



# Support for redistribution is shaped by compassion, envy, and self-interest, but not a taste for fairness

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**Why do people support economic redistribution? Hypotheses include inequity aversion, a moral sense that inequality is intrinsically unfair, and cultural explanations such as exposure to and assimilation of culturally transmitted ideologies. However, humans have been interacting with worse-off and better-off individuals over evolutionary time, and our motivational systems may have been naturally selected to navigate the opportunities and challenges posed by such recurrent interactions. We hypothesize that modern redistribution is perceived as an ancestral scene involving three notional players: the needy other, the better-off other, and the actor herself. We explore how three motivational systems—compassion, self-interest, and envy—guide responses to the needy other and the better-off other, and how they pattern responses to redistribution. Data from the United States, the United Kingdom, India, and Israel support this model. Endorsement of redistribution is independently predicted by dispositional compassion, dispositional envy, and the expectation of personal gain from redistribution. By contrast, a taste for fairness, in the sense of (i) universality in the application of laws and standards, or (ii) low variance in group-level payoffs, fails to predict attitudes about redistribution.**

inequality | redistribution | emotion | fairness | morality

*[More recently the “Greatest happiness principle” has been brought prominently forward. It is, however, more correct to speak of the latter principle as the standard, and not as the motive of conduct.*

—Charles Darwin (1)

**W**hy do people support social policies? One level of explanation addresses properties of populations that individual minds might process—local practices, shared beliefs and ideologies, collective identities, and recent history (2). A second, independent level of explanation asks which specific psychological mechanisms participate in forming the individual’s response to a policy—that is, what interpretive, emotional, and motivational systems are activated by external inputs, shaping the response (3, 4). Here, we explore this second level of explanation. We investigate several evolved psychological mechanisms to see to what degree they pattern the individual’s response to economic redistribution. We also investigate the extent to which a taste for fairness shapes support for redistribution.

By economic redistribution, we mean the modification of a distribution of resources across a population as the result of a political process. In the case of progressive redistribution (henceforth, redistribution)—a policy for which there is large worldwide demand (5, 6)—the ostensible group-level goal is to even out a skewed statistical distribution by transferring resources from the better off to the less well off. However, it is possible that the public rationale for supporting a policy is distinct from the private or even nonconscious motives of

individuals supporting (or opposing) it. It is important to recognize that such a transformation in the distribution of resources does not necessarily entail conservation of a fixed and constant amount of resources: The process of taking from some and giving to others may diminish the total (as when very high levels of taxation reduce productivity) or increase it (as when starving people are returned to productive health).

One class of models of the origins of distributive preferences posits large-scale determinants such as geography, history, political institutions (7–9), racial stereotypes (10), culturally transmitted ideology (7, 11), and party identification (12). For these and other inputs to affect political judgment and decision making, however, the relevant information must be processed by a human-specific psychology—a diverse array of neurocomputational programs that were built by natural selection and are functionally specialized for solving ancestrally recurrent adaptive problems (ref. 13; for review, see ref. 14). Therefore, it is worthwhile to understand how distributive policies are mapped into and refracted through our evolved psychological mechanisms.

Briefly, applying an evolutionary perspective to individual responses to redistribution (or anything else) involves the following (15). **Universality:** First, humans have a rich, underlying species-universal psychological and developmental architecture (despite some genetic noise that contributes to individual differences). **Specialization:** Second, this architecture includes a large and diverse set of functionally specialized programs (analogous to “apps” on a smartphone) designed over evolutionary time because

## Significance

**Markets have lifted millions out of poverty, but considerable inequality remains and there is a large worldwide demand for redistribution. Although economists, philosophers, and public policy analysts debate the merits and demerits of various redistributive programs, a parallel debate has focused on voters’ motives for supporting redistribution. Understanding these motives is crucial, for the performance of a policy cannot be meaningfully evaluated except in the light of intended ends. Unfortunately, existing approaches pose ill-specified motives. Chief among them is fairness, a notion that feels intuitive but often rests on multiple inconsistent principles. We show that evolved motives for navigating interpersonal interactions clearly predict attitudes about redistribution, but a taste for procedural fairness or distributional fairness does not.**

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they promoted functional behavior, in addition to whatever general-purpose mechanisms the human mind might contain. Ancestral functional logic: Third, each program (e.g., incest avoidance, disposition to share) will operate according to a proprietary functional logic that reflects an evolved strategy for solving its adaptive problem that would have been effective under ancestral conditions (whether or not it is effective under modern conditions; e.g., liking salt, fat, and sugar). Individual differences: Fourth, despite underlying psychological universality, differences in the responses of these programs from individual to individual arise not only because of genetic and environmental perturbations in their development, but also because these programs are designed to calibrate their operation in functional ways based on the individual's personal, social, and ecological circumstances [e.g., stronger men feel more entitled to favorable treatment (16, 17); people are more shame-prone when they have fewer opportunities to cultivate new relationships (18)]. That is, elements of our psychology operate according to a universal functional logic, but are parameterized individually and locally and, therefore, vary quantitatively at the individual level.

The human mind has been organized by natural selection to respond to evolutionarily recurrent challenges and opportunities pertaining to the social distribution of resources, as well as other social interactions. The lives of ancestral humans involved recurrent social situations ("games") that statistically associated cues, choices, and payoffs, selecting for emotions, preferences, and dispositions designed to navigate those games successfully. This framework has already been successfully used to derive and test hypotheses about the evolved political psychology of redistribution and its close relative, welfare. For example, it was hypothesized that modern welfare activates the evolved forager risk-pooling psychology—a psychology that causes humans to be more motivated to share when individual productivity is subject to chance-driven interruptions, and less motivated to share when they think they are being exploited by low-effort free riders. Ancestrally, sharing resources that came in unsynchronized, high-variance, large packages (e.g., large game) allowed individuals to buffer each other's shortfalls at low additional cost. Accordingly, people are more inclined to share under these conditions than under low-variance conditions (19–21), where need implies low effort instead. Additionally, as predicted by the forager risk-pooling hypothesis, individual and national differences in support for welfare is accounted for by differences in beliefs about whether the unemployed are unlucky or caused their unemployment by low effort (10, 22, 23).

At the most general level, in every generation, our ancestors faced others who were worse off, better off, or equally well off (under equality, no systematic issue of interpersonal redistribution arises). Hence, we propose that the mind perceives modern redistribution as an ancestral game or scene featuring three notional players: the needy other, the better-off other, and the actor herself. The game involves two situations: an actor interacting with a better-off individual, and an actor interacting with someone who is worse off. This scene approximates the minimal ancestrally relevant expression to which the various themes of modern redistribution can be reduced, while still being recognizably about economic redistribution.

We hypothesize that (*i*) the mind is equipped with evolved emotions and motivations designed for dealing with each of these situations, (*ii*) the issue of modern redistribution meets the input conditions of, and therefore triggers, those motivational systems, and (*iii*) the outputs of those motivational systems jointly shape people's judgment and decision making regarding redistribution (24, 25). A number of different motivational systems are expected to shape responses to redistribution, but here we focus on three: compassion, self-interest, and envy. Moreover, individual differences are pervasive in psychological mechanisms (26). Here, we use the existence of individual differences in compassion, self-interest, and envy as a research tool for investigating the joint contribution of these motivational systems to forming attitudes about redistribution.

## Interacting with the Needy Other

Our ancestors lived in a world without social or medical insurance, and were perpetually vulnerable to the risks posed by scarcity, variability, and disease (27, 28). Ethnographically, better-off foragers tend to share with needy band-mates (28). This forms a system of mutual assistance that minimizes the risk that individuals and families temporarily encountering a string of bad luck will die from need (29, 30). These patterns appear to be generated by a universal psychology of sharing that was naturally selected over evolutionary time by the payoff structure of this enduring game. If you are better off, and someone else is worse off, you can inexpensively enhance their welfare because the marginal cost to you of giving is less than the marginal benefit to them of receiving. That is, seeing others in need affords you the opportunity to cost-effectively enhance their welfare. If your neighbor is starving, you can give them some of your extra food and save their life at little personal cost. Critically, your benefitting them may cause them to increase the weight they attach to your welfare (31), thus making them more likely to help you when the roles reverse. In contrast, not helping them removes the incentive for them to help you in the future when you are needy: You have already demonstrated your disposition not to help them. Accordingly, cues that a valued or potentially valuable individual is in need elicit the spontaneous motivation to help them (32). By hypothesis, this is orchestrated by the emotion of compassion (33, 34). Of course, evolutionarily, individuals are also designed to place value on themselves and their families [a self-interest component is a central part of the motivational system (35, 36)], and the outcome of the interaction between compassion and self-interest will cause individual differences in the degree to which people are willing to make costly welfare trade-offs on behalf of others (37, 38). [As history shows, beyond a certain limit, self-interest can motivate an individual to take from those who are less well-off, if the taker is sufficiently powerful or the taking is hidden (39).] Compassion will thus be more easily elicited in some individuals than in others, yielding individual differences in dispositional compassion. As applied to the inequality scene, then, support for redistribution should increase with an individual's dispositional compassion.

## Interacting with the Better-Off Other

Self-interest motivates support for the transfer of resources from the better-off to the self (40). Here, the goal is increasing one's own level of resources, with the reduction in the welfare of the better-off being simply a by-product. However, some social competition is over positional goods such as rank and prestige, whose consumption by others adversely impacts one's consumption. Here, having more than others helps in such competitions (refs. 41 and 42; see ref. 43). Physical scarcity too may turn a resource (e.g., food) into a positional resource, and so ancestral economies of limited productivity would have featured a higher proportion of such goods than later, more productive economies (44–46). (Ancestral economies also included non-positional goods [e.g., drinking water in a large lake] and positive-sum games [e.g., sharing food to pool risk (47)], although to a lesser extent than modern economies do.) With positional goods, the better-off losing resources is a benefit for the actor even if the actor gets no additional resources; her relative competitive position is improved (48). In such a case, the harm to the better-off is not a by-product of attaining some other good, but the good itself. When efficient, actors will even incur costs to effect such reductions in the welfare of positional rivals (49–52). By hypothesis, this motivation to spitefully reduce the welfare of the better-off is orchestrated by the emotion of envy (53–55). Thus, support for redistribution should be higher in those more disposed to feel envy. [Whether in any specific case it is prudent to act out of self-interest and envy in a way that injures others depends on whether such action can be carried out covertly (56), whether responsibility can be diffused among many others, and the degree to which there is a difference in the aggressive formidability or power of the different players (16).]

## Empirical Investigation

We conducted 13 studies with 6,024 participants in four countries to test the hypothesis that compassion, envy, and self-interest jointly predict support for redistribution. Participants completed instruments measuring their (i) support for redistribution; (ii) dispositional compassion; (iii) dispositional envy; (iv) expected personal gain or loss from redistribution (our measure of self-interest); (v) political party identification; (vi) aid given personally to the poor; (vii) wealthy-harming preferences; (viii) endorsement of procedural fairness; (ix) endorsement of distributional fairness; (x) age; (xi) gender; and (xii) socioeconomic status (SES). Different studies used different sets of measures; see *Methods* and *SI Appendix*.

## Results

If the mind sees modern redistribution as a three-player game eliciting compassion, envy, and self-interest (57–59), then the intensities of those emotions and motives will independently predict support for redistribution. To test this prediction, we regressed participants' support for redistribution simultaneously on their dispositional compassion, their dispositional envy, and their expected personal gain (or loss) from redistribution. As predicted, the three motives have positive, significant, and independent effects on support for redistribution. This is true in the four countries tested: the United States (US) (study 1a), India (IN) (study 1b), the United Kingdom (GB) (study 1c), and Israel (IL) (study 1d)—standardized regression coefficients ( $\beta$  values): compassion, 0.28–0.39; envy, 0.10–0.14; self-interest, 0.18–0.30. Jointly, these motives account for 13–28% of the variance in support for redistribution. Adding to the regression models age and gender, or age, gender, and SES, does not appreciably alter the effect of the emotion/motivation triplet, or the total variance accounted for. We note that age did not have significant effects in any country. Gender had significant effects in the United States and the United Kingdom (females more opposed to redistribution), but not in India or Israel. SES had a significant (negative) effect in the United Kingdom, but not in the other countries (*SI Appendix*, Tables S1–S3).

**Party Affiliation.** Participants in the United States also reported the political party they most identify with. Consistent with historical survey data (60), self-described Democrats endorsed redistribution to a greater extent than Republicans and Libertarians did. Democrats also reported more compassion and more expected personal gain from redistribution than Republicans and Libertarians did; envy did not differ by party (*SI Appendix*, Table S4). Thus, compassion and self-interest predict identification with political parties, which are themselves associated with attitudes toward redistribution (12). In isolation, the emotion/motivation triplet accounts for 28% of the variance in support for redistribution, whereas party identification accounts for 34%; when entered together, they have unique effects of similar magnitude ( $\Sigma r^2$  in the full model: triplet, 0.15; party, 0.18; *SI Appendix*, Table S1, study 1a, model 4). This suggests that emotions and party ideology shape attitudes toward redistribution to a similar extent.

**Compassion and Envy.** Compassion and envy evolved in response to different adaptive problems and have different elicitors and motivational and behavioral outputs. Therefore, different signatures of compassion and envy should be discernible in distributional matters.

Consider personally aiding the poor—as distinct from supporting state-enacted redistribution. Participants in the United States, India, and the United Kingdom (studies 1a–c) were asked whether they had given money, food, or other material resources of their own to the poor during the last 12 mo; 74–90% of the participants had (*SI Appendix*, Table S3). When the emotion/motivation triplet, age, gender, SES, and support for government redistribution were entered as independent variables in binary logistic regressions, dispositional compassion was the only reliable predictor of giving aid to the poor. A unit increase in dispositional compassion is associated with 161%, 361%, and 96% increased odds of having given aid to the poor in the United States, India, and the United Kingdom (*SI Appendix*, Table S5).

Interestingly, support for government redistribution was not a unique predictor of personally aiding the poor in the regressions (*SI Appendix*, Table S5), and its effects were unreliable when considered by itself [zero-order effects as increased odds (95% CI): US, 13% (0.95–1.34); IN, 71% (0.98–2.99); GB, 37% (1.04–1.81)]. Support for government redistribution is not aiding the needy writ large—in the United States, data from the General Social Survey indicate that support for redistribution is associated with lower charitable contributions to religious and nonreligious causes (61). Unlike supporting redistribution, aiding the needy is predicted by compassion alone (62).

Now consider envy. Participants in the United States, India, and the United Kingdom (studies 1a–c) were given two hypothetical scenarios and asked to indicate their preferred one. In one scenario, the wealthy pay an additional 10% in taxes, and the poor receive an additional sum of money. In the other scenario, the wealthy pay an additional 50% in taxes (i.e., a tax increment five times greater than in the first scenario), and the poor receive (only) one-half the additional amount that they receive in the first scenario. That is, higher taxes paid by the wealthy yielded relatively less money for the poor, and vice versa (63). To clarify the rationale for this trade-off, we told participants that the wealthy earned more when tax rates were low, thereby generating more tax revenue that could be used to help the poor. Fourteen percent to 18% of the American, Indian, and British participants indicated a preference for the scenario featuring a higher tax rate for the wealthy even though it produced less money to help the poor (*SI Appendix*, Table S3). We regressed this wealthy-harming preference simultaneously on support for redistribution, the emotion/motivation triplet, age, gender, and SES. Dispositional envy was the only reliable predictor. A unit increase in envy is associated with 23%, 47%, and 43% greater odds of preferring the wealthy-harming scenario in the United States, India, and the United Kingdom (*SI Appendix*, Table S6). Support for government redistribution has no reliable effect on this preference, whether in the regressions (*SI Appendix*, Table S6) or considered by itself [zero-order effects (95% CI): US, 10% (0.89–1.36); IN, –11% (0.56–1.42); GB, 43% (1.05–1.95)].

Compassion and envy motivate the attainment of different ends. Compassion, but not envy, predicts personally helping the poor. Envy, but not compassion, predicts a desire to tax the wealthy even when that costs the poor.

Compassion, envy, and the self-interest independently predict support for redistribution in four countries with different economic histories and distributional policies. This is consistent with an evolutionary–psychological approach that models redistribution as a set of interpersonal relations. However, might redistribution be perceived also as a group-level affair?

**Fairness.** Prominent views argue that redistribution is driven by concerns over fairness (64–66). Issues of fairness have a long evolutionary history (67) and therefore potentially shape attitudes about modern redistribution. Study 2, conducted in the United States, asks whether a taste for fairness predicts support for redistribution, and how the effect of fairness compares to the effect of the emotion/motivation triplet.

The term fairness is used to refer to many distinct concepts (68), including low variance in outcomes (69, 70); uniformity in the application of rules or the law (64, 71–75); proportionality between payoff and effort, skills, economic output, seniority, need, or social status (e.g., caste, religion, or race, in various times and places) (refs. 76–83; see ref. 84); the availability of institutional safeguards against risk (22, 64); and allocations arrived at through mutual recognition of relative power (85). Although intuitive, the concept of fairness remains ill-specified to date.

Here, we focus on the two concepts most common in political discourse about redistribution: distributional fairness and procedural fairness. For the purposes of these studies, we define distributional fairness as low variance in outcomes, and procedural fairness as the application of the same laws and standards across individuals and groups. Extant measures (e.g., ref.

75) are ill suited for our purposes, so we created two instruments tailored to the present inquiry.

Endorsement of distributional fairness was measured with a set of seven decisions about how to allocate a windfall between the participant herself (P) and two other individuals (P1 and P2)—we note that allocational decisions are widely used to assess fairness preferences (e.g., refs. 38 and 86; see ref. 87). In each decision, the participant must choose one of three options. P receives the same amount in every option, but the amounts for P1 and P2 vary across options. In the Distributional Fairness option, P gets less than P1 but more than P2 (e.g., P1: \$120; P: \$100; P2: \$80); this option has the lowest variance in payoffs and the lowest sum of (absolute) self-other differences. In the Compassion option, P2 gets as much as P, whereas P1 gets (even) more than they would get in the Distributional Fairness option (e.g., P1: \$165; P: \$100; P2: \$100); this option raises P2's payoff to P's level while maximizing total payoffs. In the Envy option, P1 gets less than P, whereas P2 gets (even) less than they would get in the Distributional Fairness option (e.g., P1: \$30; P: \$100; P2: \$70); this option provides P a higher payoff than P1 (and P2) while minimizing total payoffs. A decision is scored "1" if Distributional Fairness is chosen, and "0" otherwise. Our measure of endorsement of distributional fairness is the participant's average score across the seven decisions. [All seven decisions have the same payoff structure; what differs across decisions is (i) the particular amounts, and (ii) the order in which the options are presented. The options were presented to the participants as options 1, 2, and 3.] Importantly, this instrument measures a preference for low variance in payoffs (our operationalization of distributional fairness) barring payoffs compatible with compassion and envy (86, 88), which, as established in studies 1a–d, predict support for redistribution.

To test for fairness effects, we conducted three follow-up studies in the United States (studies 2a–c). The distributional fairness decisions varied across studies, as follows. In studies 2a and 2c, P1 and P2 were two anonymous same-sex individuals, and the amounts were in the single to triple digits. In study 2b, P1 and P2 were groups: "the rich" and "the poor," and the amounts (five to six digits) were described as salaries per capita "from now and into the indefinite future" for each of P1, P, and P2 (see decisions in *SI Appendix*, Tables S7–S9). In studies 2a and 2b, the decisions were hypothetical; in study 2c, the decisions were paid by lottery method. Studies 2a and 2b were conducted with 355 and 364 participants each, yielding ~95% power to detect an effect size of  $f^2 = 0.04$  at the 0.05 level in regression analyses. Study 2c included 275 participants.

Endorsement of procedural fairness was measured with a seven-item instrument, including "The law of the land should apply to everybody in the same way," and "It would not bother me much if different groups of people were subject to different rules" (reversed), with scales ranging from 1 (do not agree at all) to 7 (strongly agree).

In addition to measuring how strongly participants endorsed distributional and procedural fairness, studies 2a–c also measured the emotion/motivation triplet (dispositional compassion, dispositional envy, and expected personal gain or loss from redistribution), age, gender, SES, and support for redistribution (*SI Appendix*, Tables S10 and S11).

Endorsement of distributional fairness failed to predict support for redistribution in all three studies: 2a [ $r_{348} = -0.10$  (wrong direction),  $P = 0.059$ ]; 2b ( $r_{351} = 0.00$ ,  $P = 1$ ); 2c ( $r_{273} = 0.05$ ,  $P = 0.38$ ). It also failed to do so when entered with the other variables in the regressions (*SI Appendix*, Table S12). Endorsement of procedural fairness predicted support for redistribution at the zero-order level in all three studies (2a:  $r_{348} = 0.19$ ,  $P = 0.0003$ ; 2b:  $r_{351} = 0.12$ ,  $P = 0.028$ ; 2c:  $r_{273} = 0.13$ ,  $P = 0.029$ ). However, when entered with the other variables in the regressions, the procedural fairness effect failed to predict support for redistribution in two of the three studies (it remained only in study 2c; *SI Appendix*, Table S12).

By contrast, dispositional compassion, dispositional envy, and expected personal gain from redistribution predicted support for redistribution in each of the three studies. Moreover, each motive continued to predict support for redistribution when entered

into regressions with procedural fairness and distributional fairness (separately or jointly), or with both measures of fairness and demographic variables (*SI Appendix*, Table S12). In sum, the emotion/motivation triplet has a greater effect on support for redistribution than either measure of fairness does.

In studies 2a–c, the Distributional Fairness option had some variance in payoffs—P gets less than P1 and more than P2. Might a fairness effect be moderated by the (absolute) variance of payoffs? For example, might a taste for equal payoffs (zero variance) succeed in predicting support for redistribution? To answer this question, we conducted a set of two follow-up studies (S1a–b). These were identical to studies 2a (interpersonal allocations) and 2b (allocations among groups), respectively, except that in studies S1a–b the Distributional Fairness option gives identical amounts to P1, P, and P2. Endorsement of distributional fairness had no effect in study S1a; however, it had an effect in study S1b, which survived the inclusion of the other predictors. However, even in study S1b, the effect of the emotion/motivation triplet was several times greater than the effect of distributional fairness (*SI Appendix*, studies S1a–b and Tables S13–S17).

We conducted further follow-up studies to address two potential issues. In the studies conducted so far, the Compassion option of the distributional fairness instrument has the highest efficiency or aggregate payoff. Thus, this instrument may be insensitive to participants who value distributional fairness but not so much to trade it for efficiency (86). We conducted four follow-up studies (S2a–d) in which the Compassion option was removed, thus leaving two options: a high-efficiency, low-variance Distributional Fairness option, and a low-efficiency, high-variance Envy option. Still, the resulting two-option instrument may be insensitive to participants who value low-variance payoffs but fail to correctly identify a particular set of payoffs as the low-variance set. To address this other potential issue, in two of the four studies we included labels indicating the options where the total payoff is higher (lower) and "the money is split most (least) evenly." The four studies measured endorsement of distributional fairness, as follows: interpersonal, options unlabeled (study S2a); interpersonal, options labeled (study S2b); groups, options unlabeled (study S2c); and groups, options labeled (study S2d). In studies S2a–b, the decisions were paid by lottery method. Endorsement of distributional fairness (and efficiency) uniquely predicted support for redistribution in only one of the four studies (study S2d). However, even in this study the effect of the emotion/motivation triplet was far greater than the effect of distributional fairness (*SI Appendix*, studies S2a–d and Tables S18–S22).

To sum up the set of fairness studies, in predicting support for redistribution, the effect of fairness as a group-wide concern is unreliable and of far smaller magnitude than the effect of the emotion/motivation triplet. This is true whether fairness is operationalized as uniformity in the application of laws and standards or as low (or null) variance in payoffs; whether distributional fairness is assayed between individuals (studies 2a, 2c, S1a, S2a, S2b) or between groups ("the rich," "the poor"; studies 2b, S1b, S2c, S2d); and whether allocational decisions are hypothetical (studies 2a, 2b, S1a, S1b, S2c, S2d) or consequential (studies 2c, S2a, S2b).

## Discussion

Consistent with the three-player, two-situation model, support for redistribution is predicted by compassion, envy, and self-interest. The fact that a sizeable minority (14–18% of American, Indian, and British participants prefers a higher tax rate for the wealthy even when that yields less money for the poor underscores that redistribution features spiteful motives (45, 53, 57, 88) alongside humanitarian motives (57, 62, 86), as predicted by the three-player model.

A taste for fairness had little or no effect on support for redistribution. This is striking, because fairness is invoked in many arguments for redistribution. Notions of fairness are intuitive and compelling—they seem to inspire charity, courageous acts, outrages, wars, and moral crusades. Furthermore, notions of

fairness other than those we assessed here may well shape attitudes about redistribution. As stated above, however, fairness refers to a wide variety of distinct phenomena and goals. The usefulness of this concept is thus limited at present.

These data support the evolutionary–psychological hypothesis that redistribution is not perceived—at least not entirely—as a population-level phenomenon. Individual attitudes about redistribution reflect several motivational systems, which is what one would predict given the redistributive games faced by our ancestors. Distributional optima differ by individual (89), but also by mental faculty within individuals. This may explain why the enterprise of optimizing a society-wide variable or distributional state (e.g., aggregate welfare, the welfare of the least well-off) has proven so problematic. For example, obstacles to increasing the welfare of the least well-off involve not only insufficient compassion but also the presence of envy. This is because the motivational mechanisms implicated in redistribution were shaped by different adaptive problems, have different circuit logics, and deliver different, sometimes opposing, outputs. As Walt Kelly's character Pogo famously said, "We have met the enemy and he is us."

## Methods

The study procedures were approved by the Institutional Review Boards at the University of California, Santa Barbara, the Ben Gurion University of the Negev, and the Interdisciplinary Center, Herzliya. The studies were conducted in English in the United States, India, and the United Kingdom, and in Hebrew in Israel. All of the participants gave their informed consent. The stimuli are described in full in the *SI Appendix*. The data are included in *Dataset S1*.

**Participants.** Amazon Mechanical Turk (AMT) was used to recruit participants for studies 1a–c as follows: study 1a, US: 1,032 participants (559 females, 8 of unknown gender), and mean age, 31 (SD = 11); study 1b, IN: 838 participants; 278 participants were excluded from analyses due to failure to correctly respond to an attention check, leaving an effective sample size of 560 (208 females, 2 of unknown gender); mean age, 28 (SD = 8); study 1c, GB: 646 participants (195 females, 40 of unknown gender); mean age, 29 (SD = 10); study 1d: 282 participants were recruited in Israel from two universities (194 females); their mean age was 23 (SD = 2). These participants completed additional measures; some are reported in refs. 90 and 91, and others are to be reported elsewhere.

### Measures for Studies 1a–d.

**Support for redistribution.** Support for redistribution (studies 1a–c) was measured with 11 items (based on ref. 17), coded on 1 (strongly disagree) to 5 (strongly agree) scales. Examples of items include the following: "Wealth should be taken from the rich and given to the poor," and "The government spends too much money on the unemployed" (reversed). Study 1d used nine, slightly modified items, coded on 1–7 scales. Mean  $\alpha$  across studies was 0.78. **Dispositional compassion.** Dispositional compassion (studies 1a–d) was measured with 10 items (92), coded on 1 [very inaccurate (in describing myself)] to 5 [very accurate (in describing myself)] scales. Examples of items include the following: "I suffer from others' sorrows," and "I tend to dislike soft-hearted people" (reversed). Mean  $\alpha$  was 0.68.

**Dispositional envy.** Dispositional envy (studies 1a–d) was measured with eight items (93), coded on 1 (strongly disagree) to 5 (strongly agree) scales. Examples of items include the following: "I feel envy every day," and "It is so frustrating to see some people succeed so easily." Mean  $\alpha$  was 0.89.

**Expected personal gain from redistribution.** Expected personal gain from redistribution (studies 1a–d) was measured with one item, coded on a 1–5 scale (My own economic situation would significantly worsen–improve): "Imagine that a policy of higher taxes on the wealthy is implemented. What overall impact do you think the higher taxes on the wealthy would have on you?"

**Aid to the poor.** Aid to the poor (studies 1a–c) was measured with one item: "In the last 12 months, did you give money, food, or other material resources of your own to poor people (either directly to them or to charities)?" (yes = 1, no = 0).

**Fiscal scenarios.** Fiscal scenarios (studies 1a–c): study 1a (US) version, "The top 1% wealthiest individuals pay an extra 50% [10%] of their income in additional taxes, and as a consequence of that the poor get an additional \$100 million [\$200 million] per year (the extra 50% [10%] in taxes paid in former fiscal years leaving the wealthiest with relatively less [more] taxable income)" (coded "1" ["0"]). The IN and GB scenarios featured amounts in local currency.

**SES.** SES (studies 1a–c) was measured with seven items, coded on 1 (strongly disagree) to 5 (strongly agree) scales. Examples of items: "I have enough money to buy the things I desire," and "I feel relatively poor these days" (reversed). Mean  $\alpha$  was 0.75. Study 1d used the single item, "How would you define the socioeconomic status of your parents?," coded on a 1 (low) to 7 (high) scale.

**Samples for Studies 2a–c.** We recruited 355/364/275 (studies 2a/b/c) participants in the US; 5/11 participants were excluded from analyses in studies 2a/b due to failure to correctly respond to an attention check, leaving an effective sample size of 350/353/275. Their mean age was 34/34/19 (SD = 12/12/1). Participants were AMT users (studies 2a–b), and college students (study 2c).

### Measures for Studies 2a–c.

**Support for redistribution.** Support for redistribution was measured as in studies 1a–c, except that the scales ranged from 1 to 7. Dispositional compassion, dispositional envy, and expected personal gain from redistribution were measured as in studies 1a–d. SES was measured as in studies 1a–c, except that study 2c included an additional item: "How would you define your parents' socioeconomic status?" (low to high).

**Endorsement of procedural fairness.** Endorsement of procedural fairness (studies 2a–c) was measured with seven items, coded on 1 (do not agree at all) to 7 (strongly agree) scales. Examples of items included the following: "The law of the land should apply to everybody in the same way," and "It would not bother me much if different groups of people were subject to different rules" (reversed). Mean  $\alpha$  was 0.66.

**Endorsement of distributional fairness.** Endorsement of distributional fairness (studies 2a–c) was measured with seven decisions with three options each. Each option dictates a particular allocation of money between the participant herself (P) and two other individuals or sets of individuals (P1 and P2). Decisions are hypothetical, interpersonal (study 2a); hypothetical, between groups ("the rich," "the poor") (study 2b); and interpersonal, paid by lottery method with a chance of 1 in 36 (study 2c). Mean  $\alpha$  was 0.86.

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- Darwin C (1888) *The Descent of Man, and Selection in Relation to Sex* (John Murray, London).
- Alesina AF, Giuliano P (2009) Preferences for redistribution. *Handbook of Social Economics*, eds Bisin A, Benhabib J (North Holland, San Diego), pp 93–132.
- Cosmides L, Tooby J (2006) *Evolutionary Psychology, Moral Heuristics, and the Law*, eds Gigerenzer G, Engel C (MIT Press, Cambridge, MA), pp 175–205.
- Boyer P, Petersen MB (2012) The naturalness of (many) social institutions: Evolved cognition as their foundation. *J Inst Econ* 8:1–25.
- International Social Survey Programme (2009) *ISSP 2009 Social Inequality IV*. Available at [www.gesis.org/issp/modules/issp-modules-by-topic/social-inequality/2009/](http://www.gesis.org/issp/modules/issp-modules-by-topic/social-inequality/2009/). Accessed June 1, 2015.
- Kiatpongsan S, Norton MI (2014) How much (more) should CEOs make? A universal desire for more equal pay. *Perspect Psychol Sci* 9:587–593.
- Alesina A, Glaeser EL (2004) *Fighting Poverty in the US and Europe: A World of Difference* (Oxford Univ Press, Oxford).
- Iversen T, Soskice D (2006) Electoral institutions and the politics of coalitions: Why some democracies redistribute more than others. *Am Polit Sci Rev* 100:165–181.
- Korpi W, Palme J (1998) The paradox of redistribution and strategies of equality: Welfare state institutions, inequality, and poverty in the Western countries. *Am Sociol Rev* 63:661–687.
- Gilens M (2009) *Why Americans Hate Welfare: Race, Media, and the Politics of Antipoverty Policy* (Univ of Chicago Press, Chicago).
- Alesina A, Fuchs-Schündeln N (2007) Good-bye Lenin (or not?): The effect of communism on people's preferences. *Am Econ Rev* 97:1507–1528.
- Sears DO, Lau RR, Tyler TR, Allen HM (1980) Self-interest vs. symbolic politics in policy attitudes and presidential voting. *Am Polit Sci Rev* 74:670–684.
- Kenrick DT, et al. (2009) Deep rationality: The evolutionary economics of decision making. *Soc Cogn* 27:764–785.
- Buss DM (2005) *The Handbook of Evolutionary Psychology* (Wiley, Hoboken, NJ).
- Tooby J, Cosmides L (1990) On the universality of human nature and the uniqueness of the individual: The role of genetics and adaptation. *J Pers* 58:17–67.
- Sell A, Tooby J, Cosmides L (2009) Formidability and the logic of human anger. *Proc Natl Acad Sci USA* 106:15073–15078.

17. Petersen MB, Sznycer D, Sell A, Cosmides L, Tooby J (2013) The ancestral logic of politics: Upper-body strength regulates men's assertion of self-interest over economic redistribution. *Psychol Sci* 24:1098–1103.
18. Sznycer D, et al. (2012) Cross-cultural differences and similarities in proneness to shame: An adaptationist and ecological approach. *Evol Psychol* 10:352–370.
19. Kaplan HS, Schniter E, Smith VL, Wilson BJ (2012) Risk and the evolution of human exchange. *Proc Biol Sci* 279:2930–2935.
20. Kameda T, Takezawa M, Tindale RS, Smith CM (2002) Social sharing and risk reduction—exploring a computational algorithm for the psychology of windfall gains. *Evol Hum Behav* 23:11–33.
21. Skitka LJ, Tetlock PE (1993) Providing public assistance: Cognitive and motivational processes underlying liberal and conservative policy preferences. *J Pers Soc Psychol* 65:1205–1223.
22. Petersen MB, Sznycer D, Cosmides L, Tooby J (2012) Who deserves help? Evolutionary psychology, social emotions, and public opinion about welfare. *Polit Psychol* 33:395–418.
23. Fong C (2001) Social preferences, self-interest, and the demand for redistribution. *J Public Econ* 82:225–246.
24. Haidt J (2001) The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychol Rev* 108:814–834.
25. Tetlock PE (2002) Social functionalist frameworks for judgment and choice: Intuitive politicians, theologians, and prosecutors. *Psychol Rev* 109:451–471.
26. Buss DM, Hawley PH (2010) *The Evolution of Personality and Individual Differences* (Oxford Univ Press, New York).
27. Sugiyama LS (2004) Illness, injury, and disability among Shiwiar forager-horticulturalists: Implications of health-risk buffering for the evolution of human life history. *Am J Phys Anthropol* 123:371–389.
28. Kaplan H, Hill K (1985) Food sharing among ache foragers: Tests of explanatory hypotheses. *Curr Anthropol* 26:223–239.
29. Cashdan EA (1985) Coping with risk: Reciprocity among the Basarwa of northern Botswana. *Man (Lond)* 20:454–474.
30. Aktipis A, et al. (2016) Cooperation in an uncertain world: For the Maasai of East Africa, need-based transfers outperform account-keeping in volatile environments. *Hum Ecol Interdiscip J* 44:353–364.
31. Tooby J, Cosmides L (1996) Friendship and the banker's paradox: Other pathways to the evolution of adaptations for altruism. *Evolution of Social Behaviour Patterns in Primates and Man*. Proceedings of the British Academy, eds Runciman WG, Maynard Smith J, Dunbar RIM (Oxford Univ Press, Oxford), Vol 88, pp 119–143.
32. Burnstein E, Crandall C, Kitayama S (1994) Some neo-Darwinian decision rules for altruism: Weighing cues for inclusive fitness as a function of the biological importance of the decision. *J Pers Soc Psychol* 67:773–789.
33. Batson CD, O'Quin K, Fultz J, Vanderplas M, Isen AM (1983) Influence of self-reported distress and empathy on egoistic versus altruistic motivation to help. *J Pers Soc Psychol* 45:706–718.
34. Goetz JL, Keltner D, Simon-Thomas E (2010) Compassion: An evolutionary analysis and empirical review. *Psychol Bull* 136:351–374.
35. McClintock CG, Allison ST (1989) Social value orientation and helping behavior. *J Appl Soc Psychol* 19:353–362.
36. Weeden J, Kurzban R (2014) *The Hidden Agenda of the Political Mind: How Self-Interest Shapes Our Opinions and Why We Won't Admit It* (Princeton Univ Press, Princeton).
37. Messick DM, McClintock CG (1968) Motivational bases of choice in experimental games. *J Exp Soc Psychol* 4:1–25.
38. Charness G, Rabin M (2002) Understanding social preferences with simple tests. *Q J Econ* 117:817–869.
39. Dana J, Weber RA, Kuang JX (2007) Exploiting moral wiggle room: Experiments demonstrating an illusory preference for fairness. *Econ Theory* 33:67–80.
40. Blurton Jones N (1984) A selfish origin for human food sharing: Tolerated theft. *Ethol Sociobiol* 5:1–3.
41. Betzig L (2012) Means, variances, and ranges in reproductive success: Comparative evidence. *Evol Hum Behav* 33:309–317.
42. Frank RH (1985) *Choosing the Right Pond* (Oxford Univ Press, New York).
43. Gardner A, West SA, Buckling A (2004) Bacteriocins, spite and virulence. *Proc Biol Sci* 271:1529–1535.
44. Foster GM (1965) Peasant society and the image of limited good. *Am Anthropol* 67:293–315.
45. Rubin PH (2003) Folk economics. *South Econ J* 70:157–171.
46. Hill SE, Buss DM (2008) The evolutionary psychology of envy. *Envy: Theory and Research*, ed Smith RH (Oxford Univ Press, New York), pp 60–70.
47. Kaplan H, Hill K, Lancaster J, Hurtado AM (2000) A theory of human life history evolution: Diet, intelligence, and longevity. *Evol Anthropol* 9:156–185.
48. Smith RH, et al. (1996) Envy and schadenfreude. *Pers Soc Psychol Bull* 22:158–168.
49. Fehr E, Hoff K, Kshetramade M (2008) Spite and development. *Am Econ Rev* 98:494–499.
50. McAuliffe K, Blake PR, Warneken F (2014) Children reject inequity out of spite. *Biol Lett* 10:20140743.
51. Sheskin M, Bloom P, Wynn K (2014) Anti-equality: Social comparison in young children. *Cognition* 130:152–156.
52. Pedersen EJ, Kurzban R, McCullough ME (2013) Do humans really punish altruistically? A closer look. *Proc R Soc Lond B Biol Sci* 280:20122723.
53. Schoeck H (1987) *Envy: A Theory of Social Behavior* (Liberty Fund, Indianapolis, IN).
54. Smith RH, Kim SH (2007) Comprehending envy. *Psychol Bull* 133:46–64.
55. Fiske ST (2011) *Envy Up, Scorn Down: How Status Divides Us* (Russell Sage Foundation, New York).
56. Cikara M, Fiske ST (2012) Stereotypes and schadenfreude: Affective and physiological markers of pleasure at outgroup misfortunes. *Soc Psychol Personal Sci* 3:63–71.
57. Tullock G (1983) *Economics of Income Redistribution* (Kluwer-Nijhoff, Boston).
58. Corneo G, Grüner HP (2002) Individual preferences for political redistribution. *J Public Econ* 83:83–107.
59. Meltzer AH, Richard SF (1981) A rational theory of the size of government. *J Polit Econ* 89:914–927.
60. Davis JA, Smith TW (2010) *General Social Surveys, 1972–2008* (National Opinion Research Center, Chicago).
61. Brooks AC (2007) *Who Really Cares* (Basic Books, New York).
62. Feldman S, Steenbergen MR (2001) The humanitarian foundation of public support for social welfare. *Am J Pol Sci* 45:658–677.
63. Laffer AB (2004) The Laffer curve: Past, present, and future. *Background Herit Found* 2004:1765.
64. Rawls J (1971) *A Theory of Justice* (Harvard Univ Press, Cambridge, MA).
65. Alesina A, Angeletos G-M (2005) Fairness and redistribution. *Am Econ Rev* 95:960–980.
66. Tyrann J-R, Sausgruber R (2006) A little fairness may induce a lot of redistribution in democracy. *Eur Econ Rev* 50:469–485.
67. Brosnan SF, de Waal FB (2014) Evolution of responses to (un)fairness. *Science* 346:1251776.
68. Cappelen AW, Hole AD, Sørensen EØ, Tungodden B (2007) The pluralism of fairness ideals: An experimental approach. *Am Econ Rev* 97:818–827.
69. Fehr E, Schmidt KM (1999) A theory of fairness, competition, and cooperation. *Q J Econ* 114:817–868.
70. Dawes CT, Fowler JH, Johnson T, McElreath R, Smirnov O (2007) Egalitarian motives in humans. *Nature* 446:794–796.
71. Thibaut J, Walker L, LaTour S, Houlden P (1974) Procedural justice as fairness. *Stanford Law Rev* 26:1271–1289.
72. Baumard N, André J-B, Sperber D (2013) A mutualistic approach to morality: The evolution of fairness by partner choice. *Behav Brain Sci* 36:59–78.
73. Shaw A, Olson K (2014) Fairness as partiality aversion: The development of procedural justice. *J Exp Child Psychol* 119:40–53.
74. DeScioli P, Kurzban R (2013) A solution to the mysteries of morality. *Psychol Bull* 139:477–496.
75. Graham J, Haidt J, Nosek BA (2009) Liberals and conservatives rely on different sets of moral foundations. *J Pers Soc Psychol* 96:1029–1046.
76. Hook JG, Cook TD (1979) Equity theory and the cognitive ability of children. *Psychol Bull* 86:429–445.
77. Hundley G, Kim J (1997) National culture and the factors affecting perceptions of pay fairness in Korea and the United States. *Int J Organ Anal* 5:325–341.
78. Liénard P, Chevallier C, Mascaro O, Kiura P, Baumard N (2013) Early understanding of merit in Turkana children. *J Cogn Cult* 13:57–66.
79. Walster E, Walster GW, Berscheid E (1978) *Equity: Theory and Research* (Allyn and Bacon, Boston).
80. Sloane S, Baillargeon R, Premack D (2012) Do infants have a sense of fairness? *Psychol Sci* 23:196–204.
81. Kanngiesser P, Warneken F (2012) Young children consider merit when sharing resources with others. *PLoS One* 7:e43979.
82. Haidt J (2012) *The Righteous Mind: Why Good People Are Divided by Politics and Religion* (Paragon, New York).
83. Pratto F, Sidanius J, Stallworth LM, Malle BF (1994) Social dominance orientation: A personality variable predicting social and political attitudes. *J Pers Soc Psychol* 67:741–763.
84. Falk A, Fehr E, Fischbacher U (2008) Testing theories of fairness: Intentions matter. *Games Econ Behav* 62:287–303.
85. Tooby J, Cosmides L (2010) *Groups in Mind: The Coalitional Roots of War and Morality*, ed Høgh-Olesen H (Palgrave MacMillan, New York), pp 191–234.
86. Engelmann D, Strobel M (2004) Inequality aversion, efficiency, and maximin preferences in simple distribution experiments. *Am Econ Rev* 94:857–869.
87. Van Lange PAM, Otten W, De Bruin EMN, Joireman JA (1997) Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *J Pers Soc Psychol* 73:733–746.
88. Zizzo DJ, Oswald AJ (2001) Are people willing to pay to reduce others' incomes? *Ann Econ Stat* 2001:39–65.
89. Arrow KJ (1950) A difficulty in the concept of social welfare. *J Polit Econ* 58:328–346.
90. Sznycer D, et al. (2016) Shame closely tracks the threat of devaluation by others, even across cultures. *Proc Natl Acad Sci USA* 113:2625–2630.
91. Sell A, et al. (2017) Physically strong men are more militant: A test across four countries. *Evol Hum Behav* 38:334–340.
92. Goldberg LR (1999) *A Broad-Bandwidth, Public Domain, Personality Inventory Measuring the Lower-Level Facets of Several Five-Factor Models*, eds Mervielde I, Deary I, De Fruyt F, Ostendorf F (Tilburg Univ Press, Tilburg, The Netherlands), pp 7–28.
93. Smith RH, Parrott WG, Diener EF, Hoyle RH, Kim SH (1999) Dispositional envy. *Pers Soc Psychol Bull* 25:1007–1020.