Durham University Business School

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Working Paper No. 1, 2026

Durham Business School working papers series ISSN 1749-3641

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Zero-Sum Views and Support for Redistribution Across Borders

Anca Balietti and Diego Marino-Fages*

March 13, 2026

Abstract

This paper provides causal evidence on how zero-sum framing affects support for global redistribution and economic openness. In a preregistered survey experiment with a large UK sample, we show that a zero-sum prime about general social and economic interactions, without reference to redistribution, reduces revealed support for international redistribution by lowering the probability of donating to an international anti-poverty NGO. Effects on stated support for global redistribution, globalization, and migration are directionally similar but not distinguishable from zero. These experimental results contrast with the positive cross-sectional association between zero-sum beliefs and stated support for redistribution in our data and in prior work, cautioning against a causal interpretation of observational gradients. In an additional, independently randomized treatment, information about respondents' position in the global income distribution offsets the donation response to the zero-sum prime. The results speak to how rising nationalist and protectionist rhetoric in high-income countries, by making zero-sum narratives salient, may shape economic and policy preferences in the population.

JEL classification: C83, C90, D31, Z10.
Keywords: Zero-sum Views; Global Redistribution; Global Income Rank.

In recent years, nationalist and protectionist rhetoric has gained renewed prominence in political discourse across advanced democracies. From Brexit in the United Kingdom to America First in the United States, political movements increasingly frame international economic relations in zero-sum terms, portraying gains for other countries or groups as losses for the national interest (Chinoy et al., 2026; Ali, Mihm and Siga, 2025). Similar narratives have accompanied rising support for anti-immigration parties across Europe. These developments are particularly striking given that they follow decades in which political discourse emphasized globalization, free trade, and international cooperation as mutually beneficial. This rhetorical shift raises the question of whether zero-sum framings can be strategically employed to influence public support for specific policy agendas.

While prior research has mapped the origins and distribution of zero-sum beliefs (Ongis and Davidai, 2022; Carvalho et al., 2023; Chinoy et al., 2026), much less is known about their

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causal consequences. From a policy perspective, a central question is how greater endorsement of zero-sum worldviews shapes support for nationalist and protectionist agendas versus policies favoring global redistribution and openness (Davidai and Ongis, 2019). Existing evidence is largely correlational. For example, Chinoy et al. (2026) show that stronger zero-sum mindsets are associated with greater support for government redistribution, race- and gender-based affirmative action, and more restrictive immigration policies.

These patterns are not straightforward to interpret. On the one hand, they suggest that zero-sum thinking may increase demand for redistribution. On the other hand, contemporary political rhetoric frequently invokes zero-sum framings to undermine support for global redistribution and economic integration. This ambiguity raises a fundamental identification problem: do zero-sum beliefs causally shape policy preferences, or do they instead reflect underlying ideological commitments and lived experiences that independently drive both beliefs and preferences?

This paper aims to causally identify how zero-sum priming influences support for global redistribution. We conduct a preregistered survey experiment with 2,116 UK adults, quota-sampled to match the population distributions of age and gender. The design is a 2×2 factorial with two independently randomized treatments: a zero-sum prime and information about respondents' position in the global income distribution.

The first treatment primes a zero-sum (versus positive-sum) view of economic exchange. Participants recall a personal experience of economic or professional advancement framed either as coming at others' expense or as generating mutual gains, and then complete three role-based scenarios designed to reinforce the assigned interpretation. The prime does not mention redistribution or inequality; it is intended to activate general beliefs about exchange. This design follows an experimental literature that uses priming to vary which considerations are top-of-mind at the time of evaluation without altering incentives or information; with random assignment and identical subsequent tasks, any differences in choices can be attributed to exposure to the primed frame (Benjamin, Choi and Strickland, 2010; Callen et al., 2014; Cohn et al., 2015). More broadly, the prime is designed to temporarily heighten the salience of a zero-sum interpretive frame, akin to brief framings in social and political discourse that individuals encounter repeatedly.

Because zero-sum beliefs are inherently relational, the effect of a zero-sum frame on redistribution preferences may vary with perceived relative income status. We therefore independently randomize a second treatment that provides respondents with information on their household's rank in the global income distribution, following work on rank perceptions and redistribution (Kuziemko et al., 2015; Karadja, Mollerstrom and Seim, 2017; Fehr, Mollerstrom and Perez-Truglia, 2022; Hauser, 2023; Hvidberg, Kreiner and Stantcheva, 2023). In a high-income country such as the UK, this information also helps make salient that the relevant international redistribution typically runs from comparatively affluent respondents to poorer recipients abroad, i.e., toward an out-group. The design therefore allows us to estimate how global-rank salience moderates the effect of zero-sum priming on support for cross-border redistribution.

We assess the effects on both behavioral and attitudinal measures of global redistribution and openness. The behavioral outcome is whether respondents contributed part of their participation fee to an international anti-poverty organization and the amount contributed. Attitudinal outcomes capture support for international redistribution, trade, globalization, and migration. While these domains may appear zero-sum, given the distinct roles that countries occupy in such interactions, a large body of evidence suggests aggregate gains. Redistribution across countries tends to increase aggregate welfare because one unit of income generates greater utility in poorer households than in richer households. In addition, aid can generate long-run gains by improving human capital (Mishra and Newhouse, 2009; Kazianga et al., 2013; Cavalcanti et al., 2025), strengthening political stability (Steinwand, 2015), and fostering economic growth where institutions are strong (Burnside and Dollar, 2000; Clemens et al., 2012; Arndt, Jones and Tarp, 2016). Donor countries may also benefit indirectly, for example, through expanded trade and political influence (Wagner, 2003; Kuziemko and Werker, 2006; Dreher et al., 2022). Migration can similarly produce gains for both sending and receiving countries (Clemens, 2011). Trade and globalization tend to likewise be positive-sum, with liberalization consistently associated with higher growth and poverty reduction in developing economies (Dollar and Kraay, 2004; Wacziarg and Welch, 2008; Frankel and Romer, 2017; Feyrer, 2019).

We show that the zero-sum priming successfully shifts respondents' measured beliefs: the zero-sum belief index increases by 0.25 standard deviations in the high zero-sum condition relative to the low zero-sum condition, while general views about luck and effort remain unaffected. Turning to outcomes, inducing stronger zero-sum views significantly reduces the likelihood to make a real-stakes contribution to international anti-poverty organizations. For stated support for international redistribution, migration, and international economic cooperation, point estimates are generally negative but imprecise, and we cannot reject zero effects. Providing information about respondents' global income rank appears to offset the negative behavioral effect of zero-sum priming. Since most respondents underestimated their global rank, the information treatment typically revealed a higher-than-perceived relative position, making global affluence salient in a way that appears to counteract the exclusionary logic activated by zero-sum framing.

These findings speak to a context in which political actors increasingly frame international relations in zero-sum terms. In our experiment, activating a zero-sum frame reduces real-stakes giving to a global anti-poverty organization, primarily by lowering the probability of making any donation. This pattern suggests that fixed-pie narratives can discourage private prosocial engagement toward international out-groups. At the same time, we find that making individuals' relative position in the global income distribution salient mitigates this behavioral response in our setting. This suggests that communications emphasizing relative global affluence, which is relevant for many citizens in high-income countries, may help sustain support for international redistribution when zero-sum narratives are salient.

We observe a divergence between revealed behavior and stated policy support. Zero-sum priming reduces real-stakes contributions to an international anti-poverty organization, primar-

ily on the extensive margin, while the estimated effects on stated support for international redistribution, migration, and economic cooperation are uniformly negative but imprecisely estimated. One interpretation is that zero-sum framing becomes more behaviorally consequential when choices involve immediate private costs. Real-stakes giving requires respondents to incur a direct monetary sacrifice, and the fixed-pie logic activated by the prime may increase the perceived trade-off between one's own payoff and the welfare of distant others. Survey-reported policy positions, by contrast, do not involve an immediate personal cost, which may attenuate the short-run behavioral consequences of the same frame.

Importantly, our manipulation induced stronger endorsement of general zero-sum beliefs without referencing redistribution, inequality, or migration. Contemporary political rhetoric, by contrast, often embeds zero-sum narratives directly within specific policy domains and pairs them with concrete claims about material trade-offs. Our estimates therefore isolate the effect of shifting a broad zero-sum worldview, whereas targeted political messaging may operate both by increasing zero-sum thinking and by directly framing particular policies as entailing losses for the in-group.

We make several contributions to the literature. First, we document a divergence between cross-sectional associations and causal effects of zero-sum thinking for global redistribution in our data. In the baseline cross-section, stronger zero-sum views are positively associated with stated support for global redistribution, mirroring patterns reported by Chinoy et al. (2026) in the US. Yet experimentally inducing a zero-sum frame reduces revealed support for global redistribution measured by real donations to an international anti-poverty NGO, primarily by lowering the probability of giving, while leaving stated policy preferences largely unchanged within our statistical precision. The divergence between correlational and experimental results cautions against a causal interpretation of the cross-sectional association and indicates that baseline zero-sum measures have limited predictive power for responses to zero-sum framing.

Second, our experiment provides empirical evidence that increasing the salience of a zero-sum worldview reduces cooperative behavior toward out-groups. This finding speaks directly to the theoretical framework of Gavrilets and Seabright (2025), who model how zero-sum and positive-sum worldviews persist or change depending on environmental conditions, peer influence, and authority interventions. In their model, individuals holding a zero-sum worldview invest more in competition, whereas those with a positive-sum worldview invest more in cooperation. By demonstrating that priming a zero-sum perspective shifts behavior away from cooperation, our results offer empirical support for one of the key behavioral mechanisms in their framework.

Furthermore, we show that making a zero-sum perspective prominent affects individual redistribution decisions of their own resources, thus complementing and extending the findings of Strang and Schaube (2025). In their experiment, participants act as third-party spectators and evaluate vignettes describing different bonus allocation schemes, some of which are explicitly zero-sum. Spectators are then asked to redistribute bonuses between two other individuals, and the authors find that they allocate more to the disadvantaged party when the bonus structure is

zero-sum. Although both studies examine how zero-sum framing shapes redistributive behavior, their design differs from ours in important ways: they elicit redistribution preferences from impartial spectators rather than from individuals allocating their own resources, and they rely on a within-subject design in which zero-sum beliefs are measured only at the end of the experiment, assuming that exposure to the hypothetical scenarios does not itself alter those beliefs. In this regard, our design also differs from Chinoy et al. (2026). We study preferences for global, rather than national, redistribution. This allows us to rule out a potential self-interest channel that may be present in their setting if respondents expect to be among the beneficiaries of national redistribution policies. The distinction becomes particularly salient in our second treatment, where on average respondents learn that their income rank in the global distribution is higher than they initially believed.

Third, we show that zero-sum beliefs can be temporarily activated and that such activation has meaningful behavioral consequences. This contribution speaks to the broader literature on the formation and variability of zero-sum beliefs in the population, which has developed along two main strands. One emphasizes the deep-rooted nature of these beliefs, linking them to personal and ancestral experiences. For example, zero-sum thinking is more prevalent among individuals with competitive educational backgrounds or family histories of hardship and exclusion (Chinoy et al., 2026), and it is more likely to emerge in contexts of perceived scarcity, such as economic downturns (Sirola and Pitesa, 2017). Zero-sum beliefs are also correlated with psychological traits such as envy or diminished regard for merit (Carvalho et al., 2023). Another strand highlights their strategic malleability in political and economic contexts (Davidai and Ongis, 2019). Voters, for instance, may adopt zero-sum reasoning around elections, rejecting policies supported by rival groups due to adverse inference under asymmetric information (Ali, Mihm and Siga, 2025). Relatedly, Roberts and Davidai (2022) shows that zero-sum thinking is asymmetric: individuals are more likely to perceive others' gains as personal losses than to view their own gains as harmful to others, reflecting a form of motivated reasoning. By experimentally demonstrating that zero-sum beliefs can be activated in the short run and translate into observable behavior, our findings bridge these perspectives and provide causal evidence on their behavioral relevance.

Fourth, we contribute to a growing literature showing that preferences for redistribution are shaped not only by material self-interest but also by beliefs and perceptions that can be influenced. Previous research emphasizes the importance of fairness concerns, beliefs about poverty and mobility, and political or social identity in shaping redistributive preferences (e.g., Fehr and Schmidt, 1999; Fong, 2001; Alesina and La Ferrara, 2005; Alesina and Giuliano, 2011). More recent work shows that exposure to information, such as inequality levels or one's position in the income distribution, can shift attitudes toward redistribution (Kuziemko et al., 2015; Karadja, Mollerstrom and Seim, 2017; Hauser, 2023; Hvidberg, Kreiner and Stantcheva, 2023).

While most of this literature focuses on perceptions of national income rank and their effects on support for domestic redistribution, relatively few studies examine the global context.

Nair (2018) finds that correcting downward misperceptions about one's global income position increases support for global redistribution in a representative U.S. sample, whereas Fehr, Mollerstrom and Perez-Truglia (2022) finds no significant effects in a representative German sample. We contribute to this emerging literature by showing that perceived global income rank moderates the impact of zero-sum priming on preferences for global redistribution in a UK sample.

I. Materials and Methods

A. Survey Design

To examine how zero-sum beliefs shape responses to information about global income rank and influence support for global redistribution, we conducted a large-scale online survey experiment in the United Kingdom. The study was pre-registered on AsPredicted (ID #188268) and fielded in August 2024 using the Prolific platform. Participants completed an anonymous questionnaire hosted on Qualtrics. Each respondent received a fixed payment of £1 and a bonus between £0 and £1, depending on decisions made during the survey.

The experiment was structured into seven sections: (A) an entry questionnaire eliciting demographic characteristics, including household income and perceived rank in the global income distribution; (B) a priming treatment designed to shift zero-sum views; (C) the measurement of zero-sum views; (D) an information treatment providing respondents with their actual position in the global income distribution based on World Bank data; (E) a real-stakes donation decision involving an international NGO targeting global poverty; (F) a battery of questions on stated preferences regarding global redistribution, international institutions, globalization, and migration; (G) questions on political orientation, followed by an attention check. The experimental variation across the four treatment conditions is presented in Table 1.

Table 1 – Overview of Experimental Design by Treatment Condition

Section	Low ZSV		High ZSV	
	No Rank Info	Rank Info	No Rank Info	Rank Info
A. Entry questionnaire	X	X	X	X
B. Zero-Sum Views Priming	X	X	X	X
Positive-sum condition (Low ZSV)	X	X		
Zero-sum condition (High ZSV)			X	X
C. Zero-Sum Views Elicitation	X	X	X	X
D. Income Rank Information		X		X
E. Donation Decision	X	X	X	X
F. Stated Support Questions	X	X	X	X
G. Political Views Elicitation	X	X	X	X

Notes: The table summarizes the structure of the survey and the assignment of treatment conditions across the four experimental groups. All participants completed the full questionnaire, with treatments varying across the zero-sum views priming (positive vs. zero-sum) and the provision of global income rank information.

Following informed consent and initial procedural checks, participants completed a baseline

questionnaire (Section A) that collected demographic and socioeconomic information. This included age, gender, education level, employment status, household size, total household income before taxes, and a self-assessed estimate of their household's position in the global income distribution, recorded on a 10-point decile scale.

Participants were then randomly assigned to one of four experimental conditions in a fully crossed 2-by-2 design. The first treatment (Section B) varied whether respondents received a priming intervention designed to increase zero-sum views (high ZSV) or a control condition intended to maintain low zero-sum views. In Section C, all participants answered a set of seven statements eliciting their views on economic zero-sum thinking, measured on a five-point Likert scale. These items were adapted from Różycka-Tran, Boski and Wojciszke (2015) (see Appendix Table A-1 for the list of questions).

In Section D, the second treatment was introduced. Participants either received information about their actual position in the global income distribution based on World Bank data (Rank Info) or received no such information (No Rank Info). This design produced four experimental groups: (1) High ZSV + Rank Info, (2) High ZSV + No Rank Info, (3) Low ZSV + Rank Info, and (4) Low ZSV + No Rank Info; see Table 1.

In Section E, participants made a donation decision involving four international NGOs working to reduce global inequality (Oxfam UK, Givedirectly, CARE International, and Concern Worldwide). Participants could also choose not to donate. Those who selected an NGO were then asked to allocate a £1 bonus between themselves and the chosen organization.

Section F elicited stated support for redistribution, globalization, and immigration using 10-point scale items, following the approach in Fehr, Mollerstrom and Perez-Truglia (2022). Finally, Section G included questions on participants' voting behavior in the most recent UK general election and their views on Brexit.

B. Priming Zero-Sum Views

The first treatment primes a zero-sum (versus positive-sum) view of economic exchange. Participants were randomly assigned to a high zero-sum condition, designed to make salient the idea that one party's gains come at others' expense, or to a low zero-sum condition, designed to make salient the possibility of mutually beneficial exchange.

Both conditions followed an identical structure. Participants first completed an open-ended recall task. In the high zero-sum condition, they were asked: "Please think about a time during your education or professional life when you strongly felt that in order for someone to succeed, someone else had to lose out." In the low zero-sum condition, the prompt instead read: "Please think about a time during your education or professional life when you strongly felt that multiple people could succeed without negatively affecting each other." Open-ended recall tasks mimic real-world exposure to narratives (media, political rhetoric, personal experiences) that may temporarily activate zero-sum thinking. Participants then completed three short role-based vignette tasks designed to reinforce the assigned interpretation of economic exchange

across different domains.

In each vignette, respondents were asked to imagine themselves in a decision-maker role as a neighborhood leader, the CEO of a successful technology firm, or a government official in a country that has gained a trade advantage, and to indicate which actions they would take by selecting all options that applied. The underlying settings were held constant across conditions and covered resource allocation within a community, competitive dynamics in an industry, and international trade, but the framing of the available actions differed.

This priming design aims to shift which interpretive frame, zero-sum competition versus mutually beneficial exchange, is top-of-mind at the time of subsequent evaluation, while holding incentives and information in the downstream tasks constant, following *e.g.* Cohn et al. (2015). Importantly, the prime does not mention redistribution, inequality, charities, or the specific policy domains elicited later; instead, it operates through general scenarios about exchange, competition, and cooperation.

C. Global Income Rank Information Treatment

The second experimental treatment introduced variation in participants' awareness of their household's position in the global income distribution. Following random assignment in the 2-by-2 design, half of the participants were shown their actual income rank, based on household income data and World Bank estimates. The other half received no information.

This intervention builds on well-documented evidence that individuals often hold inaccurate beliefs about their relative income position, both within and across countries. Prior studies show that providing income rank information can meaningfully shift these perceptions (Karadja, Mollerstrom and Seim, 2017; Hoy and Mager, 2021; Hvidberg, Kreiner and Stantcheva, 2023).

Participants in the information condition were shown a visual representation of the global income distribution divided into ten brackets, with accompanying explanatory text. Their estimated income decile according to the World Bank data was clearly marked to highlight their relative standing. An example of the information screen is shown in Figure 1.

On the following page, participants who received the information were asked to recall which income group their household belonged to, based on the previous screen. This recall question served as a check on immediate retention of the information. They were also asked to indicate whether the information surprised them, using a three-point scale ranging with the options "Not surprising," "Neither surprising nor unsurprising," to "Surprising."

D. Data and Summary Statistics

The experiment includes $N = 2{,}116$ UK adults recruited via Prolific using quota matching on age and gender.[1] The sample has a mean age of 46.5 years and is 51.5% female. Employment is high

[1]We collected 2,134 completed submissions with unique respondent identifiers. We exclude 18 observations based on the pre-registered data-quality criteria: failing either of two attention checks, reporting an age at baseline that is inconsistent with the age group reported at the end of the survey, or completing the questionnaire in less than 180 seconds.

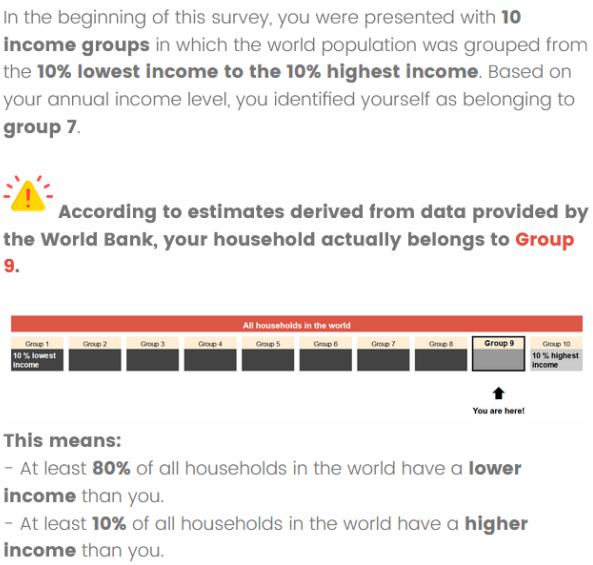

FIGURE 1 – Example Page for the Global Income Rank Information Treatment.

(70.2%), average household size is 2.67, and educational attainment is relatively strong: 38.2% hold a bachelor's degree and 18.9% a master's degree or higher. Respondents substantially underestimate their position in the global income distribution: the mean perceived rank is 5.37 (decile), compared with a mean actual rank of 7.74, an average gap of about 2.4 deciles. Politically, 46.3% classify as left-leaning, 9.9% as centrist, and 17.4% as right-leaning; 26.5% fall into an undisclosed/other category. In the Brexit referendum, 24.7% report supporting Leave and 71.8% supporting Remain (3.4% non-response).

Appendix Table A-2 benchmarks these characteristics against weighted estimates from the 2024 cross-section of Understanding Society (UKHLS). The experimental sample closely matches UKHLS benchmarks for age and gender. Compared with UKHLS, the experimental sample has smaller households (2.67 vs. 3.03), higher educational attainment (Bachelor's: +7.9 pp; Master's+: +5.9 pp), and higher employment (+15.2 pp). The mean global income rank is lower in the experimental sample (7.74 vs. 9.24; −1.50 deciles). Finally, vote-intention categories differ, most notably in a much larger undisclosed/other share in the experimental sample (26.5% vs. 4.1% in UKHLS; +22.4 pp). Correspondingly, both the left-leaning share (46.3% vs. 58.8%; −12.6 pp) and the right-leaning share (17.4% vs. 28.3%; −10.9 pp) are lower than in UKHLS.

Appendix Table A-3 reports baseline covariates by treatment assignment. Across the four experimental cells, characteristics are generally well balanced: most within-arm differences are small and statistically indistinguishable from zero, and the difference-in-differences balance tests are uniformly insignificant. Two covariates exhibit modest imbalances within the no-information arm (left-leaning and centrist identification), but these do not translate into systematic differences across the full 2×2 design. For precision, our main specifications control for age, gender, education, employment status, and political support throughout.

II. Zero-sum Views and Redistribution Preferences

This section reports the main empirical findings from the zero-sum framing experiment. We begin by testing whether the manipulation successfully shifted participants' zero-sum beliefs as intended. We then document the cross-sectional relationship between zero-sum beliefs and preferences for global redistribution. Finally, we exploit the experimental variation in zero-sum beliefs as an exogenous source of identifying variation to test whether the observed correlation reflects a causal effect on redistribution preferences.

A. Manipulation Check of Zero-Sum Views

To assess whether the zero-sum prime shifted beliefs as intended, we elicited six Likert-scale items measuring general zero-sum views immediately after the first treatment. We standardize each item and average the standardized scores to form an aggregate zero-sum views index, with higher values indicating stronger zero-sum beliefs. The items capture the extent to which respondents perceive economic gains as coming at others' expense, typically contrasting the fortunes of richer and poorer individuals or groups (Appendix Table A-1). Importantly, the index does not reference redistribution policies, globalization, or migration, and is intended to measure a general economic worldview rather than attitudes toward any specific domain. Because the items are measured prior to the second treatment, the manipulation check uses the full sample ($N = 2{,}116$).

Figure 2 displays the kernel density estimates of the index by treatment group, with the distribution for the low zero-sum views condition shown in light gray and the high zero-sum views condition in light blue. The figure shows a clear rightward shift in the distribution under the high zero-sum views treatment, indicating stronger endorsement of zero-sum beliefs. The mean of the index in the low zero-sum views group is approximately zero by construction, while the high zero-sum group exhibits a mean increase of 0.25 standard deviations.[2] A two-sample t-test confirms that this difference is statistically significant ($t = 8.86$, $p < 0.001$), and a Mann-Whitney rank-sum test yields consistent results ($z = 8.85$, $p < 0.001$).

As a further check, we also asked participants to place themselves on a 1–10 scale ranging from "everything in life is determined by fate" to "people shape their fate themselves." Responses were standardized using the mean and standard deviation of the low zero-sum views group. We find no significant treatment effect on this item ($p = 0.62$ in both the t-test and the rank-sum test; $N = 2,116$), suggesting that the zero-sum treatment did not shift broader beliefs about fate or personal control.[3]

[2] Notably, the mean of the raw index in the low zero-sum group is 3.05 on a five-point scale, indicating that participants lean modestly toward zero-sum views even when primed to think of positive-sum situations.

[3] Consistent with this, we find a modest negative association between the zero-sum index and the fate/control measure in both treatment conditions: in the low zero-sum group, a one-standard-deviation increase in personal control beliefs is associated with a 0.14 standard deviation decrease in zero-sum views ($p < 0.001$); in the high zero-sum group, the corresponding decrease is 0.10 standard deviations ($p < 0.001$). This pattern is in line with findings by Carvalho et al. (2023), who show that zero-sum beliefs are negatively correlated with individual agency and perceptions of personal control.

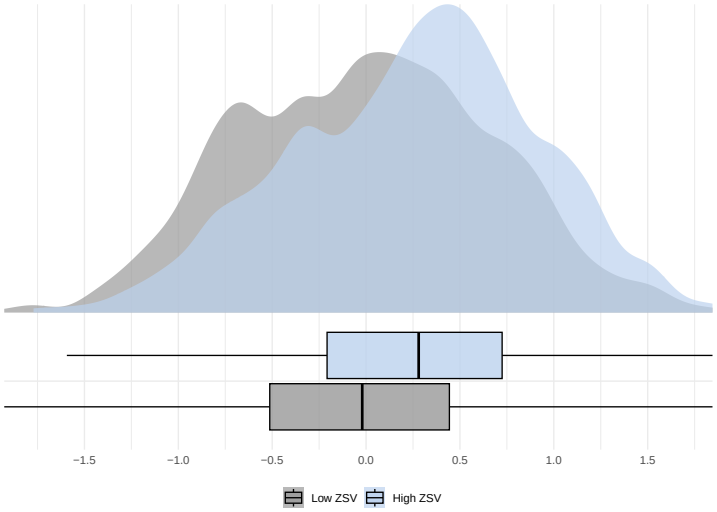

FIGURE 2 – Distribution of the zero-sum views index by treatment group.

Notes: The figure presents the estimated kernel densities of the distributions of zero-sum views, as measured by the standardized index of participants' answers to the 6-item questionnaire adapted from Różycka-Tran et al. (2018). Two distributions are presented, where light gray corresponds to the low zero-sum views group and light blue corresponds to the high zero-sum views group. See Appendix Table A-1 for variable definitions.

Open-Text Analysis. To provide further evidence of our manipulation, we explore the open text responses using an LLM classifier. Specifically, we asked Claude Opus 4.6 to classify the responses according to whether they contain high- or low-zero-sum views (for the exact prompt and examples of the responses with the score see Figure A-2 and Table A-6 in the Appendix). Our zero-sum index correlates strongly with the LLM classification (see Table A-4 in the Appendix). Table A-5 in the Appendix shows that our zero-sum priming produced a robust shift in participants' open-text responses towards zero-sum language as identified by our LLM classifier: coeff = 0.687 (p = 0.008), while the orthogonal income-information treatment had no detectable effect (coeff = -0.004, p = 0.578). Figure A-3 in the Appendix further shows the score distributions, which are clearly skewed toward zero-sum or non-zero-sum language depending on treatment, confirming that the priming reliably altered what participants recalled and how they described past social and economic situations.

Responsiveness to the Zero-Sum Manipulation. To assess whether responsiveness to the prime varies across observable characteristics, we begin with descriptive comparisons of baseline zero-sum views across a rich set of covariates, separately by assignment to the low- versus high-zero-sum condition. We consider age, gender, ethnicity, education, employment status, political leaning, and actual and perceived global income rank. Figure 3 reports regression-adjusted subgroup means, which hold remaining covariates constant and isolate differences associated with each characteristic rather than compositional differences across subgroups. Two patterns emerge. First, the zero-sum views index is consistently higher in the high zero-sum group across all characteristics, indicating that the manipulation shifted views broadly rather than being

confined to specific subgroups. Second, baseline zero-sum views vary systematically with age and political leaning: younger respondents and left-leaning individuals exhibit higher index values, with scores declining among centrists and right-leaning respondents. Zero-sum views also tend to be lower among respondents with higher actual and perceived global income rank, though these differences are imprecisely estimated. Importantly, these patterns are similar in both treatment arms, suggesting that they reflect baseline correlates of zero-sum views rather than differential responsiveness to the manipulation.

Building on these descriptives, we examine treatment-effect heterogeneity using a causal forest approach following Nie and Wager (2021). We estimate individualized average treatment effects (IATEs) allowing the effect of the zero-sum prime to vary flexibly with pre-treatment covariates, including age group, gender, employment status, educational attainment, political leaning, and household size. We first test the null hypothesis of homogeneous treatment effects using an omnibus Wald test that jointly evaluates heterogeneity across all observed characteristics. We do not reject the null of constant effects for the zero-sum views index ($\chi^2(1) = 2.64$, $p = 0.10$), providing no statistically significant evidence of systematic heterogeneity in responsiveness at conventional levels. As a complementary check, we implement an out-of-sample calibration exercise in which predicted IATEs are generated on a holdout sample and used to form quintiles of predicted responsiveness. Treatment effects do not differ across these quintiles ($F(4, 818) = 1.12$, $p = 0.35$), indicating that observed baseline characteristics have limited predictive power for individual-level responsiveness to the zero-sum manipulation.

These results suggest that, while zero-sum views are systematically correlated with observable characteristics, the experimental manipulation shifts beliefs in a broadly uniform manner, with no detectable heterogeneity in treatment responsiveness along observed dimensions.

B. Correlation between Zero-Sum Views and Preferences for Global Redistribution

Before turning to causal effects, we examine correlations between zero-sum views and preferences for redistribution and economic openness. Figure 4 reports point estimates and 95% confidence intervals from separate regressions of each outcome on the standardized Zero-Sum Score Index, controlling for age, gender, education, household size, employment status, and political leaning. The analysis is restricted to respondents who were not exposed to the global income rank treatment ($N = 1{,}050$). Estimates are shown separately for participants in the Low and High zero-sum conditions, allowing comparison of conditional associations across treatment arms.

Stronger zero-sum views are positively and statistically significantly associated with stated support for global redistribution, the creation of an international organization to redistribute income or resources across countries, and support for globalization. These correlations closely mirror those documented by Chinoy et al. (2026) for the United States. In contrast, whereas Chinoy et al. (2026) report a negative association with preferences for migration, we find no statistically or substantively meaningful relationship: estimated coefficients are positive, close

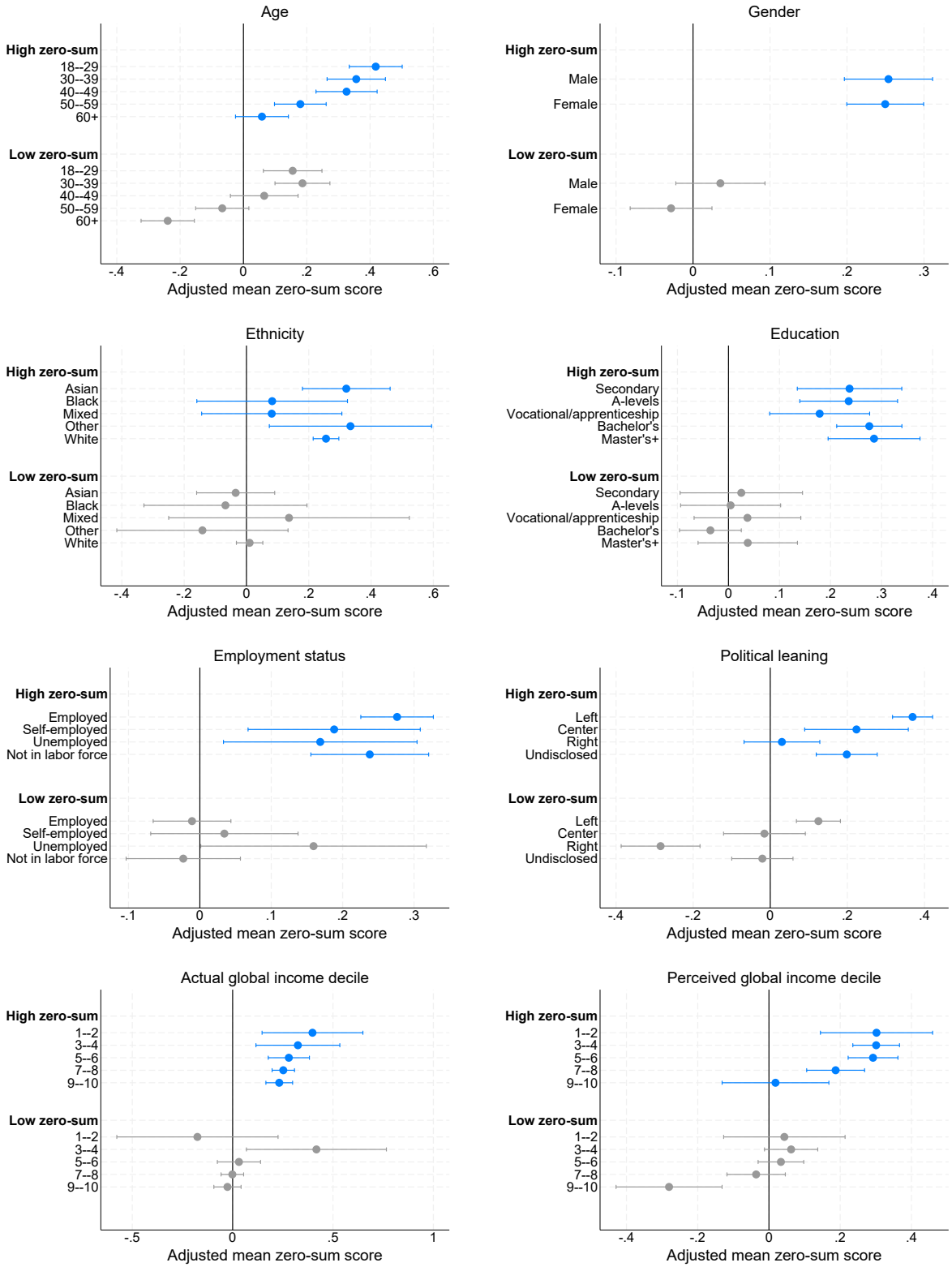

FIGURE 3 – ZERO-SUM VIEWS ACROSS SUBGROUPS, CONDITIONAL ON BASELINE COVARIATES.

Notes: For each panel, points show estimated means of the zero-sum views index separately for respondents assigned to the low versus high zero-sum prime. In each panel, estimates are obtained from an OLS regression of the zero-sum views index on indicators for the subgroup categories, the zero-sum prime, and their interaction, controlling for the remaining baseline covariates. The Zero-Sum Index is standardized using the mean and standard deviation of the Low zero-sum treatment group, so values are expressed in standard deviation units relative to that group. Bars indicate 95% confidence intervals based on heteroskedasticity-robust standard errors. Appendix Figure A-1 presents the unconditional means.

to zero, and not statistically significant. Revealed redistribution behavior, as measured by donation decisions, also shows no meaningful relationship with zero-sum views when considered in isolation.

To summarize these patterns, we construct a composite index following Kling, Liebman and Katz (2007). Within the no-information subsample, we standardize the donation amount and four stated preference measures using the low-ZSV group mean and standard deviation, orient each measure so that higher values indicate greater support for international redistribution and related forms of economic openness, and take their unweighted average. The resulting index exhibits good internal consistency (Cronbach's $\alpha = 0.75$), indicating substantial shared variation across components. An alternative summary measure based on the first principal component of the same standardized outcomes exhibits a similarly positive association. Figure 4 shows that both aggregate measures are positively and statistically significantly associated with the zero-sum views score.

Overall, the results indicate that stronger zero-sum views are systematically associated with more favorable stated preferences for redistribution and economic openness, but not with revealed redistribution behavior. Importantly, these associations are qualitatively similar in both the Low and High zero-sum conditions.

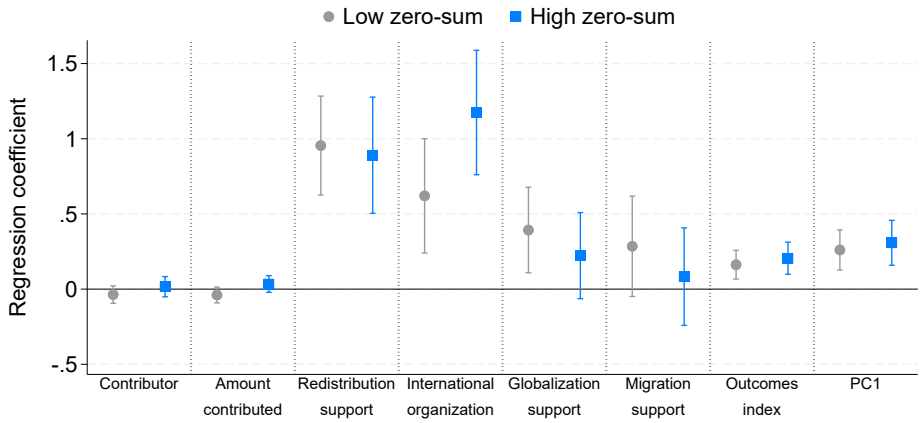

Figure 4 – Conditional Correlations between Zero-Sum Index and Outcomes, by Low and High Zero-Sum Treatment Conditions.

Notes: The figure shows estimated coefficients from separate regressions of each outcome on the standardized Zero-Sum Index, controlling for age, gender, education, employment status, household size, and political ideology. Gray markers indicate estimates for respondents in the Low zero-sum condition; blue markers indicate estimates for those in the High zero-sum condition. *Contributor* is an indicator equal to one if the respondent made a strictly positive donation to one of the international anti-poverty NGOs; the reported mean is the share of contributors in the low-ZSV group. *Amount contributed* is the donation amount in GBP, including zeros for non-contributors. *Redistribution*, *International organization*, *Globalization*, and *Migration* are policy-preference items elicited on a 10-point Likert scale; higher values indicate stronger support for the stated policy. The *Outcomes index* is an equally weighted average of five components (amount contributed and the four policy-preference measures), each standardized using the low-ZSV group mean and standard deviation and oriented so that higher values indicate greater support for global redistribution and related forms of international economic openness. Column (8) reports the first principal component of the standardized donation amount and the four standardized policy-preference measures; PCA weights are estimated using the low-ZSV group and the resulting score is re-standardized to have mean zero and unit variance in that group. Whiskers denote 95% confidence intervals based on robust standard errors. The sample is restricted to participants not exposed to the global income rank treatment. See Appendix Table A-1 for variable definitions.

C. Causal Effects of Zero-Sum Views on Preferences for Global Redistribution

We now turn to experimental estimates of the effect of zero-sum thinking on redistribution-related outcomes. Respondents were randomly assigned to the low or high zero-sum condition, generating exogenous variation in the Zero-Sum Index. While the correlations documented above already control for observable characteristics such as age, gender, education, employment status, household size, and political leaning, the experimental design also eliminates bias from unobserved confounders and reverse causality, allowing for a clean causal interpretation.

C.1 Real-Stakes Contributions to Global Redistribution

We begin by examining whether priming individuals to adopt stronger zero-sum views affects their willingness to engage in global redistribution through real-stakes contributions. As described in Section I, participants received a £1 bonus and decided whether, and to what extent, to share it with one of four international anti-poverty NGOs. We analyze both the likelihood of contributing a positive amount and the average amount contributed.

Figure 5 summarizes donation behavior by treatment status. Panel A shows that priming zero-sum views shifts the distribution of donations toward zero. The cumulative distribution function (CDF) for the high-ZSV group exhibits a larger mass point at zero (23.71% versus 16.89%) and lies above that of the low-ZSV group for donations up to approximately £0.50. At this point, the low-ZSV CDF displays a discrete upward jump, reflecting a concentration of donations at £0.50, after which the two distributions converge. Consistent with this pattern, Panel B shows that the share of contributors is 6.8 percentage points lower in the high-ZSV condition (Fisher's exact test $p = 0.007$). By contrast, the unconditional mean donation, including zeros for non-contributors, is only slightly lower under high ZSV and is not statistically significant (Mann–Whitney $p = 0.164$). The intensive margin, defined as the average contribution among contributors, also does not differ across treatment arms (Mann–Whitney $p = 0.424$).

We next estimate average treatment effects using OLS regressions with controls for age, gender, education, household size, employment status, and political affiliation.[4] Appendix Table A-9 reports corresponding p-values and Benjamini–Hochberg adjusted q-values (Anderson, 2008). Results, shown in Columns 1 and 2 of Table 2, confirm the non-parametric evidence. Participants in the high-ZSV condition are 6.9 percentage points less likely to contribute ($p = 0.005$, $q = 0.034$), relative to a baseline contribution rate of 0.83 in the low-ZSV group, corresponding to an 8.2% decline in the likelihood of giving. Column 2 reports treatment effects on the average contribution amount, including non-donors. The estimated effect is negative but small and statistically insignificant ($p = 0.249$, $q = 0.447$).[5]

[4] Appendix Table A-8 documents robustness to alternative covariate specifications.

[5] Donations were elicited using a slider from £0 to £1 with the pointer initially positioned at £0.50. The distribution exhibits bunching at the default, which limits variation in donation amounts and reduces power to detect intensive-margin effects. Appendix Figure A-5 reports donation distributions and NGO choices by treatment condition.

The results indicate that the ZSV prime primarily operates through the extensive margin, reducing the propensity to give and shifting mass away from small-to-moderate donations, while leaving higher donation amounts largely unchanged. The fact that the treatment affects a monetarily incentivized behavioral outcome mitigates concerns that the results are driven purely by experimenter demand or expressive responding.

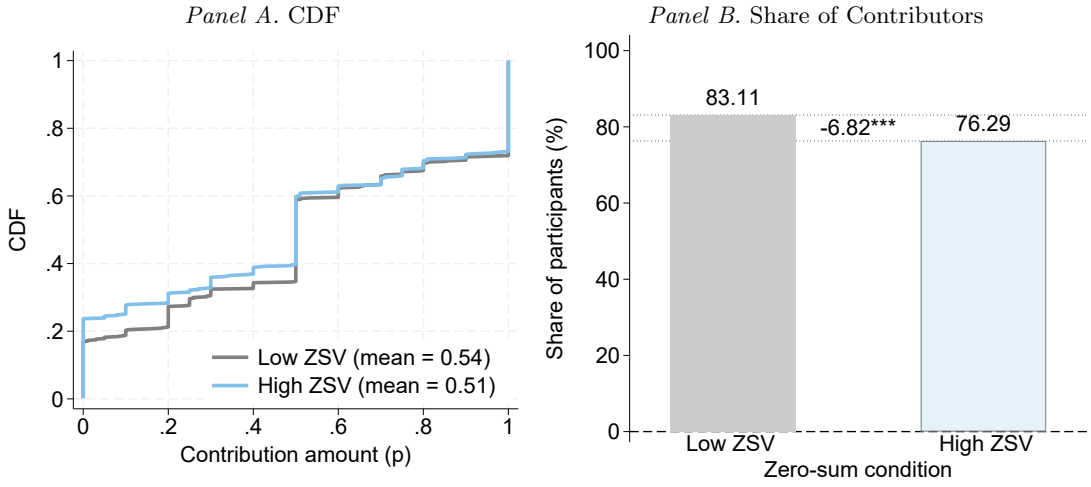

FIGURE 5 – ZERO-SUM VIEWS AND CONTRIBUTIONS TO ANTI-POVERTY NGOS.

Notes: Sample restricted to respondents not informed of their global income rank (N = 1,050). Panel A shows the cumulative distribution of contributions to international NGOs; Panel B shows the share contributing a positive amount. Low zero-sum views condition is shown in gray; high zero-sum views condition in light blue.

C.2 Stated Preferences

Columns 3 through 6 of Table 2 report treatment effects on stated support for (i) global income redistribution, (ii) an international institution aimed at reducing global inequality, (iii) globalization, and (iv) migration from poorer countries, restricting attention to the subsample that did not receive income-rank information. All four point estimates are negative, consistent with the reduction in real-stakes giving. However, none is statistically distinguishable from zero at conventional levels. Moreover, the implied magnitudes are modest, ranging from 2.4 to 3.0 percent of the respective low-ZSV group means.[6]

As discussed in the analysis of correlations, we summarize outcomes using a composite index following Kling, Liebman and Katz (2007). In the experimental analysis, this index serves as a summary measure of overall support and provides a complementary aggregate estimand alongside the multiple-hypothesis adjustments reported above. Column (7) of Table 2 shows

[6]Appendix Table A-7 reports treatment effects in standard-deviation units (standardized using the low-ZSV mean and standard deviation within the no-income-rank-information sample) to facilitate comparisons across outcomes measured on different scales. The standardized estimates mirror the pattern in Table 2: effects are uniformly negative and are largest for the extensive margin of real-stakes giving to the international NGOs (-0.18 SD), while estimates for the remaining outcomes are smaller in magnitude and imprecise, ranging from -0.05 to -0.09 SD.

Table 2 – Effects of Increasing Zero-sum Views on Global Redistribution Preferences and Economic Openness

	Contributor	Amount contrib.	Redistrib.	Internat. org.	Globaliz.	Migration	Outcomes index	First PC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Zero-sum treatment	-0.069***	-0.027	-0.152	-0.182	-0.189	-0.115	-0.068*	-0.091
	(0.025)	(0.023)	(0.149)	(0.160)	(0.117)	(0.136)	(0.040)	(0.056)
Observations	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
LZS Mean	0.831	0.536	5.869	5.970	6.924	4.899	0.000	0.000

Notes. Each column reports estimates from a separate OLS regression of the indicated outcome on an indicator for assignment to the high zero-sum views treatment. All specifications include controls for age, gender, education, household size, political party, and employment status. *Contributor* is an indicator equal to one if the respondent made a strictly positive donation to one of the international anti-poverty NGOs; the reported mean is the share of contributors in the low-ZSV group. *Amount contributed* is the donation amount in GBP, including zeros for non-contributors. *Redistribution*, *International organization*, *Globalization*, and *Migration* are policy-preference items elicited on a 10-point Likert scale; higher values indicate stronger support for the stated policy. The *Outcomes index* is an equally weighted average of five components (amount contributed and the four policy-preference measures), each standardized using the low-ZSV group mean and standard deviation and oriented so that higher values indicate greater support for global redistribution and related forms of international economic openness. Column (8) reports the first principal component of the standardized donation amount and the four standardized policy-preference measures; PCA weights are estimated using the low-ZSV group and the resulting score is re-standardized to have mean zero and unit variance in that group. Robust standard errors are in parentheses. Stars indicate statistical significance based on two-sided tests using unadjusted p-values: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. Appendix Table A-9 reports the corresponding p-values and the q-values obtained after adjusting for multiple hypothesis testing employing the method proposed by Anderson (2008).

that the high-ZSV prime reduces the index by 0.068 standard deviations ($p = 0.092$). Results are similar when using the first principal component of the same standardized outcomes, reported in Column (8), which yields a negative but more imprecise estimate (-0.091 SD; $p = 0.105$).

C.3 Instrumental Variables Analysis

We instrument measured zero-sum beliefs with randomized assignment to the zero-sum treatment to relate treatment-induced shifts in beliefs to corresponding shifts in outcomes. The first stage is strong (F = 34.8), alleviating concerns about weak instruments. Figure 6 reports two-stage least squares estimates with 95% confidence intervals. The point estimates are negative across all outcomes, consistent with the reduced-form estimates. The only statistically significant effect arises on the extensive margin of giving: a one-standard-deviation increase in instrumented zero-sum beliefs reduces the probability of making a positive donation by 30.6 percentage points (p = 0.011), relative to a baseline donation rate of 79.7%. This corresponds to a 38.4% reduction relative to the mean donation rate. The remaining IV estimates are imprecisely estimated and not statistically distinguishable from zero, consistent with reduced precision when restricting variation to treatment-induced belief shifts.

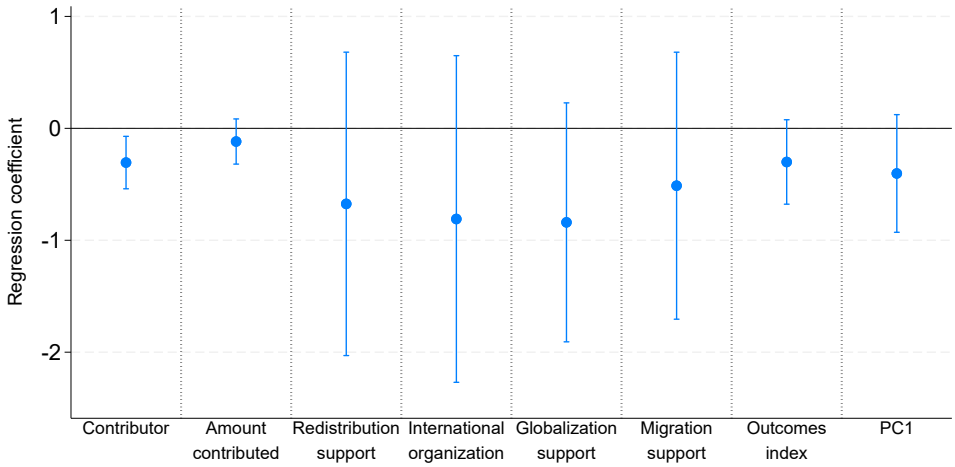

FIGURE 6 – INSTRUMENTAL VARIABLES ESTIMATES: EFFECT OF ZERO-SUM VIEWS ON GLOBAL REDISTRIBUTION PREFERENCES.

Notes: The figure displays two-stage least squares (2SLS) estimates of the effect of zero-sum views on support for global redistribution outcomes. Each coefficient corresponds to a separate regression of the outcome variable on the zero-sum views index, instrumented by the treatment indicator. The zero-sum views index is constructed as an equally weighted average of standardized items and is thus interpreted in standard deviation units. All regressions include controls for age, gender, education, employment status, and political party support. Robust standard errors are used to construct 95% confidence intervals. The analysis is restricted to participants not exposed to the global income rank treatment ($N = 1,050$). See Appendix Table A-1 for variable definitions.

C.4 Heterogeneity Using Causal Forest Analysis

The estimated average effects of the zero-sum prime are uniformly negative but, for several outcomes, imprecisely estimated. A natural concern is that average treatment effects may conceal meaningful heterogeneity across observable characteristics, including offsetting subgroup responses that attenuate the ATE. This concern is particularly relevant given the systematic variation in baseline zero-sum views across age groups and political leanings documented in Section IIA. We therefore explore treatment-effect heterogeneity using a flexible, non-parametric machine-learning approach.[7]

For each outcome, we estimate individualized average treatment effects (IATEs) following Nie and Wager (2021), allowing effects to vary with pre-treatment covariates: age, gender, household size, employment status, educational attainment, and political leaning. To facilitate comparison across outcomes, we standardize each outcome using the mean and standard deviation of the low-ZSV group in the no-information subsample ($N = 1{,}050$). We summarize heterogeneity by aggregating IATEs into group average treatment effects (GATEs) within moderator categories.[8]

We test whether GATEs differ across categories of each moderator. Table 3 reports joint Wald tests of (i) an omnibus null of constant treatment effects across all moderators (column 1) and (ii) moderator-specific equality restrictions (columns 2–7). The omnibus tests provide evidence of heterogeneity for a subset of outcomes. In particular, the null of constant effects is

[7]This analysis was not pre-registered and should be interpreted as exploratory.

[8]We estimate conditional average treatment effects using Stata's `cate` command with the partialing-out (PO) estimator. This procedure implements the orthogonal R-learner of Nie and Wager (2021), combining cross-fitted nuisance estimates with a generalized random forest to flexibly learn the treatment effect function.

rejected at conventional levels for the extensive margin of giving, the donation amount, and for both aggregate summary measures (the outcomes index and its first principal component), while it is not rejected for the individual stated policy preferences. Moderator-specific tests reveal additional heterogeneity along certain dimensions, most notably gender, employment status, and political leaning, and again primarily for donation-related outcomes and the summary measures. At the same time, these patterns are not pervasive, and no single dimension consistently explains the variation in treatment effects.[9]

The heterogeneity analysis indicates that the imprecision of average effects for stated policy preferences is not driven by offsetting subgroup responses, as these outcomes exhibit little systematic heterogeneity. Instead, heterogeneity is concentrated in donation behavior and aggregate summary measures, where average effects are more precisely estimated. Thus, while the zero-sum prime shifts beliefs uniformly, heterogeneity arises primarily in how these beliefs translate into downstream behavior rather than in policy preferences.

TABLE 3 – Joint P-Values from Heterogeneity Tests of the Zero-Sum Treatment.

	Overall	Age group	Female	Employ.	Educ.	Political leaning	Household size
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Contributor (indicator)	0.087	0.531	0.096	0.010	0.302	0.007	0.043
Amount contributed	0.042	0.678	0.013	0.011	0.369	0.023	0.015
Support redistribution	0.750	0.619	0.283	0.167	0.882	0.136	0.227
Support international org.	0.246	0.783	0.144	0.322	0.659	0.412	0.476
Support globalization	0.227	0.664	0.027	0.203	0.785	0.214	0.501
Support immigration	0.941	0.633	0.116	0.243	0.394	0.198	0.608
Outcomes index	0.018	0.458	0.008	0.024	0.897	0.130	0.137
PC1	0.019	0.513	0.015	0.066	0.879	0.093	0.245

Notes: The table reports p-values from joint tests of treatment-effect heterogeneity in the sample that *did not* receive information about their rank in the global income distribution. Rows correspond to outcome variables; columns correspond to moderators. For each outcome–moderator pair, we first estimate individual treatment effects following Nie and Wager (2021), where the treatment is the random assignment to the high zero-sum priming condition. We then compute group-average treatment effects (GATEs) for the categories of the moderator indicated in the column heading and report the p-value from a joint Wald test of equality of these GATEs. Thus, each cell shows the p-value for the null hypothesis that the treatment effect is homogeneous across the groups defined by that moderator. All p-values are based on chi-squared tests with degrees of freedom equal to the number of moderator categories minus one.

D. Summary

Taken together, the evidence delivers three main conclusions. First, the manipulation successfully shifted zero-sum beliefs in the intended direction. The high-ZSV prime induces a clear

[9] Appendix Subsection 6 reports GATE point estimates by outcome and moderator. Where differences arise, effects tend to be more negative for respondents who do not identify as female, live in households of smaller size, are self-employed or unemployed relative to other employment categories, and are center- and right-leaning (and undisclosed) relative to left-leaning respondents. These patterns should be regarded as descriptive, as comparisons across categories do not isolate causal effects of moderators.

rightward shift in the distribution of the zero-sum views index, raising average scores by roughly 0.25 standard deviations. The shift is broadly uniform across observed characteristics.

Second, cross-sectional associations between zero-sum views and policy preferences do not map cleanly into revealed redistribution behavior. Conditional on rich covariates and within each priming condition, stronger zero-sum views are positively associated with stated support for global redistribution and with more favorable views of globalization, whereas the association with migration is close to zero. Donations to anti-poverty NGOs are essentially uncorrelated with the zero-sum index. This pattern aligns with an interpretation in which zero-sum beliefs covary with normative views about international redistribution and openness, but do not translate into higher real-stakes giving.

Third, the experimental estimates indicate that inducing zero-sum thinking primarily reduces revealed support for global redistribution on the extensive margin, with limited evidence of effects on stated policy preferences. In the no-income-rank-information subsample, assignment to the high-ZSV prime reduces the probability of making any positive donation by 6.9 percentage points (an 8% decline relative to the low-ZSV baseline); by contrast, the average amount donated (including zeros) and the intensive margin are essentially unchanged. Treatment effects on stated support for redistribution, an international redistributive organization, globalization, and migration are uniformly negative but small and statistically indistinguishable from zero, yielding a modest decline in the composite outcomes index (about -0.07 SD). Overall, we observe a divergence between cross-sectional correlations and experimental results.

III. Interaction Between Zero-Sum Views and Global Income Rank Information

In this section, we test whether the effect of zero-sum framing on preferences for global redistribution is moderated by informing individuals of their rank in the global income distribution. As described in Section I, participants were first randomly assigned to either the high or low zero-sum views condition, and then half were randomly assigned to receive information about their global income rank, yielding a fully crossed 2-by-2 design.

A. Beliefs of Global Income Rank

We first examine respondents' prior beliefs about their position in the global income distribution, measured before any treatment. Figure 7 Panel A plots these beliefs for the full sample ($N = 2{,}116$). The horizontal axis reports actual global income deciles, constructed by matching respondents' household income to World Bank estimates. The vertical axis reports perceived deciles. The 45-degree line denotes accurate perceptions.

Perceptions are systematically downward biased. Aggregating responses within each actual decile, nearly all points lie below the 45-degree line. Overall, 171 respondents (8%) report the correct decile, 154 (7%) overestimate, and 1,791 (85%) underestimate their rank. Underestimation increases sharply with actual rank, whereas overestimation is concentrated among lower

actual deciles. On average, respondents place themselves 2.4 deciles below their true position. Misperceptions are similar across the four treatment conditions.

Panel B focuses on the subsample of respondents ($N = 1{,}066$) who were shown their actual income rank. Immediately after the information was provided, participants were asked: *Based on the information on the previous page, which income group does your household belong to according to estimates based on data from the World Bank?* This measure captures immediate recall of the assigned rank. The figure shows that recalled values are tightly aligned with the 45-degree line, indicating near-perfect recall. Among those informed, 1,031 respondents (97%) recall their assigned income decile correctly. There is no significant difference in recall accuracy between the low and high zero-sum views conditions ($p = 0.33$; $N = 1{,}066$), implying that attention to the information was not differentially affected by the first treatment. Although we do not observe belief updating, the high rate of accurate recall suggests that participants register the signal as relevant,[10] providing a foundation for downstream effects.

To further assess the subjective relevance of the information, we asked participants how surprising they found the rank information they received. Among those who received the treatment, 71% reported being surprised, 13% were neutral, and only 16% were not surprised. Reported surprise correlates strongly with the magnitude of prior misperceptions: a regression of the surprise measure on the absolute difference between prior beliefs and actual rank yields a positive and highly significant association ($p < 0.001$, $R^2 = 0.28$).

Overall, the rank information treatment is expected to have two effects. First, by providing an explicit signal, it increases the salience of participants' global income position relative to those who receive no information. Second, given the widespread underestimation of global income rank in the sample, it is likely to shift perceptions upward. Treated participants are therefore likely to see themselves as better off globally than they previously believed.

B. Effects on Preferences for Global Redistribution

We now turn to the effects of the two treatments on participants' preferences and behavior regarding global redistribution. Table 4 reports estimates from a model that includes the interaction between the zero-sum views treatment and the income rank information treatment. All regressions include controls for age, gender, education, household size, employment status, and political party affiliation.

Real-Stakes Contributions. Table 4 shows that priming zero-sum views significantly reduces the likelihood of contributing to the international NGOs when income rank information is absent. The estimated effect is -6.8 percentage points relative to a baseline contribution rate of 83 percent in the low–zero-sum, no–rank-information condition ($p = 0.006$, $q = 0.078$). The main effect of rank information, relative to the same baseline, is negative but imprecisely esti-

[10] Fehr, Mollerstrom and Perez-Truglia (2022) show that individuals in Germany are willing to pay for this information and that the information is partially retained one year later.

Table 4 – Effects of Increasing Zero-sum Views and Global Rank Information on Global Redistribution and Economic Openness.

	Contributor	Amount contrib.	Redistrib.	Internat. org.	Globaliz.	Migration	Outcomes index	First PC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Zero-sum treatment	-0.068***	-0.027	-0.152	-0.167	-0.173	-0.140	-0.067*	-0.090
	(0.025)	(0.023)	(0.148)	(0.159)	(0.116)	(0.135)	(0.040)	(0.055)
Rank info treatment	-0.030	0.009	-0.170	0.055	0.046	0.092	0.007	0.006
	(0.024)	(0.023)	(0.146)	(0.156)	(0.123)	(0.139)	(0.040)	(0.055)
Zero-sum x Rank info	0.073**	0.038	0.203	0.045	0.194	-0.002	0.059	0.073
	(0.034)	(0.032)	(0.207)	(0.226)	(0.170)	(0.194)	(0.056)	(0.078)
Observations	2,116	2,116	2,116	2,116	2,116	2,116	2,116	2,116
LZS Mean	0.831	0.536	5.869	5.970	6.924	4.899	0.000	0.000

Notes. Each column reports estimates from a separate OLS regression of the indicated outcome on an indicator for assignment to the high zero-sum views treatment. All specifications include controls for age, gender, education, household size, political party, and employment status. *Contributor* is an indicator equal to one if the respondent made a strictly positive donation to one of the international anti-poverty NGOs; the reported mean is the share of contributors in the low-ZSV group. *Amount contributed* is the donation amount in GBP, including zeros for non-contributors. *Redistribution*, *International organization*, *Globalization*, and *Migration* are policy-preference items elicited on a 10-point Likert scale; higher values indicate stronger support for the stated policy. The *Outcomes index* is an equally weighted average of five components (amount contributed and the four policy-preference measures), each standardized using the low-ZSV group mean and standard deviation and oriented so that higher values indicate greater support for global redistribution and related forms of international economic openness. Column (8) reports the first principal component of the standardized donation amount and the four standardized policy-preference measures; PCA weights are estimated using the low-ZSV group and the resulting score is re-standardized to have mean zero and unit variance in that group. Robust standard errors are in parentheses. Stars indicate statistical significance based on two-sided tests using unadjusted p-values: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. Appendix Table A-11 reports the corresponding p-values and the q-values obtained after adjusting for multiple hypothesis testing employing the method proposed by Anderson (2008). Appendix Table A-10 reports additional robustness specifications, including models without covariates and models that additionally control for ethnicity.

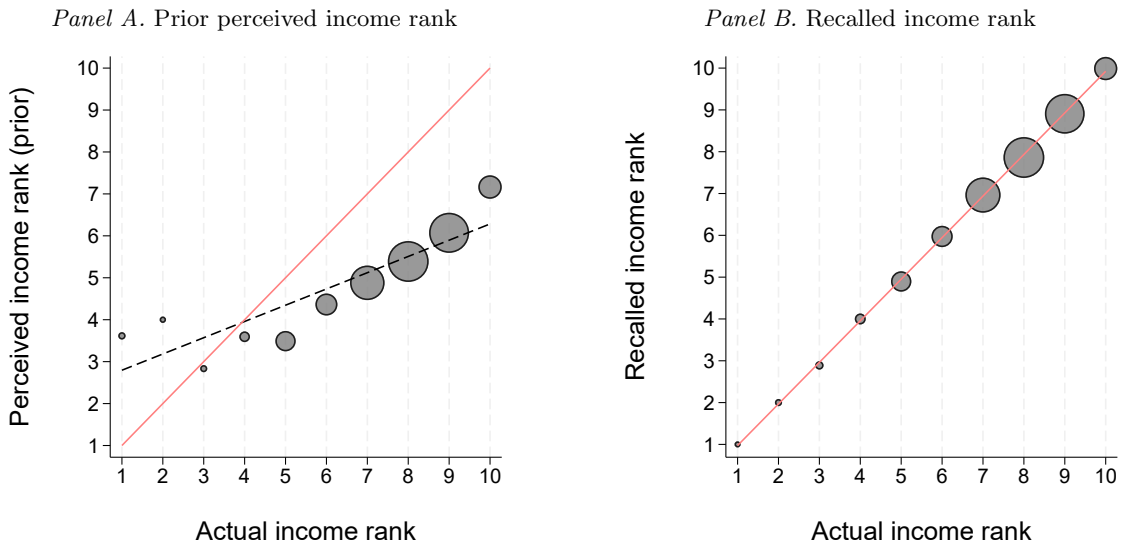

FIGURE 7 – PERCEIVED AND RECALLED GLOBAL INCOME RANK.

Notes: Panel A plots participants' prior beliefs about their household's position in the global income distribution (y-axis) against their actual income decile based on World Bank data (x-axis). Each point shows the average perceived rank for respondents within each actual decile. Panel B plots recalled income rank among participants who were shown their actual decile. Recalled values were elicited immediately after the information was shown. The red 45-degree line indicates perfect alignment between perceived or recalled rank and actual rank. The size of the markers is relative to the sample size in the respective income decile. In Panel A, we include a linear fit. Most observations fall below the line, indicating widespread underestimation. In Panel B, nearly all points lie on the line, reflecting near-perfect recall of the provided information. See Appendix Table A-1 for variable definitions.

mated (-0.03, $p = 0.211$). By contrast, the interaction between the two treatments is positive and statistically significant ($+0.073$, $p = 0.032$), indicating that rank salience moderates the impact of zero-sum beliefs.

Estimated marginal effects confirm that the negative impact of the zero-sum prime is fully offset among participants who receive rank information; see Appendix Table A-11. Within the rank-information group, the effect of the zero-sum prime on donations is near zero ($+0.005$) and not statistically significant ($p = 0.836$, $q = 1$).[11]

These results indicate that rank salience is behaviorally consequential only when a zero-sum mindset is activated and, arguably, because of it. Substantively, the pattern is consistent with a responsibility mechanism grounded in the definition of zero-sum thinking. Under a zero-sum worldview, one party's gain implies another's loss. When respondents holding such beliefs are made aware of their relative affluence, the linkage between their own gains and others' losses becomes salient, plausibly activating responsibility-based motives that counteract the donation-reducing effect of zero-sum beliefs. By contrast, under a positive-sum worldview, personal affluence is not interpreted as coming at others' expense, so making affluence salient has no reason to alter redistribution preferences and contributions remain unchanged.

On the amount contributed, we find no statistically significant effects of either treatment or

[11] Appendix Table A-11 reports marginal effects of the zero-sum treatment separately by rank-information status, with corresponding p-values and q-values that account for multiple hypothesis testing.

their interaction. The point estimates are nevertheless directionally consistent with the extensive margin results: the coefficient on the zero-sum treatment is negative, while the interaction term with rank information is positive.

Stated Preferences. Turning to the stated policy preferences, the pattern of results broadly aligns with the donation outcomes. For stated policies, point estimates are generally negative across redistribution, international cooperation, globalization, and migration, but none is statistically distinguishable from zero. Interactions with global-rank information suggest attenuation of these effects, yet these offsets are also imprecisely estimated.

IV. Conclusion and Discussion

This paper studies how beliefs about economic exchange, and in particular zero-sum thinking, shape support for global redistribution. In a preregistered 2×2 survey experiment with UK adults (representative by age and gender), we randomly vary exposure to a zero-sum prime and, independently, information about respondents' position in the global income distribution. The zero-sum prime reduces revealed support for international redistribution primarily on the extensive margin: it lowers the probability of making any donation to an international anti-poverty NGO, with little change in donation amounts. Providing global-rank information offsets this extensive-margin response. Across stated preferences for global redistribution, an international redistributive institution, globalization, and migration, point estimates move in the same direction as the donation outcome but are imprecise and statistically indistinguishable from zero.

These experimental results stand in contrast to cross-sectional patterns in our data, where stronger zero-sum beliefs are positively associated with stated support for global redistribution, consistent with evidence from the United States in Chinoy et al. (2026). Our findings caution against interpreting such observational gradients as the causal effect of zero-sum thinking. A natural interpretation is that measured zero-sum views correlate with other (unobserved) traits that increase expressed support for redistribution, that survey responses may partly reflect reverse causality from policy attitudes to agreement with zero-sum statements, or that the zero-sum index aggregates distinct underlying dispositions such that naturally occurring variation differs from the variation induced by a short-run prime.

Under this interpretation, the experiment identifies the causal effect of making a zero-sum frame salient at the time of evaluation. This estimand is relevant for understanding responses to political rhetoric that portrays economic gains as coming at others' expense. In the short run, zero-sum views appear malleable and can meaningfully reduce revealed willingness to support transfers to distant out-groups, especially by discouraging participation on the extensive margin.

Our results speak to a growing literature showing that politically salient narratives and information campaigns can shift beliefs and preferences in ways that dampen support for redistribution and strengthen in-group bias (Alesina, Reich and Riboni, 2020; Bonomi, Gennaioli and Tabellini, 2021). Zero-sum narratives may be particularly effective at reducing support for

cross-group transfers by framing economic relations as inherently competitive, and the interaction with global-rank information suggests that perceived relative position can condition these responses.

Several questions remain for future work. First, treatment effects may differ in political environments where messages are repeated, contested, and bundled with partisan identities. Second, external validity beyond a single national context remains to be established. Third, it would be useful to examine whether similar mechanisms operate for domestic redistribution and in settings where the relevant out-group is less socially distant or partly overlaps with the in-group.

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ONLINE APPENDIX

1. Variable Definitions

Table A-1 – Main Variables: Definitions and Measurement

Variable	Definition and Measurement
Zero-sum views index	Standardized index based on responses to six items measured on 5-point Likert scales (1 = Strongly agree, 5 = Strongly disagree). Items include: *(1) "If someone gets richer, it means that someone else gets poorer"; (2) "Life is like a tennis game: A person wins only when others lose"; (3) "When some people are getting poorer, it means that other people are getting richer"; (4) "The wealth of a few is acquired at the expense of many"; (5) "Those who give much to others receive much from them"; (6) "When the number of rich people increases in the world, the poorer people benefit as well."* Items (1) through (4) are reverse-coded so that higher values consistently indicate stronger endorsement of zero-sum views.
Perceived income rank	Respondents' subjective estimate of their household's position in the global income distribution, recorded on a 10-point decile scale (1 = Poorest decile, 10 = Richest decile). Elicited prior to the information treatment.
Recalled income rank	Respondents' recall of the information provided about their actual global income decile. Elicited immediately after the income rank information treatment using the same 10-point decile scale. Only collected for participants who received the information.
Contributor	Binary indicator equal to 1 if the participant chose to contribute part of their £1 bonus to one of four international NGOs fighting global poverty; 0 otherwise.
Amount contributed	Continuous variable measuring the amount (in GBP) contributed to the selected NGO, ranging from £0 to £1. Includes zeroes for those who chose not to contribute.
Support for global redistribution	10-point Likert scale response to: *"Imagine that it would be possible to redistribute income around the world in a similar way as a state can redistribute income within a country. How much redistribution of income would you like between citizens in the world?"* (1 = No redistribution, 10 = Complete redistribution).
Support for international organization	10-point Likert scale response to: *"Would you support the creation of an international organization (similar to the United Nations) that can redistribute income or resources between countries?"* (1 = Definitely not support, 10 = Definitely support).
Support for globalization	10-point Likert scale response to: *"What level of globalization would you like?"* (1 = No globalization, 10 = Complete globalization).
Support for migration	10-point Likert scale response to: *"Should the UK, in your opinion, allow more or less people from poorer countries to come to the UK and work and live here?"* (1 = Much fewer people, 10 = Much more people).
Political leaning	Categorical measure based on responses to: *"If an election was held today, which political party would you vote for?"* Responses are coded into three groups: *(1) Center-left* (Green Party, Labour, SNP, Liberal Democrats), *(2) Right-leaning* (Conservatives, UKIP), and *(3) Other/Undisclosed* (Other, Don't know, Prefer not to say). Used to construct binary indicators for center-left and right-leaning political orientation.

A. Summary Statistics and Balance across Treatment Groups

TABLE A-2 – Summary statistics: Experimental sample vs. UKHLS (2024)

	Experimental		UKHLS		Difference	
Characteristic	Mean	SD	Mean	SD	Diff	p-val
Panel A: Experimental sample and UKHLS						
Age	46.53	15.72	46.65	18.70	-0.12	0.718
Female	51.5	50.0	51.4	50.0	0.0	0.986
Household size	2.67	1.22	3.03	1.68	-0.36	0.000
Actual income rank (decile)	7.74	1.57	9.24	1.57	-1.50	0.000
Bachelor's degree	38.2	48.6	30.3	45.9	7.9	0.000
Master's degree or higher	18.9	39.2	13.1	33.7	5.9	0.000
Other education	42.9	49.5	56.7	49.6	-13.8	0.000
Employed	70.2	45.7	55.0	49.7	15.2	0.000
Unemployed	6.5	24.7	7.7	26.7	-1.2	0.027
Not in labor force	23.3	42.3	36.0	48.0	-12.8	0.000
White	85.0	35.8	74.5	43.6	10.5	0.000
Asian	8.1	27.3	15.6	36.3	-7.4	0.000
Black	3.3	18.0	5.0	21.7	-1.6	0.000
Mixed	1.9	13.6	3.6	18.6	-1.7	0.000
Other ethnicity	1.7	12.9	1.4	11.8	0.3	0.315
Left-leaning	46.3	49.9	58.8	49.2	-12.6	0.000
Center	9.9	29.8	8.8	28.3	1.1	0.098
Right-leaning	17.4	37.9	28.3	45.0	-10.9	0.000
Undisclosed/Other	26.5	44.1	4.1	19.8	22.4	0.000
Panel B: Experimental sample only						
Perceived income rank (decile)	5.37	2.03				
Brexit support	24.7	43.1				
Brexit opposition	71.8	45.0				
Brexit: no answer	3.4	18.3				

Notes. This table presents summary statistics from the experimental sample and the UK Household Longitudinal Study (Understanding Society) harmonised cross-section, restricted to UK residents (England, Wales, Scotland, Northern Ireland), age 18+, interviewed in 2024. UKHLS statistics are weighted using the cross-sectional individual weight (`o_inding2_xw`) with the survey design (`o_psu`, `o_strata`). Indicator variables are reported as percentages; other variables are reported in levels. Means are computed over non-missing observations; the number of usable observations can vary by row. The overall sample sizes are $N = 2116$ (experimental sample) and $N =$ (UKHLS).

Political leaning is based on vote intention in both samples. Panel B variables are not available in UKHLS and are therefore shown for the experimental sample only.

Table A-3 – Baseline Summary Statistics and Balance Tests

	No income-rank info			Income-rank info			
	Low ZSV	High ZSV	Δ ZSV	Low ZSV	High ZSV	Δ ZSV	DID
Age	46.85	46.60	-0.25	46.14	46.52	0.37	0.62
			(0.801)			(0.695)	(0.649)
Female	0.54	0.50	-0.03	0.51	0.51	0.01	0.04
			(0.269)			(0.808)	(0.339)
Household Size	2.58	2.65	0.07	2.76	2.67	-0.09	-0.15
			(0.393)			(0.226)	(0.146)
Bachelor's Degree	0.37	0.36	-0.01	0.41	0.39	-0.02	-0.01
			(0.676)			(0.500)	(0.853)
Master's Degree or higher	0.18	0.21	0.03	0.17	0.19	0.02	-0.01
			(0.191)			(0.447)	(0.684)
Other Education	0.45	0.43	-0.02	0.42	0.42	0.00	0.02
			(0.524)			(0.943)	(0.615)
Employed	0.71	0.72	0.00	0.69	0.69	0.00	-0.00
			(0.899)			(0.915)	(0.990)
Unemployed	0.06	0.07	0.01	0.07	0.07	-0.00	-0.02
			(0.421)			(0.797)	(0.459)
Not in Labor Force	0.23	0.22	-0.02	0.24	0.24	0.00	0.02
			(0.550)			(0.970)	(0.655)
White	0.85	0.85	0.01	0.83	0.86	0.03	0.02
			(0.688)			(0.191)	(0.519)
Non-White	0.15	0.15	-0.01	0.17	0.14	-0.03	-0.02
			(0.688)			(0.191)	(0.519)
Actual Income Rank	7.73	7.78	0.05	7.68	7.78	0.10	0.05
			(0.624)			(0.286)	(0.689)
Perceived Income Rank	5.31	5.54	0.22	5.34	5.28	-0.06	-0.28
			(0.077)			(0.615)	(0.108)
Left-leaning	0.44	0.50	0.06	0.44	0.47	0.03	-0.03
			(0.042)			(0.293)	(0.481)
Center	0.11	0.08	-0.04	0.12	0.09	-0.03	0.01
			(0.049)			(0.153)	(0.734)
Right-leaning	0.19	0.18	-0.00	0.16	0.16	0.00	0.01
			(0.857)			(0.956)	(0.866)
Undisclosed	0.26	0.24	-0.02	0.28	0.28	-0.01	0.02
			(0.393)			(0.808)	(0.673)
Brexit Support	0.25	0.25	0.00	0.22	0.26	0.04	0.04
			(0.999)			(0.163)	(0.330)
Brexit Opposition	0.71	0.72	0.01	0.73	0.71	-0.02	-0.03
			(0.687)			(0.478)	(0.432)
Brexit No Answer	0.03	0.02	-0.01	0.05	0.03	-0.02	-0.01
			(0.276)			(0.158)	(0.713)
Observations	527	523		532	534		

Notes: This table reports baseline summary statistics and balance tests by treatment assignment in a 2×2 design. Columns 1–3 report cell means for respondents assigned to no income-rank information by zero-sum views treatment status, with Column 3 showing the within-arm difference in means (High minus Low) and the two-sided t-test p-value in parentheses. Columns 4–6 report the analogous statistics for respondents assigned to receive income-rank information. Column 7 reports the difference-in-differences (DID) estimate, defined as the coefficient on the interaction between the ZSV treatment indicator and the income-rank information indicator in an OLS regression of the covariate on both treatment indicators and their interaction; heteroskedasticity-robust standard errors are used; the p-value is reported in parentheses.

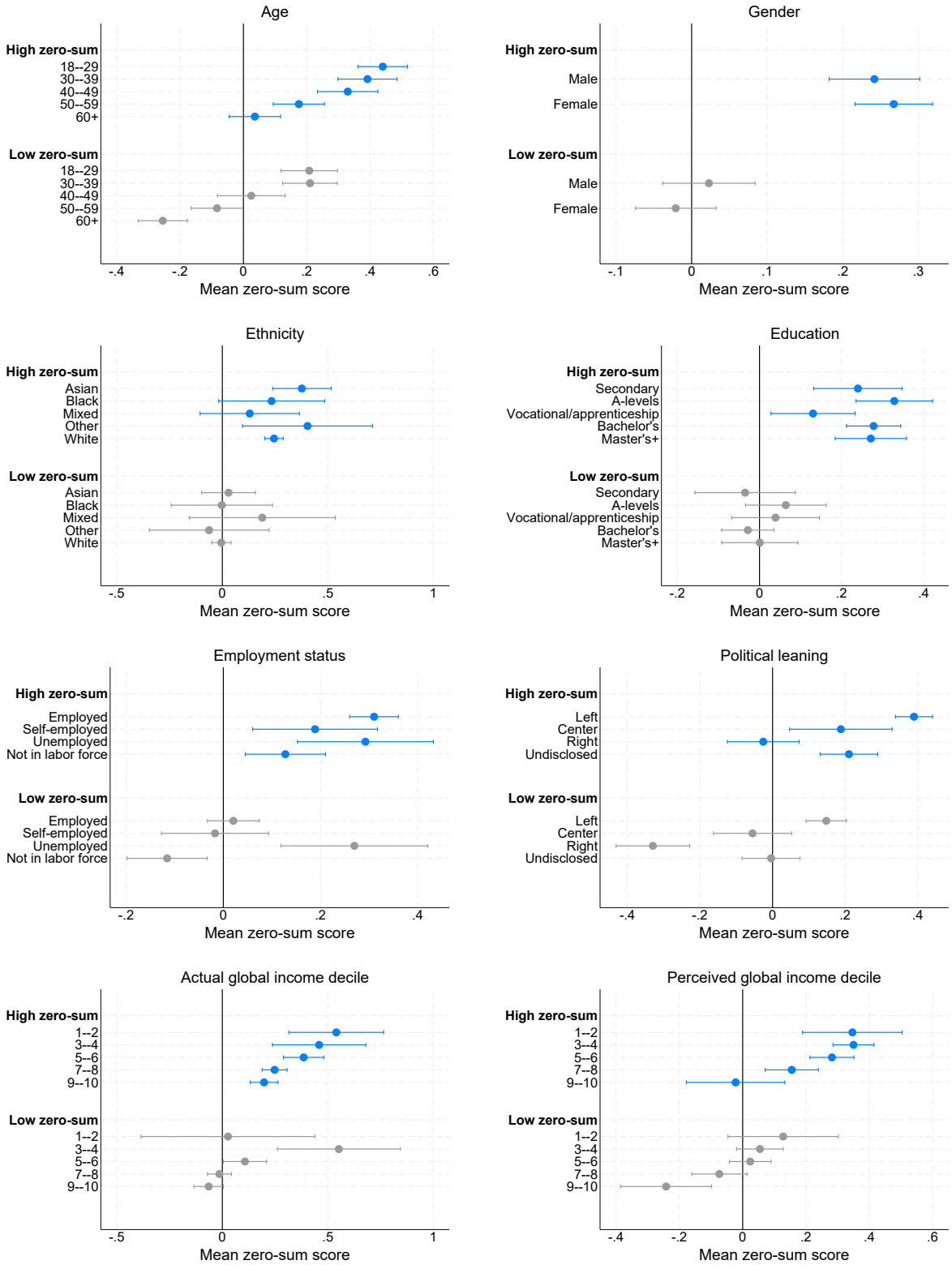


FIGURE A-1 – MEAN ZERO-SUM VIEWS ACROSS SUBGROUPS.

Notes: For each panel, points show estimated means of the zero-sum views index separately for respondents assigned to the low versus high zero-sum prime. In each panel, estimates are obtained from an OLS regression of the zero-sum views index on indicators for the subgroup categories, the zero-sum prime, and their interaction. The Zero-Sum Index is standardized using the mean and standard deviation of the Low zero-sum treatment group, so values are expressed in standard deviation units relative to that group. Bars indicate 95% confidence intervals based on heteroskedasticity-robust standard errors.

B. The Zero-Sum Views Treatment: Additional Analyses

1. Open-Text Analysis

Table A-4 – Correlation between the Zero-sum Views Index and LLM Score

	(1)
Zero-sum views index	0.120***
	(0.012)
Observations	2,104

Notes. The table shows the results of regressing the LLM zero-sum scores (classified by Claude Opus 4.6) on the zero-sum views index. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A-5 – Effect of Zero-sum and Rank-info Treatments on LLM Score

	(1)
Zero-sum treatment	0.687***
	(0.008)
Rank-info treatment	-0.004
	(0.008)
Observations	2,104

Notes. The table shows the results of regressing the LLM zero-sum scores (classified by Claude Opus 4.6) on the treatments. LLM Score = 1 indicates that the paragraph contains high zero-sum views and 0 indicates low zero-sum views. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

```
prompt = (
    "You are a classifier. Given the Response below, output ONLY a numeric score between 0.00 and 1.00 "
    "(two decimal places) where:\n"
    "0.00 = definitely low zero-sum (multiple people can succeed without harming others)\n"
    "1.00 = definitely high zero-sum (one person's success requires others to lose)\n\n"
    "Return exactly one token in the format X.XX (for example 0.00, 0.50, 1.00) and nothing else. "
    "If unsure, return 0.50.\n\n"
    f'Response: "{text}"\n\n'
    "Output:"
)
```

Figure A-2 – Prompt for LLM Classification.

Notes: Prompt used for LLM classification of open ended text.

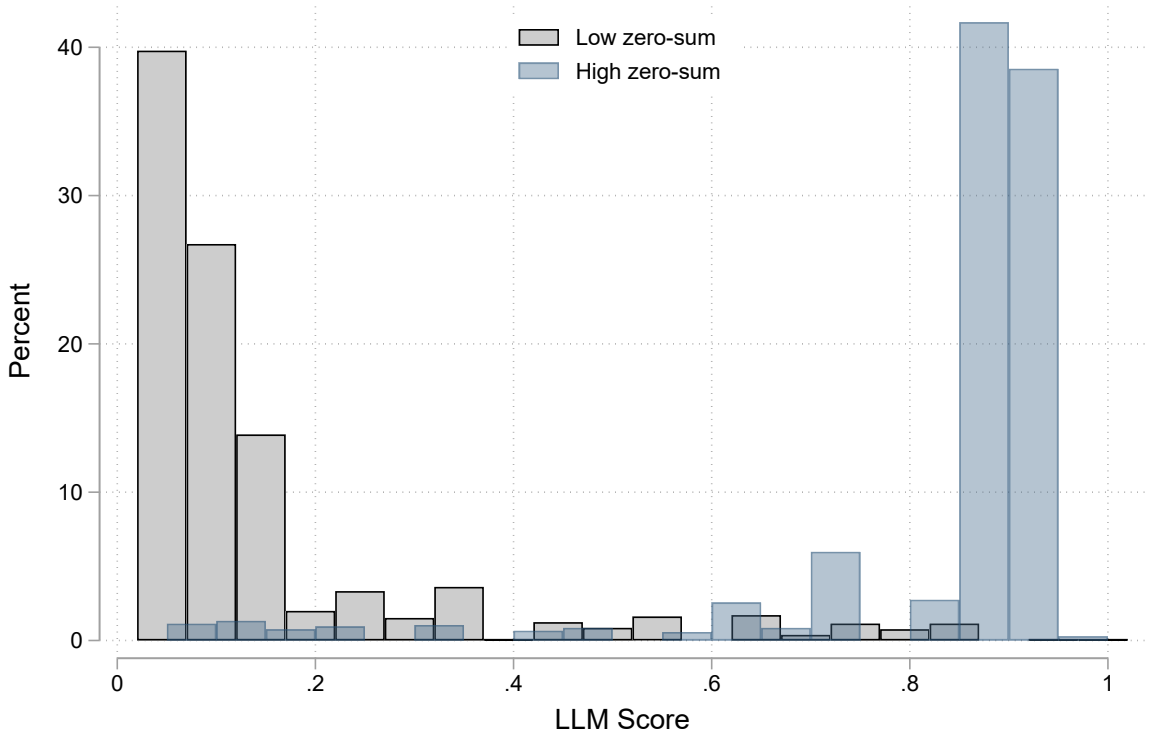


Figure A-3 – LLM Scores by zero-sum condition.

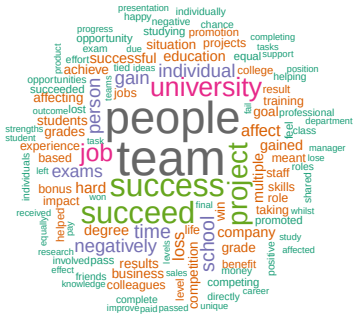
Notes: The figure shows the histogram of LLM scores in high- and low-zero sum views conditions. Higher scores represent higher zero-sum content.

Score	Response
0.95	In a job interview for a school that I really wanted to work at. There was only one role and four candidates so only one person would get the job.
0.95	i found that when i used to trade bitcoin on exchanges i learned that whenever i got a good trade and recieved good money from that trade it was usually on th ebasis that someone elese would have lost money in return. Thus if i won on the trade, it meant someone else lost on a trade
0.95	Applying for jobs where there is a large number of applicants for few places. To get the job you needed to score well on an examination and the interview. Therefore for someone to gain the place many people lost.
0.05	getting GCSE's. at school, . everyones results were based on individual performance and not related to anyone else
0.05	Myself and 2 colleagues organised a local cultural festival. All participating artists chose to voluntarily participate. The impact to the community, artists and organisers was all positive as the event was new, offering new opportunities to the public, participants and my colleagues. Even if people chose not to get involved, there was no negative effect as the opportunities for all involved were still present.
0.05	Most exams and essays during my undergraduate degree are marked individually and moderated. The results are not marked on 'a curve' and so everyone has the opportunity to succeed. One module 97% of people received the highest grade due to this
0.55	I can only think of promotion situations whereby if I earned a promotion another applicant would lose out. Although they did not really lose out. They just remained in their post and their salary remained the same. So they did not "lose out" as such.
0.45	Does this apply to anything? I mean whilst, for example, only one person can be 'top of the class' or get a single promotion slot at a time - this doesn't inherently mean that either the person 'winning' this time will actually succeed/remain motivated/etc... ...or that the people not 'winning' will not be motivated to try harder & end up in a better position. So, whilst it was always kind of good to be at the top of the class for maths at secondary school, I became completely demotivated as I was learning so little for years & the talent I had was wasted.
0.55	Someone who had good success on paper but lost employees along the way due to their attitude and lack of morals

Table A-6 – Representative examples and scores from the LLM classifier. Higher scores represent higher zero-sum views.

Figure A-4 visualizes word clouds for the low and high zero-sum groups. The most frequently used words in both conditions are *job*, *promotion*, *people*, and *person*. These terms are broadly neutral in sentiment and consistent with the task prompt, which asked respondents to recall a professional or educational experience related to success.

Panel A. Low zero-sum condition



Panel B. High zero-sum condition

Figure A-4 – Word Frequency Visualization by Zero-Sum Condition.

Notes: Word clouds show the most frequently used words in narrative responses, separately for the high-zero-sum and low-zero-sum conditions. Font size reflects relative word frequency. Common stopwords have been removed.

2. Standardized Outcomes

Table A-7 – Effects of Increasing Zero-sum Views on Redistribution Preferences and Economic Openness: Standardized Outcomes.

	Contributor	Amount contrib.	Redistrib.	Internat. org.	Globaliz.	Migration	Outcomes index	First PC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Zero-sum treatment	-0.184***	-0.072	-0.061	-0.068	-0.093	-0.045	-0.068*	-0.091
	(0.066)	(0.062)	(0.060)	(0.059)	(0.057)	(0.053)	(0.040)	(0.056)
Observations	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
LZS Mean	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes. This table replicates the results of Table 2, using standardized outcomes. Each column reports estimates from a separate OLS regression of the indicated outcome on an indicator for assignment to the high zero-sum views treatment. All specifications include controls for age, gender, education, household size, political party, and employment status. Outcomes in columns (1)–(6) are standardized using the mean and standard deviation of the low zero-sum group within the no-income-rank-information sample. The outcome index in column (7) is an equally weighted average of five standardized components: amount contributed and the four policy-preference measures. Column (8) reports the first principal component of the standardized donation amount and the four standardized policy-preference measures; PCA weights are estimated using the low-ZSV group and the resulting score is re-standardized to have mean zero and unit variance in that group. Robust standard errors are in parentheses. Stars indicate statistical significance based on two-sided tests using unadjusted p-values: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

3. Robustness to Baseline Covariates

Table A-8 – Effects of Increasing Zero-sum Views on Global Redistribution Preferences and Economic Openness: Robustness to Covariates

	Contributor	Amount contrib.	Redistrib.	Internat. org.	Globaliz.	Migration	Outcomes index	First PC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: No covariates								
Zero-sum treatment	-0.068***	-0.029	-0.118	-0.130	-0.154	-0.077	-0.056	-0.072
	(0.025)	(0.023)	(0.156)	(0.170)	(0.122)	(0.157)	(0.044)	(0.062)
Observations	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
LZS Mean	0.831	0.536	5.869	5.970	6.924	4.899	0.000	0.000
Panel B: With covariates								
Zero-sum treatment	-0.069***	-0.027	-0.152	-0.182	-0.189	-0.115	-0.068*	-0.091
	(0.025)	(0.023)	(0.149)	(0.160)	(0.117)	(0.136)	(0.040)	(0.056)
Observations	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
LZS Mean	0.831	0.536	5.869	5.970	6.924	4.899	0.000	0.000
Panel C: With covariates and ethnicity								
Zero-sum treatment	-0.064**	-0.029	-0.151	-0.191	-0.207*	-0.134	-0.073*	-0.097*
	(0.025)	(0.024)	(0.151)	(0.162)	(0.117)	(0.138)	(0.041)	(0.057)
Observations	1,007	1,007	1,007	1,007	1,007	1,007	1,007	1,007
LZS Mean	0.831	0.536	5.869	5.970	6.924	4.899	0.000	0.000

Notes. Each column reports estimates from a separate OLS regression of the indicated outcome on an indicator for assignment to the high zero-sum views treatment. Panel A includes no additional covariates. Panel B adds controls for age, gender, education, household size, political party, and employment status. Panel C further adds controls for ethnicity. The number of observations differs across panels because ethnicity information is not available for all participants; ethnicity was not elicited in the survey itself but obtained by merging survey responses with Prolific administrative metadata. *Contributor* is an indicator equal to one if the respondent made a strictly positive donation to one of the international anti-poverty NGOs; the reported mean is the share of contributors in the low-ZSV group. *Amount contributed* is the donation amount in GBP, including zeros for non-contributors. *Redistribution*, *International organization*, *Globalization*, and *Migration* are policy-preference items elicited on a 10-point Likert scale; higher values indicate stronger support for the stated policy. The *Outcomes index* is an equally weighted average of five components (amount contributed and the four policy-preference measures), each standardized using the low-ZSV group mean and standard deviation and oriented so that higher values indicate greater support for global redistribution and related forms of international economic openness. Column (8) reports the first principal component of the standardized donation amount and the four standardized policy-preference measures; PCA weights are estimated using the low-ZSV group and the resulting score is re-standardized to have mean zero and unit variance in that group. Robust standard errors are in parentheses. Stars indicate statistical significance based on two-sided tests using unadjusted p-values: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. Appendix Table A-9 reports the corresponding p-values and the q-values obtained after adjusting for multiple hypothesis testing employing the method proposed by Anderson (2008).

4. Real-Stakes Contributions to International NGOs

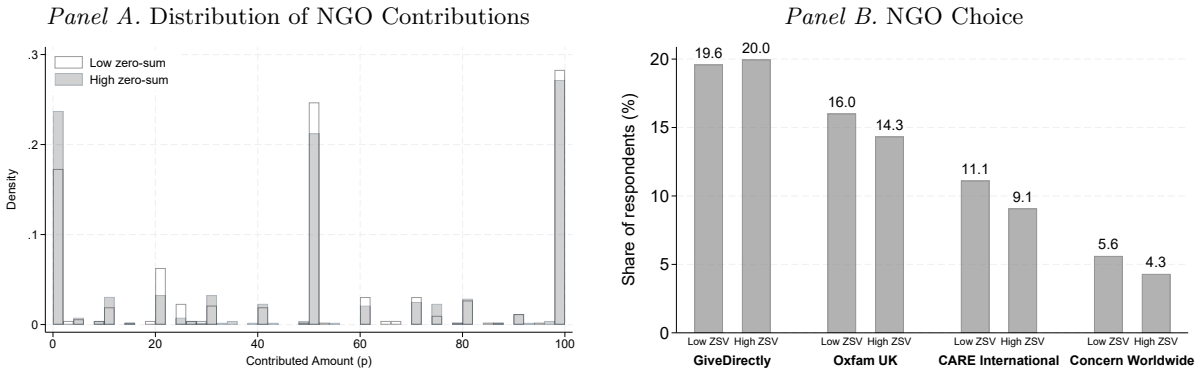


FIGURE A-5 – CONTRIBUTIONS AND NGO CHOICES BY ZERO-SUM VIEWS TREATMENT CONDITION

Notes: Panel A shows the distribution of individual contribution amounts, measured in pence (GBP), by assignment to either the low or high zero-sum condition. Panel B reports the percentage of respondents selecting each NGO. The figure uses only observations from participants that were not informed about their rank in the global income distribution ($N = 1,050$).

5. Multiple Hypotheses Testing

TABLE A-9 – EFFECTS OF ZERO-SUM FRAMING ON POLICY PREFERENCES WITH P-VALUES AND MULTIPLE HYPOTHESIS TESTING–ADJUSTED Q-VALUES

	Contributor (1)	Amount contrib. (2)	Redistrib. (3)	Internat. org. (4)	Globaliz. (5)	Migration (6)
Zero-sum treatment	-0.069	-0.027	-0.152	-0.182	-0.189	-0.115
	(0.025)	(0.023)	(0.149)	(0.160)	(0.117)	(0.136)
p-value	0.005	0.249	0.309	0.254	0.105	0.397
q-value	0.034	0.447	0.447	0.447	0.358	0.463
Observations	1,050	1,050	1,050	1,050	1,050	1,050

Notes: This table replicates the results of Table 2, reporting robust p-values and multiple hypothesis testing (MHT) adjusted q-values for the six primary outcomes. Each column reports estimates from a separate OLS regression of the outcome on an indicator for assignment to the zero-sum belief treatment. The sample is restricted to respondents not shown their position in the global income distribution (N = 1,050). All specifications include controls for age, gender, education, household size, political party, and employment status. Contributor is an indicator equal to one if the respondent made a positive contribution to an international anti-poverty organization. Amount contributed is measured in GBP and includes zeros. Policy preference outcomes are measured on 10-point Likert scales, with higher values indicating stronger support. q-values are computed using the Benjamini–Hochberg procedure following Anderson (2008).

6. Heterogeneity in Zero-Sum Treatment Effects

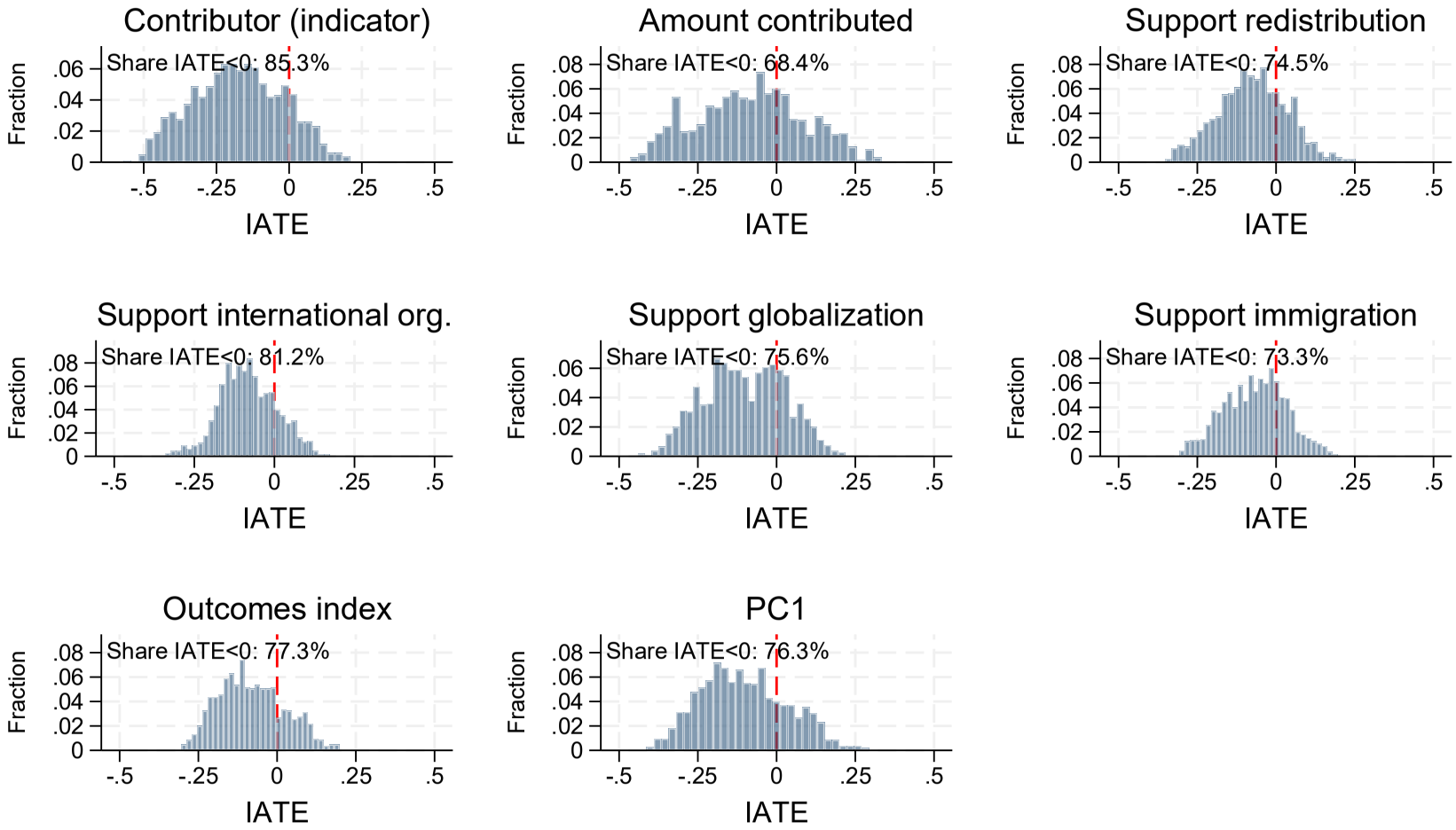


FIGURE A-6 – Distribution of Estimated Individual Average Treatment Effects (IATEs) of the Zero-Sum Treatment.

Notes: Each panel plots the empirical distribution of estimated individual average treatment effects (IATEs) of the high zero-sum treatment relative to the low zero-sum condition on the outcome indicated in the panel title. IATEs are estimated using the machine-learning procedure of Nie and Wager (2021), implemented by the cate command in Stata, with age group, gender, employment status, educational attainment, political leaning, actual global income rank, and perceived income rank (baseline beliefs) as covariates in the nuisance functions. The x-axis reports IATEs and the y-axis reports the fraction of respondents in each bin. Negative values indicate that the high zero-sum condition reduces the outcome relative to the low zero-sum condition, and positive values indicate that it increases the outcome. Estimates are based on the sample that did not receive information about their actual global income rank ($N = 1,050$).

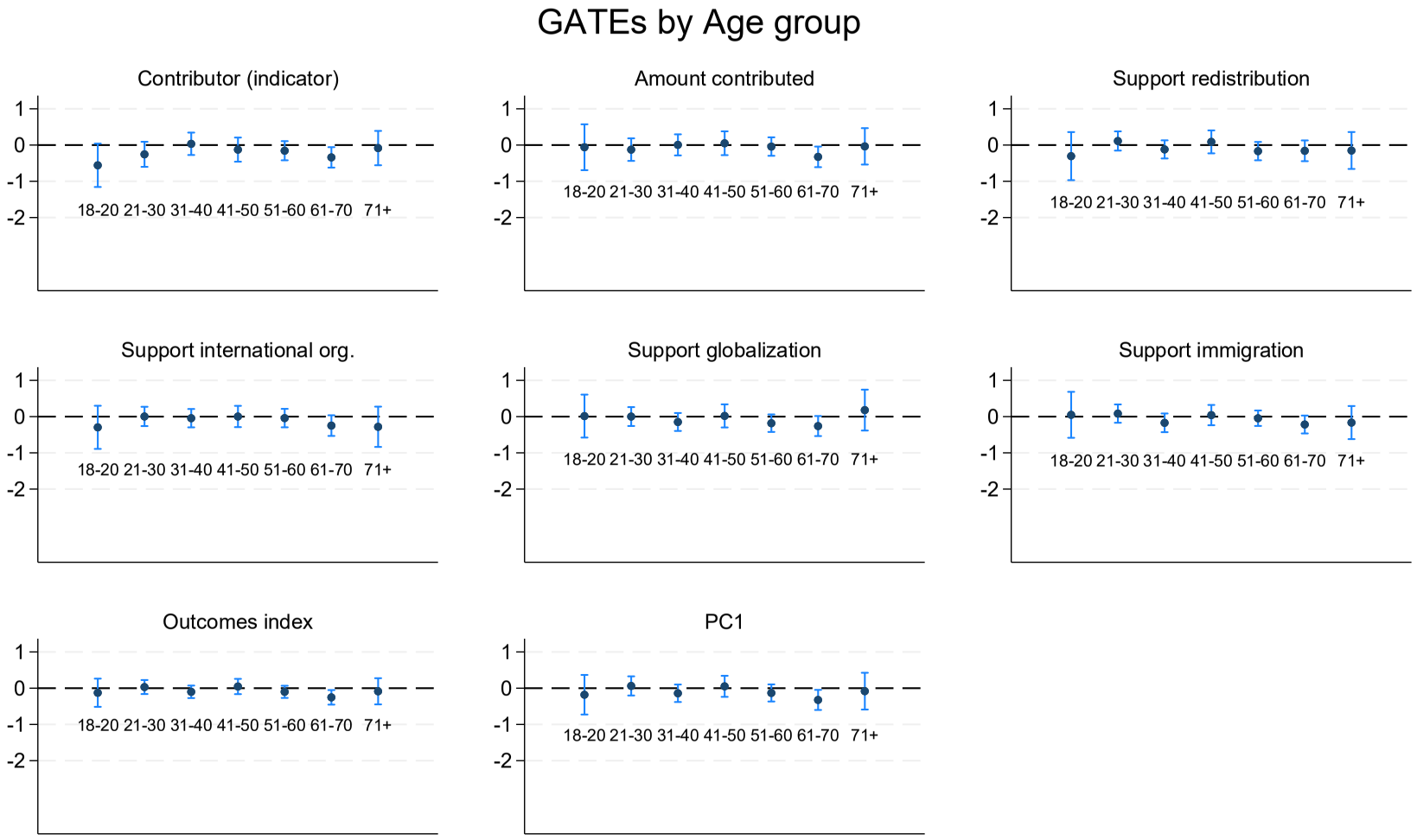


FIGURE A-7 – Group Average Treatment Effects by Age Group in the Zero-Sum Treatment.

Notes: The figure shows GATEs of the high vs. low zero-sum prime by age group. GATEs are computed as mean causal-forest IATEs within each age category (Stata `cate`, following Nie and Wager, 2021) using the full set of pre-treatment moderators. The whiskers denote 95% confidence intervals; the horizontal line indicates zero effect. For the amount contributed and the four stated support measures, the outcomes are standardized by the mean and standard deviation in the low zero-sum group that received no income rank information. Estimates are based on the sample that did not receive information about their actual global income rank.

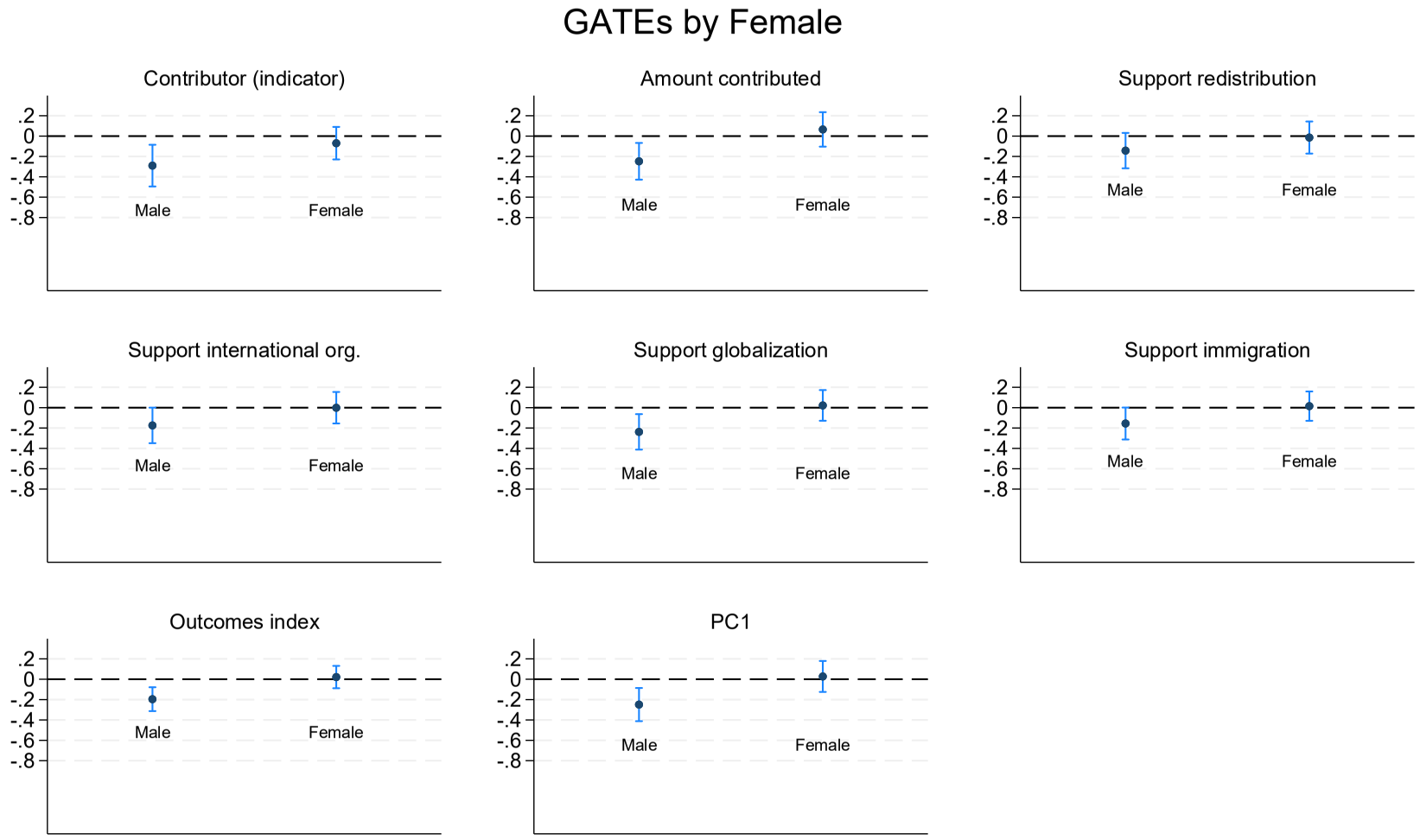


FIGURE A-8 – Group Average Treatment Effects by Gender in the Zero-Sum Treatment.

Notes: The figure shows GATEs of the high vs. low zero-sum prime by gender. GATEs are computed as mean causal-forest IATEs within each gender (Stata `cate`, following Nie and Wager, 2021) using the full set of pre-treatment moderators. The whiskers denote 95% confidence intervals; the horizontal line indicates zero effect. For the amount contributed and the four stated support measures, the outcomes are standardized by the mean and standard deviation in the low zero-sum group that received no income rank information. Estimates are based on the sample that did not receive information about their actual global income rank.

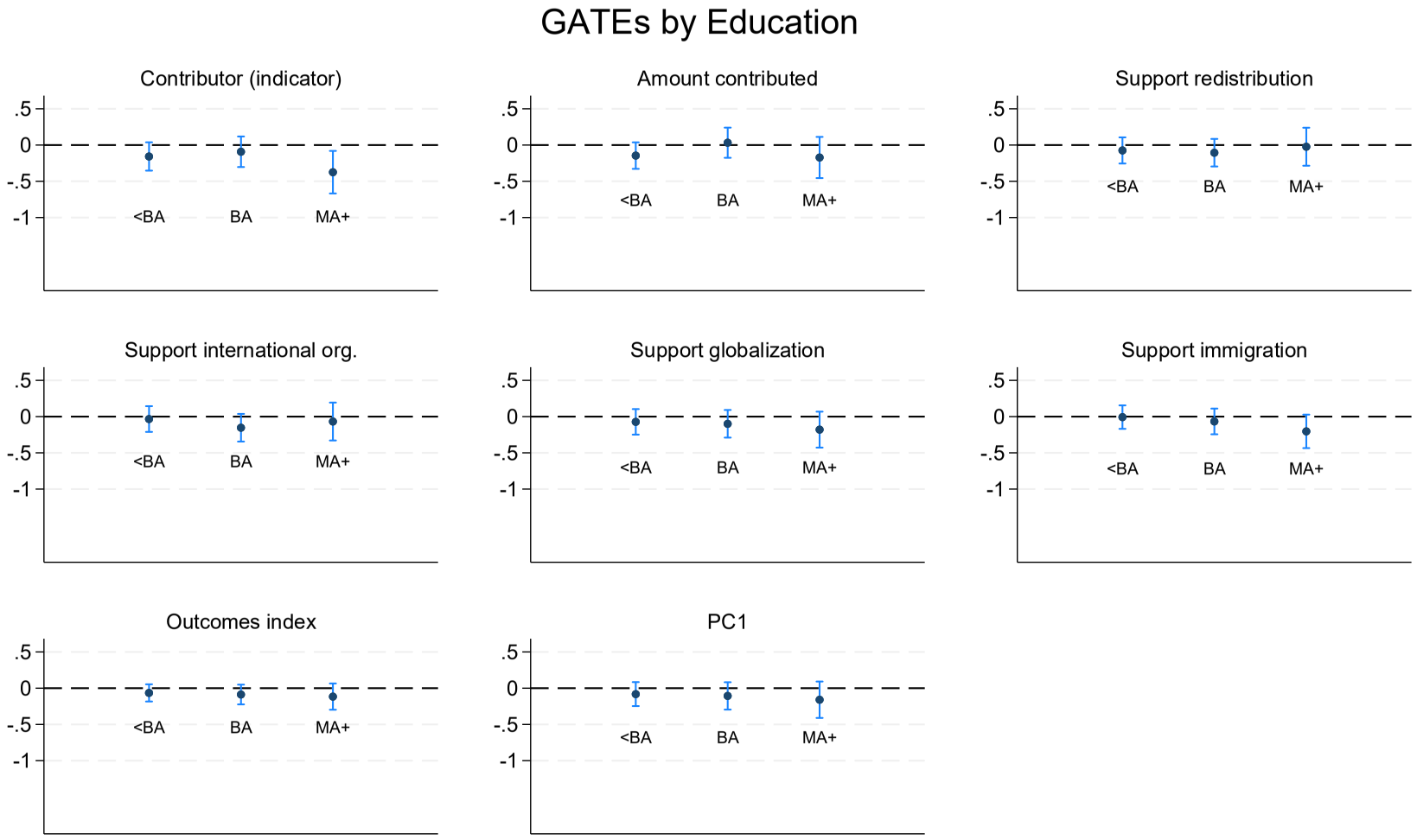


FIGURE A-9 – Group Average Treatment Effects by Education Level in the Zero-Sum Treatment.

Notes: The figure shows GATEs of the high vs. low zero-sum prime by education level. GATEs are computed as mean causal-forest IATEs within each education level (Stata `cate`, following Nie and Wager, 2021) using the full set of pre-treatment moderators. The whiskers denote 95% confidence intervals; the horizontal line indicates zero effect. For the amount contributed and the four stated support measures, the outcomes are standardized by the mean and standard deviation in the low zero-sum group that received no income rank information. Estimates are based on the sample that did not receive information about their actual global income rank.

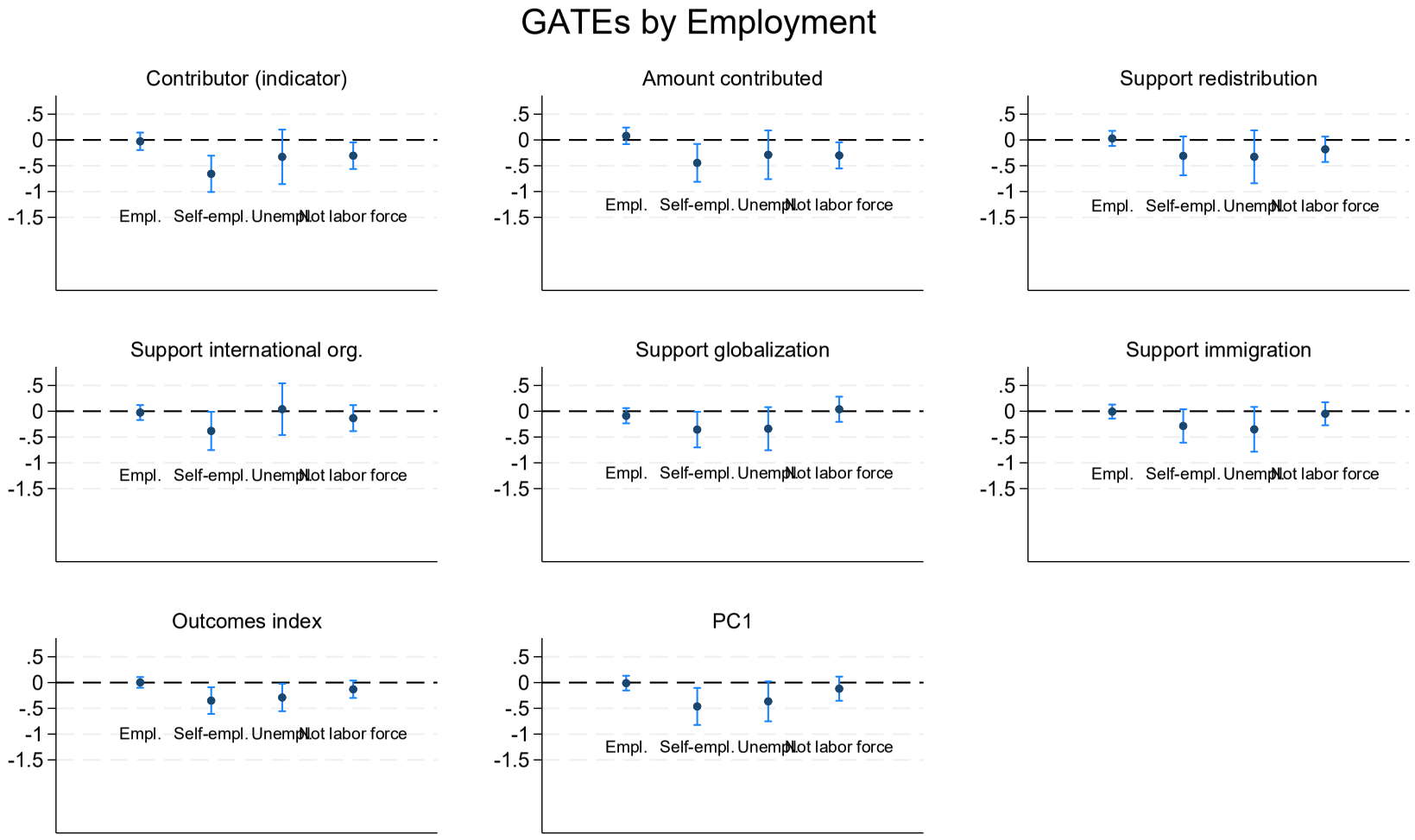


FIGURE A-10 – Group Average Treatment Effects by Employment Level in the Zero-Sum Treatment.

Notes: The figure shows GATEs of the high vs. low zero-sum prime by employment status. GATEs are computed as mean causal-forest IATEs within each employment category (Stata `cate`, following Nie and Wager, 2021) using the full set of pre-treatment moderators. The whiskers denote 95% confidence intervals; the horizontal line indicates zero effect. For the amount contributed and the four stated support measures, the outcomes are standardized by the mean and standard deviation in the low zero-sum group that received no income rank information. Estimates are based on the sample that did not receive information about their actual global income rank.

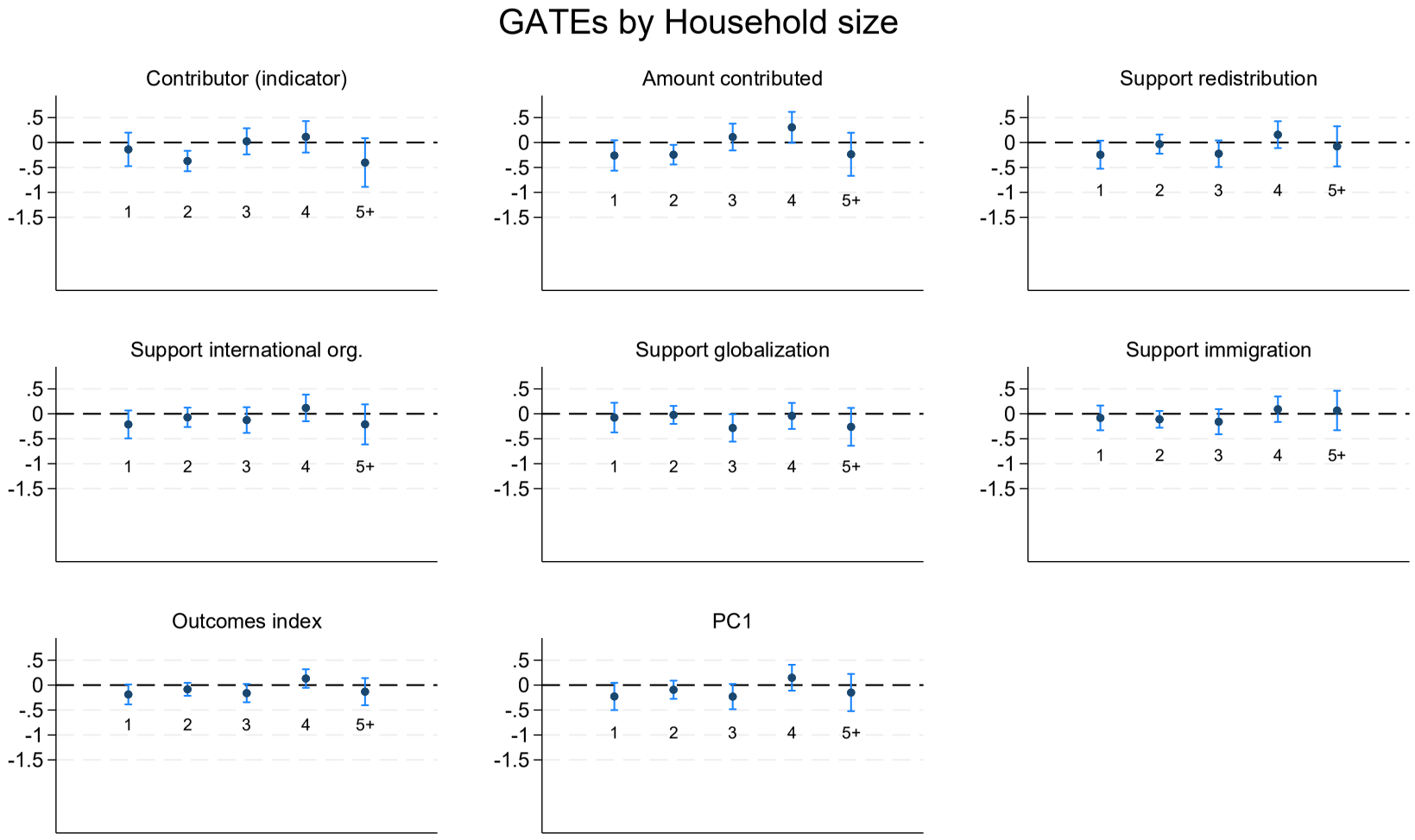


FIGURE A-11 – Group Average Treatment Effects by Household Size in the Zero-Sum Treatment.

Notes: The figure shows GATEs of the high vs. low zero-sum prime by household size. GATEs are computed as mean causal-forest IATEs within each household size group (Stata `cate`, following Nie and Wager, 2021) using the full set of pre-treatment moderators. The whiskers denote 95% confidence intervals; the horizontal line indicates zero effect. For the amount contributed and the four stated support measures, the outcomes are standardized by the mean and standard deviation in the low zero-sum group that received no income rank information. Estimates are based on the sample that did not receive information about their actual global income rank.

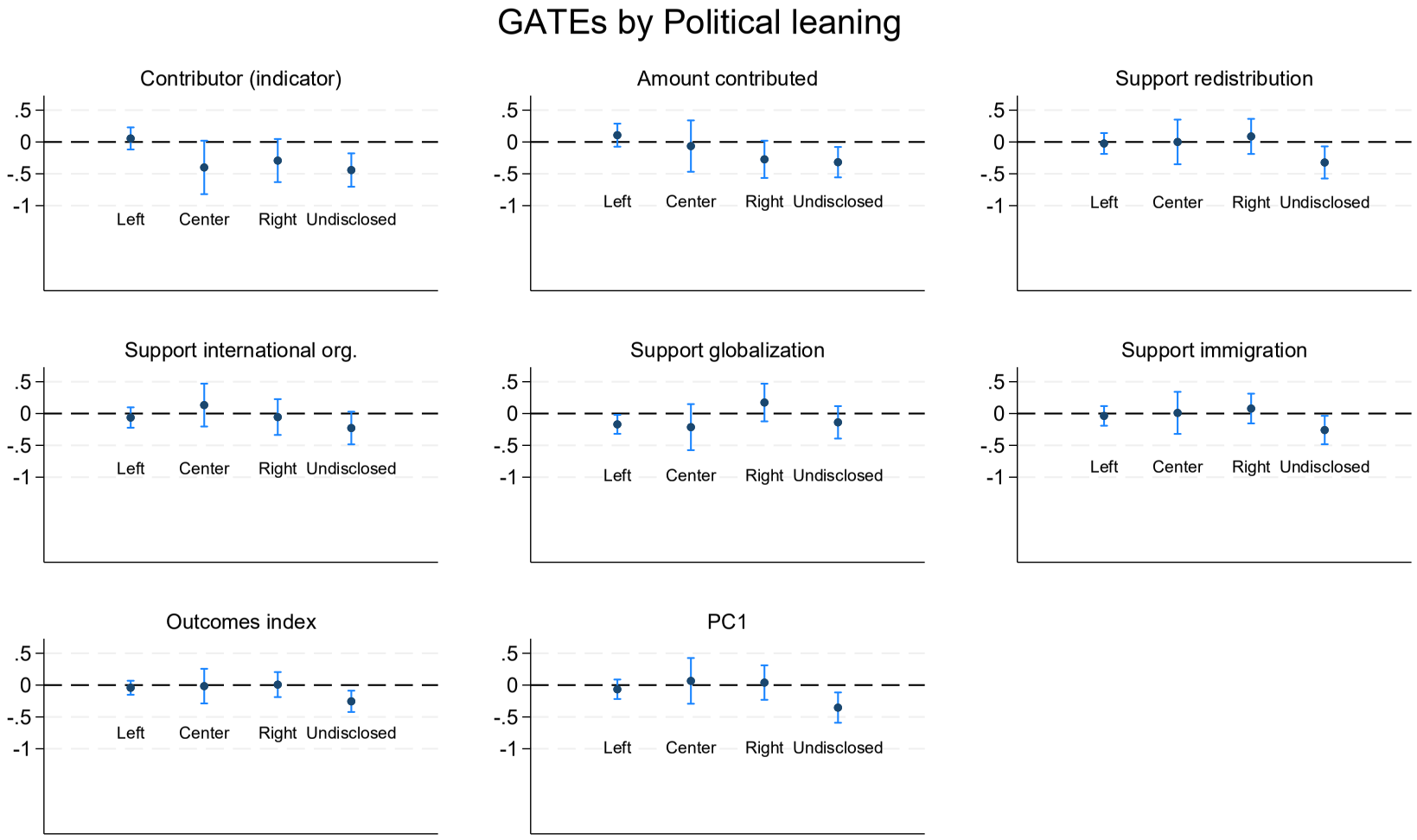


FIGURE A-12 – Group Average Treatment Effects by Political Leaning in the Zero-Sum Treatment.

Notes: The figure shows GATEs of the high vs. low zero-sum prime by political leaning. GATEs are computed as mean causal-forest IATEs within each political category (Stata `cate`, following Nie and Wager, 2021) using the full set of pre-treatment moderators. The whiskers denote 95% confidence intervals; the horizontal line indicates zero effect. For the amount contributed and the four stated support measures, the outcomes are standardized by the mean and standard deviation in the low zero-sum group that received no income rank information. Estimates are based on the sample that did not receive information about their actual global income rank.

C. The Global Income Rank Information Treatment: Additional Analyses

1. Robustness to Covariates

Table A-10 – Impact of Zero-sum Views and Global Rank Information on Global Redistribution and Economic Openness: Robustness to Covariates.

	Contributor	Amount contrib.	Redistrib.	Internat. org.	Globaliz.	Migration	Outcomes index	First PC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: No covariates								
Zero-sum treatment	-0.068***	-0.029	-0.118	-0.130	-0.154	-0.077	-0.056	-0.072
	(0.025)	(0.023)	(0.156)	(0.170)	(0.122)	(0.157)	(0.044)	(0.062)
Rank info treatment	-0.030	0.007	-0.147	0.079	0.068	0.161	0.017	0.021
	(0.024)	(0.023)	(0.155)	(0.167)	(0.128)	(0.162)	(0.044)	(0.062)
Zero-sum x Rank info	0.075**	0.041	0.177	0.016	0.172	-0.071	0.049	0.057
	(0.035)	(0.033)	(0.220)	(0.240)	(0.177)	(0.226)	(0.063)	(0.088)
Observations	2,116	2,116	2,116	2,116	2,116	2,116	2,116	2,116
Panel B: With covariates								
Zero-sum treatment	-0.068***	-0.027	-0.152	-0.167	-0.173	-0.140	-0.067*	-0.090
	(0.025)	(0.023)	(0.148)	(0.159)	(0.116)	(0.135)	(0.040)	(0.055)
Rank info treatment	-0.030	0.009	-0.170	0.055	0.046	0.092	0.007	0.006
	(0.024)	(0.023)	(0.146)	(0.156)	(0.123)	(0.139)	(0.040)	(0.055)
Zero-sum x Rank info	0.073**	0.038	0.203	0.045	0.194	-0.002	0.059	0.073
	(0.034)	(0.032)	(0.207)	(0.226)	(0.170)	(0.194)	(0.056)	(0.078)
Observations	2,116	2,116	2,116	2,116	2,116	2,116	2,116	2,116
Panel C: With covariates and ethnicity								
Zero-sum treatment	-0.064**	-0.029	-0.141	-0.172	-0.181	-0.158	-0.070*	-0.092*
	(0.025)	(0.023)	(0.149)	(0.160)	(0.117)	(0.137)	(0.040)	(0.056)
Rank info treatment	-0.020	0.011	-0.130	0.111	0.056	0.125	0.019	0.023
	(0.024)	(0.023)	(0.150)	(0.161)	(0.125)	(0.142)	(0.041)	(0.057)
Zero-sum x Rank info	0.064*	0.041	0.199	0.040	0.213	-0.030	0.060	0.073
	(0.035)	(0.033)	(0.212)	(0.230)	(0.172)	(0.197)	(0.057)	(0.079)
Observations	2,007	2,007	2,007	2,007	2,007	2,007	2,007	2,007

Notes. Panel A reports OLS regressions including indicators for the zero-sum treatment and the global income rank information treatment, as well as their interaction. Panel B adds controls for age, gender, education, household size, political party, and employment status. Panel C further adds controls for ethnicity. The number of observations differs across panels because ethnicity information is not available for all participants; ethnicity was not elicited in the survey itself but obtained by merging survey responses with Prolific administrative metadata. *Contributor* is an indicator equal to one if the respondent made a strictly positive donation to one of the international anti-poverty NGOs; the reported mean is the share of contributors in the low-ZSV group. *Amount contributed* is the donation amount in GBP, including zeros for non-contributors. *Redistribution*, *International organization*, *Globalization*, and *Migration* are policy-preference items elicited on a 10-point Likert scale; higher values indicate stronger support for the stated policy. The *Outcomes index* is an equally weighted average of five components (amount contributed and the four policy-preference measures), each standardized using the low-ZSV group mean and standard deviation and oriented so that higher values indicate greater support for global redistribution and related forms of international economic openness. Column (8) reports the first principal component of the standardized donation amount and the four standardized policy-preference measures; PCA weights are estimated using the low-ZSV group and the resulting score is re-standardized to have mean zero and unit variance in that group. Robust standard errors are in parentheses. Stars indicate statistical significance based on two-sided tests using unadjusted p-values: ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

2. Multiple Hypotheses Testing

TABLE A-11 – IMPACT OF ZERO-SUM VIEWS BY GLOBAL RANK INFORMATION WITH P-VALUES AND MULTIPLE HYPOTHESIS TESTING–ADJUSTED Q-VALUES.

	Contributor (1)	Amount contrib. (2)	Redistrib. (3)	Internat. org. (4)	Globaliz. (5)	Migration (6)
Zero-sum: No rank info	-0.068	-0.027	-0.152	-0.167	-0.173	-0.140
	(0.025)	(0.023)	(0.148)	(0.159)	(0.116)	(0.135)
p-value	.006	.244	.302	.292	.137	.3
q-value	0.078	0.938	0.938	0.938	0.938	0.938
Zero-sum: Rank info	0.005	0.011	0.051	-0.123	0.020	-0.142
	(0.024)	(0.023)	(0.146)	(0.161)	(0.124)	(0.140)
p-value	.836	.619	.729	.445	.87	.308
q-value	1	1	1	1	1	0.938
Observations	2,116	2,116	2,116	2,116	2,116	2,116

Notes: This table presents the marginal treatment effects of the zero-sum condition, by randomization into receiving information about global income rank, computed based on the results presented in Table 4. Each column reports estimates from separate OLS regressions. All specifications include controls for age, gender, education, household size, political party, and employment status. Robust standard errors are denoted SE and are reported in parentheses. For each coefficient, we report both the conventional p-value and the corresponding q-value. The q-values are computed using the Benjamini–Hochberg procedure as described in Anderson (2008), jointly adjusting for multiple hypothesis testing across all twelve marginal treatment effects (six outcomes in each income-rank condition). The reported q-values indicate the smallest false discovery rate at which the null hypothesis of a zero effect would be rejected.