective]* condition, with the same response scale:

Imagine that one person [everyone] in Scotland is going to walk to work instead of driving. Do you think one person [everyone] walking to work could help enough with Scotland's traffic jams that they should walk, even if it means this one person [everyone] gets tired walking?

We randomized the order of the stories and, within each story, we randomized the order of the *individual* and *collective* question.

Experiment 2

We collected 798 valid responses from U.S. participants (376 female, 406 male, M_{age} = 41.76, SD_{age} = 13.43) online via Prolific. At the start of the experiment, we introduced participants to the charity, World Vision. They first made hypothetical judgments about this charity and then made incentive compatible decisions. Both parts of the survey followed an *individual* vs. *collective* within-subjects design. For the hypothetical judgments, we asked participants to consider a typical survey-taker making a donation to the charity. Here is what participants saw for the hypothetical judgment for the *individual* [*collective*] condition:

Do the benefits of one [10] typical survey-taker[s] donating $5 to World Vision outweigh the cost of the donation for that person [those 10 people]?

- *Yes, the benefits are greater* {coded 1}
- *No, the cost is greater* {coded -1}
- *Not sure whether benefits or cost are greater* {coded 0}

These *collective* and *individual* condition questions were always presented on the same page in counterbalanced order. The results of the hypothetical judgment questions are reported in the Supplementary Information Section 1.4.

For the incentive-compatible decisions, participants took part in an economic game. We informed them how this game would work. We would randomly select some participants to be assigned $5. They would either receive this $5 as a bonus or donate it to World Vision. All participants in the experiment made decisions about whether those selected participants should receive or donate the $5 endowment. We used these decisions to test for the collective action bias. Each participant made a decision both for ten participants (*collective* condition) and for one individual participant (*individual* condition). Here is an example of what participants saw for the incentive-compatible judgment in the *individual* [*collective*] condition:

Do you choose for this one [group of 10] other participant[s] to donate their $5 instead of keeping it?

- *Yes* {coded 1}
- *No* {coded 0}

These *collective* and *individual* judgment questions were always presented on the same page in counterbalanced order.

For incentive compatibility, we randomly selected one participant's *individual* judgment and another participant's *collective* judgment and implemented the chosen bonus payments and donations after the experiment. We informed participants that their decisions could be randomly selected. We also emphasized that their decision would have no bearing on whether they would receive or donate their own endowment.

On the last page, we asked participants to explain the reasoning behind their decisions in one or two sentences.

Experiment 3

We collected 516 valid responses from elected U.S. local government policymakers (166 female, 343 male, see Supplementary Information Section 1.5 for breakdown by birth year, political party, and ethnic minority status) in partnership with CivicPulse, a nonprofit organization researching local government in the United States. All participants contributed to the experiment on a voluntary basis and so were not compensated.

In a 2 (*individual* vs. *collective*; within-subjects) by 3 (policy domain; between-subjects) design, participants were randomly assigned to assess the costs and benefits of a policy in one of the following domains: 1) carbon: *'A policy to reduce their carbon footprint by 20% by switching to cleaner energy sources';* 2) procurement: *'A policy to limit procurement to only American companies in an effort to help support the American economy';* 3) drug crime: *'A policy to reallocate 10% of police effort from stopping property crimes to policing illegal drug activity to address international drug trafficking'.*

In randomized order, participants were asked to imagine that the policy was being considered both by all local governments across the United States (*collective* condition) and by just their own (*individual* condition) then asked to compare its costs and benefits. For each condition, participants were asked:

How do you think the total benefits of this policy would compare with the total costs of this policy?

- *The total benefits would probably be greater than the total costs* {coded 1}
- *The total benefits would probably be equal to the total costs* {coded 0}
- *The total benefits would probably be less than the total costs* {coded -1}

The *collective* and *individual* condition questions were always presented on consecutive pages in counterbalanced order.

To limit the possibility of participants simply believing their own locality was different, we always told them to assume the trade-off between costs and benefits was the same for all other localities as for their locality. Lastly, participants were asked to describe how much they value coordination with other local governments. This experiment was part of a larger survey, so participants answered questions about other scenarios unrelated to this experiment along with some demographic questions.

Experiment 4

We collected a sample of 300 legal experts (77 female, 179 male, 44 other gender/unanswered, M_{age} = 59.76, SD_{age} = 11.55) containing 37 judges and 263 lawyers on a voluntary basis by finding email-addresses for judges and lawyers online and emailing them over the course of 3 months, from August to October 2023. We originally preregistered that we would recruit only judges up until November 2023, after which point we would recruit the remaining sample via a combination of judges, lawyers, law academics, and law students. However, our initial response rate from judges was very low (less than 20 valid responses in the first month) so we began recruiting lawyers on September 24th, 2023.

In a within-subjects *individual vs. collective* design, we asked participants to imagine that they were the judge for a lawsuit opposing measures to reduce CO_2 emissions (for example, carbon taxes). Participants were told that the measures could reduce CO_2 emissions by up to 10%, but could also reduce the long-term GDP of the country and risk job losses. Then they were instructed that *". . . to decide the case, it is required to weigh the costs to consumers, industry, and GDP against the positive impact of these measures on mitigating climate change."*

Separately, for both a single small country (*individual* condition) and a large group of countries (*collective* condition), participants were asked if the reduction in climate change

would justify the economic costs to the country/countries. Here is an example of what participants saw for the cost-benefit questions in the *collective* [*individual*] condition:

For context, this group of countries contributes around 10% of global CO2 and around 20% of global GDP [this small country contributes around 0.01% of global CO2 and around 0.02% of global GDP]. Its GDP per capita is around $33,000.

Do the benefits to the world from reduced climate change outweigh the domestic economic costs of these measures?

- *The economic costs are more important* {coded -1}
- *They are equally important* {coded 0}
- *The reduced climate change is more important* {coded 1}

On the next page, we repeated the scenario with the opposite *collective*/*individual* condition.

We roughly based the emissions percentages and GDP statistics on 2021 data for the EU and Malta for the *collective* and *individual* country conditions, respectively.

This experiment was part of a larger survey, so participants answered questions about other scenarios unrelated to this experiment along with some demographic questions.

Experiment 5

We collected 989 valid responses (601 female, 376 male, M_{age} = 39.77, SD_{age} = 13.84) online via Prolific. In an *individual* vs. *collective* within-subjects design, participants were asked to evaluate the relative costs and benefits of taking an action both for one individual and for a collective of 400,000 people. In the scenario, 4 million individuals could all donate $5 to help achieve an outcome worth $60 million for society. The $60-million benefit would arise if and only if the total number of donations reached some threshold number that triggered it. This threshold was unknown, but was equally likely to be anywhere between one

donation and 4 million donations. Thus, the impact of each extra donation was probabilistic. Yet, the expected benefits of action were greater than the costs (with the same 3:1 ratio of expected benefits to costs in both conditions, see Table 1 for a summary of these stimuli for Experiments 5, 6, and 7). Participants answered a comprehension check after reading the initial description to ensure they understood the threshold information. Those who failed the check were corrected and asked to read more carefully in the remainder of the survey; excluding these participants from the analyses did not alter any results.

Across conditions, we controlled how many donations there would be in total if the individual or collective decided to act (1,966,632 in both cases). Then, separately for both the individual and the 400,000-person collective, participants were asked whether the expected benefits outweighed the costs from donating. Here is an example of what participants saw for the cost-benefit questions in the *collective* [*individual*] condition:

Imagine that currently 1,566,632 [1,966,631] people have donated $5 (so donations total $7,833,160 [$9,833,155]).

Imagine also that there are exactly 400,000 extra people [is exactly one extra person] considering donating $5. If these 400,000 extra people, acting together, all donate [this one extra person, acting alone, donates] $5, it increases the total probability for a desirable outcome worth $60 million by 10% (1 in 10) [0.000025% (1 in 4 million)].

Before knowing what will happen, do you think the 10% (1 in 10) [0.000025% (1 in 4 million)] probability increase for the desirable outcome outweighs 400,000 people each [1 person] incurring a $5 cost?

- *Yes: The 10% (1 in 10) [0.000025% (1 in 4 million)] probability increase for the desirable outcome outweighs 400,000 people each [one person] incurring a $5 cost* {coded 1}

- *No: 400,000 people each [one person] incurring a $5 cost outweighs the 10% (1 in 10) probability [0.000025% (1 in 4 million)] increase for the desirable outcome* {coded -1}
- *Equal: The two factors should be weighted equally* {coded 0}

Participants reported how easy they found it to assess the costs and benefits in the respective decisions on the page after they judged them. We used a scale of three items: (1) What did you find easier to evaluate? (2) For which of these factors are you more confident in your evaluation? And (3) Which of these factors did you find most intuitive to think about? For the *collective* [*individual*] condition, the items were measured from 1 (indicating the 10% [0.000025%] increase in the probability of the positive outcome) to 6 (indicating 400,000 people each [one person] incurring a $5 cost).

Experiment 6

We collected a sample of 872 valid participants (546 female, 311 male, M_{age} = 34.36, SD_{age} = 12.83) online via Prolific.

Using a similar vignette as in Experiment 4, we manipulated the expected benefits of donating in a 2 (*individual* vs. *collective*; within-subjects) by 2 (*large-benefit* vs. *small-benefit*; between-subjects) design. In all conditions, as in Experiment 5, there was a potential monetary benefit to the world which required an unknown threshold number of donations to materialize (between one and one million). In the *large-benefit* condition, this benefit would be worth $9 million, but in the *small-benefit* condition, it would only be worth $1 million. In both conditions, the chances of each extra $5 donation triggering the benefit was 1 in a million, meaning the expected benefits were greater than the cost when the benefit was $9 million ($9 per $5 donation) but not $1 million ($1 per $5 donation). To ensure participants understood the instructions, we explained them in detail over five pages with a

comprehension question at the end of each page. As preregistered, we manually excluded all participants who failed more than one of these five questions from the analysis (n = 101).

Participants were asked to evaluate the relative costs and benefits of taking the action of donating $5 both for one individual and also for a collective. Here is an example of what participants saw for the cost-benefit questions in the *individual* [*collective*] condition:

In situations such as this one, when one person acts [500,000 people act] (without considering the actions of others), considering both the potential of a desirable outcome and the personal costs to that one person [those 500,000 people], is the world as a whole better off, worse off, or no different?

- *Better off, the increase in the probability of a desirable outcome from that one person [those 500,000 people] acting outweighs the total personal cost to that one person [those 500,000 people]* {coded 1}
- *Worse off, the personal cost to that one person outweighs [costs to those 500,000 people outweigh] the increase in the probability of a desirable outcome from that one person [those 500,000 people] acting* {coded -1}
- *No different, the increase in the probability of a desirable outcome and the personal cost should be weighted equally* {coded 0}

We collected additional dependent measures by asking participants to estimate the ratio of expected benefits to cost and by eliciting their confidence in their judgment (see Supplementary Information Section 2.7).

Experiment 7

We recruited 2,904 valid responses (1,754 female, 1,113 male, M_{age} = 44.18, SD_{age} = 12.3) online via Prolific. Using a vignette similar to Experiments 5 and 6, in a 2 (*individual* vs. *collective*; within-subjects) by 3 (outcome certainty: *threshold* vs. *50/50* vs. *incremental*;

between-subjects) design, we tested the effect of the nature of the impact of an individual action on the collective action bias. The *threshold* condition was most similar to previous experiments. One million people wanted to achieve an outcome which would deliver $6 million worth of benefits to people in need. If enough of them donated $5, the desirable outcome would happen, but participants could not know exactly how many of them had to donate $5 to trigger it; it was equally likely to require any number between one and one million donations. In the *50/50* and *incremental* conditions, there were the same number of people (one million) but instead of all working for the same desirable outcome, they each wanted to achieve a separate desirable outcome. In the *50/50* condition, each separate desirable outcome was worth $12 of benefits to people in need and had a 50% chance of happening after a $5 donation. In the *incremental* condition, each $5 donation would certainly trigger $6 worth of benefits to people in need. We explained the scenario in each condition over one page with no comprehension questions. The tasks for our dependent measures were identical to those in Experiment 6.

References

1. Hardin, R. Collective action as an agreeable n-prisoners' dilemma. *Syst. Res.* **16**, 472–481 (1971).
2. Olson, M. *The logic of collective action : public goods and the theory of groups*. (Harvard University Press, 1965).
3. Hardin, G. The tragedy of the commons. The population problem has no technical solution; it requires a fundamental extension in morality. *Science* **162**, 1243–1248 (1968).

4. Read, D., Loewenstein, G., Rabin, M., Keren, G. & Laibson, D. Choice Bracketing. in *Elicitation of Preferences* (eds. Fischhoff, B. & Manski, C. F.) 171–202 (Springer Netherlands, 2000).
5. Andreoni, J. Why free ride?: Strategies and learning in public goods experiments. *J. Public Econ.* **37**, 291–304 (1988).
6. Baumol, W. J. *Welfare economics and the theory of the state*. (Harvard University Press, 1952).
7. Fehr, E. & Fischbacher, U. The nature of human altruism. *Nature* vol. 425 785–791 Preprint at https://doi.org/10.1038/nature02043 (2003).
8. Hofmann, W., Wisneski, D. C., Brandt, M. J. & Skitka, L. J. Morality in everyday life. *Science* **345**, 1340–1343 (2014).
9. Bernhard, H., Fischbacher, U. & Fehr, E. Parochial altruism in humans. *Nature* **442**, 912–915 (2006).
10. Fehr, E. & Schmidt, K. M. A theory of fairness, competition, and cooperation. *Q. J. Econ.* **114**, 817–868 (1999).
11. Gintis, H., Bowles, S., Boyd, R. & Fehr, E. Explaining altruistic behavior in humans. *Evol. Hum. Behav.* **24**, 153–172 (2003).
12. Rand, D. G., Dreber, A., Ellingsen, T., Fudenberg, D. & Nowak, M. A. Positive interactions promote public cooperation. *Science* **325**, 1272–1275 (2009).
13. Andreoni, J., Harbaugh, W. & Vesterlund, L. The Carrot or the Stick: Rewards, Punishments, and Cooperation. *Am. Econ. Rev.* **93**, 893–902 (2003).
14. Sugden, R. Reciprocity: The Supply of Public Goods Through Voluntary Contributions. *Econ J* **94**, 772–787 (1984).
15. Fehr, E. & Gächter, S. Cooperation and punishment in public goods experiments. *Am. Econ. Rev.* **90**, 980–994 (2000).

16. Fehr, E. & Gächter, S. Altruistic punishment in humans. *Nature* **415**, 137–140 (2002).
17. Jordan, J. J., Yoeli, E. & Rand, D. G. Don’t get it or don't spread it: comparing self-interested versus prosocial motivations for COVID-19 prevention behaviors. *Sci. Rep.* **11**, 20222 (2021).
18. Van Bavel, J. J. *et al.* Using social and behavioural science to support COVID-19 pandemic response. *Nature human behaviour* **4**, 460–471 (2020).
19. Mertens, S., Herberz, M., Hahnel, U. J. J. & Brosch, T. The effectiveness of nudging: A meta-analysis of choice architecture interventions across behavioral domains. *Proc. Natl. Acad. Sci. U. S. A.* **119**, (2022).
20. Kraft-Todd, G. T., Bollinger, B., Gillingham, K., Lamp, S. & Rand, D. G. Credibility-enhancing displays promote the provision of non-normative public goods. *Nature* **563**, 245–248 (2018).
21. Maier, M. *et al.* No evidence for nudging after adjusting for publication bias. *Proc. Natl. Acad. Sci. U. S. A.* **119**, e2200300119 (2022).
22. Szaszi, B. *et al.* No reason to expect large and consistent effects of nudge interventions. *Proceedings of the National Academy of Sciences of the United States of America* vol. 119 e2200732119 (2022).
23. DellaVigna, S. & Linos, E. RCTs to scale: Comprehensive evidence from two Nudge Units. *Econometrica* **90**, 81–116 (2022).
24. Chater, N. & Loewenstein, G. The i-frame and the s-frame: How focusing on individual-level solutions has led behavioral public policy astray. *Behav. Brain Sci.* 1–60 (2022).
25. Savage, L. J. The Foundations of Statistics. New York, NY: Jon Wiley and Sons. Preprint at (1954).
26. Schelling, T. C. *Micromotives and Macrobehavior*. (W. W. Norton & Company, 2006).
27. Scheffer, M. Complex systems: Foreseeing tipping points. *Nature* vol. 467 411–412

(2010).

28. Centola, D., Becker, J., Brackbill, D. & Baronchelli, A. Experimental evidence for tipping points in social convention. *Science* **360**, 1116–1119 (2018).
29. Kagan, S. Do I make a difference? *Philos. Public Aff.* **39**, 105–141 (2011).
30. Camilleri, A. R. & Larrick, R. P. The collective aggregation effect: Aggregating potential collective action increases prosocial behavior. *J. Exp. Psychol. Gen.* **148**, 550–569 (2019).
31. Bartels, D. M. & Burnett, R. C. A group construal account of drop-in-the-bucket thinking in policy preference and moral judgment. *J. Exp. Soc. Psychol.* **47**, 50–57 (2011).
32. Baron, J. Confusion of Relative and Absolute Risk in Valuation. *J. Risk Uncertain.* **14**, 301–309 (1997).
33. Jenni, K. & Loewenstein, G. Explaining the Identifiable Victim Effect. *J. Risk Uncertain.* **14**, 235–257 (1997).
34. Simmons, J. P. & Nelson, L. D. Intuitive confidence: Choosing between intuitive and nonintuitive alternatives. *J. Exp. Psychol. Gen.* **135**, 409–428 (2006).
35. Wagner, J. A. Experiments of Individualism-Collectivism: Effects on Cooperation in Groups. *AMJ* **38**, 152–173 (1995).
36. Lewis, J. & Simmons, J. P. Prospective outcome bias: Incurring (unnecessary) costs to achieve outcomes that are already likely. *J. Exp. Psychol. Gen.* **149**, 870–888 (2020).
37. Parfit, D. *Reasons and Persons*. (OUP Oxford, 1984).
38. Edlin, A., Gelman, A. & Kaplan, N. Voting as a Rational Choice: Why and How People Vote To Improve the Well-Being of Others. *Ration. Soc.* **19**, 293–314 (2007).
39. Downs, A. An Economic Theory of Political Action in a Democracy. *J. Polit. Econ.* **65**, 135–150 (1957).

40. Jackman, R. W. Political Institutions and Voter Turnout in the Industrial Democracies. *Am. Polit. Sci. Rev.* **81**, 405–423 (1987).

41. Rogers, T., Goldstein, N. J. & Fox, C. R. Social Mobilization. *Annu. Rev. Psychol.* **69**, 357–381 (2018).

42. Gerber, A. S., Green, D. P. & Larimer, C. W. Social Pressure and Voter Turnout: Evidence from a Large-Scale Field Experiment. *Am. Polit. Sci. Rev.* **102**, 33–48 (2008).

43. DeScioli, P., Christner, J. & Kurzban, R. The omission strategy. *Psychol. Sci.* **22**, 442–446 (2011).

44. Wagner, G. Cold, Hard Economics, Why changing your old lightbulbs and toting your eco-friendly canvas shopping bag around won't save the planet. *Foreign Policy* (2011).

45. Oyserman, D. The lens of personhood: Viewing the self and others in a multicultural society. *J. Pers. Soc. Psychol.* **65**, 993–1009 (1993).