Empirical Research Paper

Economic Inequality Fosters the Belief That Success Is Zero-Sum

Personality and Social Psychology Bulletin
1–17

DOI: 10.1177/01461672231206428
journals.sagepub.com/home/pspb
Sage

Shai Davidai[1]

Abstract

Ten studies ($N = 3{,}628$; including five pre-registered), using correlational and experimental methods and employing various measures and manipulations, reveal that perceived economic inequality fosters *zero-sum beliefs about economic success*—the belief that one person's gains are inevitably offset by others' losses. As the gap between the rich and the poor expands, American participants increasingly believed that one can only get richer at others' expense. Moreover, perceptions of economic inequality fostered zero-sum beliefs even when the distribution of resources was not strictly zero-sum and did so beyond the effect of various demographics variables (household income, education, subjective socioeconomic status) and individual differences (political ideology, social dominance orientation, interpersonal trust). Finally, I find that zero-sum beliefs account for the effect of inequality on people's view of the world as unjust. The article concludes with a discussion of the theoretical and practical implications of zero-sum beliefs about economic success.

Keywords

economic inequality, zero-sum beliefs, income inequality, just world beliefs

Received January 18, 2023; revision accepted September 22, 2023

During the 2016 and 2020 U.S. Democratic Party primaries, Senator Bernie Sanders ran on a surprisingly popular platform: Wealthy Americans gain at less-fortunate others' expense. This sentiment was echoed during the 2019 U.K. General Elections, in which the Labour Party's leader argued that rich Britons amass their wealth at the expense of ordinary folk, making money by "betting against our country and on other people's misery" (Parker & Payne, 2019). Although both political bids proved unsuccessful, they clearly struck a nerve in many voters' minds: That the gains of the few come at the expense of the many. What explains this belief?

This article argues that *economic inequality fosters zero-sum beliefs about economic success*. Using correlational and experimental methods, I find that as the perceived gap between the rich and the poor expands, people increasingly view success as zero-sum, such that one person's gains are inevitably offset by others' losses. Regardless of whether economic success is objectively zero-sum, perceptions of high economic inequality lead people to see it as such.

Zero-Sum Beliefs About Economic Success

People often view life as zero-sum, believing that wealth can only be acquired at others' expense (Różycka-Tran et al., 2015), that economic exchanges benefit one party at other parties' expense (Johnson et al., 2022), that their interests are incompatible with others' interests (Thompson & Hastie, 1990) and that they, their group, and their country lose when other people, groups, and countries succeed (Roberts & Davidai, 2022). Such zero-sum beliefs are associated with many adverse consequences, including racism, sexism, xenophobia, and low life satisfaction (for a review, see Davidai & Tepper, 2023).

Many researchers have conceptualized zero-sum beliefs as a general mind-set about social relations (Davidai & Tepper, 2023), construing such beliefs as a useful cognitive heuristic for making sense of resource distribution (Meegan, 2010), an erroneous mercantilist judgment of economic transactions (Johnson et al., 2022), and a motivated reaction to the status-quo (Davidai & Ongis, 2019). At the same time, whether people exhibit zero-sum beliefs depends on their views of the economy (e.g., whether they believe it is facing a downturn; Sirola & Pitesa, 2017), feelings of threat (e.g., whether they compare themselves to better-off others; Ongis & Davidai, 2022; Smithson et al., 2015), and their companies' organizational practices (e.g., whether their employer evaluates them based on relative performance; Andrews-Fearon & Davidai,

[1]Columbia University in the City of New York, USA

Corresponding Author:
Shai Davidai, Columbia Business School, 665 West 130th Street, New York, NY 10027, USA.
Email: sd3311@columbia.edu

2023). People may be generally inclined to see success as zero-sum, but whether they do so is clearly affected by domain-specific factors in the environment.

This article examines one such critically important contextual factor—*perceived economic inequality*. As perceptions of inequality increase, I find that people come to view success as zero-sum, such that one can only get richer at others' expense.

Perceived Economic Inequality and Zero-Sum Beliefs About Economic Success

Economic inequality has been rising for decades around the world, reaching its highest level in the United States since the onset of the Great Depression (Piketty & Saez, 2014). Concerningly, inequality is linked with many adverse consequences, including risky decision-making, low social connection and civic participation, and high mortality, substance abuse, and debt (Wilkinson & Pickett, 2017). And, although misperceptions of inequality abound, the effects of perceived economic inequality can be as important as its objective level (Jachimowicz et al., 2022). For instance, subjective inequality is associated with low life satisfaction, skepticism about meritocracy, and general societal cynicism (Buttrick & Oishi, 2017).

Importantly, the level of inequality in society is theoretically *independent from* whether resource distribution is in fact zero-sum. According to game theory, outcomes in zero-sum situations are inversely correlated such that all gains and losses sum to zero (von Neuman & Morgenstern, 1944). Yet, while zero-sum situations can create inequality (i.e., gaining at others' expense creates disparities), inequality in itself is not inherently zero-sum. For instance, outcomes in positive-sum situations (where multiple parties stand to gain by "expanding the pie") and negative-sum situations (where multiple parties stand to lose) can improve or deteriorate at different rates, creating inequality that is, by definition, *non*-zero-sum.

Of course, although economic inequality doesn't have to be zero-sum, people may still see it as such. Folk beliefs often diverge from reality and misperceptions of basic economic principles abound (Boyer & Petersen, 2018). This is especially true in regards to inequality, where ideology (Waldfogel et al., 2021) and cognitive processes (Jackson & Payne, 2021) can distort perceptions of economic gaps in society. Given that zero-sum beliefs do not always match reality, and since inequality and zero-sum beliefs similarly affect such things as life satisfaction and interpersonal trust, understanding the effect of perceived inequality on zero-sum beliefs is imperative.

Economic Inequality Fosters Zero-Sum Beliefs by Cultivating Perceptions of Competition

One way in which economic inequality may foster zero-sum beliefs is through perceived competitiveness. Specifically, as economic disparities widen, people may see the social climate as increasingly competitive and thus believe that one can only succeed at others' expense. Indeed, inequality often cultivates a view of competition as normative (Sánchez-Rodríguez et al., 2023; Sommet & Elliot, 2023a) and people who live in highly unequal areas tend to see their neighbors as especially competitive (Sommet et al., 2019). And, since inequality increases how much people value power, dominance, and independence (Sánchez-Rodríguez, Rodríguez-Bailón, & Willis, 2022; Sánchez-Rodríguez, Willis, & Rodriguez-Bailon, 2019), it is not surprising that it also shapes their perceptions of the overall climate. Thus, as people try to make sense of rising economic inequality, they may see the normative climate as increasingly competitive and individualistic (Sánchez-Rodríguez et al., 2023) and subsequently view success as zero-sum.

There are several reasons why perceived competitiveness may foster zero-sum beliefs about success. First, zero-sum beliefs emerge when people feel threatened (Davidai & Tepper, 2023) and being in competitive environments may thus lead people to see others as gaining at their expense. Indeed, since competitions can be inherently threatening, it is not surprising that seeing social interactions as a competition is linked with increased susceptibility to zero-sum beliefs (Halevy et al., 2012). Second, since competitions elicit social comparisons to better-off others (Weingarten, 2023), they are likely to increase zero-sum beliefs about success (Ongis & Davidai, 2022). Finally, since dominant and competitive leaders foster zero-sum beliefs among their followers by shaping their views of the normative climate (Kakkar & Sivanathan, 2022), one may expect that simply seeing the environment as competitive may foster such beliefs. Thus, by depicting the normative climate as competitive, economic inequality may foster the belief that success is zero-sum.

The Consequences of the Effect of Inequality on Zero-Sum Beliefs

What are the consequences of seeing success as zero-sum? In a series of *exploratory analyses*, I examine whether zero-sum beliefs can help explain the negative effects of inequality on people's perceptions of the economic system.

First, economic inequality cultivates a view of the world as unjust, where people do not necessarily "get what they deserve and deserve what they get" (Davidai, 2022; Lerner, 1980). Indeed, inequality fosters a view of society as "breaking down" (Sprong et al., 2019), weakens beliefs in social mobility (Davidai & Wienk, 2021), and elicits external attributions of economic outcomes (Davidai, 2018). Consequently, given the relationship between zero-sum beliefs, just-world beliefs, and attributions about economic outcomes (Ongis & Davidai, 2022), I examine whether zero-sum beliefs help explain why inequality decreases just-world beliefs and how people make sense of their own

and others' outcomes (i.e., attributions of economic success, perceptions of external constraints, and beliefs about mobility). That is, I examine whether the effect of inequality on zero-sum beliefs reduces perceptions of economic mobility and leads people to make external attributions for economic success, perceive their lives as restricted by external forces, and view the system as generally unjust.

In addition to explaining its effect on just-world beliefs, zero-sum beliefs may help explain why inequality fosters a view of "the rich" and "the poor" as separate and distinct groups (Jetten et al., 2021). Inequality divides society based on economic resources (Côté et al., 2017; Wilkinson & Pickett, 2017) "through patterns, practices, and worldviews that rarely intersect, interact only thinly [. . .] and grow increasingly distant" (Markovits, 2019). As such, inequality makes economic differences salient (Jetten et al., 2017), amplifies class-based stereotypes (Connor et al., 2021), fosters wealth-based categorizations (Tanjitpiyanond, Jetten J & Peters, 2022), and increases the use of wealth- and poverty-related words (Peters et al., 2022). Indeed, a study of participants from 32 countries found that perceived inequality predicts the belief that wealth is a meaningful basis for social categorization (Tanjitpiyanond et al., 2023). Thus, by rendering wealth an informative cue for social categorization and by depicting society through the lens of wealth and poverty, inequality motivates people to label "the rich" as a different group than less-wealthy individuals. Consequently, I examine whether the effect of perceived economic inequality on such wealth-based categorization is due to people's zero-sum beliefs about success.

Research Overview

Ten studies examine the relationship between perceived economic inequality and zero-sum beliefs. Using various measures and experimental designs, Studies 1A to 1C and 2A to 2C find correlational and experimental evidence for the relationship between perceived inequality and zero-sum beliefs. Following, using an experimental-causal-chain design (Spencer et al., 2005), Studies 3A and 3B find that economic inequality fosters the perceptions of competition which, in turn, increase the belief that success is zero-sum. Finally, Studies 4A and 4B replicate the effect of perceived inequality and explore its potential consequences. Below, I report all conditions run and measures collected. Sample sizes were determined in advance and analyses were conducted after data collection was complete. The materials and data are available through the Open Science Framework. https://osf.io/96xh4/?view_only=9902e1f4e3ad4377ba8e704e72a4eff4.

Studies 1A to 1C

I began by examining whether perceived inequality in society and in one's personal life predicts zero-sum beliefs about success. Given the importance of converging evidence and the need for generalizability, I examine this relationship with different measures of economic inequality and zero-sum beliefs. Moreover, I examine whether perceived inequality predicts zero-sum beliefs beyond other relevant variables such as social dominance orientation, interpersonal trust, and socioeconomic status. Finally, Studies 1B and 1C were preregistered (https://aspredicted.org/blind.php?x=58sc65; https://aspredicted.org/87Q_N45).

Methods

Participants. U.S. residents were recruited from Amazon's Mechanical Turk for all three studies (see Table 1 for demographics). Post hoc sensitivity power analyses examining achieved power revealed 80% power for detecting small, standardized coefficients in simple linear regressions (1A: $\beta = 0.23$; 1B: $\beta = 0.12$; 1C: $\beta = 0.17$).

Materials and Procedure

Perceived Economic Inequality. Participants in Study 1A completed a one-item measure of perceived economic inequality in society, choosing among nine images of ladders that depict different distributions of wealth across five quintiles the one that "best represents the distribution of wealth in the United States" (Appendix A). Participants in Study 1B completed a measure of inequality that focuses on one's personal life using the 12-item Perceived Economic Inequality in Everyday Life scale (García-Castro et al., 2019) (*1—Strongly disagree, 7—Strongly agree*; $\alpha = .90$). As another test of generalizability, participants in Study 1C completed the eight-item Subjective Inequality Scale (Schmalor & Heine, 2022) ($\alpha = .92$).

Zero-Sum Beliefs. Participants in Study 1A indicated their agreement with five zero-sum statements about economic outcomes (e.g., "The economic success of people from the top 20% often comes at the expense of people from the bottom 20%"; 1—strongly disagree, 7—strongly agree; $\alpha = .91$; Appendix B). To test for generalizability, participants in Studies 1B and 1C indicated their zero-sum beliefs on a different seven-item measure: four items from the Belief in a Zero-Sum Game Scale (Różycka-Tran et al., 2015) and three new items ("The economic success of rich people often comes at the expense of people who don't have a lot of money"; 1—strongly disagree, 7—strongly agree; αs = .93; Appendix B).

Demographics and Control Variables. Participants reported their ideology (*1—very liberal, 7—very Conservative;* $M_{1A} = 3.44$, $SD = 1.70$; $M_{1B} = 3.48$, $SD = 1.77$; $M_{1C} = 3.62$, $SD = 1.79$), income ($Median_{1A\text{-}1C}$ = *US$50K-US$75K*), gender, age, and ethnicity. Participants in Studies 1B and 1C also completed a measure of Subjective Social Status. Finally, participants in Study 1B completed the seven-item version of the Social Dominance Orientation scale (Ho et al., 2015;

Table 1. Sample Sizes and Participant Demographics for Studies 1-4.

	Participants			Gender				Race/ethnicity				
Study	Recruited	Excluded	Final sample	Male	Female	Other	M_{age}	European American (%)	African American (%)	Hispanic/ Latino (%)	Asian American (%)	Other (%)
1A	155	14	140	53	86	1	36.42	79	8	3	9	<2
1B	405	9	396	200	195	3	40.19	77	7	5	8	4
1C	274	3	271	143	124	4	40.70	82	8	4	5	4
2A	198	9	189	101	85	3	39.97	70	11	9	6	2
2B	301	7	294	151	140	3	44.54	78	6	3	9	4
2C	402	14	388	193	190	5	41.69	76	8	7	7	3
3A	305	8	297	161	130	4	40.73	71	11	4	10	4
3B	304	3	301	153	145	3	41.84	76	8	3	6	7
4A	784	72	712	315	392	5	37.25	77	9	5	7	3
4B	500	7	493	266	218	9	40.06	73	7	7	10	3

$\alpha = .92$) and the six-item Social Trust Scale (Baryla et al., 2015) (*1-Strongly disagree, 7-Strongly agree;* $\alpha = .94$).

Results

Perceived economic inequality significantly predicted the belief that success is zero-sum in all three studies. In each study, a simple linear regression predicting zero-sum beliefs from participants' perceptions of inequality was significant., 1A: $\beta = 0.18$, 95% CI = [.11, .26], $\eta^2 = 0.14$, $t(139) = 4.65$, $p < .001$; 1B: $\beta = 0.42$, 95% CI = [.27, .58], $\eta^2 = 0.07$, $t(395) = 5.27$, $p < .001$; 1C: $\beta = 0.63$, 95% CI = [.56, .69], $t(270) = 19.04$, $\eta^2 = 0.57$, $p < .001$. The more participants saw inequality in society and in their personal lives, the more they believed that success is zero-sum. Moreover, a series of multiple regression analyses found that perceived inequality predicted zero-sum beliefs beyond ideology, income, gender, age, ethnicity, social status, and other control variables, 1A: $\beta = 0.10$, 95% CI = [.02, .18], $t(128) = 2.45$, $p = .016$; 1B: $\beta = 0.24$, 95% CI = [.09, .38], $t(372) = 3.18$, $p = .002$; 1C: $\beta = 0.58$, 95% CI = [.50, .66], $t(250) = 14.20$, $\eta^2_{partial} = 0.44$, $p < .001$, (Table 2).

Finally, a series of multiple regression analyses found that the predictive power of perceived economic inequality in all three studies was not moderated by ideology nor income, as reflected by the lack of significant interactions (Tables S2–S9 in the Supplementary Materials). Although the sample's restricted range of income and ideology limits the interpretation of null findings, the consistent pattern of results suggests that perceived inequality predicts zero-sum beliefs regardless of relevant demographic variables. Beyond the influence of income, socioeconomic status, and political ideology, participants who saw high inequality in society and their personal lives were more prone to believe that wealthy people succeed at less fortunate others' expense.

Studies 2A to 2C

Perceived economic inequality in one's life and in society in general predicts zero-sum beliefs about success. Using various experimental methods, Studies 2A to 2C examine whether economic inequality *causally* increases zero-sum beliefs, whether this is true for beliefs about income (rather than wealth), and whether it is true even when controlling for a distribution's average income (Study 2B). Finally, Study 2C examines whether inequality increases zero-sum beliefs *independent of the actual process of resource distribution* (i.e., whether the resources are zero-sum). All three studies were pre-registered (2A: https://aspredicted.org/KK8_QBG; 2B: https://aspredicted.org/VS7_PSY; 2C: https://aspredicted.org/9H5_LDQ).

Study 2A

Study 2A examines whether economic inequality causally increases zero-sum beliefs. Specifically, I examined whether manipulating the level of organizational inequality increases zero-sum beliefs about success in the organization.

Methods

Participants. U.S. residents were recruited from Amazon's Mechanical Turk (see Table 1 for demographics). A post hoc sensitivity power analysis examining achieved power revealed 80% power for detecting small effects ($f = 0.23$) in an omnibus, one-way ANOVA.

Materials and Procedure. Participants read about the salaries of 20 employees in a hypothetical company and were randomly assigned to one of three conditions that varied the disparity in wages. In the *high inequality condition*, the salaries differed greatly, varying between US$38,000 and US$350,000 (for wages and Gini index, see Table 3). In the

Table 2. Multiple Regression Analyses Predicting Zero-Sum Beliefs From Perceived Economic Inequality, Demographics, and Control Variables (Studies 1A-1C).

Study	Predictor	Estimate	95% CI		t	*p*
			Lower	Upper		
Study 1A (n = 139)	Intercept	6.101	4.929	7.273	1.297	<.001
	Perceived economic inequality	**0.098**	**0.018**	**0.177**	**2.430**	**.016**
	Age	−0.006	−0.024	0.011	−.741	.460
	Gender	0.167	−0.249	0.582	.792	.430
	Ethnicity	0.072	−0.076	0.220	.959	.339
	Household income	−0.155	−0.288	−0.022	−2.298	.023
	Political orientation	−0.353	−0.477	−0.022	−5.637	<.001
Study 1B (n = 396)	Intercept	6.759	5.692	7.825	12.457	<.001
	Perceived economic inequality	**0.235**	**0.098**	**0.371**	**3.385**	**<.001**
	Age	−0.015	−0.025	−0.005	−3.043	.003
	Gender	0.057	−0.178	0.293	.479	.632
	Household income	−0.052	−0.148	0.045	−1.047	.296
	Political orientation	−0.300	−0.382	−0.218	−7.220	<.001
	Socioeconomic Status	−0.157	−0.245	−0.068	−3.474	<.001
	Social trust	−0.130	−0.229	−0.031	−2.575	.010
	Social Dominance Orientation	−0.161	−0.273	−0.048	−2.802	.005
Study 1C (n = 271)	Intercept	2.248	1.479	3.017	5.758	<.001
	Perceived economic inequality	**0.582**	**0.504**	**0.661**	**14.563**	**<.001**
	Subjective Socioeconomic Status	−0.010	−0.083	0.062	−.282	.778
	Age	−0.006	−0.014	0.002	−1.527	.128
	Gender	0.062	−0.115	0.240	.692	.490
	Household income	−0.009	−0.091	0.072	−.229	.819
	Political orientation	−0.049	−0.114	0.015	−1.507	.133

Note. CI = confidence interval.

low inequality/high income condition, participants saw the same employees but with different salaries, such that the disparity was low and wages varied between $317,000 and $350,000 (mean income = $337,800, ~5x the average U.S. income). In the *low inequality/low income condition*, the wages varied between US$32,000 and US$43,000 (mean income = US$38,450, ~0.5x the average U.S. income). Participants described what working in this company might feel like and completed a one-item manipulation check ("To what extent would you think that the distribution of wages in this office is equal or unequal?" 1—extremely equal, 7—extremely unequal). Next, participants completed a six-item measure of zero-sum beliefs (e.g., *"*When some workers in this company make economic gains, others lose out economically," 1—strongly disagree, 7—strongly agree; α = .91; Appendix B). Finally, they reported their ideology (*1—very liberal, 7—very conservative; M* = 3.35, *SD* = 1.69), gender, age, income (*Median= US$50K-US$75K)*, education, and ethnicity.

Results

Manipulation Check. Participants judged the *high inequality* condition as more unequal (M = 5.21, SD = 1.78) than the *low inequality/high income* condition (M = 2.49, SD = 1.61), $F(1,187) = 93.85$, $p < .001$), and the *low inequality/low income* condition (M = 2.70, SD = 1.36), $F(1,187) = 76.15$, $p < .001$), which did not differ from each other, $F(1,187) = 0.59$, $p = .45$.

Next, I examined whether inequality *causally* increased zero-sum beliefs. A one-way, three-condition between-participants ANOVA found higher zero-sum beliefs when inequality was high (M = 4.67, SD = 1.29) relative to an office with low inequality and high incomes (M = 2.96, SD = 1.33) or an office with low inequality and low incomes (M = 3.29, SD = 1.25), $F(2,187) = 31.44$, $\eta^2 = 0.25$, $p < .001$ (Figure 1). Planned contrasts found higher zero-sum beliefs in the *high inequality condition* than the *low inequality/high income condition, F*(1,187) = 56.78, $p < .001$, $d = 1.31$, and the *low inequality/low income condition, F*(1,187) = 35.42, $p < .001$, $d = 1.09$, which did not differ from each other, $F(1,187) = 2.07$, $p = .152$, $d = 0.26$.[1] Thus, zero-sum beliefs were affected by the level of inequality in each office rather than the average level of income. Moreover, a robustness check found that inequality affected zero-sum beliefs even when controlling for ideology, income, education, gender, age, and ethnicity, $F(1,170) = 26.35$, $\eta^2 = 0.24$, $p < .001$, Table S10. Finally, two multiple regression analyses found

Table 3. Distribution of Wages (in Thousands of Dollars) and Gini Index Across Different Conditions in Study 2A (Top) and Study 2B (Bottom).

Study	Condition		*n*	Annual wages (in thousands of dollars)	Gini
Study 2A	High inequality		62	345,325,338,345,350,145,130,125,115,110,82,80,73,61,62,39,38,42,43, 42	.42
	Low inequality	High income	66	345,325,338,345,350, 335,325,328,345,345, 350,317,348,325,340, 345,325,335,345,345	.02
		Low income	61	39,38,42,43,42, 35,39,42,39,35, 39,37,35,41,38, 37,39,39,38,32	.04
Study 2B	High inequality	High income	50	425,535,495,515,505,205,210,225,125,140,88,100,103,101,102,67,69,69,68,62	.42
		Medium income	48	345,325,335,345,345,145,130,125,115,110,88,80,73,71,72,37,39,39,38, 32	.42
		Low income	47	200,200,205,210,200,100,105,100,80,75,53,45,49,47,48,22,19,24,13,17	.42
	Low inequality	High income	48	299,326,299,289,299,295,287,275,285,187,221,189,99,131,104,129,153, 140,104,98	.22
		Medium income	46	240,237,221,225,219,195,177,145,145,132,81,129,93,81,94,99,92,98,99, 87	.22
		Low income	55	143,125,133,135,123,125,117,105,119,112,88,86,53,51,44,51,52,58,41, 51	.22

that the effect of inequality was not moderated by ideology nor income (Tables S11-S12). Taken together, these results reveal that inequality *causally* increased the belief that success is zero-sum.

Study 2B

Study 2B is a direct replication and extension of Study 2A in which, in addition to manipulating inequality, I manipulated each office's average income.

Methods

Participants. U.S. residents were recruited from Amazon's Mechanical Turk (see Table 1 for demographics). A post hoc sensitivity power analysis examining achieved power revealed 80% power for detecting small effects ($f = 0.21$) in an omnibus, two-way ANOVA.

Materials and Procedure. The materials were identical to Study 2A, with the only difference being the distribution of wages in each office. Participants were randomly assigned to one of six conditions in a 2 (*Inequality*: High vs. Low) × 3 (*Average Income*: High, Medium, Low) between-participant design. In the *high inequality* conditions, participants saw an office with high pay disparity (Gini = .42). In the *low inequality conditions*, they saw an office with relatively low pay disparity (Gini = .22) (Table 2).

In addition, participants were randomly assigned to high (US$210,450), medium (US$144,450), or low (US$90,600) income conditions (~3.1×, 2.1×, and 1.3× average U.S. income). After writing what working in this company might feel like, participants completed two manipulation checks ("To what extent would you think that the distribution of wages in this office is equal or unequal?" and "To what extent would you think that the average wage in this office is high or low?"; 1—extremely equal/low, 7—extremely unequal/high). Next, participants indicated their zero-sum beliefs on the six-item measure from Study 2A (e.g., "When some workers in this company make economic gains, others lose out economically," 1—strongly disagree, 7—strongly agree; $\alpha = .91$). Finally, they reported their ideology (*1—very liberal, 7—very Conservative; M* = 3.50, *SD* = 1.81), gender, income (*Median= US$50K-US$75K*), education, and ethnicity.

Results

Manipulation Checks. Participants perceived the wages as more unequal in the *high inequality conditions* ($M = 5.08$, $SD = 1.71$) than the *low inequality conditions* ($M = 4.40$, $SD = 1.51$), $t(292) = 3.61$, $p < .001$. Participants also perceived the average wage as higher in the *high income conditions* ($M = 5.19$, $SD = 0.98$) than the *medium income* ($M = 4.74$, $SD = 1.21$), $F(1,291) = 8.41$, $p = .004$, and the *low income* ($M = 4.26$, $SD = 1.02$), $F(1,291) = 37.48$, $p < .001$, conditions, which differed from each other, $F(1,291) = 9.79$, $p = .002$.

Replicating Study 2A, a 2 (Inequality: High vs. Low) × 3 (Average Income: Low, Medium, or High) between-participants ANOVA revealed an effect of inequality: Participants saw success as more zero-sum when inequality was high ($M = 4.43$, $SD = 1.16$) rather than low ($M = 3.82$, $SD = 1.29$), $F(1,288) = 20.88$, $\eta^2_{partial} = 0.07$, $p < .001$.[2] In addition, zero-sum beliefs decreased as the average income increased, $F(2,288) = 8.20$, $\eta^2_{partial} = 0.05$, $p < .001$. Importantly, the interaction between inequality and average income was not significant, $F(2,288) = 1.00$, $\eta^2_{partial} < 0.01$, $p = .369$, and planned comparisons found that inequality increased

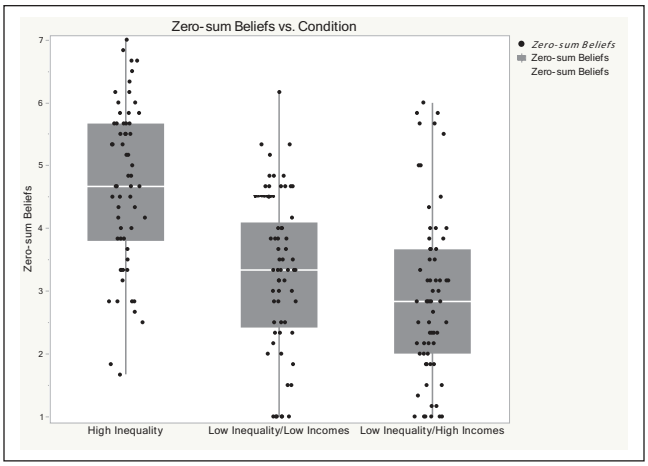


Figure 1. The Belief That Economic Success is Zero-Sum as a Function of Inequality (Study 2A).

zero-sum beliefs when average income was high, $M_{\text{high-inequality}} = 4.02$, $SD = 1.09$; $M_{\text{low-inequality}} = 3.53$, $SD = 1.12$; $F(1,288) = 4.06$, $p = .045$, $d = .407$, medium, $M_{\text{high-inequality}} = 4.58$, $SD = 1.10$; $M_{\text{low-inequality}} = 3.65$, $SD = 1.20$; $F(1,288) = 13.92$, $p < .001$, $d = .770$, or low, $M_{\text{high-inequality}} = 4.72$, $SD = 1.20$; $M_{\text{low-inequality}} = 4.21$, $SD = 1.43$; $F(1,288) = 4.58$, $p = .033$, $d = .425$. Finally, the effect on zero-sum beliefs was exhibited even when controlling for ideology, income, education, gender, and ethnicity, $F(1,267) = 17.51$, $\eta^2_{\text{partial}} = 0.07$, $p < .001$, and was not moderated by ideology nor income (Tables S13-S15). Thus, independent from the effect of average income, economic inequality increased zero-sum beliefs about success.

Study 2C

Study 2C is a conceptual replication using a different approach to manipulating economic inequality. In addition, I examined whether inequality increases zero-sum beliefs in situations that are not strictly zero-sum (i.e., where additional resources could be theoretically accumulated).

Method

Participants. U.S. residents were recruited from Amazon's Mechanical Turk (see Table 1 for demographics). A post hoc sensitivity power analysis examining achieved power revealed 80% power for detecting small effects ($f = 0.14$) in a 2×2 ANOVA.

Materials and Procedure. Participants imagined a scenario in which a manager decides to give US$1,700 in bonuses to her two supervisees and were randomly assigned to one of four conditions in a 2 (Inequality: High vs Low) × 2 (Distribution: Strong Zero-sum vs Weak Zero-sum) between-participants design. In the *Low Inequality* conditions, participants read that one employee received US$925 and the other received US$775, creating low disparity between the two employees (US$150). In the *High Inequality* conditions, they read that one employee received US$1425 and the other received US$275, creating high disparity between them (US$1,150).

Participants were additionally assigned to either a *Strong Zero-sum condition* or a *Weak Zero-sum condition*. In the *Strong Zero-sum condition*, they read that the manager's budget was capped at US$1,700 so that she can only give bonuses up to that amount and that "the overall sum cannot exceed" it ($n_{\text{high-inequality}} = 103$, $n_{\text{low-inequality}} = 100$). In the *Weak Zero-sum condition*, participants read that the budget was not strictly limited so that the manager "can give out as large or as small bonuses as she wishes, as long as she keeps the total of bonuses 'reasonable'" and that "if she thinks she'll need more money for the bonuses, she can [. . .] consult with the accountant and receive extra funds" ($n_{\text{high-inequality}} = 93$, $n_{\text{low-inequality}} = 92$).

After reading about the allocation decision, participants completed a manipulation check ("In your opinion, how equal or unequal is this allocation of bonuses between the two employees?" 1-Extremely unequal, 7-Extremely equal). Following, they completed a three-item measure of their zero-sum beliefs about the bonus allocation ("The higher the bonus for one employee, the lower the bonus that the other employee receives", "The size of one employee's bonus comes at another employee's expense", and "When one employee receives a higher bonus", another employee receives a lower bonus"; 1—strongly disagree, 7—strongly agree; $\alpha = 0.95$). Finally, participants reported their ideology (1—very liberal, 7—very conservative; $M = 3.80$, $SD = 1.75$), gender, age, income (Median = US$50K-US$75K), education, and ethnicity.

Results

Manipulation Check. As intended, participants perceived the distribution as significantly less equal in the *High Inequality condition* ($M = 1.70$, $SD = 1.25$) than the *Low Inequality condition* ($M = 3.73$, $SD = 1.16$), $t(385) = 16.63$, $p < .001$, $d = 1.69$.

Next, I examined whether inequality causally increased zero-sum beliefs. As predicted, a 2 (Inequality: High vs. Low) × 2 (Condition: Strong vs. Weak Zero-Sum) between-participants ANOVA revealed two main effects of distribution, $F(1,384) = 98.80$, $\eta^2_{\text{partial}} = 0.21$, $p < .001$, and of inequality, $F(1,384) = 14.37$, $\eta^2_{\text{partial}} = 0.04$, $p < .001$, but no interaction, $F(1,384) = 0.78$, $\eta^2_{\text{partial}} < 0.01$, $p = .378$. Unsurprisingly, zero-sum beliefs were higher in the *Strong Zero-sum conditions* (i.e., when the bonuses were strictly zero-sum; $M = 5.77$, $SD = 1.14$) than the *Weak Zero-sum conditions* ($M = 4.24$, $SD = 1.88$), $t(384) = 9.94$, $p < .001$, showing that participants were attuned to the actual process of resource allocation. More important, inequality causally increased zero-sum beliefs about the bonus allocation:

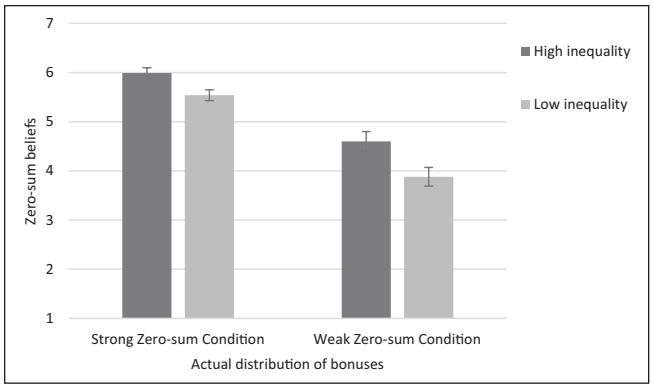


Figure 2. The Belief That Success is Zero-Sum as a Function of Inequality and Whether the Actual Distribution of Resources Was Zero-Sum (Left) or Not Strictly Zero-Sum (Right) (Study 2C).

Participants had higher zero-sum beliefs in the *High inequality conditions* ($M = 5.33$, $SD = 1.68$) than the *Low inequality conditions* ($M = 4.74$, $SD = 1.71$), $t(384) = 3.79$, $p < .001$. Thus, participants were more prone to believe that one employee gained at the other employee's expense when the disparity between them was high.

Finally, post hoc analyses revealed that regardless of the actual distribution, participants who saw unequal bonuses viewed it as more zero-sum: Participants in the *Strong Zero-sum condition* exhibited higher zero-sum beliefs when they saw an unequal distribution ($M = 5.99$, $SD = 1.13$) than a more equal distribution ($M = 5.54$, $SD = 1.12$), $t(384) = 2.11$, $p = .036$, $d = .296$. Similarly, although they read that the amount was not strictly zero-sum, participants in the *Weak Zero-sum* condition exhibited higher zero-sum beliefs when the distribution was highly unequal ($M = 4.60$, $SD = 1.88$) than relatively equal ($M = 3.88$, $SD = 1.81$), $t(384) = 3.23$, $p < .001$, $d = .475$. Finally, robustness checks found that these effects were exhibited even when controlling for ideology, income, gender, age, and ethnicity, $Fs(1,379) > 11.50$, $ps < .04$, and were not moderated by ideology nor income (Tables S16-S18). As shown in Figure 2, inequality increased zero-sum beliefs both when the distribution was strictly zero-sum and when additional resources could be theoretically accumulated.

Studies 3A and 3B

Studies 2A to 2C found that economic inequality causally increases the belief that success is zero-sum. Next, I used an experimental-causal-chain design (Spencer et al., 2005) to examine whether perceived competitiveness accounts for the effect of inequality on zero-sum beliefs. Specifically, in a sequence of two pre-registered studies (https://aspredicted.org/M65_8F8) that independently manipulate both the independent variable (economic inequality) and the proposed mediator (perceived competition), I examine whether economic inequality causally increases perceptions of competition (Study 3A) and, subsequently, whether perceived competition causally fosters zero-sum beliefs about success (Study 3B).[3]

Study 3A: The Causal Effect of Economic Inequality on Perceived Competition

Participants

U.S. residents were recruited from Amazon's Mechanical Turk (see Table 1 for demographics). A post hoc sensitivity power analysis examining achieved power revealed 80% power for detecting small effects ($d = 0.33$) in independent two-sample *t*-tests.

Materials and Procedure

Participants saw 20 employees' salaries and were randomly assigned to one of two conditions. In the *high inequality condition* ($n = 149$), the salaries varied between US$38,000 and US$350,000. In the *low inequality condition* ($n = 148$), the salaries varied between US$317,000 and US$350,000. Following a one-item manipulation check ("*To what extent would you think that the distribution of wages in this office is equal or unequal?*" 1—extremely equal, 7—extremely unequal), participants completed a five-item measure of perceived competition (adapted from Sommet et al., 2019): "In this company, it seems that people are competing with each other," "In this company, people seem to share the feeling that competing with each other is important," "In this company, people seem to value competition," "If I worked in this company, I would feel that I am competing with others," and "If I worked in this company, I would feel that I am being compared with others," (1—strongly disagree, 7—strongly agree; $\alpha = .95$). Finally, they reported their ideology (*1—very liberal, 7—very Conservative;* $M = 3.62$, $SD = 1.86$), gender, age, income (*Median = US$50K-US$75K*), education, and ethnicity.

Results

Manipulation Check. As intended, participants saw the wages as more unequal in the *high inequality* condition ($M = 5.28$, $SD = 1.50$) than the *low inequality* condition ($M = 4.19$, $SD = 1.48$), $t(295) = 6.33$, $p < .001$, $d = 0.74$.

Perceived Competition. Testing the first link in the experimental-causal-chain, I examined whether economic inequality *causally* fostered a view of the organization as highly competitive. Indeed, replicating past findings (Sommet & Elliot, 2023a), an independent two-sample *t*-test (inequality: high vs. low) found that participants expected more competition when the office had high pay disparity ($M = 5.15$, $SD =$

1.21) than low disparity ($M = 4.69$, $SD = 1.40$), $t(295) = 3.02$, $p = .003$, $d = 0.35$. A robustness check revealed that this effect of inequality on perceived competitiveness was exhibited even when controlling for ideology, income, education, gender, age, and ethnicity, $F(1,288) = 11.42$, $\eta^2 = 0.04$, $p < .001$ (Table S19). Thus, establishing the first link of the causal chain (Spencer et al., 2005), participants saw an office as more competitive when it had high, rather than low, inequality. That is, inequality cultivated a perception of the company as highly competitive.

Study 3B: The Causal Effect of Perceived Competition on Zero-Sum Beliefs

Supporting the first link in the experimental-casual-chain, Study 3A found that inequality increased an organization's perceived competitiveness. Study 3B tests the second link in the causal chain, examining whether perceived competitiveness increases zero-sum beliefs.

Participants

U.S. residents were recruited from Amazon's Mechanical Turk (see Table 1 for demographics). A post hoc sensitivity power analysis examining achieved power revealed 80% power for detecting small effects ($d = 0.32$) in independent two-sample *t*-tests.

Materials and Procedure

Participants were randomly assigned to one of two conditions that manipulated a company's perceived competitiveness. Importantly, since organizations are often seen as competitive by default (e.g., perceived competition in both conditions of Study 3A was above the midpoint), Study 3B focused on experimentally *reducing* perceptions of competition. Specifically, participants in the *low competition condition* ($n = 151$) read about an organization that was clearly non-competitive. Adapting materials from Sommet and Elliot (2023), participants read that "a recent poll of the company revealed that the employees report an average score of 1.23 out of 7 to the question 'Do you value competition?'" In addition, participants read several employees' quotes about the company's non-competitive climate (e.g., "*What I like about working here is that it seems like people never compete with each other*"). Participants in the *control condition* ($n = 150$) read information that was unrelated to competitiveness, stating that "a recent poll of the company revealed that the employees report an average score of 6.23 out of 7 to the question 'How much do you value your customers?,'" including employees' quotes about customer relations (e.g., "*What I like about working here is that I get to hear what customers really care about*"). As a manipulation check, participants completed the five-item measure of perceived competitiveness from Study 3A, indicating how much they viewed the environment in the company as competitive ($\alpha = .96$).

Next, participants indicated the extent to which they view success in this company as zero-sum on a four-item measure (e.g., *"When some workers in this company make economic gains, others lose out economically";* strongly disagree, 7—strongly agree; $\alpha = .96$; Appendix B). Finally, participants reported their ideology (*1—very liberal, 7—very conservative; M* = 3.52, *SD* = 1.92), gender, age, income (*Median= US$50K-US$75K*), education, and ethnicity.

Results

Manipulation Check. As intended, participants perceived the company as significantly less competitive in the *low competition* condition ($M = 2.15$, $SD = 1.49$) than the *control* condition ($M = 3.34$, $SD = 1.48$), $t(299) = 6.93$, $p < .001$, $d = 0.80$.

Zero-Sum Beliefs. Testing the second link in the causal chain, I examined whether perceived competition causally increased zero-sum beliefs about success. As predicted, an independent two-sample *t*-test (competition: low vs. control) revealed that participants were less prone to zero-sum beliefs when they read information about a non-competitive organization ($M = 2.63$, $SD = 1.51$) than information that was unrelated to an organization's competitive climate ($M = 3.04$, $SD = 1.44$), $t(299) = 2.37$, $p = .018$, $d = 0.27$. A robustness check revealed that the effect of perceived competition on zero-sum beliefs was exhibited even when controlling for ideology, income, education, gender, age, and ethnicity, $F(1,293) = 5.07$, $\eta^2 = 0.017$, $p = .025$ (Table S20). Thus, fostering perceptions of the company as non-competitive reduced zero-sum beliefs about it.

Studies 4A and 4B

An experimental-causal-chain design (Spencer et al., 2005) found that inequality increases perceived competitiveness (Study 3A) which then fosters zero-sum beliefs (Study 3B). I next examine the effect of perceived inequality on zero-sum beliefs by manipulating participants' perceptions of the actual level of economic inequality in the United States. In addition, as noted in the "Introduction" section, I explore the potential consequences of zero-sum beliefs, examining whether they account for the effect of inequality on just-world beliefs (Lerner, 1980), perceived mobility (Davidai & Gilovich, 2015), wealth-based categorization (Jetten et al., 2017), attributions of economic outcomes (Davidai, 2022), and perceived constraints (Lachman & Weaver, 1998).

Study 4A

Methods

Participants. U.S. residents were recruited from Amazon's Mechanical Turk (see Table 1 for demographics). A post hoc sensitivity power analysis examining achieved power revealed 80% power for detecting small effects ($d = 0.21$) in independent two-sample *t*-tests.

Materials and Procedure. Participants were randomly assigned to read one of two articles. In the *economic inequality condition* ($n = 356$), the article discussed pay disparities between CEOs and median employees at their firms. In the *control condition* ($n = 356$), the article was unrelated to inequality (i.e., about the popularity of print books relative to e-books and audio books). To guarantee attention, participants summarized each article's main point and their reactions to it. Following, participants completed the seven-item measure of zero-sum beliefs from Studies 1B and 1C.

To explore the potential consequences of zero-sum beliefs, participants completed the seven-item Belief in Just World Scale (Lipkus, 1991; $\alpha = .92$), a one-item measure of wealth-based categorization (adapted from Aron et al., 1992 seven pairs of increasingly overlapping circles depicting the similarity between the richest and poorest Americans, asking participants to indicate "which of these circles best represent how similar very rich people are to people who don't have a lot of money?" *1—The rich and the poor are extremely different from each other; 7—The rich and the poor are extremely similar to each other*), a one-item measure of attributions of economic outcomes (Shariff et al., 2016), the six-item Perceived Economic Mobility Scale (Day & Fiske, 2017) and the eight-item Perceived Constraints subscale of the Sense of Control Scale (Lachman & Weaver, 1998) (1—strongly agree, 7—strongly disagree; see Table S27 for intercorrelations). Finally, participants reported their ideology (*1—very liberal, 7—very conservative;* $M = 3.70$, $SD = 1.77$), gender, age, income (*Median = US$50K-US$75K*), and ethnicity.

Results

As predicted, an independent two-sample *t*-test (inequality: high vs. low) found that perceived economic inequality increased the belief that success is zero-sum. Participants who read about the vast disparity between CEOs and their workers exhibited higher zero-sum beliefs ($M = 5.02$, $SD = 1.45$) than those who did not read about it ($M = 4.58$, $SD = 1.41$), $t(710) = 4.16$, $p < .001$, 95% CI = [.24, .66], $d = 0.31$. Importantly, a multiple regression analysis found that the effect of perceived inequality on zero-sum beliefs was exhibited even when controlling for ideology, income, gender, age, and ethnicity, $\beta = 0.22$, 95% CI = [.13, .31], $t(701) = 4.65$, $p < .001$; Table S21, and was not moderated by ideology nor income (Tables S22 and S23). Thus, learning about the high level of inequality in the United States fostered zero-sum beliefs about success.

I next examined how inequality affected each of the potential outcomes (for bivariate correlations, see Table 4). Using a Bonferroni-corrected threshold of $p = .01$, participants saw "the rich" and "the poor" as significantly different groups, $M_{inequality} = 2.48$, $SD = 1.45$; $M_{control} = 2.76$, $SD = 1.38$; 95% CI = [.07, .49], $d = 0.198$, $t(710) = 2.64$, $p = .008$, and the world as marginally less just, $M_{inequality} = 3.43$, $SD = 1.20$; $M_{control} = 3.65$, $SD = 1.16$; 95% CI = [.05, .39], $d = 0.186$, $t(710) = 2.49$, $p = .013$, in the *economic inequality condition*. There were no differences in perceived mobility, $M_{inequality} = 3.45$, $SD = 1.19$, $M_{control} = 3.60$, $SD = 1.14$; 95% CI = [−.02, .32], $d = 0.126$, $t(710) = 1.68$, $p = .093$, perceived constraints, $M_{inequality} = 3.35$, $SD = 1.34$, $M_{control} = 3.38$, $SD = 1.33$; 95% CI = [−.17, .23], $d = 0.023$, $t(710) = 0.31$, $p = .76$, or attributions of success, $M_{inequality} = 50.39$, $SD = 25.70$, $M_{control} = 54.02$, $SD = 24.50$; 95% CI = [−.07, 7.32], $d = 0.144$, $t(709) = 1.92$, $p = .055$. Thus, perceived economic inequality fostered a view of the world as unjust, where the rich are different from the poor.

Exploratory Analyses. Finally, bootstrap analyses found significant mediation via zero-sum beliefs on just-world beliefs (Indirect: $\beta = -.180$, 95% CI = [−.268, −.092]; Direct: $\beta = -.039$, 95% CI = [−.191, .113]) and wealth-based categorization (Indirect: $\beta = -.145$, 95% CI = [−.220, −.070]; Direct: $\beta = -.136$, 95% CI = [−.335, .063]) (Figure S1 in the Supplementary Materials). Alternative models with each measure as a mediator and zero-sum beliefs as the outcome found significant *direct* effects (Just-world beliefs: $\beta = .315$, 95% CI = [.132, .499]; wealth-based categorization: $\beta = .353$, 95% CI = [.154, .552]), suggesting a lesser fit (*cf.* Thoemmes, 2015). Thus, inequality fostered zero-sum beliefs which then predicted a view of the world as unjust and of "the rich" as different from "the poor."

Study 4B

To manipulate perceptions of economic inequality without invoking interpersonal relationships between CEOs and their workers (which may activate zero-sum schemas about social relations; Różycka-Tran et al., 2015), and to include information about inequality in both conditions, participants in Study 4B read about inequality in the United States relative to more equal or unequal countries. In addition, since perceived economic inequality in Study 4A did not affect perceived constraints, attributions of success, or perceived mobility, Study 4B focused on its effect on just-world beliefs and wealth-based categorization.

Table 4. Bivariate Correlations Between Potential Outcomes of Economic Inequality (Study 4A).

Construct	BJW	WBC	AEO	PEM	PC
BJW	–				
WBC	0.199**	–			
AEO	0.642**	0.222**	–		
PEM	0.563**	0.259**	0.648**	–	
PC	−0.332**	−0.118*	−0.368**	−0.381**	–

Note. BJW = belief in a just world; WBC = wealth-based categorization; AEO = attribution of economic outcomes; PEM = perceived economic mobility; PC = perceived constraints.
*$p < .01$. **$p < .001$.

Methods

Participants. U.S. residents were recruited from Amazon's Mechanical Turk (see Table 1 for demographics). A post hoc sensitivity power analysis examining achieved power revealed 80% power for detecting small effects ($d = 0.25$) in independent, two-sample *t*-tests.

Materials and Procedure. Participants were randomly assigned to read one of two articles. In the *inequality condition* ($n = 247$), the article discussed inequality in the United States relative to more equal countries such as Canada or South Korea. In the *equality condition* ($n = 246$), the article discussed inequality in the United States relative to more unequal countries such as Brazil or Singapore. To ensure their attention, participants summarized the article's main point and their reactions to it. Next, they completed the seven-item measure of zero-sum beliefs from Study 4A ($\alpha = .95$) and, in counterbalanced order, the wealth-based categorization measure and the seven-item Belief in Just World Scale (Lipkus, 1991). Finally, participants reported their gender, age, income (*Median = US$50K-US$75K*), ethnicity, ideology (*1—very liberal, 7—very conservative; M* = 3.30, *SD* = 1.73), and political affiliation (22% Republican, 49% Democrat, 29% Independent).

Results

As before, an independent two-sample *t*-test (inequality: high vs. low) found that perceived economic inequality fostered zero-sum beliefs about success: Participants exhibited significantly higher zero-sum beliefs in the *inequality condition* ($M = 4.94$, $SD = 1.52$) than the *equality condition* ($M = 4.46$, $SD = 1.57$), $t(491) = 3.46$, $p < .001$; 95% CI = [.21, .76], $d = 0.31$). Importantly, perceived inequality increased zero-sum beliefs beyond ideology, income, gender, age, and ethnicity, $\beta = 0.13$, 95% CI = [.02, .24], $t(492) = 2.26$, $p = .024$, and its effect was not moderated by ideology nor income (Tables S24-S26).

In addition, using a Bonferroni-corrected threshold of $p = .025$, I found that participants viewed the world as less just in the *inequality condition* ($M = 3.42$, $SD = 1.50$) than the *equality condition* ($M = 3.72$, $SD = 1.43$), 95% CI = [.04, .56], $d = 0.24$, $t(491) = 2.29$, $p = .023$. Although they also saw the rich and the poor as more distinct in the *inequality condition* ($M = 2.43$, $SD = 1.22$) than the *equality condition* ($M = 2.57$, $SD = 1.30$), this was not significant, 95% CI = [−.09, .36], $d = 0.11$, $t(491) = 1.20$, $p = .231$. Thus, inequality fostered a view of society as unjust but not necessarily as one where the rich differ from the poor.

Exploratory Analyses. Finally, a bootstrap analysis examined whether the effect of perceived inequality on just-world beliefs was due to a view of success as zero-sum. This analysis revealed a significant indirect effect on just-world beliefs through zero-sum beliefs, $\beta = -0.294$, 95% CI = [−.463, −.125] and an insignificant direct effect, $\beta = -0.008$, 95% CI = [−.207, .192]. In contrast, an alternative model with just-world beliefs as the mediator and zero-sum beliefs as the outcome found a significant direct effect ($\beta = 0.277$, 95% CI = [.067, .486]), suggesting that the zero-sum beliefs are more likely to predict just-world beliefs than vice-versa.

General Discussion

Across 10 studies, perceived economic inequality fostered a belief that success is zero-sum, and this was true even when controlling for the effects of income, education, ideology, social dominance orientation, interpersonal trust, and other demographics. Moreover, a series of exploratory analyses found that zero-sum beliefs mediated the effect of inequality on just-world beliefs, although caution should obviously be taken when interpreting statistical mediation. Thus, as economic inequality rises, people increasingly view success as zero-sum and, as a result, believe that the world is unjust. Consequently, the belief that the rich gain at the expense of the poor helps explain why perceived inequality fosters a view of the world as unjust.

Although perceived economic inequality increased zero-sum beliefs, participants' income inhibited them. Accordingly, while wealthier people might not view their own success as zero-sum, inequality may still lead them to view *others' success* as such. Indeed, although people often see others' gains as zero-sum, they rarely view their own gains as such (Roberts & Davidai, 2022). And, since inequality increases social comparisons (Cheung & Lucas, 2016), it may lead people to view others (but not themselves) as benefiting at less-fortunate others' expense. Just as people believe that they haven't personally benefited from their group's privilege (Phillips & Lowery, 2020), it is possible that inequality similarly affects their views of *others,'* but not their own,

success, seeing others' success as zero-sum while insisting that their own success is not so.

Wealth-Based Categorization as a Potential Outcome of Zero-Sum Beliefs

Although *exploratory* analyses found that zero-sum beliefs mediated the effect of perceived inequality on just-world beliefs, the effect on wealth-based categorization was less pronounced, with inequality increasing a view of "the rich" as different from "the poor" through zero-sum beliefs in Study 4A but not Study 4B. What explains these mixed findings?

First, unlike Study 4B, participants in Study 4A read an article that explicitly highlighted the existence of inequality between specific individuals (i.e., CEOs and their employees) rather than as a country-level feature. As a result, highlighting the interpersonal nature of economic inequality may have made wealth a more salient cue for categorization. Accordingly, people may only view the rich as different from the poor when thinking about inequality in interpersonal terms, which facilitates zero-sum beliefs about success. Second, the belief in social mobility may foster a view of economic disparities as reflecting superficial differences in circumstances, not deep-rooted differences between economic classes. Echoing Hemingway's quip that the only thing separating the rich from the poor is how much money they have, people may believe that deep-down we are all the same regardless of our economic circumstances (Kluegel & Smith, 2017). Thus, while zero-sum beliefs consistently predicted wealth-based categorization in both studies, the effect of inequality was less consistent.

Potential Limitations

Of course, despite the multimethod approach, each specific study has its advantages and disadvantages. Beyond the obvious benefit of using different measures of perceived inequality and zero-sum beliefs in Studies 1A to 1C, each measure has its specific limitations (e.g., focusing only on personal exposure to inequality vs. general perceptions of societal inequality). Similarly, while Studies 2A and 2C allowed for experimental control, they involved hypothetical scenarios, an issue that was resolved in Studies 4A and 4B where participants read information about *actual* inequality in the United States. And, while focusing on CEO compensation in Study 4A may have primed the concept of interpersonal relations, this concern was ruled-out in Study 4B which focused on inequality in the United States as a whole. Thus, despite their specific limitations, together these studies paint a clear picture of how inequality fosters zero-sum beliefs about success.

Another factor to consider involves a potential asymmetry in zero-sum beliefs about economic resources. Although zero-sum situations are, by definition, symmetrical (i.e., each party gains or loses at other parties' expense), people do not always see them as such. Rather, because people often exhibit zero-sum beliefs under threat, they tend to see others' gains as coming at their (or their party's) expense but not vice-versa (Roberts & Davidai, 2022). Similarly, when it comes to economic resources, people are more prone to view wealthy individuals as gaining at the expense of less-fortunate others than vice-versa (Ongis & Davidai, 2022; Smithson & Shou, 2016). Accordingly, since people hold asymmetric zero-sum beliefs about economic resources, and given that such beliefs shape attitudes about inequality (Davidai & Tepper, 2023), the current work specifically focused on the belief that "the rich" gain at the expense of "the poor." Consequently, it is unclear whether and how economic gaps affect the alternative belief: that "the poor" succeed at the expense of wealthier others. Thus, while Studies 2A to 2C found that inequality increases zero-sum beliefs *in general* about organizational success (i.e., without explicitly referring to rich or poor employees), it remains an open question whether it also fosters a belief that "the rich" need to lose for "the poor" to gain.

It is important to note that while income and education did not moderate the effect of inequality on zero-sum beliefs, the samples did not include extremely wealthy participants. Similarly, the fact that this effect was not moderated by political ideology does not mean that ideology does not affect zero-sum beliefs but rather that it does so independently from inequality. Thus, although null findings should be cautiously interpreted, the absence of moderation by income, education, or political ideology throughout all studies is notable.

Although inequality consistently increased zero-sum beliefs, future research should also examine the reverse causal pathway. For instance, zero-sum beliefs may increase awareness of economic gaps in society and, as a result, heighten perceptions of inequality. Thus, perceived inequality may both affect and be affected by zero-sum beliefs, with inequality fostering a belief that success is zero-sum which consequently leads people to see even higher levels of inequality.

Finally, there is reason to believe that the effect of perceived inequality on zero-sum beliefs will generalize beyond the U.S. context. Indeed, concerns about resource distribution and zero-sum beliefs are rooted in our evolutionary past (Boyer & Petersen, 2018) and their relationship is likely to traverse cultural boundaries. At the same time, zero-sum beliefs vary around the world and cultural factors may moderate the effect of inequality on them. Thus, future research could examine how perceived inequality affects zero-sum beliefs across cultures.

Theoretical Contribution and Future Directions

In examining the cognitive and behavioral consequences of economic inequality, research has focused on two seemingly distinct processes: interpersonal trust (i.e., trust in

other people) and status anxiety (i.e., concern about "falling behind") (Buttrick & Oishi, 2017; Wilkinson & Pickett, 2017). Building on past research, the current work suggests that these two processes may be linked by an underlying belief that success is zero-sum. Since inequality fosters zero-sum beliefs about success, and since zero-sum beliefs increase concerns about status loss (Chernyak-Hai & Davidai, 2022) and about others' aggression (Andrews-Fearon & Davidai, 2023), it is not surprising that economic inequality fosters both status anxiety and a general lack of trust. As such, zero-sum beliefs may be the "building blocks" that underly the impact of economic inequality. Moreover, since zero-sum beliefs involve views of gains and losses, the current findings contribute to our understanding of how people make sense of wealth and poverty (e.g., Davidai, 2022). That is, beyond studying attributions of wealth (e.g., whether people believe that "the rich" succeed due to their own merit), this work suggests that researchers ought to consider *judgments of the relationship* between wealth and poverty (e.g., whether people believe that "the rich" gain at the expense of "the poor"). Thus, by pointing to the potentially critical role of zero-sum beliefs, this research advances our understanding of the psychology of inequality.

The current work also contributes to the literature on how perceptions of macroeconomic factors shape lay beliefs about society (Sirola, 2019). For instance, since zero-sum beliefs are common among people who live in less developed countries or who think their country is facing an economic downturn (Różycka-Tran et al., 2015; Sirola & Pitesa, 2017), such beliefs may be especially pronounced during economically volatile times when inequality is high and growth is low. And, since such periods often elicit intergroup hostility, understanding how macroeconomic forces shape economic beliefs is imperative.

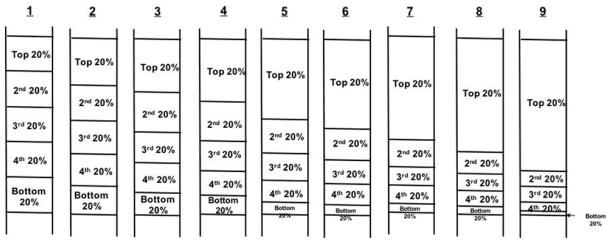
At the same time, zero-sum beliefs may also have some *positive* implications. Since perceived inequality fosters a view of "the rich" as gaining at others' expense, it may bolster support for disparity-mitigating policies. Indeed, drawing on research in anthropology, it has been argued that zero-sum beliefs help societies keep inequality at check by enforcing strict egalitarian norms and deterring people from accumulating too much capital (Sarti, 2022). For instance, a survey of over 14,000 people found that zero-sum beliefs predict support for redistribution of economic resources (Chinoy et al., 2023). Similarly, in an analysis of more than 90,000 people from 60 countries (see Study S1 for description of materials, analyses, and results), I found that zero-sum beliefs significantly predict the desire for lower inequality in 43 countries and that this is true even when controlling, in each country, for ideology (Figure S2, and Tables S29-S30 in the Supplementary Materials). Moreover, a cross-country comparison found that country-level zero-sum beliefs predict the desire for more egalitarian distribution (Figure S3 and Table S31). The higher the belief that success is zero-sum, the lower inequality people desire, suggesting that the negative effects of such beliefs might be offset by longer-term positive changes in attitudes about inequality.

These findings may similarly contribute to understanding how inequality affects zero-sum beliefs in non-economic domains (e.g., between racial groups). Just as economic inequality fosters a belief that some people gain at others' expense, future research could examine whether *social* inequality fosters a belief that some groups gain at other groups' expense. At the same time, interpersonal inequalities differ from inter*group* inequalities, and their effect on zero-sum beliefs may depend on the context in which they occur (e.g., whether they relate to beliefs about "the rich" and "the poor" or about different social groups; Davidai & Tepper, 2023). Thus, since various personality and situational factors tend to affect economic and non-economic zero-sum beliefs differently (e.g., social dominance orientation negatively predicts economic zero-sum beliefs but *positively* predicts non-economic beliefs), examining the effect of inequality on the latter may be especially fruitful. By doing so, researchers may reach a more comprehensive understanding of the consequences of zero-sum beliefs, with economic beliefs increasing concerns about inequality and non-economic beliefs potentially reducing such concerns.

Finally, these findings make a descriptive claim about the effect of inequality on zero-sum beliefs, not a normative claim about the accuracy of such beliefs. I examined whether people view unequal resource distributions as zero-sum, not whether they *ought* to do so. In fact, many instances of inequality may in fact be zero-sum and viewing inequality as such may not be inherently incorrect. Since the process of resource distribution (i.e., whether it is zero-sum) is independent from its outcome (i.e., whether it is unequal), the effect of inequality on zero-sum beliefs is neither "accurate" nor "inaccurate." And, since even non-zero-sum situations can involve some zero-sum aspects, the effect of inequality on zero-sum beliefs may sometimes be justified. Thus, while economic inequality may not be zero-sum in the narrowest sense of the term (i.e., rising inequality typically involves *some* economic growth), it is understandable why it promotes zero-sum beliefs, such as when workers see CEO soaring compensation as coming at their expense. Regardless of their veracity, zero-sum beliefs may therefore reflect a broader truth about people's *experience* of inequality. Yet, normative claims notwithstanding, one thing remains clear: As economic inequality rises, people increasingly believe that "the haves" accrue their wealth at "the have nots" expense, viewing "the spoils of the rich" as gained at the expense of "the poor."

Appendix A (Perceived Economic Inequality, Study 1A)

Below are images of nine different ladders depicting the distribution of wealth among the different quintiles. In your opinion, which image best represents the distribution of wealth in the United States?



Appendix B (Zero-Sum Beliefs)

Study 1A

To what extent do you agree or disagree with each of the following statements?

1. The profits people from the top 20% make often leave people from the bottom 20% in a worse position than they previously were.
2. The economic success of people from the top 20% often comes at the expense of people from the bottom 20%.
3. The financial and political interests of people from the top 20% are typically opposed to the interests of people from the bottom 20%.
4. Tax policies that benefit people in the top 20% often hurt people from the bottom 20%.
5. The more money that people from the top 20% have, the worse off people from the bottom 20% become.

Studies 1B, 1C, 3, and 4

To what extent do you agree or disagree with each of the following statements?

1. If someone gets richer, it means that somebody else gets poorer.
2. When some people are getting poorer, it means that other people are getting richer.
3. The wealth of a few is acquired at the expense of many.
4. When the number of rich people increases in the country, the poorer people benefit as well (*reverse-coded*).
5. The economic success of rich people often comes at the expense of people who don't have a lot of money.
6. The financial and political interests of people who have a lot of money are typically opposed to the interests of people who don't have a lot of money.
7. The more money that very rich people have, the worse off people who don't have a lot of money become.

Studies 2A and 2B

Think about what it is like to work in this company. To what extent do you agree or disagree with the following statements?

1. When some workers in this company make economic gains, others lose out economically.
2. People who want to get ahead economically in this company must do so at the expense of others.
3. The more employees this company employs, the harder it is for existing employees to advance.
4. More good jobs for some employees in this company means fewer good jobs for other employees.
5. Not everyone in this company can be wealthy.
6. For every rich employee in this company, there is usually an employee experiencing financial hardship.

Study 3B

1. When some workers in this company make economic gains, others lose out economically.
2. In this company, some workers' gains are other workers' losses.
3. People who want to get ahead economically in this company must do so at the expense of others.
4. In this company, the gains made by some workers leave other workers in a worse position than they previously were.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Shai Davidai https://orcid.org/0000-0002-2603-2217

Open Practices

Materials and data are available on the Open Science Framework: https://osf.io/96xh4/?view_only=9902e1f4e3ad4377ba8e704e72a4eff4.

Supplemental Material

Supplemental material is available online with this article.

Notes

1. Examining each item separately revealed similar results (Fs > 7.00, ps $< .001$). Each item was rated higher in the *high*

inequality condition than the *low inequality/high income condition* ($ts > 3.57$, $ps < .001$) and the *low inequality/low income condition* ($ts > 2.58$, $ps < .013$), which did not differ from each other ($ts < 1.15$, $ps > .480$).
2. Examining each item separately was significant for five items ($Fs > 3.90$, $ps < .05$) and marginal for one item, *The more employees this company employs, the harder it is for existing employees to advance;* $F(1,288) = 3.63$, $p=.058$.
3. For a similar approach, see Sommet & Elliot (2023b).

References

Andrews-Fearon, P., & Davidai, S. (2023). Is status a zero-sum game? Zero-sum beliefs increase people's preference for dominance but not prestige. *Journal of Experimental Psychology: General*, *152*(2), 389–409.

Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*(4), 596–612. https://doi.org/10.1037/0022-3514.63.4.596

Baryla, W., Wojciszke, B., & Cichocka, A. (2015). Legitimization and delegitimization of social hierarchy. *Social Psychological and Personality Science*, *6*(6), 669–676. https://doi.org/10.1177/1948550615576211

Boyer, P., & Petersen, M. B. (2018). Folk-economic beliefs: An evolutionary cognitive model. *Behavioral and Brain Sciences*, *41*, Article e158. https://doi.org/10.1017/S0140525X17001960

Buttrick, N. R., & Oishi, S. (2017). The psychological consequences of income inequality. *Social and Personality Psychology Compass*, *11*(3), 1–12. https://doi.org/10.1111/spc3.12304

Chernyak-Hai, L., & Davidai, S. (2022). "Don't teach them how to fish": The effect of zero-sum beliefs on help-giving. *Journal of Experimental Psychology: General*, *151*(10), 2466–2480. https://doi.org/10.1037/xge0001196

Cheung, F., & Lucas, R. E. (2016). Income inequality is associated with stronger social comparison effects: The effect of relative income on life satisfaction. *Journal of Personality and Social Psychology*, *110*(2), 332–341. https://doi.org/10.1037/pspp0000059

Chinoy, S., Nunn, N., Sequeira, S., & Stantcheva, S. (2023). *Zero-sum thinking and the roots of U.S. political divides*. https://scholar.harvard.edu/files/stantcheva/files/zero_sum_political_divides.pdf

Connor, P., Varney, J., Keltner, D., & Chen, S. (2021). Social class competence stereotypes are amplified by socially signaled economic inequality. *Personality and Social Psychology Bulletin*, *47*(1), 89–105. https://doi.org/10.1177/0146167220916640

Côté, S., Kraus, M. W., Carpenter, N. C., Piff, P. K., Beermann, U., & Keltner, D. (2017). Social affiliation in same-class and cross-class interactions. *Journal of Experimental Psychology: General*, *146*(2), 269–285. https://doi.org/10.1037/xge0000258

Davidai, S. (2018). Why do Americans believe in economic mobility? Economic inequality, external attributions of wealth and poverty, and the belief in economic mobility. *Journal of Experimental Social Psychology*, *79*, 138–148. https://doi.org/10.1016/j.jesp.2018.07.012

Davidai, S. (2022). How do people make sense of wealth and poverty? *Current Opinion in Psychology*, *43*, 42–47. https://doi.org/10.1016/j.copsyc.2021.06.010

Davidai, S., & Gilovich, T. (2015). Building a more mobile America—One income quintile at a time. *Perspectives on Psychological Science*, *10*(1), 60–71. https://doi.org/10.1177/1745691614562005

Davidai, S., & Ongis, M. (2019). The politics of zero-sum thinking: The relationship between political ideology and the belief that life is a zero-sum game. *Science Advances*, *5*(12), Article eaay3761. https://doi.org/10.1126/sciadv.aay3761

Davidai, S., & Tepper, S. J. (2023). The psychology of zero-sum beliefs. *Nature Reviews Psychology*, *2*(8), 472–482. https://doi.org/10.1038/s44159-023-00194-9

Davidai, S., & Wienk, M. N. A. (2021). The psychology of lay perceptions in economic mobility. *Social and Personality Psychology Compass*, *15*(8), Article e12625. https://doi.org/10.1111/spc3.12625

Day, M. V., & Fiske, S. T. (2017). Movin'on up? How perceptions of social mobility affect our willingness to defend the system. *Social Psychological and Personality Science*, *8*(3), 267–274. https://doi.org/10.1177/1948550616678454

García-Castro, J. D., Willis, G. B., & Rodríguez-Bailón, R. (2019). I know people who can and who cannot: A measure of the perception of economic inequality in everyday life. *Social Science Journal*, *56*(4), 599–608. https://doi.org/10.1016/j.soscij.2018.09.008

Halevy, N., Chou, E. Y., & Murnighan, J. K. (2012). Mind games: The mental representation of conflict. *Journal of Personality and Social Psychology*, *102*(1), 132–148. https://doi.org/10.1037/a0025389

Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E., Foels, R., & Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and measuring preferences for intergroup inequality using the new SDO□ scale. *Journal of Personality and Social Psychology*, *109*(6), 1003–1028. https://doi.org/10.1037/pspi0000033

Jachimowicz, J. M., Davidai, S., Goya-Tocchetto, D., Szaszi, B., Day, M. V., Tepper, S. J., Phillips, L. T., Mirza, M. U., Ordabayeva, N., & Hauser, O. P. (2022). Inequality in researchers' minds: Four guiding questions for studying subjective perceptions of economic inequality. *Journal of Economic Surveys*. Advance online publication. https://doi.org/10.1111/joes.12507

Jackson, J. C., & Payne, K. (2021). Cognitive barriers to reducing income inequality. *Social Psychological and Personality Science*, *12*(5), 687–696. https://doi.org/10.1177/1948550620934597

Jetten, J., Peters, K., Álvarez, B., Casara, B. G. S., Dare, M., Kirkland, K., Sánchez-Rodríguez, Á., Selvanathan, H. P., Sprong, S., Tanjitpiyanond, P., Wang, Z., & Mols, F. (2021). Consequences of economic inequality for societies' social and political vitality: A social identity analysis. *Political Psychology*, *42*(S1), 241–266. https://doi.org/10.1111/pops.12800

Jetten, J., Wang, Z., Steffens, N. K., Mols, F., Peters, K., & Verkuyten, M. (2017). A social identity analysis of responses to economic inequality. *Current Opinion in Psychology*, *18*, 1–5. https://doi.org/10.1016/j.copsyc.2017.05.011

Johnson, S. G. B., Zhang, J., & Keil, F. C. (2022). Win-win denial: The psychological underpinnings of zero-sum thinking. *Journal of Experimental Psychology: General*, *151*(2), 455–474. https://doi.org/10.1037/xge0001083

Kakkar, H., & Sivanathan, N. (2022). The impact of leader dominance on employees' zero-sum mindset and helping behavior.

Journal of Applied Psychology, *107*(10), 1706–1724. https://doi.org/10.1037/apl0000980

Kluegel, J. R., & Smith, E. R. (2017). *Beliefs about inequality: Americans' views of what is and what ought to be*. Routledge.

Lachman, M. E., & Weaver, S. L. (1998). The sense of control as a moderator of social class differences in health and well-being. *Journal of Personality and Social Psychology*, *74*(3), 763–773. https://doi.org/10.1037//0022-3514.74.3.763

Lerner, M. J. (1980). The belief in a just world. In M. J. Lerner (Eds.), *The belief in a just world* (pp. 9–30). Springer.

Lipkus, I. (1991). The construction and preliminary validation of a global belief in a just world scale and the exploratory analysis of the multidimensional belief in a just world scale. *Personality and Individual Differences*, *12*(11), 1171–1178. https://doi.org/10.1016/0191-8869(91)90081-L

Markovits, D. (2019). *The meritocracy trap*. Penguin Books.

Meegan, D. V. (2010). Zero-sum bias: Perceived competition despite unlimited resources. *Frontiers in Psychology*, *1*, Article 191. https://doi.org/10.3389/fpsyg.2010.00191

Ongis, M., & Davidai, S. (2022). Personal relative deprivation and the belief that wealth is zero-sum. *Journal of Experimental Psychology: General*, *151*(7), 1666–1680.

Parker, G., & Payne, S. (2019, October 31). Jeremy Corbyn sets campaign tone by targeting rich individuals. *Financial Times*. https://www.ft.com/content/9119c74e-fb4e-11e9-98fd-4d6c20050229

Peters, K., Jetten, J., Tanjitpiyanond, P., Wang, Z., Mols, F., & Verkuyten, M. (2022). The language of inequality: Evidence economic inequality increases wealth category salience. *Personality and Social Psychology Bulletin*, *48*(8), Article 01461672. https://doi.org/10.1177/01461672211036627

Phillips, L. T., & Lowery, B. S. (2020). I ain't no fortunate one: On the motivated denial of class privilege. *Journal of Personality and Social Psychology*, *119*(6), 1403–1422. https://doi.org/10.1037/pspi0000240

Piketty, T., & Saez, E. (2014). Inequality in the long run. *Science*, *344*(6186), 838–843. https://doi.org/10.1126/science.1251936

Roberts, R., & Davidai, S. (2022). The psychology of asymmetric zero-sum beliefs. *Journal of Personality and Social Psychology*, *123*(3), 559–575. https://doi.org/10.1037/pspi0000378

Różycka-Tran, J., Boski, P., & Wojciszke, B. (2015). Belief in a zero-sum game as a social axiom: A 37-nation study. *Journal of Cross-cultural Psychology*, *46*(4), 525–548. https://doi.org/10.1177/0022022115572226

Sánchez-Rodríguez, Á., Willis, G. B., & Rodríguez-Bailón, R. (2019). Economic and social distance: Perceived income inequality negatively predicts an interdependent self-construal. *International Journal of Psychology*, *54*(1), 117–125. https://doi.org/10.1002/ijop.12437

Sánchez-Rodríguez, Á., Rodríguez-Bailón, R., & Willis, G. B. (2022). Economic inequality affects perceived normative values. *Group Processes & Intergroup Relations*, *25*(1), 211–226. https://doi.org/10.1177/1368430220968141

Sánchez-Rodríguez, Á., Rodríguez-Bailón, R., & Willis, G. B. (2023). The economic inequality as normative information model (EINIM). *European Review of Social Psychology*, 1–41.

Sarti, S. (2022). *The belief in a zero-sum game and the origins of inequality: A theory of the earliest institutional change*. https://ssrn.com/abstract=4181862

Schmalor, A., & Heine, S. J. (2022). The construct of subjective economic inequality. *Social Psychological and Personality Science*, *13*(1), 210–219. https://doi.org/10.1177/1948550621996867

Shariff, A. F., Wiwad, D., & Aknin, L. B. (2016). Income mobility breeds tolerance for income inequality: Cross-national and experimental evidence. *Perspectives on Psychological Science*, *11*(3), 373–380. https://doi.org/10.1177/1745691616635596

Sirola, N. (2019). Economic cycles as a source of social influence on individuals. *Social and Personality Psychology Compass*, *13*(5), Article e12452. https://doi.org/10.1111/spc3.12452

Sirola, N., & Pitesa, M. (2017). Economic downturns undermine workplace helping by promoting a zero-sum construal of success. *Academy of Management Journal*, *60*(4), 1339–1359. https://doi.org/10.5465/amj.2015.0804

Smithson, M., & Shou, Y. (2016). Asymmetries in responses to attitude statements: The example of "zero-sum" beliefs. *Frontiers in Psychology*, *7*, Article 984. https://doi.org/10.3389/fpsyg.2016.00984

Smithson, M., Sopeña, A., & Platow, M. J. (2015). When is group membership zero-sum? Effects of ethnicity, threat, and social identity on dual national identity. *PLOS ONE*, *10*(6), Article e0130539. https://doi.org/10.1371/journal.pone.0130539

Sommet, N., & Elliot, A. J. (2023a). A competitiveness-based theoretical framework on the psychology of income inequality. *Current Directions in Psychological Science*, *32*(4), 318–327. https://doi.org/10.1177/09637214231159563

Sommet, N., & Elliot, A. J. (2023b). Opposing effects of income inequality on health: The role of perceived competitiveness and avoidance/approach motivation. *European Journal of Social Psychology*, *53*(1), 61–77. https://doi.org/10.1002/ejsp.2884

Sommet, N., Elliot, A. J., Jamieson, J. P., & Butera, F. (2019). Income inequality, perceived competitiveness, and approach-avoidance motivation. *Journal of Personality*, *87*(4), 767–784. https://doi.org/10.1111/jopy.12432

Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, *89*(6), 845.

Sprong, S., Jetten, J., Wang, Z., Peters, K., Mols, F., Verkuyten, M., Bastian, B., Ariyanto, A., Autin, F., Ayub, N., Badea, C., Besta, T., Butera, F., Costa-Lopes, R., Cui, L., Fantini, C., Finchilescu, G., Gaertner, L., Gollwitzer, M., . . . Wohl, M. J. A. (2019). "Our country needs a strong leader right now": Economic inequality enhances the wish for a strong leader. *Psychological Science*, *30*(11), 1625–1637. https://doi.org/10.1177/0956797619875472

Tanjitpiyanond, P., Jetten, J., & Peters, K. (2022). How economic inequality shapes social class stereotyping. *Journal of Experimental Social Psychology*, *98*, Article 104248. https://doi.org/10.1016/j.jesp.2021.104248

Tanjitpiyanond, P., Jetten, J., Peters, K., Ashokkumar, A., Barry, O., Billet, M., Becker, M., Booth, R. W., Castro, D., Chinchilla, J., Costantini, G., Dejonckheere, E., Dimdins, G., Erbas, Y., Espinosa, A., Finchilescu, G., Gómez, Á., González, R., Goto, N., . . . Yeung, V. W.-L. (2023). A 32-society investigation of the influence of perceived economic inequality on social class stereotyping. *European Journal of Social Psychology*, *53*, 367–382.

Thoemmes, F. (2015). Reversing arrows in mediation models does not distinguish plausible models. *Basic and Applied Social*

Psychology, *37*(4), 226–234. https://doi.org/10.1080/01973533.2015.1049351

Thompson, L., & Hastie, R. (1990). Social perception in negotiation. *Organizational Behavior and Human Decision Processes*, *47*(1), 98–123. https://doi.org/10.1016/0749-5978(90)90048-E

von Neuman, J. & Morgenstern, O. (1944). *Theory of Games and Economic Behavior*. New York, NY: John Wiley & Sons.

Waldfogel, H. B., Sheehy-Skeffington, J., Hauser, O. P., Ho, A. K., & Kteily, N. S. (2021). Ideology selectively shapes attention to inequality. *Proceedings of the National Academy of Sciences of the United States of America*, *118*(14), Article e2023985118. https://doi.org/10.1073/pnas.2023985118

Weingarten, E., Davidai, S., & Barasch, A. (2023). Who's on first? People asymmetrically attend to higher-ranked (vs. lower-ranked) competitors. *Journal of Experimental Social Psychology*, *104*, Article 104405. https://doi.org/10.1016/j.jesp.2022.104405

Wilkinson, R. G., & Pickett, K. E. (2017). The enemy between us: The psychological and social costs of inequality. *European Journal of Social Psychology*, *47*(1), 11–24. https://doi.org/10.1002/ejsp.2275