

High economic inequality leads higher-income individuals to be less generous

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Research on social class and generosity suggests that higher-income individuals are less generous than poorer individuals. We propose that this pattern emerges only under conditions of high economic inequality, contexts that can foster a sense of entitlement among higher-income individuals that, in turn, reduces their generosity. Analyzing results of a unique nationally representative survey that included a real-stakes giving opportunity ($n = 1,498$), we found that in the most unequal US states, higher-income respondents were less generous than lower-income respondents. In the least unequal states, however, higher-income individuals were more generous. To better establish causality, we next conducted an experiment ($n = 704$) in which apparent levels of economic inequality in participants' home states were portrayed as either relatively high or low. Participants were then presented with a giving opportunity. Higher-income participants were less generous than lower-income participants when inequality was portrayed as relatively high, but there was no association between income and generosity when inequality was portrayed as relatively low. This research finds that the tendency for higher-income individuals to be less generous pertains only when inequality is high, challenging the view that higher-income individuals are necessarily more selfish, and suggesting a previously undocumented way in which inequitable resource distributions undermine collective welfare.

inequality | income | generosity

Are people with higher incomes less generous than people with lower incomes? Heightened awareness of economic inequality has led to increased interest in understanding the implications of income for behavior, in particular generosity toward others. Psychological research in this area has painted a picture of higher-income individuals as consistently more selfish than poorer individuals. Studies find that higher-income individuals break the laws of the road and endanger pedestrians more frequently (1), take more candy from children (1), feel less compassion for cancer patients (2), and give less help to strangers in distress (3). These findings resonate with themes from political philosophy, literature, and lay discourse that often portray wealth as a corrupting force and economic elites as morally suspect (4, 5).

Here we propose a different, multilevel perspective on the relationship between income and generosity that incorporates both the extent of macrolevel economic inequality and individuals' positions within that structure. We contend that economic inequality—the extent to which wealth is concentrated in the hands of a small proportion of the population (6)—is a key macrostructural condition that curtails the generosity of higher-income individuals. Where income is more concentrated in the hands of fewer people, higher-income individuals may come to compare themselves more favorably relative to the general population (7, 8). When people engage in such favorable downward social comparisons, they tend to acquire a sense of entitlement, the belief that one is more important and deserving than others (9, 10). Feeling entitled may in turn reduce the generosity of higher-income individuals living in highly unequal areas, because people who believe they are more important than others also believe that resources rightfully belong to them (7, 11). In addition, where

greater inequality exists, the living conditions of the poor are particularly bleak and the apparent costs of low economic standing are more glaring. These settings may increase higher-income individuals' concerns about losing their privileged position, concerns that in turn may lead to less willingness to share resources with others. In contrast, where inequality is low, higher-income individuals might be as generous as their lower-income counterparts, or even more generous because their greater capacity to give makes giving more affordable to them.

The preceding arguments suggest that the negative association between income and generosity might be particularly pronounced in highly unequal areas, and that this association might be attenuated or even reversed in less unequal areas. If true, this reasoning would point to a hitherto undiscovered effect of economic inequality on the psychology and behavior of higher-income individuals, with implications for contemporary debates about the social impact of inequitable resource distributions (6). In particular, if inequality diminishes the generosity of those with the highest incomes, then their charity may not be a reliable corrective to high inequality, as some have argued (12).

Past findings are inconclusive, yet generally consistent, with the prediction that a negative relation between income and generosity emerges under conditions of higher inequality, and is attenuated or reversed under conditions of lower inequality. Many studies finding that higher-income individuals are less generous were conducted in California (1–3), one of the most unequal US states (6). In contrast, recent investigations conducted in the

Significance

Recent research finds that higher-income individuals are less generous than lower-income individuals. This work has received widespread academic and media attention, but the formulation is likely oversimplistic because it neglects the role of economic inequality. We test a new, multilevel perspective on the relationship between income and generosity that incorporates economic inequality. In a nationally representative survey study and an experiment, we find that higher-income individuals are only less generous if they reside in a highly unequal area or when inequality is experimentally portrayed as relatively high. Our findings offer a more complete understanding of the association between income and generosity and have implications for contemporary debates about the social impact of unequal resource distributions.

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Netherlands and Germany, where there is considerably less inequality (6), found no association and a positive association, respectively, between income and how much participants in a “trust game” reciprocated the cooperative behavior of their partner (13, 14). Furthermore, a study conducted in Japan, where inequality is also relatively low (6), found no association between a composite of income and related status indicators and giving behavior in dictator games (15). Although these findings suggest that a negative relation between income and generosity might emerge only under conditions of high inequality, whether the extent of inequality modifies the income-generosity link has never been systematically tested.

To test our prediction that economic inequality reduces the generosity of higher-income individuals, we analyzed a unique nationally representative dataset that included a real-stakes giving opportunity, and then conducted a follow-up experiment. In the nationally representative survey study, we tested whether income was negatively associated with generosity in the most unequal US states, but not in less unequal states. In the experiment, we manipulated perceptions of the extent of inequality in participants’ home states, and tested whether income was negatively associated with generosity when inequality was portrayed as relatively high, but not when inequality was portrayed as relatively low. In both studies, we controlled for other factors that could drive the results, including characteristics of individuals that are related to income (e.g., age, education) and characteristics of geographical areas that are related to inequality (e.g., population size).

Results

Nationally Representative Survey Study. We first tested the relationship between economic inequality, income, and generosity with data from the Measuring Morality study, a nationally representative survey of United States residents (*n* for analysis = 1,498 respondents). This study was useful to test our hypothesis because a measure of generosity was administered to individuals with different incomes residing in areas (US states plus the District of Columbia) that vary in levels of inequality (6). Respondents reported their household income (*M* = \$82,314, *SD* = 82,045), home state, and other demographic characteristics that we used as controls in the analyses. We retrieved Gini coefficients (*M* = 0.459, *SD* = 0.022), a widely used index of income inequality (6), where 0 represents perfect equality (everyone has the same amount of income) and 1 represents perfect inequality (one individual has all of the income and all others have no income), from the American Community Survey (16).

Additionally, respondents completed a validated behavioral measure of generosity: the dictator game (17–21). Respondents learned that they had been randomly assigned the role of “decider” and had received 10 tickets, each worth one entry in a raffle to win a monetary prize of either \$10 or \$500. They could transfer any number of tickets to the next participant, a “receiver” who did not have any tickets. By giving tickets, respondents could benefit another person at a cost to themselves in a zero-sum opportunity to win money (*M* = 4.24 tickets donated; *SD* = 2.49). Because the receiver was another participant in this nationwide study, deciders were under the impression that they would never meet the receiver, ensuring that this measure assesses generosity rather than anticipated reciprocity (21). Ample evidence supports the validity of the dictator game as a measure of generosity. In particular, donations in the dictator game are correlated with real-life charitable donations and other generous acts (18, 20).

To test our hypothesis, we used hierarchical linear modeling (using the MIXED procedure in SAS), because respondents were nested within states and, thus, the observations were nonindependent (22, 23). We first regressed donations in the dictator game on only income (centered at its grand mean across individuals). This analysis revealed no overall association

between income and generosity, $\gamma = 0.005$, $SE = 0.01$, $P = 0.66$, a result that is consistent with our perspective that higher-income individuals are not necessarily less generous than lower-income individuals.

We then tested whether income is negatively associated with generosity in highly unequal areas, but not in less unequal areas, by regressing donations on income (centered at its grand mean across individuals), inequality (centered at its grand mean across states), and the interaction term. The test of the cross-level interaction reveals whether the association between income and generosity varies depending on the extent of inequality. This analysis yielded a significant interaction (Table 1, model 1) that is displayed in Fig. 1.

The pattern was consistent with our hypothesis: Income was negatively associated with generosity in the most unequal states, but positively associated with generosity in the least unequal states. We probed this interaction by examining regions of significance, which reveal levels of inequality where income was significantly related to generosity, based on the regression estimates (22, 23). To obtain these regions, we used the web utility developed by Preacher, Curran, and Bauer (23). According to the estimates, the association between income and generosity was significantly negative in states with Ginis of 0.485 or higher. In contrast, the association between income and generosity was significantly positive in states with Ginis of 0.454 or lower.

We conducted spotlight analyses (24) to examine how inequality related to the generosity of the richest individuals and, separately, of the poorest individuals. We examined the association between inequality and generosity for individuals in the top 15% of the income distribution who are considered to comprise

Table 1. Hierarchical linear modeling results predicting generosity (survey study)

Variable	Model 1			Model 2		
	γ	SE	<i>t</i>	γ	SE	<i>t</i>
Intercept	4.33	0.08	56.13***	4.56	0.20	22.41***
Income	0.02	0.01	1.48	0.02	0.01	1.75
Inequality	-7.46	4.04	-1.85	-6.16	7.03	-0.88
Income × Inequality	-1.56	0.54	-2.91**	-1.52	0.58	-2.64**
Age				0.01	0.00	2.74**
Gender				0.27	0.13	2.03*
Ethnicity				-0.08	0.15	-0.54
Education				-0.02	0.04	-0.49
Employment status				-0.02	0.14	-0.15
Marital status				0.02	0.14	0.11
Religiosity				0.09	0.05	1.76
Conservative ideology				0.02	0.05	0.31
Raffle amount				-0.60	0.13	-4.63***
State median income				0.13	0.13	1.05
State population				0.02	0.01	1.64
State percentage urban				-1.15	0.90	-1.28
State age diversity				-68.28	45.57	-1.50
State gender diversity				-163.37	579.40	-0.28
State ethnic diversity				-1.40	0.87	-1.62

For model 1, *n* = 1,498. For model 2, *n* = 1,475 because of missing data. All variables were centered at their grand means. Gender was coded 1 = female, 0 = male. Ethnicity was coded 1 = European-American, 0 = other. Employment status was coded 1 = working as a paid employee or self-employed, 0 = unemployed. Marital status was coded 1 = married, 0 = not married. Raffle amount was coded 1 = \$500, 0 = \$10. **P* < 0.05. ***P* < 0.01, ****P* < 0.001.

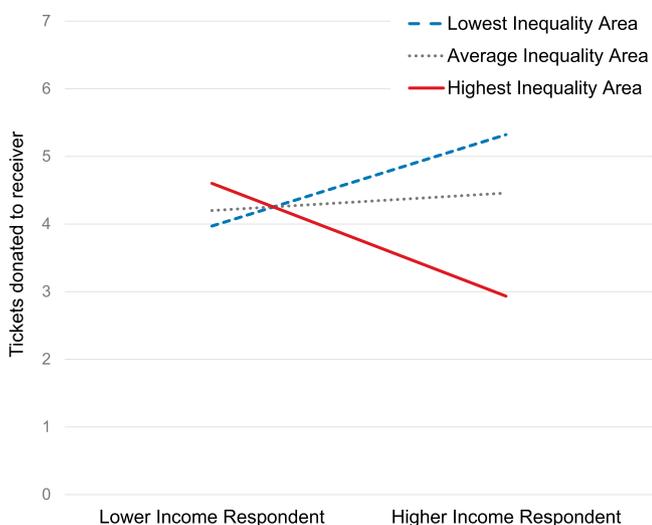


Fig. 1. Results from nationally representative survey study: Generosity as a function of household income (\pm SD) and level of economic inequality in respondents' home states. Lines are projections based on regression estimates from the overall model. The blue, dashed line depicts the projected association between income and generosity in the area with the lowest level of inequality (the state of Wyoming). The gray, dotted line depicts this projected association in an area with an average level of inequality. The red, solid line depicts this projected association in the area with the highest level of inequality (the District of Columbia).

the professional class (25, 26). Individuals in the top 15% earn approximately \$125,000 or more (27). Higher (compared with lower) inequality was associated with reduced generosity among people in the top 15% of the income distribution, $\gamma = -14.14$, $SE = 4.74$, $P < 0.01$. As comparison, we examined the association between inequality and generosity for individuals in the bottom 15% of the income distribution, who earn approximately \$15,000 or less (27). Inequality was not associated with the generosity of people in the bottom 15% of the income distribution, $\gamma = 3.06$, $SE = 5.29$, $P = 0.57$.

To verify the robustness of the results, we repeated the analysis controlling for characteristics of individuals that could correlate with income (age, gender, ethnicity, education, employment status, marital status, religiosity, political ideology, and raffle amount) and state characteristics that could correlate with inequality (median income, population, percentage of residents living in urban centers, age diversity, ethnic diversity, and gender diversity). The interaction between inequality and income remained significant (Table 1, model 2). In addition, we repeated the analyses with inequality across the nine divisions identified by the US Census Bureau, instead of inequality across the states. We found the same interaction, supporting the robustness of this pattern (the results and graph for this analysis, and the results of additional robustness checks, are reported in the *Supporting Information*; see Fig. S1 for the graph and Table S1 for the results).

These results suggest that economic inequality modifies the relationship between income and generosity, such that higher-income individuals are less generous in highly unequal areas, but more generous in less unequal areas. An open question that we cannot fully address with the survey study regards causality. For example, a selection effect whereby generous individuals with high incomes migrate to less unequal states, because a relatively even distribution of resources is consistent with their prosocial values, could explain the results. Therefore, to provide stronger leverage on causal inference, we conducted an experiment.

Experiment. Participants (704 Amazon Mechanical Turk workers) completed a survey on their thoughts and opinions about various topics. Participants reported their household income ($M = \$55,163$, $SD = \$46,791$) and other demographic variables, including their state of residence. Participants were then randomly assigned to view one of two versions of a pie chart portraying simulated data showing that their home state featured either a relatively high ($n = 362$) or low ($n = 342$) degree of inequality. The simulated data in the charts were adapted from past research (28, 29) and depicted different proportions of wealth owned by each quintile of the population. After viewing one of the pie charts, participants indicated how equally distributed they perceived the wealth in their home state. Tests presented in Table S2 confirm that participants who viewed the chart depicting greater inequality perceived wealth to be more unequally distributed in their state than participants who viewed the chart depicting less inequality, but that participants in these two conditions did not differ on any other characteristic (as expected as a result of random assignment). After this section of the experiment, participants learned that they had the chance to win a \$500 bonus payment. As in the survey study, participants learned that they were in the role of "decider" and had received 10 tickets for the raffle. They indicated how many tickets they wished to send to another participant in the role of receiver, who did not have any tickets ($M = 3.63$ tickets donated; $SD = 2.22$).

There was no correlation between income and generosity across conditions, $r(702) = -0.05$, $P = 0.23$, indicating that higher-income participants were not overall more or less generous than lower-income participants. To test our hypothesis that income and generosity are only negatively related under unequal conditions, we used ordinary least-squares regression, regressing generosity on household income (centered at its grand mean across participants), inequality condition, and the interaction term. This analysis revealed a significant interaction (Table 2, model 1) that is displayed in Fig. 2. When inequality was portrayed as relatively high, higher-income participants were less generous than lower income participants, $B = -0.05$, $SE = 0.02$, $P < 0.05$. When inequality was portrayed as relatively low, however, income was not significantly associated with generosity, $B = 0.03$, $SE = 0.03$, $P = 0.34$. We repeated the analysis controlling for other characteristics of individuals and found the same result (Table 2, model 2).

Table 2. Ordinary least-square regression results predicting generosity (experiment)

Variable	Model 1			Model 2		
	B	SE	t	B	SE	t
Intercept	3.74	0.12	31.20***	3.48	0.29	12.08***
Income	0.03	0.03	0.96	0.03	0.03	0.91
Inequality condition	-0.21	0.17	-1.26	-0.23	0.17	-1.34
Income \times Inequality condition	-0.08	0.04	-2.15*	-0.07	0.04	-1.97*
Age				0.01	0.01	1.48
Gender				0.39	0.17	2.23*
Ethnicity				0.15	0.23	0.63
Education				0.00	0.08	0.01
Employment status				-0.13	0.19	-0.67
Religiosity				0.05	0.05	1.03
Conservative ideology				-0.04	0.06	-0.71

For model 1, $n = 704$. For model 2, $n = 698$ because of missing data. All continuous variables were centered at their grand means. Inequality condition was coded 1 = higher inequality condition and 0 = lower inequality condition. Gender was coded 1 = female and 0 = male. Ethnicity was coded 1 = European-American and 0 = other. Employment status was coded 1 = full- or part-time employed or self-employed, 0 = unemployed. * $P < 0.05$, *** $P < 0.001$.

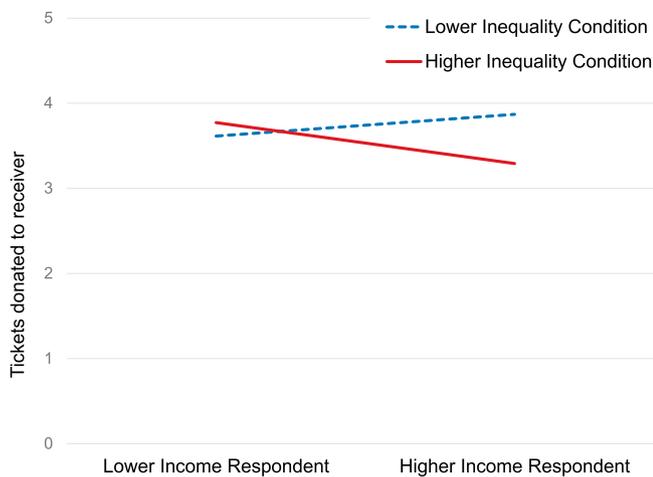


Fig. 2. Results from experiment: Generosity as a function of household income (\pm SD) and inequality condition. The blue, dashed line depicts the association between income and generosity in the condition where simulated data portrayed inequality as relatively low. The red, solid line depicts this association in the condition where simulated data portrayed inequality as relatively high.

Spotlight analyses (24) indicated that portraying inequality as higher (compared with lower) reduced the generosity of individuals from the professional class in the top 15% of the income distribution, $B = -0.76$, $SE = 0.31$, $P < 0.05$. The manipulation of inequality had no effect on the generosity of those in the bottom 15% of the income distribution, $B = 0.10$, $SE = 0.22$, $P = 0.64$.

The results of the experiment suggest that the generosity of higher-income individuals varies depending on their perceptions of economic inequality. Higher-income participants were less generous if they believed they lived in a state where resources were unevenly distributed, compared with a state featuring relatively low inequality.

Discussion

Results of a survey study and an experiment here show that higher-income individuals are only less generous than their lower-income counterparts under conditions of high actual or perceived macro-level economic inequality. We observed these patterns holding constant characteristics of individuals that correlate with income, such as education and employment status, as well as characteristics of states that correlate with inequality, such as population size.

These results challenge the prevailing view of recent research that has portrayed higher-income individuals as necessarily less generous than those of lower means (1–3). We found evidence for a multilevel perspective wherein selfish behavior by higher-income individuals is greater in structural conditions characterized by uneven distributions of resources. In the absence of these conditions, higher-income individuals were no less generous, and could even be more generous, possibly because their greater capacity to give makes giving more affordable to them. Our perspective suggests that investigations of income and generosity will yield different results depending on the geographical areas where they are conducted. Accordingly, our research helps explain why studies conducted in one of the most unequal US states, California (6), found negative associations between income and generosity (e.g., participants with higher income gave fewer resources and were less helpful to others) (3), whereas studies conducted in less unequal areas (the Netherlands, Germany, and Japan) (13–15) found no such associations.

Our findings are similar to results of a recent study of cooperative game behavior in a laboratory setting characterized by variable levels of endowment inequality (30). That study found

that experimental participants with higher resource endowments cooperated less with other participants when inequality of endowments was high, and participants' different endowment levels were visible. If these findings stem from the same dynamics that drove our findings that higher-income individuals are less generous in regions where inequality is high, then explanations of the patterns involving awareness of one's privileged standing in society may be most plausible, because in that study unequal endowments were not associated with cooperative behavior when they were not visible to participants (30).

But why specifically does inequality reduce the generosity of higher-income individuals? As we note above, higher inequality might trigger a sense of entitlement because higher-income individuals perceive a wider gap between their social standing and that of most others, engaging in more favorable downward social comparisons as a result. High inequality might also lead higher-income individuals to worry more about losing their privileged standing, because a loss of economic standing in a highly unequal area would represent a particularly large drop. Other processes could also explain the results. Where greater inequality exists, psychological motivations to justify their uniquely privileged positions could lead higher-income individuals to view the prevailing distribution of resources as fair and just. Consistent with this possibility, higher-income residents of highly unequal US counties more strongly endorse the meritocratic sentiment that hard work leads to economic success, compared with higher-income residents of less unequal counties (7). Future research is necessary to establish which of these, or other, mechanisms explain why higher-income individuals are less generous when inequality is high.

Our results identify a previously undocumented effect of economic inequality, showing that it fosters a tendency for higher-income individuals to be less generous than others. Our findings imply that reductions in economic inequality could counteract this tendency and increase the generosity of the wealthy. To the extent that redistributive policies such as progressive tax systems and social services for the poor reduce the extent of economic inequality, our research suggests that such policies could also serve to attenuate, or even reverse, the negative relationship between income and generosity, in turn increasing the generosity of those individuals who have the most to give.

Methods

Nationally Representative Survey Study.

Ethics statement. The study was approved by the Institutional Review Board at Duke University. Moreover, the use of the data for this project was approved by the Social Sciences, Humanities, and Education research ethics board at the University of Toronto. Participants provided informed consent.

Participants and procedure. Participants were 1,498 respondents (754 women and 744 men) in the Measuring Morality study, a nationally representative survey of United States residents. This survey was conducted by the Kenan Institute for Ethics at Duke University with the assistance of the Knowledge Networks firm. The materials and data are available at: kenan.ethics.duke.edu/attitudes/resources/measuring-morality. The dataset has a total of 1,519 observations, but 21 respondents could not be included in the analyses because they did not complete the measure of generosity. Participants ranged in age from 18 to 93 ($M = 50.25$ y; $SD = 16.71$). Of these, 1,082 participants (72.23%) were European-American, 151 (10.08%) were African-American, 170 (11.35%) were Hispanic, and 95 (6.34%) selected "Other" or "2+ Races."

The survey includes measures of household income and generosity (described below). Respondents completed demographic questions, including their home state and several other characteristics that we controlled in the analyses. Respondents also completed questionnaires about morality that we did not analyze in this investigation.

SAS code to conduct the analyses and state- and division-level data retrieved from the US Census Bureau are available at: <https://www.dropbox.com/sh/t34mrhczyvc3loi/AADS0Q5-iFTscFhBBL7gob4Ha?dl=0>.

Measures.

Income inequality. To assess income inequality in each state and division of the United States, we gathered Gini coefficients from the American Community

Survey (<https://www.census.gov/programs-surveys/acs/>) for the year when the Measuring Morality study was conducted (2012) (16). The American Community Survey is a yearly survey of a representative proportion of United States citizens conducted by the US Census Bureau. The Gini coefficient is a widely used measure of income inequality that ranges from 0, indicating that everyone has the exact same income, to 1, indicating that a single person holds all of the income (6). Gini coefficients for US states (plus the District of Columbia) ranged from 0.417 (Wyoming) to 0.534 (District of Columbia; $M = 0.459$, $SD = 0.022$). Gini coefficients for United States divisions ranged from 0.449 (West North Central Division) to 0.487 (Middle Atlantic Division; $M = 0.471$, $SD = 0.013$).

Income. Participants reported the income of their households by choosing one of 19 income categories ranging from 1 (less than \$5,000) to 19 (\$175,000 or more). We assigned the midpoint income amount corresponding to the chosen category (31). For example, we assigned the income value of \$13,750 to respondents who chose the fifth category (\$12,500 to \$14,999). To assign a value for the highest category (\$175,000 or more), we adopted the strategy proposed by Parker and Fenwick (32) and frequently used in sociological research (31, 33) involving extrapolating from the midpoint of the second-highest income bracket, using frequencies for the second-highest and highest brackets. Using this procedure, we assigned the value of \$410,597 to respondents in the highest income bracket. This decision had no impact on our results: The results were the same when we assigned \$175,000, the lower bound, to participants who selected the highest category. The mean household income was \$82,314 ($SD = \$82,045$). To aid interpretation of the results of the analyses, we divided income values by 10,000.

Generosity. The measure of generosity was an adapted "dictator game," a well-validated behavioral measure of generosity (17–21). Respondents were offered a chance to win money over and above their regular payment for completing the study via a raffle. There were two versions of the raffle where participants could win an additional \$10 ($n = 764$) or \$500 ($n = 734$). Participants were told that they had been assigned the role of "decider," ostensibly because they had an even-numbered participant ID (in the \$10 raffle condition) or an odd-numbered participant ID (in the \$500 raffle condition). They learned that as the decider, they were automatically given 10 tickets, each worth one entry in the raffle. The next participant had been assigned the role of "receiver" and thus did not currently have tickets. Participants were informed that they could transfer any number of their tickets to the receiver. By giving tickets away, participants reduced their chances of winning the cash prize, and thus their decisions had real consequences for them. On average, participants donated 4.24 tickets ($SD = 2.49$). Participants gave more tickets when the monetary prize was \$10 ($M = 4.52$; $SD = 2.46$) than \$500 ($M = 3.95$; $SD = 2.48$), $t(1,496) = 4.46$, $P < 0.001$. Therefore, we controlled for the raffle amount in subsequent analyses.

Control variables (state and division characteristics). We controlled for several other characteristics of states and divisions of the United States that could be correlated with inequality and, thus, cause spurious associations: median income, population, percentage of residents living in urban centers, and diversity in age, ethnicity, and gender.

We retrieved median incomes from the 2012 American Community Survey (16) (state: $M = \$51,975$, $SD = \$8,665$; division: $M = \$51,775$, $SD = \$6,010$). To aid interpretation, we divided these values by 10,000. We also retrieved populations from the American Community Survey (16) (state: $M = 6.16$ million, $SD = 6.97$ million; division: $M = 34.88$ million, $SD = 16.43$ million). To aid interpretation, we divided population values by 1,000,000. We obtained values for the proportion of the population living in urbanized areas and urban clusters from the Decennial Census, 1900–2010, conducted by the US Census Bureau (34) (state: $M = 0.74$, $SD = 0.15$; division: $M = 0.79$, $SD = 0.09$).

We calculated diversity in age, ethnicity, and gender for states and divisions using Blau's index, a frequently used measure of the amount of diversity among distinct categories (35). The formula for Blau's index is $1 - \sum p_k^2$, where k denotes the category and p denotes the proportion of individuals in the k th category. To calculate these indices, we first obtained values for age, ethnicity, and gender in each state and division from the 2012 American Community Survey (16). Age is tracked in 18 categories, starting with "under 5," "between 5 and 9," and continuing in blocks of 5 y, until the highest category, "over 86." Ethnicity is tracked in seven categories: "White," "Black or African American," "American Indian or Alaska Native," "Asian," "Native Hawaiian or Other Pacific Islander," "Some other race," and "Two or more races." We applied the formula for Blau's index to these values to obtain diversity scores for states (age: $M = 0.94$, $SD = 0.003$; ethnicity: $M = 0.36$, $SD = 0.15$; gender: $M = 0.50$, $SD = 0.0003$) and divisions (age: $M = 0.94$, $SD = 0.001$; ethnicity: $M = 0.39$, $SD = 0.09$; gender: $M = 0.50$, $SD = 0.0002$).

Control variables (individual characteristics). We controlled for the following characteristics that could correlate with income and, thus, potentially produce

spurious associations: age, gender, ethnicity (1 = European-American, 0 = other), education, employment status (1 = paid employee or self-employed, 0 = unemployed), marital status (1 = married, 0 = not married), religiosity, political ideology, and the raffle amount (1 = \$500, 0 = \$10).

Respondents selected 1 of 14 categories for education ranging from 1 (No formal education) to 14 (Professional or Doctorate degree; $M = 10.27$, $SD = 1.99$). Respondents indicated how religious they considered themselves on a scale of 1 (very religious) to 6 (antireligious). To aid interpretation, we reversed the scores so that a higher score reflects higher religiosity ($M = 3.96$, $SD = 1.36$; six unreported). Additionally, respondents indicated how they thought of themselves in general on a scale of 1 (extremely liberal) to 7 (extremely conservative; $M = 4.21$, $SD = 1.46$; 18 unreported).

Experiment.

Ethics statement. The experiment was approved by the Social Science, Humanities, and Education research ethics board at the University of Toronto. Participants provided informed consent.

Participants. One thousand and twenty-five individuals were recruited from Amazon Mechanical Turk (MTurk) and completed the measure of generosity in the experiment. Of these, 41 could not be included in the analyses because they did not report their income. Of the remaining 984 participants, 280 performed worse than chance on the comprehension checks for the inequality manipulation (described in *Supporting Information*), indicating that they did not understand the information about inequality that was presented. We removed these participants based on an a priori decision informed by past findings that some people do not understand graphical information about inequality (28, 29). The sample for analysis included 704 United States residents (408 women and 295 men, 1 unreported) between the ages of 17 and 72 ($M = 34.32$ y, $SD = 12.31$; 1 unreported). Of these, 592 participants (84.09%) were European-American, 62 (8.81%) were African-American, 45 (6.39%) were Hispanic, 36 (5.11%) were Asian-American, and 46 (6.53%) selected another category. The sum of these percentages exceeds 100 because some participants selected more than one category.

Procedure. Participants completed a survey about their thoughts and opinions about various topics. The study composed of three main parts: demographic questions (including income), the manipulation of economic inequality in participants' home states, and the measure of generosity (which we adapted from the survey study).

The manipulation of inequality was adapted from past research (28, 29). Participants read that we were interested in reactions to the distribution of wealth in people's home states. Participants indicated the state in which they resided, and then waited while the computer purportedly retrieved the income distribution in their state. Participants then viewed a pie chart that ostensibly depicted the proportion of wealth owned by each quintile of the population in their state. To increase the believability of the charts, we indicated that the charts had been constructed using data from the US Census Bureau's 2012 Economic Census, and that the Census is conducted by means of a representative stratified sampling of households. We manipulated perceptions of inequality in the participants' home states, rather than inequality in the country, because we reasoned that people would be less knowledgeable about the specific level of inequality in their home states than about the level of inequality in the country, which has been frequently discussed in the media.

Each slice of the pie ostensibly represented the proportion of wealth owned by each quintile of the population in participants' home states. In the higher-inequality graph (Fig. S2A), regardless of the state identified, the proportions of wealth owned by each quintile were 1%, 3%, 4%, 11%, and 81%. This distribution is similar to, but somewhat less unequal, than the actual distribution in the United States, which is 0.1%, 0.2%, 4%, 11%, and 84% (29). (The actual distribution is difficult to depict visually because the values for the two lowest quintiles are almost invisible in a pie chart.) Even so, because the distribution in the higher-inequality graph is more uneven than what most Americans believe (29), it was likely to successfully portray higher inequality. In the lower-inequality graph (Fig. S2B), regardless of the state identified, the proportions were 11%, 15%, 18%, 21%, and 35%, which depict the actual distribution of wealth in Sweden (29), a country with a relatively low level of economic inequality (6). Pretests described in *Supporting Information* revealed that the graphs successfully depicted different levels of inequality, and were perceived as being equally accurate and precise.

After the experiment ended, in the debriefing, participants were told that they had been given a false impression of the level of inequality in their home states so that we could examine the causal effects of perceived inequality on generosity. Participants were then given information about the actual levels of inequality in their home states, other states, the United States, and other countries.

Participants also completed measures of worldviews (just world beliefs, social mobility beliefs, and Protestant work ethic beliefs), desire to affiliate with others with similar vs. different demographic characteristics, and perceived similarity to another participant. These variables were not impacted by our manipulation of inequality and are not analyzed further for this investigation.

The data are available at [dataverse.org](https://www.dropbox.com/sh/cz1v24fbxbhf5tp/AAB3E6lbgkln9tBFGRJRIuqqa?dl=0). The materials and SAS code to conduct the analyses are available at: <https://www.dropbox.com/sh/cz1v24fbxbhf5tp/AAB3E6lbgkln9tBFGRJRIuqqa?dl=0>.

Measures.

Household income. Participants indicated their household gross income (before taxes) for the year before when the study took place (2013) by writing the actual income value. The mean was \$55,163 (SD = \$46,791; range = \$0 to \$480,000). As expected because of random assignment, the income of participants in the higher-inequality condition ($M = \$56,911$, $SD = \$50,917$) did not differ from the income of those in the lower inequality condition ($M = \$53,312$, $SD = \$41,981$), $t(702) = -1.02$, $P = 0.31$. Thus, any difference in the generosity of higher-income individuals in the higher- vs. lower-inequality conditions cannot be explained by a difference in levels of income across the two conditions. To aid interpretation, for all analyses, we divided household income by 10,000.

Generosity. We adapted the dictator game (17–21) from the survey study. Participants were informed that they would be given a chance to win a \$500 bonus payment. They were told that based on the order in which they started the study relative to other participants, they had been assigned an odd-numbered participant ID, and that participants with odd numbered IDs

had been designated to be deciders. Participants were told that as a decider, they were automatically given 10 raffle tickets for the \$500 prize. They read that the participant following them would be in the role of receiver, and thus did not have any raffle tickets to start with, but would get any tickets that the decider transferred. Participants then indicated how many of their tickets they wished to give the other participant by choosing a value between 0 and 10 from a drop-down menu ($M = 3.63$ tickets, $SD = 2.22$).

Manipulation check for inequality. Participants were asked how equally distributed the private wealth in their state was, on a scale of 1 (unequally distributed) to 7 (equally distributed; $M = 2.33$, $SD = 1.43$; 1 unreported).

Control variables (individual characteristics). We controlled for the following characteristics that could covary with income: education, gender, age, ethnicity (1 = European-American, 0 = other), employment status (1 = full- or part-time employed or self-employed, 0 = unemployed), religiosity, and political orientation. Respondents' education was coded in one of six categories: 1 = less than high school; 2 = high school diploma or GED; 3 = associate or vocational degree, or some college; 4 = Bachelor's degree; 5 = Master's degree; 6 = Doctoral or Professional degree ($M = 3.41$, $SD = 1.17$). Participants indicated how religious they were on a scale of 1 (not at all religious) to 7 (very religious; $M = 3.12$, $SD = 2.11$; 4 unreported). They indicated whether they considered themselves liberal or conservative on most political and social issues on a scale of 1 (very liberal) to 7 (very conservative; $M = 3.39$, $SD = 1.62$; 3 unreported).

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- Piff PK, Stancato DM, Côté S, Mendoza-Denton R, Keltner D (2012) Higher social class predicts increased unethical behavior. *Proc Natl Acad Sci USA* 109(11):4086–4091.
- Stellar JE, Manzo VM, Kraus MW, Keltner D (2012) Class and compassion: Socioeconomic factors predict responses to suffering. *Emotion* 12(3):449–459.
- Piff PK, Kraus MW, Côté S, Cheng BH, Keltner D (2010) Having less, giving more: The influence of social class on prosocial behavior. *J Pers Soc Psychol* 99(5):771–784.
- Marx K (1967) *Capital* (International Publishers, New York).
- Kay AC, Jost JT (2003) Complementary justice: Effects of “poor but happy” and “poor but honest” stereotype exemplars on system justification and implicit activation of the justice motive. *J Pers Soc Psychol* 85(5):823–837.
- Wilkinson R, Pickett K (2009) *The Spirit Level: Why Greater Equality Makes Societies Stronger* (Bloomsbury Publishing, New York).
- Newman BJ, Johnston CD, Lown PL (2015) False consciousness or class awareness? Local income inequality, personal economic position, and belief in American meritocracy. *Am J Pol Sci* 59(2):326–340.
- Andersen R, Curtis J (2012) The polarizing effect of economic inequality on class identification: Evidence from 44 countries. *Res. Soc. Stratif. Mobil.* 30(1):129–141.
- Campbell WK, Bonacci AM, Shelton J, Exline JJ, Bushman BJ (2004) Psychological entitlement: Interpersonal consequences and validation of a self-report measure. *J Pers Assess* 83(1):29–45.
- Major B (1994) From social inequality to personal entitlement: The role of social comparisons, legitimacy appraisals, and group membership. *Adv Exp Soc Psychol* 26:293–355.
- Zitek EM, Jordan AH, Monin B, Leach FR (2010) Victim entitlement to behave selfishly. *J Pers Soc Psychol* 98(2):245–255.
- Acz ZJ (2013) *Why Philanthropy Matters: How the Wealthy Give, and What It Means for Our Economic Well-Being* (Princeton Univ Press, Princeton, NJ).
- Trautmann ST, van de Kuilen G, Zeckhauser RJ (2013) Social class and (un)ethical behavior: A framework, with evidence from a large population sample. *Perspect Psychol Sci* 8(5):487–497.
- Korndörfer M, Egloff B, Schmukle SC (2015) A large scale test of the effect of social class on prosocial behavior. *PLoS One* 10(7):e0133193.
- Yamagishi T, Li Y, Takagishi H, Matsumoto Y, Kiyonari T (2014) In search of Homo economicus. *Psychol Sci* 25(9):1699–1711.
- U.S. Census Bureau (2014) US Census Bureau American Community Survey, 2012 American Community Survey 1-Year Estimates, Tables B01003, B02001, B19083, S0101, S1903; generated by Stéphane Côté; using American FactFinder. Available at factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed April 7, 2014.
- Bekkers R (2007) Measuring altruistic behavior in surveys: The all-or-nothing dictator game. *Surv Res Methods* 1(3):139–144.
- Benz M, Meier S (2008) Do people behave in experiments as in the field?—Evidence from donations. *Exp Econ* 11(3):268–281.
- Engel C (2011) Dictator games: A meta study. *Exp Econ* 14(4):583–610.
- Franzen A, Pointner S (2013) The external validity of giving in the dictator game. *Exp Econ* 16(2):155–169.
- Johannesson M, Persson B (2000) Non-reciprocal altruism in dictator games. *Econ Lett* 69(2):137–142.
- Aguinis H, Gottfredson RK, Culpepper SA (2013) Best-practice recommendations for estimating cross-level interaction effects using multilevel modeling. *J Management* 39(6):1490–1528.
- Preacher KJ, Curran PJ, Bauer DJ (2006) Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *J Educ Behav Stat* 31(4):437–448.
- Irwin JR, McClelland GH (2001) Misleading heuristics and moderated multiple regression models. *J Mark Res* 38(1):100–109.
- Thompson W, Hickey J (2005) *Society in Focus* (Pearson, Allyn & Bacon, Boston, MA).
- Ehrenreich B (1989) *The Inner Life of the Middle Class* (Harper-Collins, New York).
- US Census Bureau (2015) US Census Bureau 2013 Current Population Survey, Annual Social and Economic (ASEC) Supplement, Table HINC-06; generated by Stéphane Côté. Available at www.census.gov. Accessed May 29, 2015.
- Eriksson K, Simpson B (2012) What do Americans know about inequality? It depends on how you ask them. *Judgm Decis Mak* 7(6):741–745.
- Norton MI, Ariely D (2011) Building a better America—One wealth quintile at a time. *Perspect Psychol Sci* 6(1):9–12.
- Nishi A, Shirado H, Rand DG, Christakis NA (2015) Inequality and visibility of wealth in experimental social networks. *Nature* 526(7573):426–429.
- Hout M (2004) “Getting the most out of the GSS income measures.” GSS Methodological Report 101 (Univ of California, Berkeley, CA).
- Parker RN, Fenwick R (1983) The Pareto curve and its utility for open-ended income distributions in survey research. *Soc Forces* 61(3):872–885.
- Younts CW, Mueller CW (2001) Justice processes: Specifying the mediating role of perceptions of distributive justice. *Am Sociol Rev* 66(1):125–145.
- U.S. Census Bureau (2014) Decennial Census, 2010 Decennial Census, Table P2; generated by Stéphane Côté; using American FactFinder. Available at factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed April 7, 2014.
- Harrison DA, Klein KJ (2007) What's the difference? Diversity constructs as separation, variety, or disparity in organizations. *Acad Manage Rev* 32(4):1199–1228.
- Enders CK, Tofighi D (2007) Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychol Methods* 12(2):121–138.