



Exposure to rising inequality shapes Americans' opportunity beliefs and policy support

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Economic inequality has been on the rise in the United States since the 1980s and by some measures stands at levels not seen since before the Great Depression. Although the strikingly high and rising level of economic inequality in the nation has alarmed scholars, pundits, and elected officials alike, research across the social sciences repeatedly concludes that Americans are largely unconcerned about it. Considerable research has documented, for instance, the important role of psychological processes, such as system justification and American Dream ideology, in engendering Americans' relative insensitivity to economic inequality. The present work offers, and reports experimental tests of, a different perspective—the opportunity model of beliefs about economic inequality. Specifically, two convenience samples (study 1, $n = 480$; and study 2, $n = 1,305$) and one representative sample (study 3, $n = 1,501$) of American adults were exposed to information about rising economic inequality in the United States (or control information) and then asked about their beliefs regarding the roles of structural (e.g., being born wealthy) and individual (e.g., hard work) factors in getting ahead in society (i.e., opportunity beliefs). They then responded to policy questions regarding the roles of business and government actors in reducing economic inequality. Rather than revealing insensitivity to rising inequality, the results suggest that rising economic inequality in contemporary society can spark skepticism about the existence of economic opportunity in society that, in turn, may motivate support for policies designed to redress economic inequality.

economic inequality | opportunity beliefs | policy preferences | redistribution | system justification

Economic inequality has been on the rise in the United States since the 1980s and by some measures stands at levels not seen since before the Great Depression (1). The topic has been of episodic concern in presidential campaigns going back to at least the 1990s (2) and was a central theme of the 2016 presidential campaign. Economic inequality continues to rise in importance among academic researchers as well. Despite this attention, research on the topic (in economics, political science, sociology, and psychology) has largely concluded that Americans are uninformed of the strikingly high levels of income inequality in the country and, even when informed, are at best ambivalent supporters of policies to reduce it (3–7). Some studies find that this is likely due to personal investments in American Dream ideology, at least as long as opportunities to get ahead are perceived to be relatively available (8–11).

Although this body of research has nicely revealed the complicated and sometimes contradictory psychological processes that unfold when Americans think about, or become aware of, economic inequality, one puzzling aspect of this work is the tendency to infer individuals' level of concern regarding inequality from their expressed support for traditional government redistributive policies (refs. 8–10; cf. ref. 5). For instance, because Americans on average are less supportive of government tax and transfer policies, compared with the public in many other countries with similar or even lower levels of economic inequality, scholars often

conclude that Americans must not be particularly concerned about inequality (refs. 8 and 12; cf. ref. 13). The same conclusion is typically drawn from the trend over time in support for government redistribution, which has remained flat in the wake of inequality's historic rise (6).

We argue that the conflation of support for traditional redistributive government policies with concern about economic inequality (*i*) may mask individuals' actual level of concern and (*ii*) makes it difficult to discern the relations among rising economic inequality, support for policies designed to address it, and, importantly, the beliefs underlying such support. The primary aim of the present research is to decouple these questions to gain a better understanding of Americans' responses to rising economic inequality. Specifically, we examine whether exposure to straightforward, objective information about rising societal inequality affects beliefs about the opportunity structure in society—beliefs known to shape support for redistributive and other equity-enhancing policies (8, 10, 14).

Drawing on the rich literature on beliefs about economic inequality that predates its recent rise (14, 15), as well as recent survey-based studies that focus on views of inequality and opportunity rather than redistributive policy preferences (2, 16), we propose the opportunity model of beliefs about economic

Significance

Although rising economic inequality in the United States has alarmed many, research across the social sciences repeatedly concludes that Americans are largely unconcerned about it. We argue that this conclusion may be premature. Here, we present the results of three experiments that test a different perspective—the opportunity model of beliefs about inequality. Tempering the conclusions of past work, the findings suggest that perceptions of rising economic inequality spark skepticism about the existence of economic opportunity in society that, in turn, may motivate support for equity-enhancing policies. Hence, this work calls for new theoretical and methodological approaches to the study of rising economic inequality, especially those that bridge disciplinary boundaries, as well as the largely separate experimental and correlational literatures.

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Data deposition: Study materials (including consent forms) and data from all studies can be found at the Open Science Framework (<https://osf.io/bukzpf>). Study materials and data from study 3 can also be found at the Time-sharing Experiments for the Social Sciences website (tessexperiments.org/data/mccall723.html).

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inequality. According to the model, perceptions of increasing economic inequality of the kind that characterizes contemporary society spark skepticism about the existence of economic opportunity. Consequently, rising inequality leads individuals to increase their support for actions that transparently enhance opportunities to advance in the labor market, such as policies that expand access to education and/or address inequities in the workplace (2, 17, 18), in addition to policies that redistribute income through progressive taxes and government transfer programs. Evidence in support of the opportunity model, then, would offer an alternative to the “exceptionalist” interpretation of Americans as largely unconcerned about, or at least insensitive to, large disparities in economic outcomes (9).

The opportunity model extends the current literature on responses to economic inequality in three main respects. First, the model reverses the causal arrow that has long connected issues of inequality and opportunity. That is, American Dream ideology is an important framework through which Americans respond to income inequality; adherence to Dream ideology predisposes Americans to view opportunities as widely available and, as a result, outcomes as fair. Indeed, a large body of research on American exceptionalism and system justification theory, and considerable public discourse, has focused on, and found compelling evidence for, this dynamic (8–11, 19–21). Almost no work, however, considers the possibility that the reverse may also be true: namely, that perceptions of rising economic inequality can weaken faith in the American Dream of upward mobility through hard work. In recent years, popular discourse has sometimes referred to this dynamic as the rise of a “rigged” game favoring the wealthy, and scholars have begun to revisit the question of intergenerational transmission of advantage (refs. 11 and 22–24; see also ref. 25 in the racial domain). That is, rather than (or in addition to) motivating people to work harder to reap ever greater rewards in higher stakes games, rising inequality may at times trigger concerns that opportunities to climb the socioeconomic ladder of American society are receding. The primary goal of the present work is to offer a causal test of this general claim.

The second way in which this work extends the extant literature is by focusing in greater detail on the opportunity-related beliefs that underlie responses to rising economic inequality. Prior studies have recognized the motivating importance of opportunity beliefs as a cause of inequality beliefs and policy preferences but measured them in a relatively limited way: namely, as perceptions of either intergenerational mobility or the role of individual effort in getting ahead (8, 26). To explore opportunity beliefs as a key outcome of rising economic inequality, the present work instead uses a wider set of indicators drawn from, and established in, the survey literature on beliefs about economic opportunity (14, 27). This measurement approach allows us to examine how structural factors (e.g., coming from a wealthy family) and individual factors (e.g., hard work) are each affected by information about rising inequality whereas prior research typically has employed a bipolar scale or a forced-choice, single-question format wherein participants must choose whether individual or structural factors are more important (16, 19, 26).

Last, the present research also broadens the extant literature in its consideration of potential policy solutions to economic inequality. In addition to considering support for government redistribution (i.e., policies designed to reduce posttax and transfer income disparities among Americans as a whole), we also examine support for equity-enhancing policies in the labor market: namely, policies that lift wages at the bottom and reduce them at the top for employees of major corporations. (Although this policy option may be antithetical to free market principles, our aim is to understand how Americans respond to economic inequality, even if some policy options may, at present, appear to be inefficient and/or infeasible.) Taken together, the aims of the present work are to examine whether exposure to information about rising economic inequality increases concerns about opportunity in America that,

in turn, affect support for efforts to reduce inequality by either government or business actors.

In sum, we present three experiments to test the main tenets of the opportunity model. We first consider whether American participants express greater concern about economic opportunity (or the lack thereof) in society after reading about rising economic inequality, compared with neutral information. We then examine whether exposure to information about rising inequality (compared with control information) also predicts support for policies designed to reduce inequity by either government or business actors and does so, perhaps in part, because of increased concerns about opportunity.

Results

Study 1. We recruited a convenience sample of American adults from the Amazon Mechanical Turk (MTurk) marketplace in summer, 2014. Participants were randomly assigned to an inequality treatment condition ($n = 244$) or to a comparable control condition ($n = 236$). In the inequality condition, participants read a realistic, accurate, and nonpartisan article about the trend in rising economic inequality in the United States that was accompanied by a simple bar chart (see [Articles Used in Experimental Treatments](#) and [Fig. S1](#)). The article did not highlight any particular social group or mention any explanation or consequence of inequality or, importantly, reference the issue of opportunity, given that opportunity beliefs are the primary dependent variable. Participants in the control condition read an article of similar length, format, and numerical content; however, the content pertained to baseball (see [Articles Used in Experimental Treatments](#) and [Fig. S2](#)).

After reading the article, participants responded to questions that measure the importance of structural and individual factors in “getting ahead,” the phrase used in the battery of questions about economic opportunity repeated in various years since 1987 in the General Social Survey (GSS). Two items (rated from 1 to 5, with 1 being “not at all important” and 5 being “essential”) unambiguously assessed perceived importance of structural factors related to class background (“coming from a wealthy family,” “having well-educated parents,” $\alpha = 0.62$); similarly, two items assessed the perceived importance of purely individual factors (“hard work,” “ambition,” $\alpha = 0.78$). We predicted that, relative to control participants, participants exposed to the inequality treatment would rate structural factors as more important and individual factors as less important in getting ahead—reflecting greater concern about opportunity in society.

All additional information about the stimuli, sample selection criteria, randomization of survey questions and responses, pilot conditions, additional questions in the survey instrument, control variables included in all reported regression results below (income, education, race, gender, age, and partisanship), weights, and additional analyses, for instance by partisanship, is provided in [Methods](#) or [Supporting Information](#) for all studies.

Unadjusted means and SDs of the opportunity beliefs items for each experimental condition are presented in Table 1. Regressions revealed that participants in the inequality treatment condition rated structural factors as more important to getting ahead, and individual factors as less important, than did participants in the control condition [$\beta = 0.353$, $SE = 0.076$, $P < 0.001$, root-mean-squared error (RMSE) = 0.828 for structural factors; $\beta = -0.290$, $SE = 0.072$, $P < 0.001$, RMSE = 0.783 for individual factors]. Thus, these results offer preliminary evidence in support of the opportunity model: Namely, exposure to information about rising economic inequality in the United States can lead to greater skepticism regarding the extent to which opportunity to advance in America still exists.

Study 2. The primary purpose of study 2 was to replicate study 1’s finding that exposure to rising economic inequality increases concern about opportunity, compared with control information.

Recall that the opportunity model contends that rising economic inequality erodes belief in the American Dream—that is, people can advance socioeconomically if they work hard. If this is indeed the case, then we should be able to “turn off” this effect of information about rising economic inequality by assuaging concerns regarding the efficacy of individual effort (14, 19, 28). The second aim of study 2 was to investigate this possibility.

We again recruited a sample of adult residents of the United States from MTurk in spring, 2015. Participants were randomly assigned to one of three experimental conditions in which they read two articles that served to manipulate the presence or absence of information about inequality (condition 1 and 2 vs. condition 3) and the presence or absence of information bolstering the efficacy of the American Dream (condition 2 vs. conditions 1 and 3). In the inequality condition ($n = 431$), participants read the same article about rising economic inequality used in study 1, followed by an unrelated human-interest story on cooking (see *Articles Used in Experimental Treatments* and Fig. S3). Like those in the inequality condition, participants in the American Dream condition ($n = 433$) first read the article about rising economic inequality (from study 1), followed by a second article that portrayed a classic “rags-to-riches” story of one individual’s upward mobility (see *Articles Used in Experimental Treatments* and Fig. S4) and that, thus, was expected to assuage concerns about the possibility of individual upward mobility—i.e., opportunity—triggered by the inequality article.

The responses of participants in the inequality condition were compared with those in the American Dream condition, as well as to those of participants ($n = 441$) who were randomly assigned to a control condition in which they first read the baseball article from study 1 followed by the cooking article described previously. After reading the articles that corresponded with their experimental condition, participants again rated the perceived importance of structural and individual factors in getting ahead in society (i.e., opportunity beliefs), as described in study 1.

Unadjusted means and SDs of the opportunity belief scales for each condition are presented in Table 1. We first examined whether we conceptually replicated the primary findings of study 1 by comparing responses of participants in the inequality condition to those of participants in the baseline control condition. As predicted, participants in the inequality condition rated structural factors as more important to getting ahead, compared with participants in

the control condition ($\beta = 0.226$; $SE = 0.054$; $P < 0.001$; $RMSE = 0.795$; $n = 872$). Interestingly, however, the inequality information, compared with control, did not significantly reduce beliefs about the importance of individual factors although the direction of the effect is in the predicted direction ($\beta = -0.081$; $SE = 0.053$; $P = 0.124$; $RMSE = 0.778$; $n = 872$).

The second aim of study 2 was to consider whether the effect of exposure to information about rising inequality on opportunity beliefs would be observed when it is coupled with information suggesting the viability of economic mobility through individual effort (i.e., compare the inequality condition to the American Dream condition). Consistent with predictions, regression analyses revealed that participants in the inequality condition rated individual factors as less important in getting ahead than did participants in the American Dream condition ($\beta = -0.225$, $SE = 0.050$, $P < 0.001$, $RMSE = 0.729$, $n = 864$). The American Dream article did not, however, reduce concerns about the role of structural factors, relative to the inequality treatment ($\beta = -0.017$, $SE = 0.056$, $P = 0.767$, $RMSE = 0.822$, $n = 864$). Indeed, although not a focal a priori comparison, analyses revealed that participants in the American Dream condition rated structural factors as significantly more important for getting ahead ($P < 0.001$) than did control condition participants (Table 1), suggesting the residual effects of exposure to the inequality article.

Taken together, the results of study 2 offer additional evidence that exposure to information about rising economic inequality increases perceptions that there are meaningful structural barriers to getting ahead in America. By contrast, the effects of exposure to information about rising economic inequality on individualistic beliefs appear less robust. This divergence in the results for individual and structural factors related to opportunity is notable for at least two reasons: (i) It counters the widespread understanding that Americans are reticent to think about economic inequality in “structuralist” terms (28); and (ii) it, along with the generally high mean levels of support expressed for individual factors, reveals how committed Americans are to the role of individual effort in getting ahead. [It is important to note, however, that respondents in comparable countries (e.g., France and the United Kingdom) also tend to rate these individual factors as more important than the structural factors; on average, Americans are at least as inclined as those in these countries to rate structural factors as important to getting ahead; and Americans’ beliefs about the positive role of hard work in getting ahead have been declining with rising inequality (29).] Similarly, it is possible that beliefs in the importance of individual factors in shaping economic outcomes are more robust to quite minimal interventions. Perhaps simply the passage of time after the inequality article, or even distraction by the second article, was sufficient to undo any initial effects of reading about rising economic inequality on perceptions of the role of individual factors. It is less surprising, of course, that beliefs about the role of individual factors in success rebounded among participants in the American Dream condition, given that they read about one individual’s story of upward mobility (with no mention of structural support/barriers).

Nevertheless, coupled with the findings of study 1, the results of the present study offer compelling support for the hypothesis that one outcome of exposure to information about rising economic inequality is the increased perception that the opportunity structure of American society may be less open than previously assumed.

Study 3. Study 3 sought to replicate the primary findings of the prior two studies in a nationally representative sample, as well as to extend our examination of the effects of exposure to rising societal inequality to support for equity-enhancing policies. Given the documented differences between MTurk and nationally representative samples of American adults (e.g., age, partisanship, home-ownership, etc.) (30), many of which are likely to shape opinions regarding tax and corporate pay-setting policies,

Table 1. Mean differences (SDs in parentheses) between conditions for opportunity variables for each study

Opportunity scales	Inequality condition	Control condition	American dream condition
Study 1			
Structural	3.49 ^a (0.83)	3.15 ^b (0.84)	—
Individual	4.09 ^a (0.89)	4.33 ^b (0.71)	—
	$n = 244$	$n = 236$	
Study 2			
Structural	3.30 ^a (0.83)	3.07 ^b (0.80)	3.33 ^a (0.85)
Individual	4.22 ^a (0.80)	4.30 ^a (0.79)	4.44 ^b (0.69)
	$n = 431$	$n = 441$	$n = 433$
Study 3			
Structural	3.45 ^a (0.85)	3.17 ^b (0.81)	—
Individual	4.25 ^a (0.80)	4.44 ^b (0.60)	—
	$n = 714$	$n = 787$	

Unadjusted means for the structural and individual factors related to success for each experimental condition and each study. All opportunity items were assessed on a 1 to 5 scale (with 1 being “not at all important” and 5 being “essential”). Means within a study, but across conditions (i.e., within rows), that have different superscripts (a/b) differ significantly from one another (all P s < 0.01). The n for each condition for each study is presented after the means (and SDs). Dashes indicate that no data were collected for that condition.

we recruited a representative sample of the US adult population to test these questions. Specifically, in late 2015, participants ($n = 1,501$) were randomly assigned to read the same articles as in study 1, either about rising economic inequality (inequality condition, $n = 714$) or about baseball (control condition, $n = 787$). Immediately following the article manipulation, participants completed the same focal questions assessing their economic opportunity beliefs described in study 1.

Participants next responded to two questions designed to solicit support for policies to combat economic inequality, but through different means (the order of the two questions was randomized across participants within conditions). The first item, drawn from the core module of the GSS and the standard measure in the survey literature on views of government redistribution (5, 6), asks about government responsibility to reduce income differences between the rich and poor on a seven-point scale (see *Methods* for exact wording). We created an item assessing business responsibility to reduce income inequity in the workplace that mirrored the government responsibility item as closely as possible. We strategically modified the wording of the government question by substituting references to “government” with “major companies,” references to “income differences” with “pay differences,” and references to the “rich” and “poor” with “executives” and “unskilled workers” (see *Methods* and *Survey Characteristics* for details).

Participants also responded to a third question that we designed—always following the government and business responsibility items—that forced them to choose the one group that has the most responsibility to reduce income inequality (hereafter referred to as the forced-choice question). The response options were as follows: low-income individuals themselves, charities, high-income individuals themselves, government, and major companies (presented in random order across participants within conditions). A final response option indicating that no reduction in inequality is necessary was always provided last. Taken together, these policy questions allowed us to examine views about the responsibility of business actors to reduce pay disparities between workers at the top and bottom of the pay scale and the responsibility of the government to reduce income differences between the rich and poor, as well as the responsibility of individuals themselves to reduce inequality. In addition to our predictions regarding the effects of exposure to rising inequality on opportunity beliefs, we also expected participants in the inequality condition to express greater support for the idea that both government and business actors have a responsibility to reduce inequality, relative to participants in the control condition.

Opportunity beliefs. Unadjusted means and SDs of the opportunity beliefs scales for each condition are presented in the third panel of Table 1. Regression analyses again revealed the predicted effect of the inequality treatment. Replicating study 1, participants who read about rising economic inequality rated structural factors as more important ($\beta = 0.266$, $SE = 0.046$, $P < 0.001$, $RMSE = 0.815$) and individual factors as less important ($\beta = -0.191$, $SE = 0.039$, $P < 0.001$, $RMSE = 0.689$), compared with participants in the control condition.

Policy preferences. Regressions also revealed significant treatment effects for both the government and business responsibility items. As depicted in Fig. 1, participants in the inequality condition were significantly more inclined to hold both major companies and government responsible for reducing inequality ($\beta = 0.349$, $SE = 0.095$, $P < 0.001$, $RMSE = 1.716$ for major companies; $\beta = 0.376$, $SE = 0.098$, $P < 0.001$, $RMSE = 1.770$ for government), compared with participants in the control condition. Similarly, logistic regressions of participants' views regarding the one group they considered most responsible for reducing inequality (i.e., the forced-choice question) revealed that those in the inequality condition were more likely to select major companies, relative to all other options (log odds $\beta = 0.234$, $SE = 0.117$, $P = 0.046$), or to select government, relative to all other options (log odds $\beta = 0.290$, $SE = 0.141$, $P = 0.039$), compared with those in the control

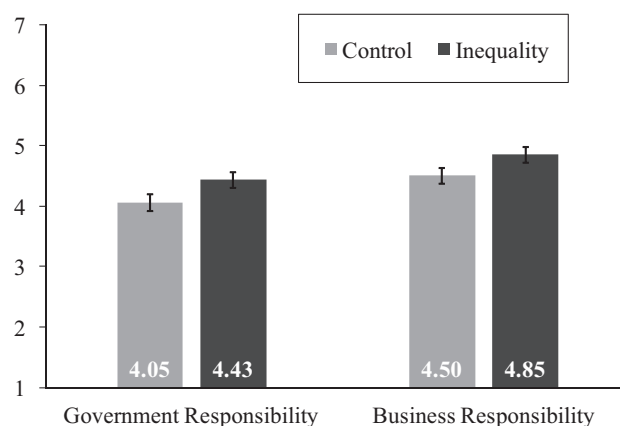


Fig. 1. Adjusted predicted effects of inequality treatment on support for business and government actors to enact policies to reduce inequality [based on ordinary least squares (OLS) regressions with controls for age, income, education, gender, race, and partisanship, evaluated at their means; bars indicate 95% confidence interval]. Support indicated on one to seven scales; higher values reflect greater support.

condition. All unadjusted mean differences between control and treatment for these outcomes are also significant at $P < 0.01$. [Unadjusted means (SDs) for the treatment and control conditions, respectively, for each policy outcome were as follows: mean (M) = 4.41 ($SD = 2.18$) and $M = 3.86$ ($SD = 2.17$) for government responsibility; $M = 4.90$ ($SD = 1.84$) and $M = 4.42$ ($SD = 1.93$) for business responsibility; 0.27 and 0.21 for the forced-choice government option; and 0.39 and 0.33 for the forced-choice business option.] Finally, participants in the inequality condition, relative to control participants, were also less likely to say that low-income individuals themselves are most responsible ($P = 0.017$), and marginally less likely to say that inequality “does not need to be reduced” ($P = 0.084$). (See *Additional Results* for analyses of partisanship differences.) Taken together, these policy preference results suggest that heightened awareness of rising inequality triggers support for both of the two major institutions in society (business and government) to address the problem of economic inequality.

Mediation analyses. Recall that the opportunity model of economic inequality argues that rising inequality increases concerns about opportunity to advance in society, and it is these concerns that increase support for efforts (by business and government actors) to reduce inequality. As an initial inquiry into this proposed pathway, we examined whether increased concerns about opportunity—as indicated by increased endorsement of structural factors and reduced endorsement of individual factors—may mediate the effect of the inequality treatment on support for the policy outcomes. For three of the four outcomes (business responsibility, government responsibility, and the forced-choice government option), the treatment effects were significantly mediated by opportunity beliefs. Using a bootstrapping approach with 5,000 resamples (31), the combined indirect effect stemming from structural and individual factors (which were also individually significant) was as follows: $\beta = 0.137$, $SE = 0.027$, 95% confidence interval (CI) = [0.090, 0.195] for business responsibility; $\beta = 0.136$, $SE = 0.026$, 95% CI = [0.091, 0.192] for government responsibility; $\beta = 0.089$, $SE = 0.030$, 95% CI = [0.036, 0.154] for the forced-choice government option; and, $\beta = 0.020$, $SE = 0.024$, 95% CI = [−0.026, 0.069] for the forced-choice business option. The direct effects of the inequality treatment for the business and government responsibility outcomes also remained significant ($P < 0.01$).

Discussion

Three studies exposed American adults to a relatively mild intervention—realistic, impersonal, veridical information regarding rising economic inequality in the United States—and then assessed their beliefs about opportunity to advance in society and support for policies that government and/or the business sector could enact to reduce economic inequality. Our studies offered consistent evidence to support the primary tenet of our theoretical model—the opportunity model of beliefs about economic inequality—that rising economic inequality increases skepticism regarding the opportunity structure in society. Exposure to rising economic inequality, rather than control, information reliably increased beliefs about the importance of structural factors in getting ahead in all three studies. In addition, the representative sample of American adults examined in study 3 revealed that the inequality treatment information also increased support for government redistribution, as well as for business actors (i.e., major companies) to enhance economic opportunities in the labor market (i.e., by reducing pay inequality between executives and unskilled workers)—outcomes that were statistically mediated by opportunity beliefs. Consistent with the opportunity model, this finding suggests that beliefs about the opportunity structure in society may play an important role in shaping Americans' evaluations of equity-enhancing policies in the wake of rising economic inequality.

We know of no other research that has explored the causal impact of exposure to information about rising societal economic inequality on perceptions of opportunity and support for multiple types of equity-enhancing policies. Further, the present work investigated these processes using measures that have been established in the survey literature and, thus, can be benchmarked against national statistics and trends. In so doing, this work underscores the benefit of conducting interdisciplinary research that bridges the largely separate psychological and other social scientific literatures on, as well as experimental and correlational approaches to, the study of Americans' reactions to rising economic inequality.

Indeed, some methodological and perhaps also theoretical reorientation is needed for research regarding beliefs about economic inequality. Most notably, our findings, especially those observed in study 2, signal the need to integrate a multidimensional perspective on opportunity beliefs and perceptions, including independent assessment of beliefs about the roles of individual and structural factors. Future research would also benefit from assessing concern about rising or even current levels of societal inequality directly (5, 6), rather than inferring concern from patterns of policy support or ideological orientation. Further, although the results of study 3 were largely consistent for policy outcomes that implicate government and business actors, examining support for a broader set of equity-enhancing policies, perhaps especially those most closely related to common understandings of economic opportunity (17, 32), is also likely to increase understanding of the relationships among rising inequality, concerns about opportunity, and policy support.

Nevertheless, we want to emphasize the fact that we do not consider either the opportunity model or the present findings as necessarily inconsistent with the well-established role of American Dream ideology and/or system justification (14, 20, 21, 28) in shaping responses to economic or other forms of societal inequality. Indeed, as mentioned previously, the influence of Dream ideology on opportunity beliefs in the present work is clearly evident in participants' higher ratings of individual, relative to structural, factors in getting ahead across all three of our experiments, even after exposure to the inequality treatment. But, consistent with the opportunity model, the gap between ratings of individual and structural factors was consistently smaller in the inequality, compared with control, condition, suggesting some erosion of faith in the American Dream. Indeed, our findings highlight the utility of reversing the causal arrow from examinations

regarding how ideologies such as the American Dream shape perceptions of, and concerns regarding, inequality to investigations of faith in the American Dream and related opportunity beliefs as outcomes of rising inequality.

In closing, the present work offered clear and consistent evidence regarding the causal relationship between exposure to information about rising inequality and beliefs about opportunity—beliefs that may subsequently shape support for equity-enhancing policies. We believe this work calls for, and opens the door to, new lines of research that examine the conditions under which rising economic inequality engenders these outcomes. For instance, it is possible that materials used to expose individuals to economic inequality that focus on current levels of economic inequality rather than current trends (as in the present work) may yield different results, as might materials that focus on the economic experiences or outcomes of particular individuals (e.g., exposure to poor individuals) (33) or societal groups (e.g., the “middle” class). Indeed, research suggests that the patterns of results found here are especially likely to be moderated by perceptions that the economic system is (or is not) changeable (24, 34) and perceptions of current societal race-based and/or gender-based dynamics (35, 36). Future research should consider how these and other psychological as well as structural factors may alter, suppress, and even amplify the dynamics uncovered here.

Methods

Human Subjects Approval. This research was reviewed and approved by the Institutional Review Board at Northwestern University (where L.M. and J.A.R. were previously employed during the tenure of data collection and analysis) and conducted ethically. Informed consent was obtained from all participants.

Opportunity Beliefs. Following are the OPWLTH, OPPARED, OPAMBIT, and OPHRDWRK variables in the GSS/International Social Survey Programme (ISSP): “We have some questions about opportunities for getting ahead. Please indicate how important each of the following is in terms of getting ahead on the scale provided. How important is ... coming from a wealthy family? Having well-educated parents? Having ambition? Hard work?” Response category order on a five-point scale from “not at all important” to “essential” was reversed for a random half of participants.

Government and Business Responsibility. Following is the EQWLTH variable in the GSS, with bracketed text denoting a substitution to generate the parallel business responsibility item: “Some people think that the government [major companies] ought to reduce the income [pay] differences between the rich and the poor [employees with high pay and those with low pay], perhaps by raising the taxes of wealthy families [reducing the pay of executives] or by giving income assistance to the poor [increasing the pay of unskilled workers]. Others think the government [major companies] should not concern itself [themselves] with reducing this income [pay] difference between the rich and the poor [employees with high pay and those with low pay]. Think of a score of 1 meaning that the government [major companies] should not concern itself [themselves] with reducing income [pay] differences, and a score of 7 as meaning that the government [major companies] ought to reduce the income [pay] differences between rich and poor [employees with high pay and those with low pay]. What score between 1 and 7 comes closest to the way you feel?” Again, response category order and scale anchors were reversed for a random half of participants.

Forced-Choice Policy Question. The forced-choice question was as follows: “Which of the following groups do you think has the greatest responsibility for reducing differences in income between those with high incomes and those with low incomes?” The randomized choices were as follows: “low income individuals themselves,” “private charities,” “high income individuals themselves,” “major companies,” and “government.” A final option, “income differences do not need to be reduced,” was always presented last.

Sample Characteristics. Descriptive statistics for demographic characteristics, dependent measures, and partisan identification are provided in Tables S1 and S2. We also provide descriptive statistics from the 2014 GSS to compare the representativeness of our samples with the US population.

Study 1 participants were recruited through MTurk in 2014, with a final sample of $n = 1,014$ (including two additional conditions described in

Additional Conditions and a target sample of $n \approx 1,000$, not including workers with non-US Internet protocol (IP) addresses, or workers with ratings below 99, who were screened out of the task. For consistency across studies, the analysis sample was further restricted to participants who completed the questions on perceptions of opportunity, policy preferences, partisan identification, and key demographic characteristics (income, age, education, gender, and race), included as control variables in all regression analyses reported in the main text, and correctly answered an attention check question. (All control variables were balanced across conditions in all studies.) Participants were paid \$1.00 for completed surveys that lasted an average of approximated 10 min.

The final sample, then, consisted of 480 participants, who on average were significantly more likely ($P < 0.05$) to be White, older, and of lower income, and marginally more likely ($P < 0.10$) to be in the control condition and lean Democratic, compared with participants who were dropped due to the above restrictions ($n = 18$); there were no differences by gender or education. Robustness checks using multiple imputation (20 sets) on a sample of $n = 498$ (i.e., including the 18 dropped cases), however, confirmed all results reported in the main text.

Study 2 participants were recruited through MTurk in 2015. Most participants were paid \$1.50 for completed surveys that lasted an average of approximated 15 min although some in the initial fielding of the survey received \$1.00. The sample of $n = 1,786$ (including one additional condition described in **Additional Conditions** and a target sample of $n \approx 2,000$) was achieved based on the same screening criteria as for study 1. The analysis sample (those in the inequality, American Dream, and control conditions) consisted of 1,305 participants, who on average were significantly more likely ($P < 0.05$) to be White, more educated, and lean Democratic than participants who were dropped due to the above restrictions ($n = 32$); there were no differences by gender, age, education, or manipulation condition. Robustness checks using multiple imputation (20 sets) on a sample of $n = 1,337$ (i.e., including the 32 dropped cases), however, confirmed all results reported in the text.

Study 3 participants were recruited during December 2015, as part of the GfK panel maintained by the Time-sharing Experiments in the Social Sciences

(TESS). Our target sample of $n = 2,150$ was reached after 3,581 surveys were fielded, for a completion rate of 60%; the average survey was completed in 7 min. GfK uses probability-based sampling to achieve a representative sample of the US population, but all analyses (except the mediation analyses) were conducted with weights provide by GfK to ensure that the sample is commensurate with March Current Population Survey distributions of key demographic characteristics. Table 1 and **Tables S1** and **S2** include these weights.

We conducted analyses on a sample of $n = 1,501$ after the restrictions described for studies 1 and 2 were imposed. Most of the substantial decline in participants ($2,150 - 1,501 = 649$) qualifying for the analysis was a consequence of failures to correctly answer the attention and manipulation check questions. This is perhaps not surprising given the numerical content of the treatment and control articles, combined with the fact that the survey was administered to a more representative sample of the public compared with the more highly educated MTurk participants. Accordingly, we found that the TESS analysis sample, compared with the entire sample, had significantly ($P < 0.05$) higher income and education, was older, and more White, but we did not find differences in partisan identification or gender. Robustness checks using participants with failed attention checks and multiple imputation of missing data (20 sets), however, confirmed all results reported in the text, with the exception of the “business” response to the forced-choice question, in which $P = 0.12$ without controls and $P = 0.10$ with controls.

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Supporting Information

McCall et al. 10.1073/pnas.1706253114

Survey Characteristics

In this section, we briefly describe notable features of the survey instrument that were not reported in the main text or *Methods*. The number of questions varied across the surveys, with the survey in study 1 having the most questions (29 substantive questions, not including demographic, other background information, and manipulation checks) and the survey in study 3 the least (14 substantive questions, as TESS space was restrictive). The general order of questions, however, remained the same: All followed the article primes, and the perceptions of opportunity questions were asked first and reproduced as they appear in the GSS/ISSP (for benchmarking purposes) although only the items that clearly denote individual and class-based structural factors were used in our analyses. These were then followed by the focal policy preference questions (with studies 1 and 2 including additional exploratory policy questions), beliefs about inequality from the GSS (for benchmarking purposes and as potential manipulation checks; see below for additional analyses using these variables), attention and manipulation checks, and demographic and other background questions, such as partisanship and political ideology.

Question wording for the new parallel measure of support for reducing pay disparities in large companies that we created was formulated in collaboration with Arvid Lindh (Stockholm University), Jonas Edlund (Umeå University), and the General Social Survey Board (we proposed these items in spring, 2013, for a special module of the 2014 survey) to be consistent with terms used in other GSS and ISSP questions, such as “major companies,” “executives,” and “unskilled workers,” which substituted for “government,” “the rich,” and “the poor,” respectively, in the existing GSS question on government redistribution.

Additional Results

Individual Items of Opportunity Scales. Given that the items in the GSS/ISSP battery of opportunity beliefs contain only two items each for the structural and individual scales, we replicated the analyses using the individual items rather than their averaged value. In all but one case (the “ambition” item in study 2), the results were upheld (all P s < 0.02).

Subjective Relative Income Position. Recent studies have examined the relationship between subjective relative position in the income distribution, as measured by where participants place themselves on a ladder from 1 to 10, and redistributive preferences (7). All regression results reported in the main text hold when this variable is included as a control (it was included only in the survey in studies 1 and 2).

Trust in Government. One recent study found that an inequality treatment reduced trust in government, which in turn explained a failure to increase support for government redistribution (6). Only study 1 included questions regarding trust (that we had designed as part of the special module of the 2014 GSS that included the government and business responsibility policy questions) in both government and business. However, we did not find a significant effect of the inequality treatment on trust for three of the four questions, and we found evidence of an increase in trust in government ($P = 0.057$ without controls and $P = 0.05$ with controls) on the fourth question: “To what extent do you think that government in general actually does the following: Provide services equally to all who need them?” Four response categories ranged from “a very little extent” to “a very large extent.”

Manipulation Checks. As mentioned previously, GSS questions regarding beliefs about inequality were examined as additional manipulation checks although they could have been influenced by the opportunity beliefs and policy questions that appeared before them in each of the surveys. Nevertheless, in regressions of a composite of two questions (agreement on five-point scales regarding whether “differences in income in America are too large” and “inequality continues to exist because it benefits the rich and powerful”) on treatment relative to control conditions, responses were not significant in study 1, albeit in the expected direction (increasing critical perceptions of inequality in the treatment condition), but statistically significant ($P < 0.001$) in studies 2 and 3. Recall that study 1 had the largest number of substantive questions on the survey, virtually all of which preceded these items, which could be responsible for this null effect. The consistency of the primary results across studies, as well as the significant effect of the inequality article on these perception items in studies 2 and 3, however, offers confidence that the inequality treatment is increasing the salience of rising economic inequality, relative to the control article.

Exploratory Analyses: Policy Preferences. The focal policy preference items reported in study 3 were also included in studies 1 and 2 (embedded among other exploratory policy items). We did not present the analyses of these items for studies 1 and 2 in the main text, however, because (i) the primary focus of these studies was the potential effects on the opportunity-beliefs items, and (ii) the many characteristics of MTurk convenience samples (e.g., age, partisanship, etc.) that are likely to limit both the validity of, and variance in, responses to questions regarding government tax redistribution, and perhaps also workplace policies regarding pay (30) (see also Table S1 to compare sample demographics to national statistics). (Indeed, these concerns about the utility of MTurk convenience samples for examining economic policy questions ultimately motivated the recruitment of a large, nationally representative sample in study 3.) Perhaps not surprisingly, then, analyses revealed no significant effects of the inequality treatment (compared with control) on these items (business responsibility, government responsibility, and forced-choice responsibility) in either study 1 or study 2 (all P s > 0.05) although a combined analysis of studies 1 and 2 demonstrated that the opportunity scales were significantly associated with the policy preference outcomes in the predicted direction (all P s < 0.05). Given the null treatment effects, however, it is important to interpret the policy outcome findings of study 3 with some caution until a direct replication bolsters our confidence in their robustness.

Exploratory Analyses: Partisanship. Although we had reason to believe that partisanship would affect the level of support for our various outcomes (e.g., Democrats would be more supportive of structural explanations and government redistribution, for which we found empirical support in our studies), we had no theoretically strong a priori expectations that the effect of the rising inequality treatment would be moderated by partisanship. Therefore, none of our experimental designs incorporated partisanship as a moderator: That is, we did not recruit based on, or block on, this variable. Nevertheless, here we report the results of closer examinations of the role of partisanship on the outcome measures. Generally speaking, the results from exploratory analyses are empirically consistent with the decision not to block on partisanship; although some effects were weaker or nonsignificant

for some partisan groups, interaction effects between treatment and partisanship were rarely significant. This is because the direction of the effects was nearly always the same for all partisan groups: that is, in the direction predicted by the opportunity model and described in *Results*.

In particular, we note two findings indicating that Republicans also conform to the tenets of the opportunity model. First, the structuralist thinking that we uncovered in response to the inequality treatment was robust among Republicans in studies 1 and 3 (i.e., those studies without the second article manipulation) ($P < 0.01$, $n = 80$, in study 1; $P < 0.01$, $n = 709$, in study 3) and was in the predicted direction in study 2 ($P = 0.167$, $n = 166$), whereas changes in both structural and individualistic opportunity beliefs subject to the inequality treatment were robust for Democrats across all three studies. Second, support for the business and government responsibility items among study 3 inequality condition vs. control participants was significant for both Republicans ($P < 0.01$ for both questions, $n = 709$) and Democrats ($P < 0.05$ for both questions, $n = 747$). Additionally, in study 3, the treatment effect on support for the business option in the forced-choice question was observed only among Republicans ($P < 0.01$ for Republicans vs. $P = 0.973$ for Democrats) whereas the opposite was true for support for the government option ($P = 0.074$ for Democrats vs. $P = 0.376$ for Republicans).

Additional Conditions

Study 1. In addition to the inequality and control conditions discussed in the main text, we also piloted two other conditions: (i) a no article control condition and (ii) a weak version of the turn-off condition that we discuss in study 2 (consisting of three sentences rather than the full second article described in study 2). Results reported in the text were the same when the inequality condition was compared with the no article control instead of with the baseball control article. As the baseball control was a more conservative test of the effect, controlling for the presence of considerable statistical information, etc., we present these results in the main text. The results of the turn-off condition were weaker but generally consistent with the results reported in study 2.

Study 2. We also included one additional condition in study 2—baseball control plus American Dream—that completed the 2×2 design afforded by the manipulation of the four articles. Upon reflection, however, we had no theoretically guided predictions for such a condition as it had no clear relation to the opportunity model, and, thus, it was not included in the analyses.

Articles Used in Experimental Treatments

Four news or personal interest articles were presented across the three studies. Each was an edited and simplified version of an existing news article, press release, or blog post, enhanced only by a simple yet realistic chart, graph, or photo (Figs. S1–S4). The texts and accompanying images for each article (included) are as follows: (i) inequality treatment article: an impersonal article (313 words) drawn from a press release of a prominent Congressional Budget Office report (37), including descriptive statistics on differential trends in income growth at the top, middle, and bottom of the income and pay distributions (note that all groups exhibited growth, minimizing the “bad” news bias of the treatment), which is our treatment article in all studies; (ii) baseball article: an impersonal article (286 words) on the trends and consequences of the American and National League victories in the annual All-Star game, including descriptive statistics, which is a control condition article in all studies; (iii) cooking article: a human interest story (255 words) describing a cooking fiasco, which serves as a second control article in study 2; and (iv) American dream article: a human interest story (233 words) describing the rags-to-riches, American Dream success of the

current CEO of Xerox, which serves as the second “turn-off” article in the American Dream condition in study 2.

The text of each article used in the experiments is provided below. Each article was accompanied by a complementary image (Figs. S1–S4). The articles, as presented, can be found at the Open Science Framework website (<https://osf.io/bukzp/>).

Inequality Treatment Article. Income Inequality (updated August 5, 2014).

In the 1990s, economists began producing a string of studies documenting rising income inequality in the United States.

But the idea did not take a central place on the national stage until the fall of 2011, when it was championed by members of both political parties in the lead-up to the 2012 Presidential election. Democrats and Republicans alike seized on the momentum for some of their agenda items.

A report was released in October 2011 by the nonpartisan Congressional Budget Office confirming that income inequality had grown in the United States.

According to the report, the budget office found that from 1979 to 2007, average income grew by 278% for the 1% of the population with the highest total household income, after taking taxes and inflation into account.

For others in the top 20% of the population, average income grew by 65%.

For the 60% of people in the middle of the income scale, the growth in income was just under 40%.

And, for the poorest 20% of the population, average income rose 18%.

The findings, based on a rigorous analysis of data from the Internal Revenue Service and the Census Bureau, are generally consistent with studies by private researchers and academic economists.

Underlying these large differences in total household income are equally large differences in individual earnings.

The median earnings of a full-time worker, who makes more than the bottom half of workers and less than the top half, rose by 2.5% from 1979 to 2012, according to the Bureau of Labor Statistics.

At the same time, the median compensation of CEO’s increased by over 600% according to the best available data from economists at the Massachusetts Institute of Technology.

Thus, from 1979 to the present, there has been a significant increase in inequality in both total household income and individual earnings.

Baseball Control Article. Major League Baseball All-Star Game (updated July 16, 2014).

With their five to three win in the 2014 MLB All-Star Game, the American League added to their impressive All-Star Game record, with 20 of 27 wins since 1988.

But the AL hasn’t always dominated this midseason tradition.

Eighty-five All-Star games have been played in total, with the National League winning 43, the American League 40, and 2 ties.

The All-Star Game has seen several “eras” in which one league tended to dominate.

From 1933 to 1949, the AL won 12 of the first 16 games.

But then the NL dominated from 1950 to 1987, winning 33 of 42 games with 1 tie.

The 2002 All-Star Game set the stage for the most recent period of rivalry between the two leagues.

The game ended in controversy in the 11th inning when both teams ran out of substitute players available to pitch in relief. At that point, Commissioner Bud Selig declared the game over, and it ended in a 7–7 tie. The crowd booed and the media roundly criticized the decision.

To provide a greater incentive for victory, Major League Baseball reached an agreement with the players union to award

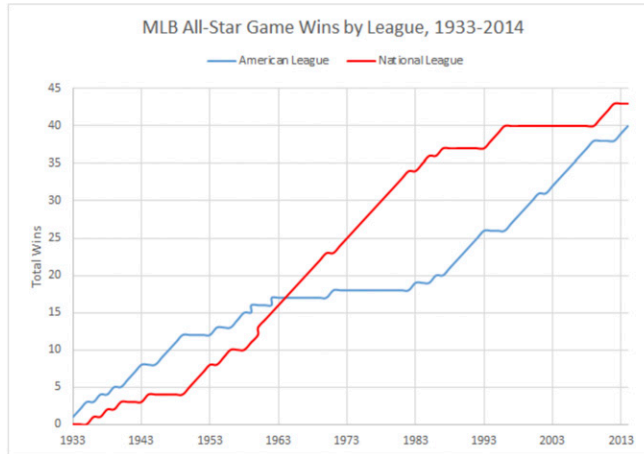


Fig. S2. Image that accompanied the baseball article.



Fig. S3. Image that accompanied the cooking article.



Fig. S4. Image that accompanied the American dream article.

Table S1. Demographic characteristics and partisan identification [means (SDs)]

Variables	Study 1 (n = 480)	Study 2 (n = 1,305)	Study 3 (n = 1,501)	2014 GSS
Education*	3.93 (1.29) (some college)	4.02 (1.28) (some college)	10.70 (1.92) (associate degree)	13.69 (3.08)
Age [†]	32.24 (10.16)	32.86 (10.40)	51.49 (16.43)	47.42 (17.22)
Income [‡]	2.77 (1.49) (40 to 70K)	2.72 (1.53) (40 to 70K)	13.04 (4.16) (60 to 75K)	17.81 (5.63) (40 to 50K)
White	0.79	0.81	0.76	0.74
Female	0.45	0.45	0.49	0.54
Strong Democrat	0.20	0.22	0.17	0.16
Democrat	0.21	0.18	0.13	0.16
Leans Democrat	0.15	0.14	0.19	0.14
Independent	0.28	0.27	0.03	0.21
Leans Republican	0.08	0.08	0.19	0.11
Republican	0.05	0.05	0.12	0.12
Strong Republican	0.04	0.05	0.16	0.10

*Education is measured on a 1 to 6 scale (with 1 being less than high school and 6 being postgraduate) for studies 1 and 2; on a 1 to 14 scale (with 1 being no formal schooling and 14 being postgraduate) for study 3; and on a 0 to 20 scale (indicating years completed) in the GSS. Substantive values of means are provided in parentheses.

[†]Age ranges from 18 to 72 y for study 1, 18 to 75 y for study 2, 18 to 92 y for study 3, and 18 to 89+ y in the GSS 2014.

[‡]Income (K indicates thousand dollars) is measured on a 1 to 9 scale (with 1 being \leq 25K and 9 being \geq 300K) for studies 1 and 2; on a 1 to 19 scale (with 1 being \leq 5K and 19 being \geq 175K) for study 3; and on a 1 to 25 scale (with 1 being <1K and 25 being \geq 150K) in the GSS. Substantive values of means are provided in parentheses.

Table S2. Perceptions of economic opportunity and policy preferences [means (SDs)]

Variables	Study 1 (n = 480)	Study 2 (n = 1,305)	Study 3 (n = 1,501)	GSS/ISSP
Structural factors				
Wealthy family	3.27 (1.07)	3.07 (1.05)	3.14 (1.08)	2.84 (1.09)
Well-educated parents	3.38 (0.91)	3.39 (0.89)	3.50 (0.87)	3.38 (0.88)
Individual factors				
Ambition	4.25 (0.86)	4.35 (0.81)	4.37 (0.76)	4.30 (0.78)
Hard work	4.17 (0.94)	4.29 (0.87)	4.38 (0.81)	4.40 (0.82)
Government responsibility	4.95 (1.98)	5.00 (1.89)	4.12 (2.19)	4.23 (2.04)
Business responsibility	5.20 (1.66)	5.19 (1.75)	4.65 (1.90)	4.66 (1.76)
Forced choice				
Government	0.40	0.45	0.24	—
Major companies	0.35	0.21	0.36	—
High-income individuals	0.09	0.15	0.09	—
Low-income individual	0.08	0.11	0.18	—
Charities	0.01	0.00	0.01	—
No reduction needed	0.07	0.08	0.11	—

Perceptions of economic opportunity are assessed on a 1 to 5 scale (with 1 being not at all important and 5 being essential); and government and business responsibility on a 1 to 7 scale (with 1 being should not be and 7 being should be). For study 2, subsamples are $n = 446$ for government responsibility, $n = 431$ for business responsibility, and $n = 428$ for forced choice as respondents were randomized within condition to receive only one policy question. Perceptions of opportunity are from the GSS/ISSP 2010, and policy preferences are from a specially designed module of the GSS 2014, which did not include the forced-choice policy question (and thus no GSS/ISSP data were available for this measure).