# Appendix for:
# "Zero-Sum Environments, the Evolution of Effort-Suppressing Beliefs, and Economic Development"
# (For Online Publication Only)

## Appendix A. Mathematical Proofs

**Proof of Proposition 1.** Under a payoff monotone dynamic for two traits $i$ and $j$ that are present in the population, $\frac{d}{dt}\left[\frac{q_i}{q_j}\right] > 0$ if and only if $F_i(\mathbf{q}) > F_j(\mathbf{q})$. The cultural fitness of trait $i$ is given by (4). Hence $F_i(\mathbf{q}) > F_j(\mathbf{q})$ is equivalent to

$$(1-\theta_i)\left(1-\tfrac{1}{2}(1-\theta_i)\right)A^2 - \sigma\alpha(1-\theta_i)A^2 \quad > \quad (1-\theta_j)\left(1-\tfrac{1}{2}(1-\theta_j)\right)A^2 - \sigma\alpha(1-\theta_j)A^2. \tag{A1}$$

Recall that $A > 0$. Hence parts (i) and (ii) follow by, respectively, setting $\theta_j = 0$, so that (A1) becomes $\theta_i < 2\sigma\alpha$, and maximizing the left-hand side of (A1) to get $\theta^* = \sigma\alpha$. □

**Corollary 1** . ***Evolution of Approximately Optimal Demotivating Beliefs.*** *Consider a* regular environment *in which the set of beliefs is the discrete grid* $\Theta = \left\{0, \frac{1}{\Delta}, \frac{2}{\Delta}, \ldots 1\right\}$ *and where the initial state* $\mathbf{q}(0)$ *has full support on* $\Theta$*.*

*If the set of beliefs is sufficiently fine (*$\Delta$ *large), cultural evolution selects a belief that is approximately* $\theta^* = \sigma\alpha$*. That is,* $q_i(t)$ *converges monotonically to one for some* $\theta_i \in \left(\theta^* - \frac{1}{\Delta}, \theta^* + \frac{1}{\Delta}\right)$*.*

This follows from $\theta^*$ being the relative cultural fitness maximizing belief and the strict concavity of $F_i(\mathbf{q}) - F_j(\mathbf{q})$ with respect to $\theta_i$ for all $j \neq i$.

**Proof of Proposition 2.** Suppose $\theta_i > \theta_j$. Rearranging (A1), $F_i(\mathbf{q}) > F_j(\mathbf{q})$ if and only if

$$\begin{aligned} -\tfrac{1}{2}(\theta_i - \theta_j) + \tfrac{1}{2}\theta_i(1-\theta_i) - \tfrac{1}{2}\theta_j(1-\theta_j) + \sigma\alpha(\theta_i - \theta_j) &> 0 \\ \iff -\tfrac{1}{2}(\theta_i - \theta_j)(\theta_i + \theta_j) + \sigma\alpha(\theta_i - \theta_j) &> 0 \\ \iff \sigma\alpha &> \tfrac{1}{2}(\theta_i + \theta_j). \end{aligned}$$

Consider $\theta_i = \theta_j + \Delta$. As $\Delta \to 0$, the last condition goes to $\theta_i < \sigma\alpha$. Therefore, material welfare is strictly increasing in $\theta$ up to $\theta^* = \sigma\alpha$ and strictly decreasing thereafter.

In addition, because $F_i(\mathbf{q}) - F_j(\mathbf{q})$ is proportional to approximately $\sigma\alpha - \theta_i$ for $\Delta$ small, material welfare is also strictly concave in $\theta$. □

**Proof of Proposition 3.** Suppose $\theta_i > \theta_j$. Then

$$\begin{aligned}
\hat{W}_i &< \hat{W}_j \\
\iff \tfrac{1}{2}(1-\theta_i)^2 - \sigma\alpha(1-\theta_i) &< \tfrac{1}{2}(1-\theta_j)^2 - \sigma\alpha(1-\theta_j) \\
\iff \tfrac{1}{2}[(1-\theta_j)^2 - (1-\theta_i)^2] &> \sigma\alpha[(1-\theta_j) - (1-\theta_i)] \\
\iff \tfrac{1}{2}[(1-\theta_j) - (1-\theta_i)][(1-\theta_j) + (1-\theta_i)] &> \sigma\alpha[(1-\theta_j) - (1-\theta_i)] \\
\iff \tfrac{1}{2}[(1-\theta_j) + (1-\theta_i)] &> \sigma\alpha \\
\iff 1 - \sigma\alpha &> \tfrac{1}{2}(\theta_i + \theta_j). \qquad \text{(A2)}
\end{aligned}$$

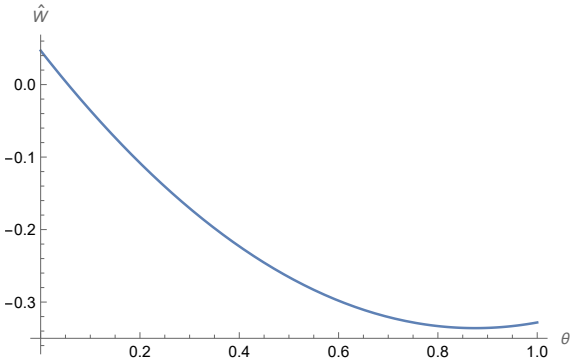
The result follows from the same argument used in Proposition 2.

Finally, if $\theta_j = 0$, then (A2) becomes $1 - \sigma\alpha > \frac{1}{2}\theta_i$, which is satisfied for all $\theta_i \in [0,1]$ if $\sigma\alpha < \frac{1}{2}$. □

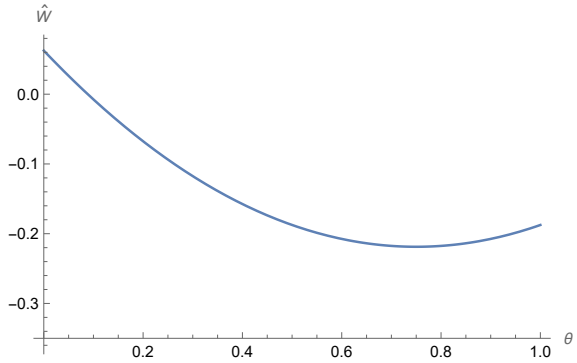
**Numerical results accompanying Proposition 3.** Figure A1 shows that even when $\max \Theta > 1 - \sigma\alpha$, subjective well-being only rises slightly for higher values of $\theta$. This theoretical prediction matches the empirical results shown in Figures E12 and E13.

**Figure A1:** Plot of subjective well-being $\hat{W}$ on the intensity of demotivating beliefs $\theta$, for $\alpha = 1/2$, $A = 1$, and a population-average belief $\sum_{k=1}^{n} q_k \theta_k = 0.5$.

**(a)** $\sigma = 0.25$




**(b)** $\sigma = 0.5$




**Proof of Proposition 4.** By Corollary 1, for any interior initial state and $\Delta$ sufficiently large, $q_i^k(t)$ converges monotonically to one, where $\theta_i$ is approximately $\sigma\alpha^k$.

This implies $\theta^k(t)$ converges to approximately $\sigma\alpha^k$. The result follows immediately. □

**Proof of Proposition 5.** $X^k(t)$ converges to approximately $\left(1 - \sigma\alpha^k\right)^2 A^2$ and mean material welfare $W^k(t)$ converges to approximately $\left(1 - \sigma\alpha^k\right)\left[\frac{1}{2} - \alpha^k\left(1 - \frac{1}{2}\sigma\right)\right] A^2$. Differentiating with respect to $\alpha^k$ yields $-\left[1 - 2\sigma\alpha^k\left(1 - \frac{1}{2}\sigma\right)\right] A^2$, which is negative for all $\alpha^k \in [0,1)$.

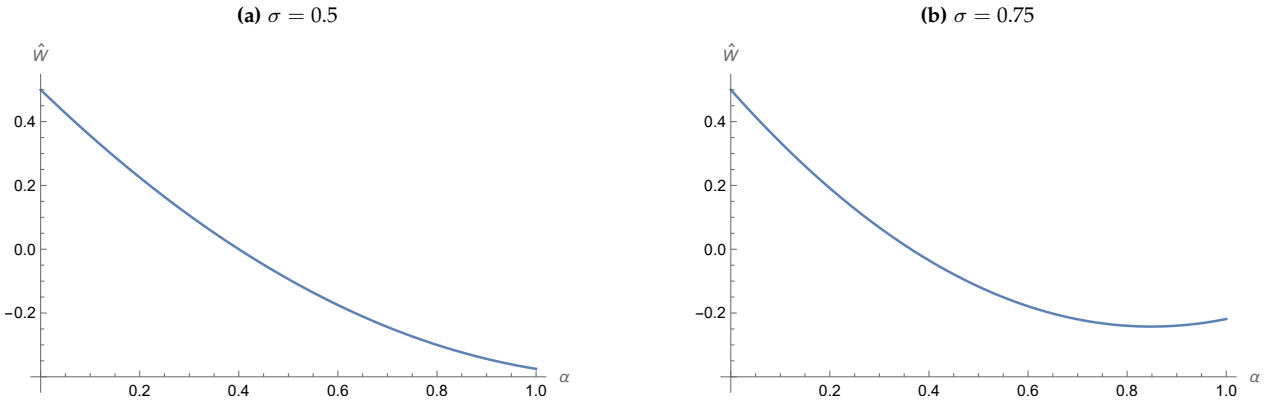
Hence, each limit point is strictly decreasing in $\alpha^k$, thus establishing the results regarding $X^k(t)$ and $W^k(t)$ for $\Delta$ sufficiently large, as hypothesized. □

**Proof of Proposition 6.** $\hat{W}^k(t)$ converges to approximately $\left(1-\sigma\alpha^k\right)\left[\frac{1}{2}\left(1-\sigma\alpha^k\right)-\alpha^k\right]A^2$. Differentiating with respect to $\alpha^k$ and dividing by $A^2$ yields $-\sigma\left[\frac{1}{2}\left(1-\sigma\alpha^k\right)-\alpha^k\right]-\frac{1}{2}\sigma(1-\sigma\alpha^k)-(1-\sigma\alpha^k)$. Rearranging, this is negative if $\alpha^k < \frac{1}{\sigma}\frac{1+\sigma}{2+\sigma}$, which holds for all $\alpha^k \in [0,1]$ if $\sigma \leq \frac{1}{2}$.

Again, the limit point is strictly decreasing in $\alpha^k$ for $\sigma \leq \frac{1}{2}$ or $\alpha^k < \frac{1}{\sigma}\frac{1+\sigma}{2+\sigma}$, thus establishing the result regarding $\hat{W}^k(t)$ for $\Delta$ and $T$ sufficiently large, as hypothesized. □

**Numerical results accompanying Proposition 6.** Figure A2 shows that even when $\hat{W}^k$ is increasing in $\alpha^k$ over part of the domain, as in panel (b), the curve does not change dramatically. In both cases, the subjective well-being curve becomes relatively flat for high degrees of zero-sumness, $\alpha^k$. This matches the empirical results reported in Figure E7.

**Figure A2:** Plot of subjective well-being $\hat{W}^k$ on the degree to which the environment is zero-sum $\alpha^k$, when $A = 1$ and all individuals hold the limiting belief $\theta^* = \sigma\alpha^k$.




## Appendix B. Robustness of Theoretical Predictions to Alternative Formulations

### *I. Alternative Forms of Demotivation*

First, suppose that demotivating beliefs enter the subjective payoff function as follows, discounting the entire benefit:

$$\hat{U}_i(x_i, x_j) = (1-\theta_i)A\left[\sqrt{x_i} - \alpha\sqrt{x_j}\right] - \tfrac{1}{2}x_i. \tag{B3}$$

The optimal effort remains the same at $x_i^* = (1-\theta_i)^2A^2$. Hence, material payoffs are unchanged and cultural evolution, which operates on material payoffs, is also unchanged. The only differences are minor changes to the conditions for the comparative dynamics involving subjective payoffs in Propositions 3 and 4. The results are qualitatively unchanged.

Second, suppose instead that demotivating beliefs raise the cost of effort as follows:

$$\hat{U}_i(x_i, x_j) = A\left[\sqrt{x_i} - \alpha\sqrt{x_j}\right] - \tfrac{1}{2}\frac{x_i}{1-\theta_i}. \tag{B4}$$

Again, the optimal effort remains the same and cultural evolution is unchanged.

### *II. Nonequivalence of Altruism*

In this section, we show that our model of demotivating beliefs is not mathematically equivalent to a model of the evolution of altruism.

Consider the following model of altruism where, again, fraction $\alpha$ of interactions are zero-sum. As in (1), material payoffs in an $i$,$j$ match are

$$U(x_i, x_j) \quad = \quad A\left[\sqrt{x_i} - \alpha\sqrt{x_j}\right] - \tfrac{1}{2}x_i. \tag{B5}$$

Subjective (other-regarding) payoffs are

$$\begin{aligned} \hat{U}_i(x_i, x_j) &= U(x_i, x_j) + \theta_i U(x_j, x_i) \\ &= A\left[\sqrt{x_i} - \alpha\sqrt{x_j}\right] - \tfrac{1}{2}x_i + \theta_i\left\{A\left[\sqrt{x_j} - \alpha\sqrt{x_i}\right] - \tfrac{1}{2}x_j\right\}, \end{aligned} \tag{B6}$$

where now $\theta_i \in \Theta$ is a level of altruism (or spite if negative).

Maximizing (B6) with respect to $x_i$ yields:

$$x_i^* \quad = \quad \arg\max_{x_i \in \mathbb{R}_+} \hat{U}_i(x_i, x_j) \;=\; (1 - \alpha\theta_i)^2 A^2.$$

The fitness of trait $i$ is

$$F_i(\mathbf{q}) \quad = \quad (1 - \alpha\theta_i)\left(1 - \tfrac{1}{2}(1 - \alpha\theta_i)\right)A^2 - \sigma\alpha(1 - \alpha\theta_i)A^2 - (1 - \sigma)\alpha A^2 \sum_{j=1}^{n} q_j(1 - \alpha\theta_j). \tag{B7}$$

Maximizing $F_i(\mathbf{q}) - F_j(\mathbf{q})$ with respect to $\theta_i$ yields the first-order condition

$$-\alpha + \alpha(1 - \alpha\theta_i) + \sigma\alpha^2 = 0.$$

Simplifying yields the unique maximizer $\theta^* = \sigma$, which is independent of $\alpha$ and not supported by our empirical evidence.

### *III. Competitive versus Prosocial Effort*

Suppose there are two types of effort, competitive effort $x$ in private (partially zero-sum) interactions and prosocial effort $y$ in interactions with positive spillovers. Again, suppose the fraction $\alpha$ of private interactions is zero-sum. Material payoffs in an $i$,$j$ match are

$$U(x_i, x_j, y_i, y_j) \quad = \quad A_1\left[\sqrt{x_i} - \alpha\sqrt{x_j}\right] - \tfrac{1}{2}x_i + (1 - \alpha)A_2 \underbrace{\left[\sqrt{y_i} + \sqrt{y_j}\right)}_{\text{positive spillovers}} - \tfrac{1}{2}y_i, \tag{B8}$$

where $A_1$ is the technology in zero-sum interactions and $A_2$ is the technology in interactions with positive spillovers.

Subjective (other-regarding) payoffs are

$$\hat{U}_i(x_i, x_j, y_i, y_j) \quad = \quad (1-\theta_i)A_1\left[\sqrt{x_i} - \alpha\sqrt{x_j}\right] - \tfrac{1}{2}x_i + (1-\alpha)A_2[\sqrt{y_i} + \sqrt{y_j}] - \tfrac{1}{2}y_i, \tag{B9}$$

where $\theta_i$ is the intensity of demotivation in private (partially zero-sum) interactions only. In this way, belief systems such as the laws of Jante and the 'tall poppy' syndrome can disincentivize anti-social effort without reducing prosocial effort.

Then the main results, including $\theta^* = \sigma\alpha$, are the same as in our baseline model. The only difference is that societies with high $A_2$ can be highly productive while having beliefs that are demotivating in zero-sum domains (e.g., Scandinavian societies).

### *IV. Cultural Leaders and Institutions*

Rather than being determined by cultural evolution, it could be that the distribution of demotivating beliefs is directed by a community leader or cultural institution in a top-down manner. To examine this alternative formulation, suppose the set of beliefs is binary, $\Theta = \{\theta_1, \theta_2\}$, with $\theta_1 = 0$ the correct belief and $\theta_2 = \theta(t)$ a demotivating belief. We assume that community leaders or some impersonal institutions dynamically tune $\theta(t)$ in a way that maximizes the spread of the demotivating belief. Because the demotivating belief $\theta^* = \sigma\alpha$ maximizes relative cultural fitness regardless of the state, it is chosen by the leader once and for all. In addition, the demotivating belief spreads from all interior initial states and achieves fixation. Thus, we expect the belief system produced by community leaders or cultural institutions to be the same as that selected by cultural evolution.

### *V. Matching Structure*

This section provides a justification for the matching structure described in Section 3.A 'Assortative Matching'. In particular, positive assortativity is assumed as follows: an individual is matched with someone with the same trait with probability $\sigma$ and with an individual chosen uniformly at random from the population with probability $1 - \sigma$. This specification has been used in evolutionary biology (Cavalli-Sforza and Feldman, 1981) and economics (Bergstrom, 2003, Alger and Weibull, 2013, 2016).

Comparative statics for our empirical analysis rely on $\sigma > 0$, i.e., some degree of positive assortative matching. This is consistent with existing empirical evidence. Positive assortativity based on cultural traits is a robust feature of human populations, both small-scale hunter-gatherer bands and modern large-scale societies (evidence below). Also, many forms of cooperation are sustained by some form of positive assortativity based on cooperative behavior (Henrich, 2018), including ostracism (Hirshleifer and Rasmusen, 1989). In addition, selection on cultural variation is likely to have been more important for the evolution of cooperation in humans than selection on genetic variation (Bell, Richerson and McElreath,

2009). Therefore, a population structure featuring positive assortativity with respect to cultural traits is a realistic feature of human societies and a critical one for cultural evolution.

Evidence for positive assortativity is found in the clustering of cultural traits within hunter-gather bands (Rzeszutek, Savage and Brown, 2012, Handley and Mathew, 2020), modern friendship networks (McPherson, Smith-Lovin and Cook, 2001), ethnolinguistic boundaries (Ross, Greenhill and Atkinson, 2013), and regional and national borders (Bell et al., 2009, Muthukrishna, Bell, Henrich, Curtin, Gedranovich, McInerney and Thue, 2020). Some studies calculate a cultural $F_{ST}$ statistic, which measures the proportion of cultural variation in the population that is attributable to differences between groups rather than within them. Estimates of cultural $F_{ST}$ between ethnolinguistic groups are an order of magnitude larger than relevant genetic $F_{ST}$ estimates (Handley and Mathew, 2020). In modern societies, studies of the marriage market find considerable positive sorting on a number of traits including ethnicity and education (e.g. Smits, Ultee and Lammers, 1998, Fernandez, Guner and Knowles, 2005). In the literature on networks in economics and sociology, positive assortative matching is called 'homophily' and is present in nearly all social networks with respect to key characteristics. Hence, people belong to groups or close-knit networks in which they are more likely to interact with individuals that share their cultural traits than if they were matched uniformly at random with people from the population.

To see how this would work in our model, consider the population being split into two groups, labeled 1 and 2. To take an extreme case, suppose trait $i$ has achieved fixation (i.e., held by 100% of group members) in group 1 and trait $j$ has achieved fixation in group 2. The index of assortativity $\sigma$ is then the likelihood of a within-population match. By the same arguments used in the paper, if $\theta_i$ is closer to $\theta^* = \sigma\alpha$ than $\theta_j$, then group $A$ will grow relative to $B$ and eventually make up almost all of the population. Hence, stronger demotivating beliefs will emerge where the groups are relatively isolated (high $\sigma$). Where there is a lot of cross-group interaction (low $\sigma$), demotivating beliefs will die out and competition will become intense.

A question arises as to the stability of this population structure. Why don't motivated individuals ($\theta = 0$) invade a demotivated group ($\theta > 0$), match with group members who compete less aggressively against them, and thereby improve their fitness? We provide an argument here based on *stable matching* à la Gale and Shapley (1962). Suppose a fraction $\sigma$ of matches are endogenous in the following sense. First, each individual with trait $i$ chooses a set of acceptable traits $S_i \subseteq \Theta$ with whom they wish to be matched. Then with probability $1 - \sigma$ an individual is selected, matched uniformly at random with someone from the population, and payoffs are as described in the paper [equations (1) and (2)]. With probability $\sigma$, however, the interaction is shaped by choice. A trait $i$ individual is selected from the population and matched at random with someone, say $j$, from their set of acceptable traits $S_i$. The match is only successful if $i$ is also acceptable to $j$, i.e., $i \in S_j$. If so, the payoffs are as described in the paper. Otherwise, both players receive a payoff of $-\kappa$, where $\kappa$ is large enough to always make failure to match unattractive.

Now, why do players end up being matched with someone with the same trait with probability $\sigma$ when they could potentially be matched with a more demotivated type that competes less aggressively against them? The most demotivated type ($\theta_n$), which is the most attractive match for all other types, will choose to match only with itself. The second most demotivated type ($\theta_{n-1}$), the most attractive type remaining, will then also choose only to match with itself, anticipating that a match with $\theta_n$ will be unsuccessful. Iterating this argument, yields the matching structure employed in the paper in which an individual is matched with someone who has the same trait with probability $\sigma$ and with an individual chosen uniformly at random from the population with probability $1-\sigma$. Under this interpretation, $\sigma$ represents the degree of choice in matching.

Precisely, how individuals screen various traits is beyond the scope of this study and deserves separate attention. There is already a considerable literature, however, on social institutions that regulate matching in this way, for example ethnic and religious groups that select for specific traits and screen out non-cooperators and non-believers (e.g., McElreath, Boyd and Richerson, 2003, Iannaccone, 1992, Carvalho and Sacks, 2021). Positive assortativity could also be generated by "limited dispersal", i.e., a spatial structure to reproduction, migration, and interaction in which genetic/cultural offspring occupy neighboring locations so that interactions are more likely among genetic/cultural relatives (e.g., Wright, 1943, West, Griffin and Gardner, 2007). Finally, the same sort of positive assortativity and evolutionary dynamics could be generated by conformity effects, which have been documented in the cultural evolution literature (Handley and Mathew, 2020). Under this interpretation, $\sigma$ is a measure of the strength of conformity.

## Appendix C. Validation of the Zero-Sum Measures

### *I. DRC Sample: Using Employment*

As an additional test of the validity of survey-based perceptions of the zero-sumness of a person's world as a measure of $\alpha$, we examine the relationship between zero-sum perceptions and current and past employment history of a person and their family in the 200 person sample in the DRC. We check for this relationship by estimating the following equation:

$$\text{Zero Sum}_i = \alpha_{e(i)} + \beta\,\text{Employment}_i + \mathbf{X}_i\mathbf{\Gamma} + \varepsilon_i \tag{C10}$$

where $i$ indexes individuals. $\alpha_{e(i)}$ denotes ethnicity fixed effects. The vector $\mathbf{X}_i$ includes demographic controls for age, age squared, a gender indicator, and its interaction with age and age squared. $\text{Employment}_i$ is a binary variable that takes on value 1 if individual $i$ or his family is/was employed.

Estimates of equation (C10) are reported in Table C1. Odd numbered columns report specifications without ethnicity fixed effects and even numbered columns include them. Columns 1–2 use the respondent's employment status, columns 3–4 use the respondent's mother's employment status, columns 5–6 use the respondent's father's employment status, columns 7–8 use a variable indicating whether the respondent got a new job in the last five years and columns 9–10 use a variable indicating whether a member of the respondent's nuclear family had a job in the past 5 years.

We find a consistent negative relationship between the economic conditions an individual faces in the first 20 or 30 years of their life and the extent to which they view the world as zero-sum today. Thus, consistent with expectations, worse economic conditions are associated with a more zero-sum view in adulthood.

### *II. DRC Sample: Using Rainfall*

As an additional test of the validity of survey-based perceptions of the zero-sumness of a person's world as a measure of $\alpha$, we examine the relationship between zero-sum perceptions and rainfall during the respondent's life in the 200-person sample in the DRC. We check for this relationship by estimating variants of the following equation:

$$\text{Zero Sum}_{i,t} = \alpha_{t,g} + \alpha_t + \beta\,\text{Rainfall}_t + \mathbf{X}_{i,t}\mathbf{\Gamma} + \varepsilon_{i,t} \tag{C11}$$

where $i$ indexes individuals, $g$ indexes gender, and $t$ indexes person $i$'s year of birth. The variable $\text{Rainfall}_t$ is the average annual rainfall (in mm) during the first 20 or 30 years of person $i$'s life given. If the measure of zero-sum captures reality, we expect to find a negative estimate of $\beta$: less rainfall should be associated with a more zero-sum view of the world.

**Table C1:** Do Zero-Sum Perceptions Reflect Reality? The Influence of Economic Conditions

| | Dependent Variable: Zero-sum index, 0-1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Respondent is employed, 0/1 | -0.028 | -0.026 | | | | | | | | |
| | (0.028) | (0.027) | | | | | | | | |
| Mother is/was employed, 0/1 | | | -0.076** | -0.069** | | | | | | |
| | | | (0.032) | (0.034) | | | | | | |
| Father is/was employed, 0/1 | | | | | -0.103** | -0.092* | | | | |
| | | | | | (0.049) | (0.048) | | | | |
| Respondent got a new job in the last 5 years, 0/1 | | | | | | | -0.112*** | -0.090** | | |
| | | | | | | | (0.039) | (0.041) | | |
| Member of nuclear family had job in last 5 years, 0/1 | | | | | | | | | -0.102*** | -0.077** |
| | | | | | | | | | (0.031) | (0.032) |
| Mean dependent variable | 0.372 | 0.372 | 0.372 | 0.372 | 0.371 | 0.371 | 0.372 | 0.372 | 0.371 | 0.371 |
| Std. dev. dependent variable | 0.191 | 0.191 | 0.191 | 0.191 | 0.189 | 0.189 | 0.191 | 0.191 | 0.189 | 0.189 |
| Mean independent variable | 0.405 | 0.405 | 0.810 | 0.810 | 0.936 | 0.936 | 0.127 | 0.127 | 0.213 | 0.213 |
| Std. dev. independent variable | 0.492 | 0.492 | 0.393 | 0.393 | 0.246 | 0.246 | 0.334 | 0.334 | 0.410 | 0.410 |
| Observations | 205 | 205 | 205 | 205 | 202 | 202 | 205 | 205 | 202 | 202 |
| R squared | 0.024 | 0.116 | 0.043 | 0.130 | 0.034 | 0.124 | 0.055 | 0.134 | 0.079 | 0.146 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Ethnicity FE | N | Y | N | Y | N | Y | N | Y | N | Y |

*Notes:* This table examines the relationship between an individual's zero-sum setting in terms of their own and their nuclear family's employment indicators and their zero-sum perceptions, for the sample of about 200 respondents collected in 2015 in Kananga, DRC. In all columns, the dependent variable is the first principal component of the six zero-sum statements. All columns include demographic controls for age, age squared, gender, interaction of age and gender, and interaction of age squared and gender. Even columns also include ethnicity fixed effects. In columns 1–2, the explanatory variable is a binary variable that takes 1 if respondent had a job at the time of asking and 0 otherwise. In columns 3–4, the explanatory variable is a binary variable that takes 1 if respondent's mother was ever employed and 0 otherwise. In columns 5-6, the explanatory variable is a binary variable that takes 1 if respondent's father was ever employed and 0 otherwise. In columns 7–8, the explanatory variable is a dummy indicating whether the respondent got a new job in the past 5 years. In columns 9–10, the explanatory variable is a dummy indicating whether any member of the respondent's nuclear family had a job in the past 5 years. Coefficients are reported with robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

The vector $\mathbf{X}_{i,t}$ includes the following controls: individual $i$'s age, age squared, an indicator for their gender, and this interacted with both age and age squared. All estimates are clustered at level of the interaction of the person's year of birth and geographic location (in terms of the 0.5-degree resolution grid cell they are located in).

Estimates of variants of equation (C11) are reported in Table C2. Columns 1–2 use report estimates that control for birth-year fixed effects, birth-year fixed effects interacted with gender and gender fixed effects, columns 3–4 report estimates that control for birth-year fixed effects and gender. Columns 5–6 report estimates that control for the respondent's age, age squared, and gender.

**Table C2:** Rainfall and Zero-Sum Perceptions

| | Dependent Variable: Zero-sum index, 0-1 | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Rainfall: First 20 years of life | -0.00525* | | -0.00364* | | -0.00271* | |
| | ( 0.00284) | | ( 0.00198) | | ( 0.00161) | |
| Rainfall: First 30 years of life | | -0.00569** | | -0.00392** | | -0.00398** |
| | | ( 0.00279) | | ( 0.00197) | | ( 0.00169) |
| Mean dependent variable | 0.380 | 0.380 | 0.380 | 0.380 | 0.377 | 0.377 |
| Std. dev. dependent variable | 0.190 | 0.190 | 0.190 | 0.190 | 0.191 | 0.191 |
| Mean independent variable | 121.572 | 121.021 | 121.572 | 121.021 | 122.542 | 121.907 |
| Std. dev. independent variable | 9.659 | 8.739 | 9.659 | 8.739 | 10.168 | 9.219 |
| Observations | 170 | 170 | 170 | 170 | 183 | 183 |
| R squared | 0.480 | 0.484 | 0.284 | 0.287 | 0.027 | 0.039 |
| Age | N | N | N | N | Y | Y |
| Gender | Y | Y | Y | Y | Y | Y |
| Birth Year FE | Y | Y | Y | Y | N | N |
| Birth Year FE and gender interaction | Y | Y | N | N | N | N |

*Notes*: This table examines the relationship between an individual's zero-sum setting in terms of the mean rainfall in the first 20 and 30 years of their life and zero-sum perceptions, for the sample of about 200 respondents collected in 2015 in Kananga, DRC. In all columns, the dependent variable is the six question zero-sum index. Columns 1 and 2 control for gender fixed effects, birth-year fixed effects and its interaction with gender. Columns 3 and 4 control for gender fixed effects and birth-year fixed effects. Columns 5 and 6 control for age, age squared, gender and its interactions with age and age squared. In columns 1, 3, and 5, the explanatory variable is the mean rainfall in the respondent's village of origin in the first 20 years of their life. In columns 2, 4, and 6, the explanatory variable is the mean rainfall in the respondent's village of origin in the first 30 years of their life. Standard errors clustered at level of the interaction of the person's year of birth and geographic location (0.5-degree grid cell) are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

### *III. IVS Sample: Using Economic Growth*

As an additional test of the validity of survey-based perceptions of the zero-sumness of a person's world as a measure of $\alpha$, we examine the relationship between zero-sum perceptions and recent economic growth among respondents in the IVS. We check for this relationship by estimating the following equation:

$$\text{Zero Sum}_{i,c,v,t} = \alpha_{c,v} + \alpha_t + \beta\,\text{Growth}_{c,t} + \mathbf{X}_{i,c,v,t}\mathbf{\Gamma} + \varepsilon_{i,c,t} \tag{C12}$$

where $i$ indexes individuals, $c$ indexes countries, $v$ indexes survey waves, and $t$ indexes person $i$'s year of birth. The variable $\text{Growth}_{c,t}$ is the average annual growth rate of economic growth in country $c$ during the first 20 or 30 years of person $i$'s life given. If the measure of zero-sum captures reality, we expect to find a negative estimate of $\beta$: weaker economic growth should be associated with a more zero-sum view of the world. The vector $\mathbf{X}_{i,c,t}$ includes the following controls: individual $i$'s age, age squared, an indicator for their gender, and this interacted with both age and age squared. All estimates are clustered at the country level.

Estimates of equation (C12) are reported in Table C3. Columns 1–2 use total real GDP growth rates, while columns 3–4 use per capita real GDP growth rates.

**Table C3:** Economic Growth and Zero-Sum Perceptions

| | Dependent Variable: Zero-sum index, 0-1 | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| GDP 20 year growth | -0.399*** | | | |
| | (0.105) | | | |
| GDP 30 year growth | | -0.544** | | |
| | | (0.223) | | |
| GDP per capita 20 year growth | | | -0.434*** | |
| | | | (0.108) | |
| GDP per capita 30 year growth | | | | -0.568** |
| | | | | (0.228) |
| Mean dependent variable | 0.407 | 0.407 | 0.407 | 0.407 |
| Std. dev. dependent variable | 0.303 | 0.304 | 0.303 | 0.304 |
| Mean independent variable | 0.038 | 0.038 | 0.020 | 0.021 |
| Std. dev. independent variable | 0.021 | 0.019 | 0.021 | 0.018 |
| Observations | 107,185 | 100,319 | 107,126 | 100,319 |
| Clusters | 80 | 76 | 80 | 76 |
| R squared | 0.079 | 0.080 | 0.079 | 0.080 |
| Demographic Controls | Y | Y | Y | Y |
| Wave-country FE | Y | Y | Y | Y |
| Birth year FE | Y | Y | Y | Y |

*Notes:* The table reports OLS estimates. An observation is an individual. All specifications include survey-wave-by-country fixed effects and birth-year fixed effects. The independent variable is a scale variable ranging from zero to one, with one representing "People can only get rich at the expense of others," and zero representing "Wealth can grow so there's enough for everyone." GDP growth rates are the GDP growth for the first 20 (or 30) years of a respondent's life. Demographic controls include age, age squared, gender, age interacted with gender, and age-squared interacted with gender. Coefficients are reported with standard errors clustered at the level of country in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

## Appendix D. Details on Additional Results

### *I. Zero-sum Environments and the Nature of Religious Beliefs*

Our analysis of the association between zero-sum environments and traditional religion and Christianity has focused on how individuals' beliefs vary between the two. However, it is also possible that the nature of one's beliefs, even within a single religion, could be altered by the zero-sumness of one's environment. This is particularly relevant for Christianity, which encompasses a wide variety of denominations and teaches that blessings from God can be perceived in non-zero-sum terms. In contrast, we expect this to be less prevalent in traditional religions, which typically do not have the same diversity of denominations. Furthermore, traditional religion often adopts a zero-sum worldview, leaving little scope for non-zero-sum perceptions. To explore this further, we estimate variants of equation (2) where the outcome of interest is perceptions of how zero-sum blessings are within either Christianity or traditional religion. The two questions we examine are:

- Statement 1: *If God is looking out for my brother, he is less likely to be looking out for me.*
  Statement 2: *If God is looking out for my brother, he is more likely to also be looking out for me.*

- Statement 1: *If my ancestors' spirits are looking out for my brother, they are less likely to look out for me.*
  Statement 2: *If my ancestors' spirits are looking out for my brother, they are more likely to look out for me.*

Using respondents' agreement with these statements, we create an index that ranges from 0–1 and is increasing in zero-sum perceptions. Estimates using the two measures as dependent variables are reported in Table D4. Our findings indicate that a higher zero-sum index is associated with a more zero-sum view in Christianity but not in traditional religion. More zero-sum perceptions are not only associated with a stronger belief in Christianity relative to traditional beliefs, but even conditional on believing in Christianity, perceptions of the nature of Christianity are more zero-sum.

**Table D4:** Zero-Sum Index of Six Survey Questions, Christianity and the Traditional God

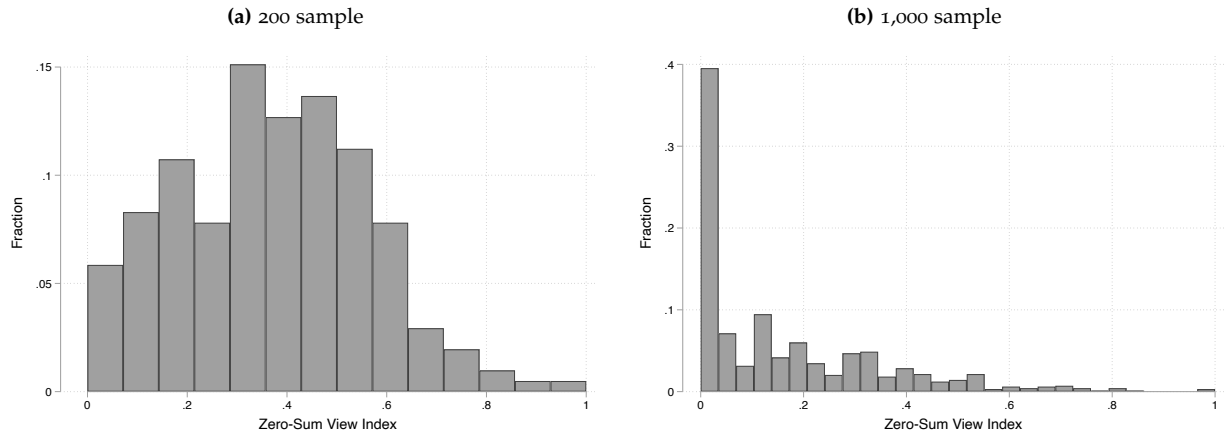
| | If god looks out for my brother, less likely to look out for me | | If ancestors look out for my brother, less likely to look out for me | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Zero-sum index, 0-1 | 0.347*** | 0.351*** | 0.158 | 0.165 |
| | (0.114) | (0.115) | (0.151) | (0.159) |
| Observations | 200 | 200 | 175 | 175 |
| R-squared | 0.090 | 0.166 | 0.024 | 0.073 |
| Mean dependent variable | 0.268 | 0.268 | 0.296 | 0.296 |
| Demographic controls | Y | Y | Y | Y |
| Ethnicity FE | N | Y | N | Y |

*Notes:* This table examines the relationship between zero-sum views and an individual's self-reported envy of others, beliefs regarding Christianity and the Traditional God, for the sample of about 200 respondents collected in 2015 in Kananga, DRC. It reports estimates of equation (8). In all columns, the explanatory variable is the first principal component of the six zero-sum statements. In columns 1 and 2, the dependent variables are the respondent's answer to the choice between two statements: Statement 1: *If God is looking out for my brother, he is less likely to be looking out for me.* Statement 2: *If God is looking out for my brother, he is more likely to also be looking out for me.* In columns 3 and 4, the dependent variables are the respondent's answer to the choice between two statements: Statement 1: *If my ancestors' spirits are looking out for my brother, they are less likely to look out for me.* Statement 2: *If my ancestors' spirits are looking out for my brother, they are more likely to look out for me.* Respondents choose from one of four options: "agree strongly with statement 1," "agree with statement 1," "agree with statement 2," and "agree strongly with statement 2." We include controls for gender, age, and age squared and their interactions in all columns. Coefficients are reported with robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

# Appendix E. Additional Figures and Tables

## *Figures*

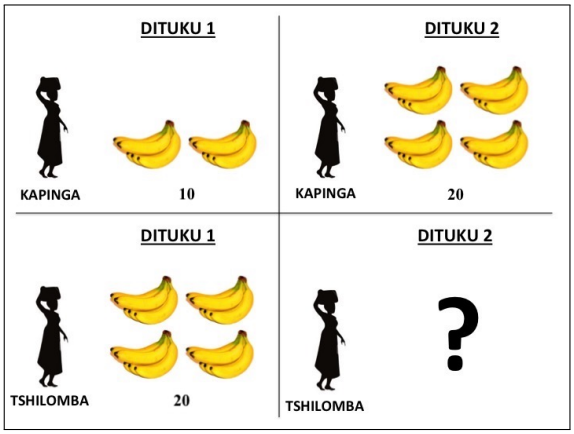
**Figure E3:** Distribution of the Six-Question Zero-Sum Measure in the DRC Survey Data



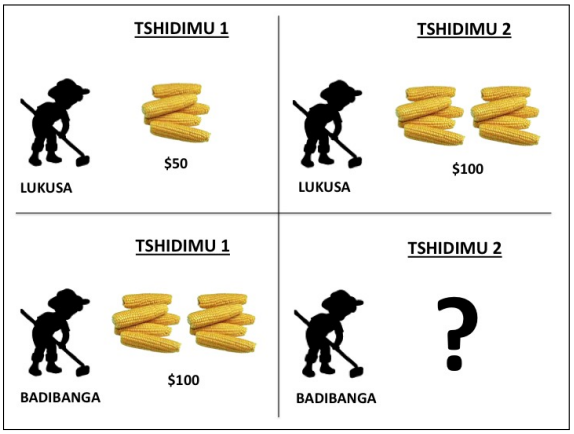

*Notes:* The figures show the distribution of the six-question zero-sum perception indices for the sample from 2015 (Figure E3a) and 2019 (Figure E3b).

**Figure E4:** Distribution of Zero-Sum Indices By Choice in the Banana and Maize Vignettes

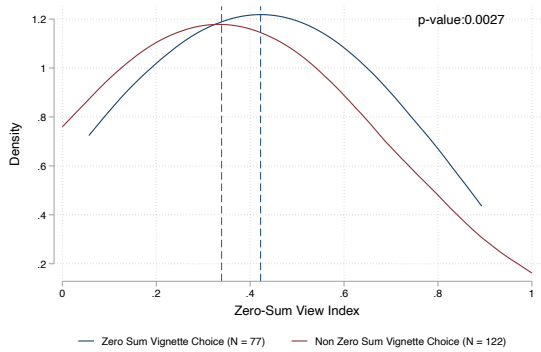
**(a)** Banana vignette: 10 or 40 bananas?



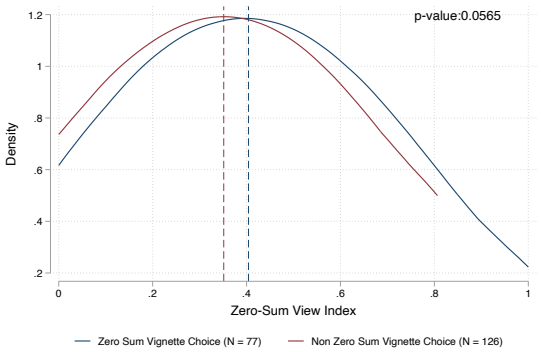

**(b)** Maize vignette: $50 or $200 of corn?



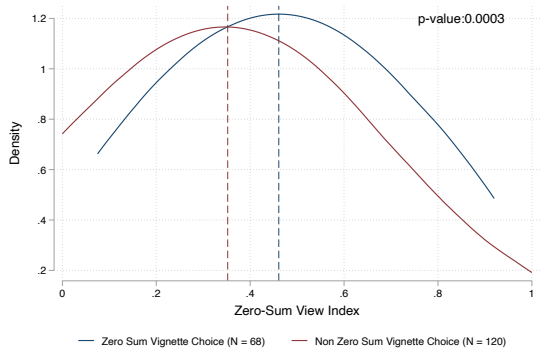

**(c)** Banana vignette and six-question ZS index



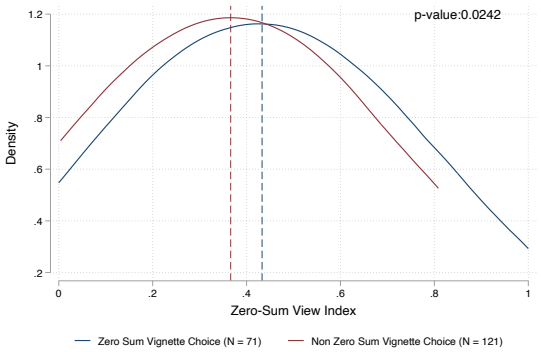

**(d)** Maize vignette and six-question ZS index




**(e)** Banana vignette and ten-question ZS index

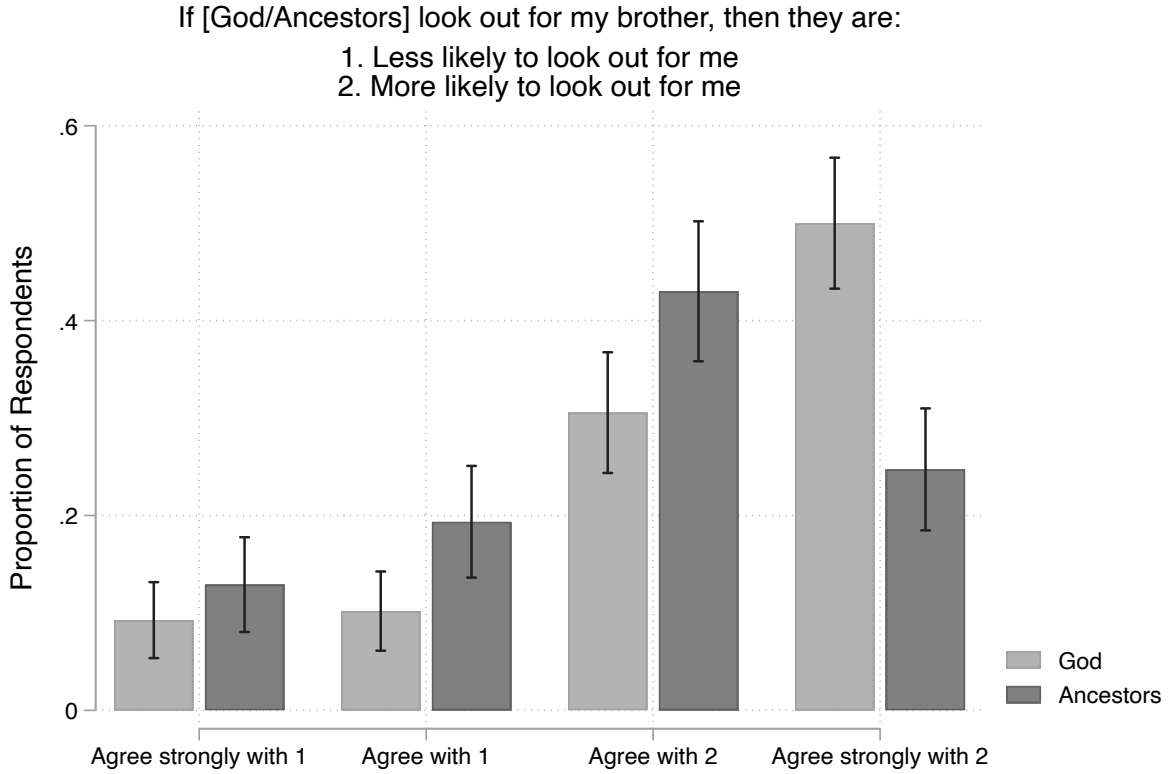



**(f)** Maize vignette and ten-question ZS index



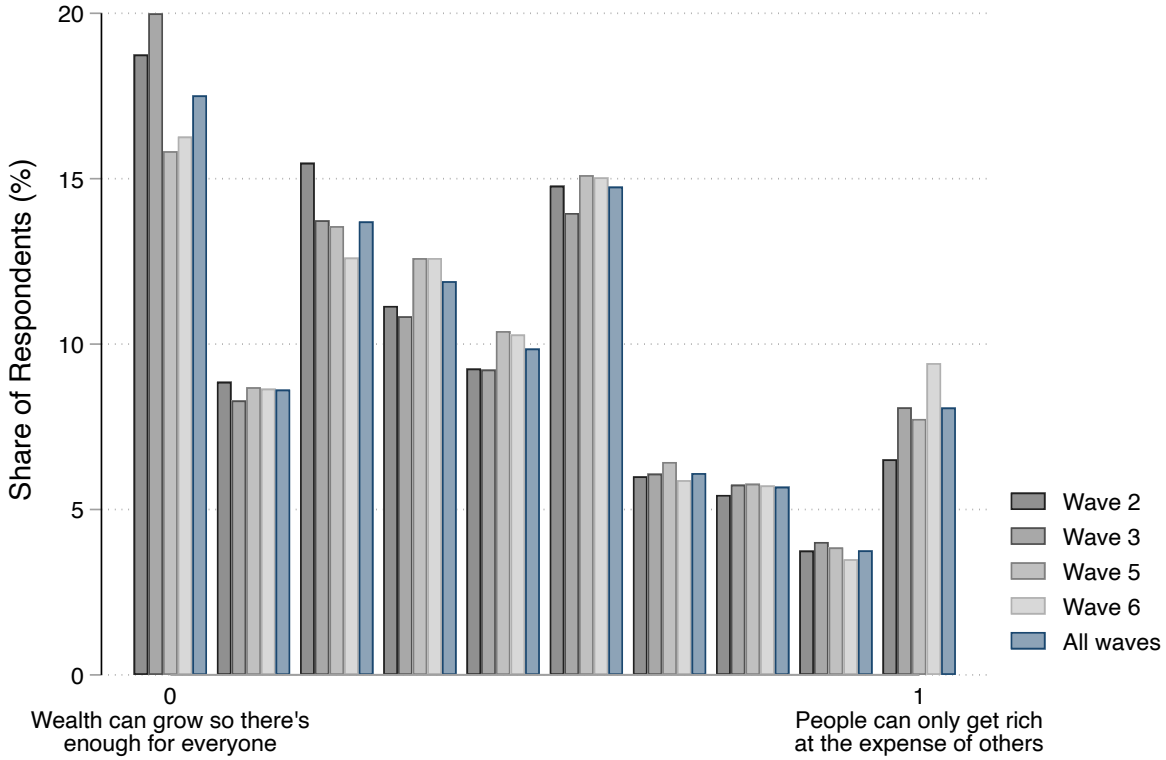

*Notes:* The figure reports the images provided to the respondents to illustrate the banana (in subfigure (a)) and maize (in subfigure (b)) vignette questions. It reports the kernel density of the zero-sum index when the zero-sum answer is chosen in the vignette question (in blue) and when the non-zero-sum answer is chosen in the vignette question (in dark red). Subfigures (c) and (e) reports results for the banana vignette, and subfigures (d) and (f) for the maize vignette. The kernel densities use the default Epanechnikov kernel and bandwidth. Also reported are the $p$-value associated with the $t$-test of equality of the zero-sum variables for respondents who, in the vignette, chose the zero-sum response and those who chose the non-zero-sum response.

**Figure E5:** Traditional Religion, Christianity, and Zero-Sum: 200 Person Sample



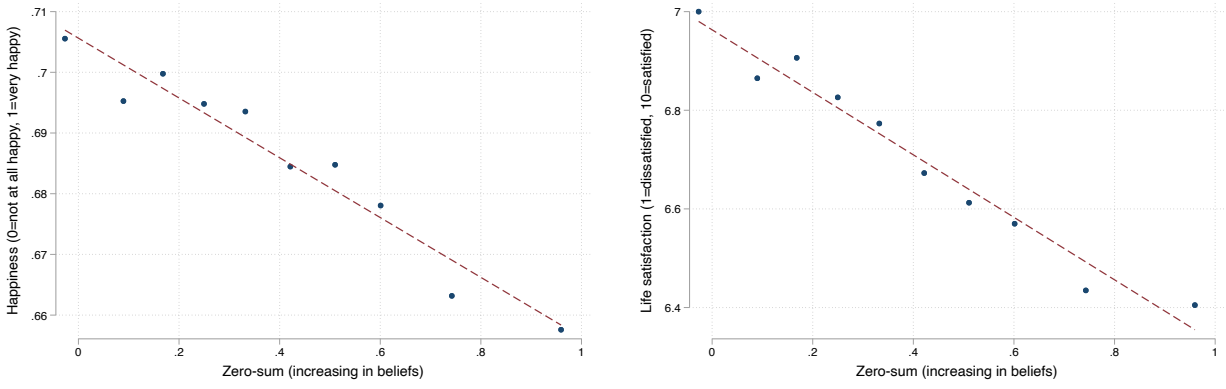

*Notes:* The figure reports the proportion of the responses to two questions which have the same structure. The questions ask "If [God/Ancestors] look out for my brother, then: they are less likely to look out for me (Statement 1), or they are more likely to look out for me (Statement 2)." Individuals could choose which statement they agreed with most and how strongly they agreed with that statement. The light gray bars correspond to the version of the question that asks about the Christian God, and the dark gray bars to the version of the question that asks about ancestors. The black lines show the 95% confidence intervals around the mean proportion of respondents choosing each response category.

**Figure E6:** Distribution of the Zero-Sum Measure in the IVS



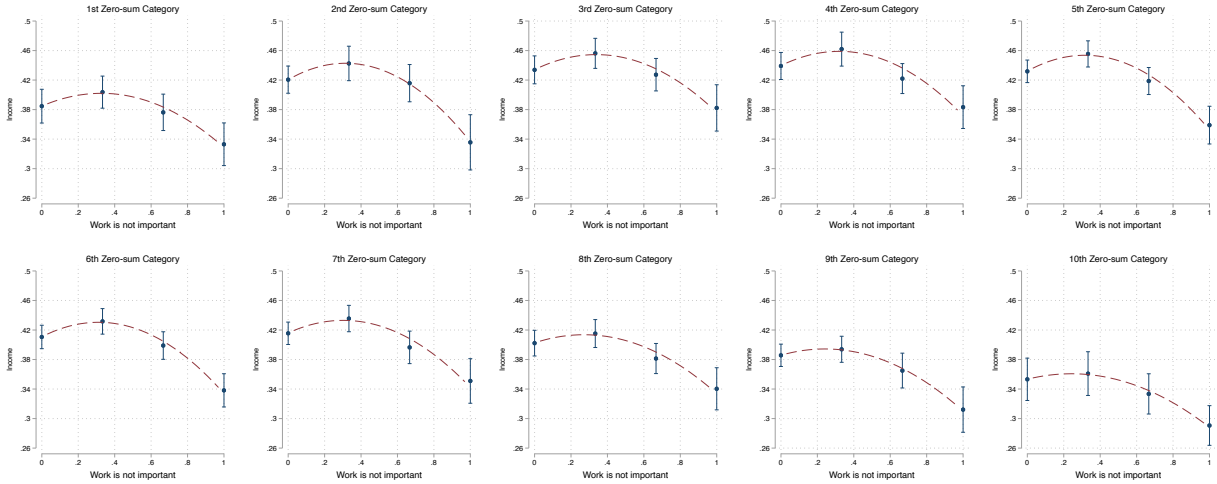

*Notes:* The figure reports the distribution of respondent answers for each of the four waves of the IVS, and for the aggregate sample. The zero-sum measure, based on variable E041 in the IVS, is normalized to fall between zero and one, where zero indicates respondents fully agreed with the statement "Wealth can grow so there's enough for everyone" and one indicates respondents fully agreed with the statement "People can only get rich at the expense of others."

**Figure E7:** Relationship Between Zero-Sum Perceptions and Happiness or Life Satisfaction



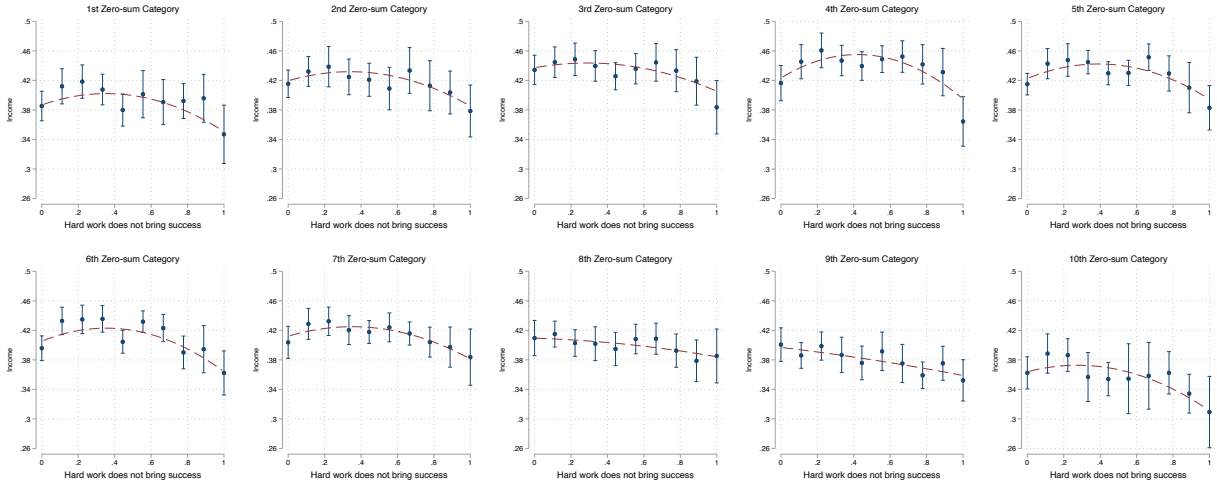

*Notes:* This figure reports the relationship between zero-sum perceptions and happiness (left panel), and zero-sum perceptions and satisfaction (right panel) using a binscatter plot with survey-wave-by-country fixed effects. Zero-sum thinking is measured using a scale variable ranging from zero to one, with one representing "People can only get rich at the expense of others" and zero representing "Wealth can grow so there's enough for everyone." Happiness is measured based on a scale variable reporting respondents' answers to the question "Taking all things together, would you say you are," with zero indicating "Not at all happy" and one indicating "Very happy." Life satisfaction is measured based on respondents' answers to the question "All things considered, how satisfied are you with your life as a whole these days?," with 1 indicating "Completely dissatisfied" and 10 indicating "Completely satisfied." ($N = 277{,}722$ for left panel and $N = 278{,}244$ for right panel).

**Figure E8:** Relationship Between Demotivating Beliefs (Work Is Not Important) and Income – Holding Constant Zero-Sumness and Without Demographic Controls and Country-Wave Fixed Effects



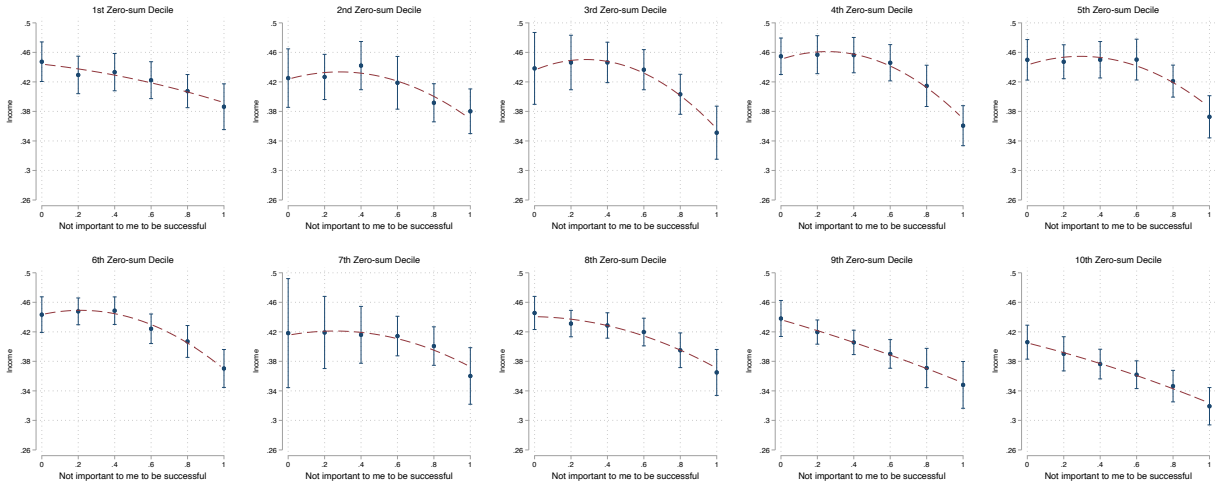

*Notes:* The figure reports estimated relationships relevant for Proposition 2 of the model. It shows the relationship between respondents' demotivating beliefs and level of income for each raw zero-sum category. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. The demotivating belief in this figure is reported based on respondents' answers to the version of the following question that asks about work: "For each of the following, indicate how important it is in your life. Would you say it is," with the options: "1 Very important, 2 Rather important, 3 Not very important, 4 Not at all important." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Work is not important at all." ($N = 251{,}552$).

**Figure E9:** Relationship Between Demotivating Beliefs (Hard Work Does Not Bring Success) and Income – Holding Constant Zero-Sumness and Without Demographic Controls and Country-Wave Fixed Effects



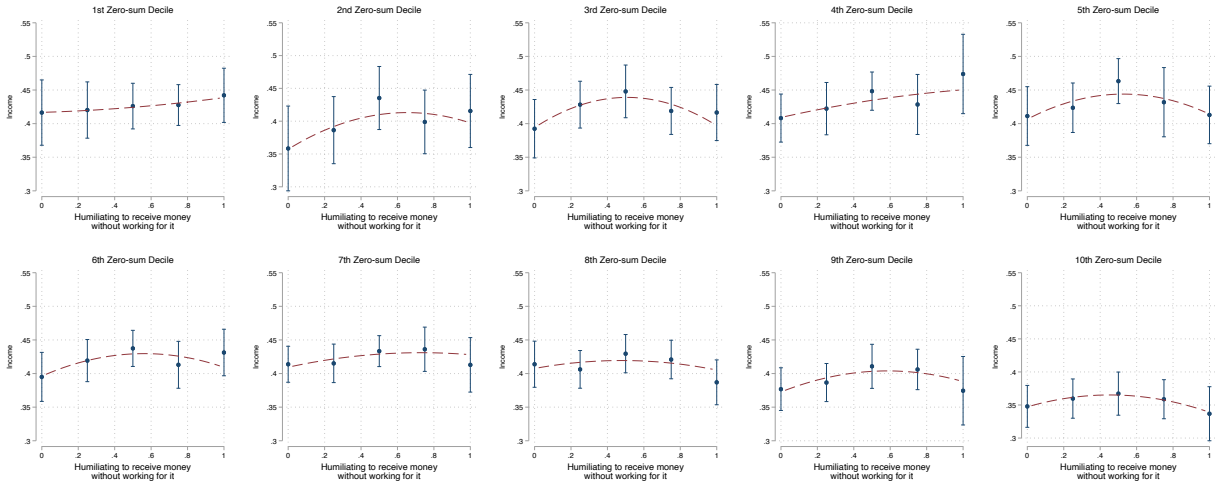

*Notes:* The figure reports estimated relationships relevant for Proposition 2 of the model. It shows the relationship between respondents' demotivating beliefs and level of income for each raw zero-sum category. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. The demotivating belief in this figure is reported based on how much respondents agree with the statement "In the long run, hard work usually brings a better life" on a scale of one to ten, with one indicating complete agreement with the statement and ten indicating "Hard work doesn't generally bring success – it's more a matter of luck and connections." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Hard work does not bring success." ($N = 255{,}229$).

**Figure E10:** Relationship Between Demotivating Beliefs (Not Important to Me to be Successful) and Income – Holding Constant Zero-Sumness



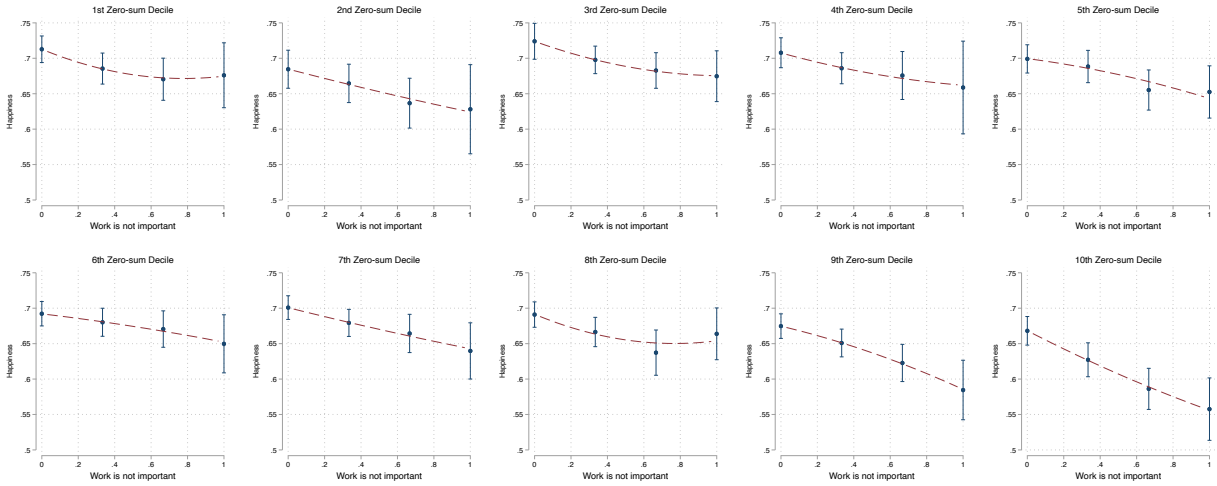

*Notes:* The figure reports estimated relationships relevant for Proposition 2 of the model. It shows the relationship between respondents' demotivating beliefs and level of income for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on respondents' answers to how they would describe themselves in relation to the statement "Being very successful is important to this person; to have people recognize one's achievements" on a scale of "1 Not at all like me" to "6 Very much like me." These responses are reverse-scored and rescaled to range from zero and one to achieve the demotivating belief used in the figure "Not important to me to be successful." ($N$ = 143,927).

**Figure E11:** Relationship Between Demotivating Beliefs (Humiliating to Receive Money Without Working for It) and Income – Holding Constant Zero-Sumness



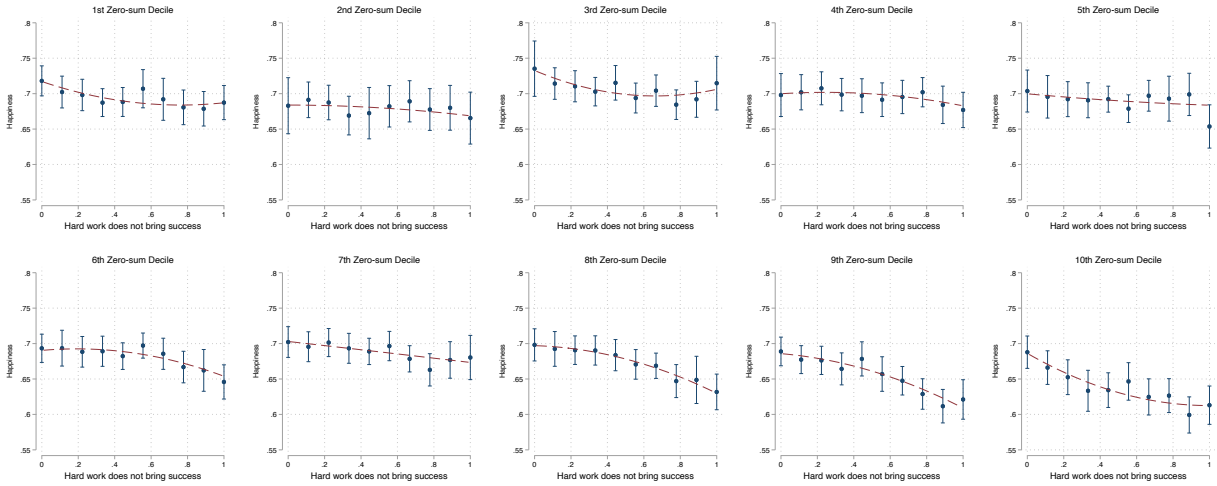

*Notes:* The figure reports estimated relationships relevant for Proposition 2 of the model. It shows the relationship between respondents' demotivating beliefs and level of income for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on how much respondents agree with the statement "It is humiliating to receive money without having to work for it" with one indicating "Strongly agree" and five indicating "Strongly disagree." These responses are reverse-scored and rescaled to range from zero and one to achieve the demotivating belief used in the figure "Humiliating to receive money without working for it." ($N$ = 56,328).

**Figure E12:** Relationship Between Demotivating Beliefs (Work Is Not Important) and Happiness – Holding Constant Zero-Sumness



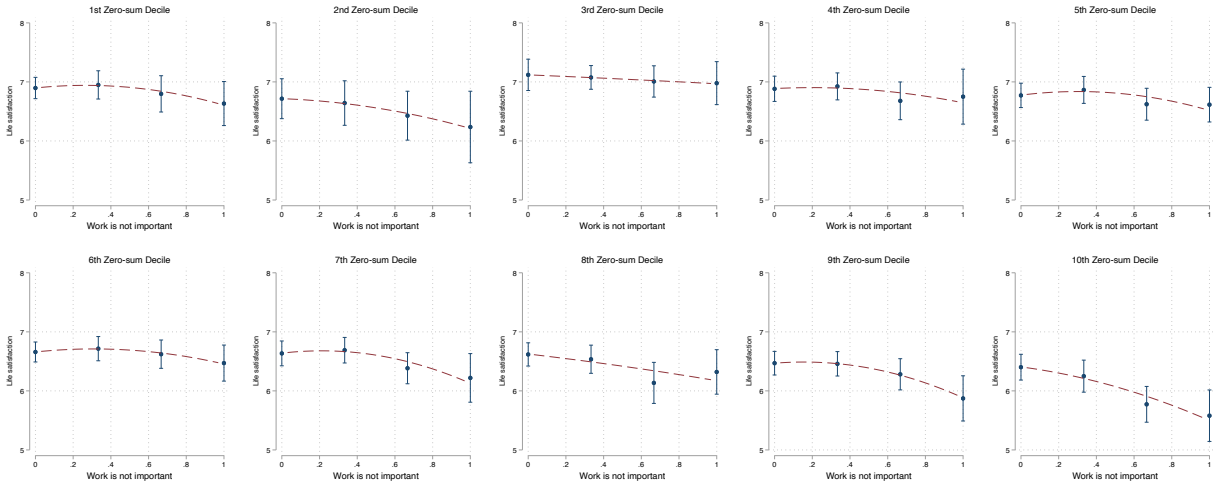

*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and level of happiness for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on respondents' answers to the version of the following question that asks about work: "For each of the following, indicate how important it is in your life. Would you say it is," with the options: "1 Very important, 2 Rather important, 3 Not very important, 4 Not at all important." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Work is not important at all." ($N = 270{,}407$).

**Figure E13:** Relationship Between Demotivating Beliefs (Hard Work Does Not Bring Success) and Happiness – Holding Constant Zero-Sumness



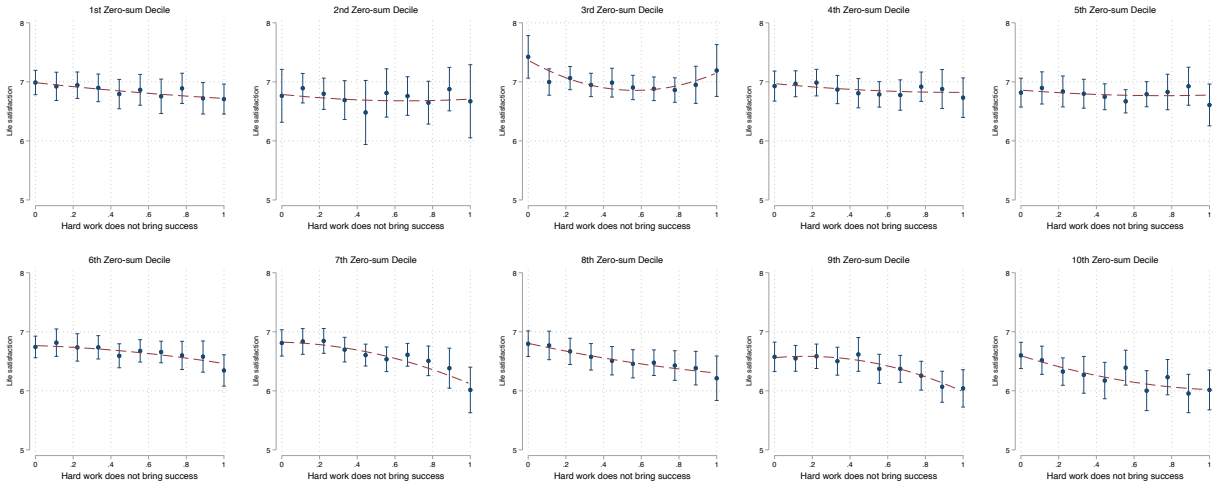

*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and level of happiness for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on how much respondents agree with the statement "In the long run, hard work usually brings a better life" on a scale of one to ten, with one indicating complete agreement with the statement and ten indicating "Hard work doesn't generally bring success – it's more a matter of luck and connections." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Hard work does not bring success." ($N = 274{,}333$).

**Figure E14:** Relationship Between Demotivating Beliefs (Work Is Not Important) and Life Satisfaction – Holding Constant Zero-Sumness



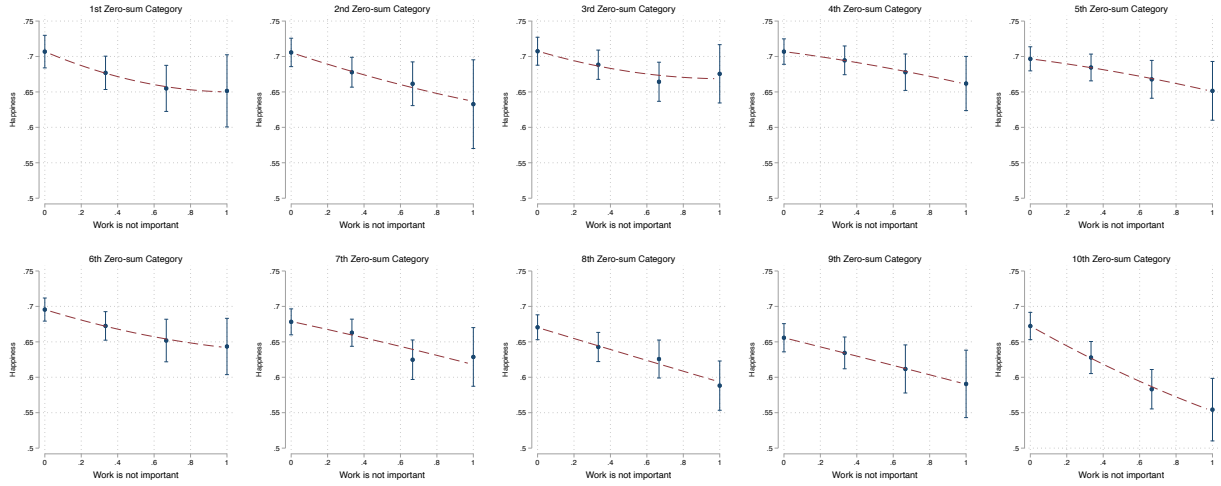

*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and life satisfaction for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on respondents' answers to the version of the following question that asks about work: "For each of the following, indicate how important it is in your life. Would you say it is," with the options: "1 Very important, 2 Rather important, 3 Not very important, 4 Not at all important." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Work is not important at all." ($N = 270{,}864$).

**Figure E15:** Relationship Between Demotivating Beliefs (Hard Work Does Not Bring Success) and Life Satisfaction – Holding Constant Zero-Sumness



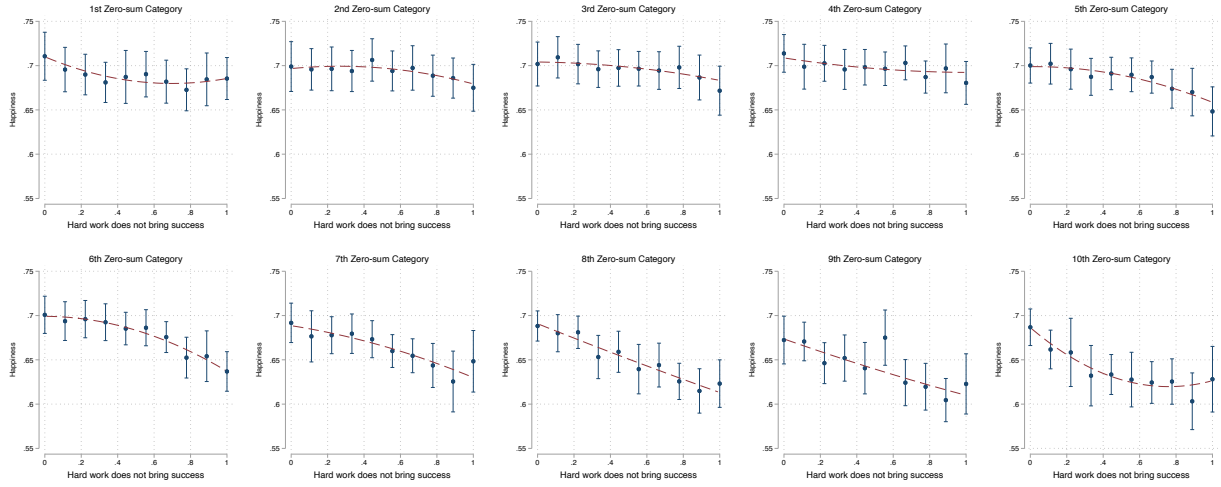

*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and life satisfaction for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on how much respondents agree with the statement "In the long run, hard work usually brings a better life" on a scale of one to ten, with one indicating complete agreement with the statement and ten indicating "Hard work doesn't generally bring success – it's more a matter of luck and connections." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Hard work does not bring success." ($N = 274{,}845$).

**Figure E16:** Relationship Between Demotivating Beliefs (Work Is Not Important) and Happiness – Holding Constant Zero-Sumness and Without Demographic Controls and Country-Wave Fixed Effects



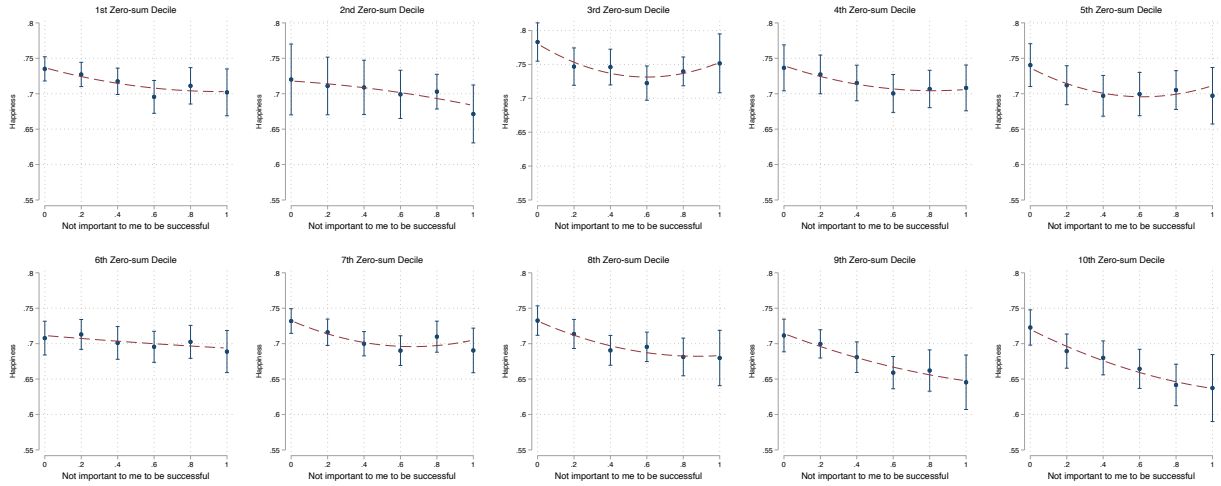

*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and level of happiness for each raw zero-sum category. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. The demotivating belief in this figure is reported based on respondents' answers to the version of the following question that asks about work: "For each of the following, indicate how important it is in your life. Would you say it is," with the options: "1 Very important, 2 Rather important, 3 Not very important, 4 Not at all important." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Work is not important at all." ($N$ = 271,198).

**Figure E17:** Relationship Between Demotivating Beliefs (Hard Work Does Not Bring Success) and Happiness – Holding Constant Zero-Sumness and Without Demographic Controls and Country-Wave Fixed Effects



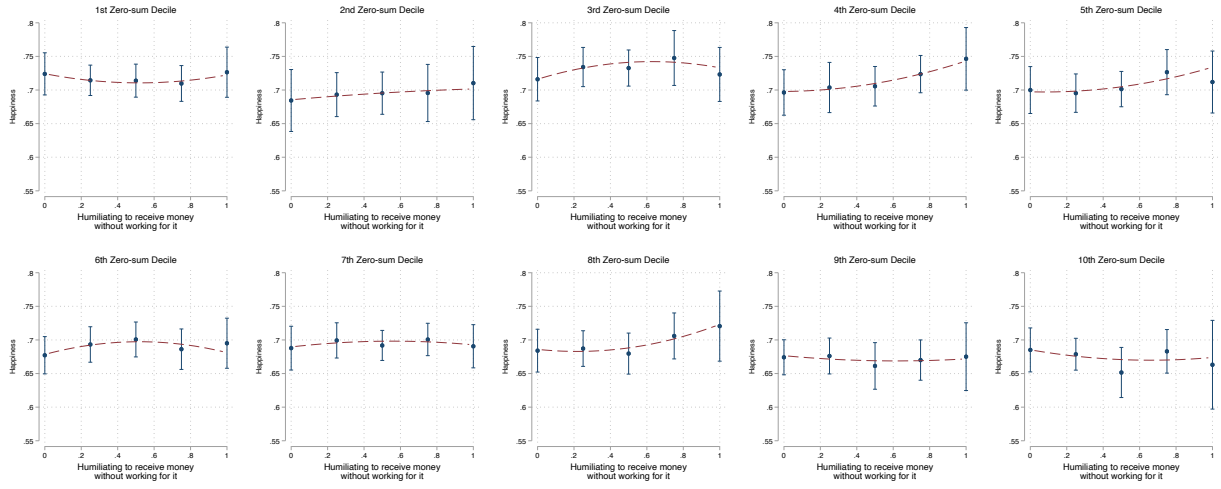

*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and level of happiness for each raw zero-sum category. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. The demotivating belief in this figure is reported based on how much respondents agree with the statement "In the long run, hard work usually brings a better life" on a scale of one to ten, with one indicating complete agreement with the statement and ten indicating "Hard work doesn't generally bring success – it's more a matter of luck and connections." These responses are rescaled to range from zero and one to achieve the demotivating belief used in the figure "Hard work does not bring success." ($N$ = 275,125).

**Figure E18:** Relationship Between Demotivating Beliefs (Not Important to Me to be Successful) and Happiness – Holding Constant Zero-Sumness




*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and level of happiness for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on respondents' answers to how they would describe themselves in relation to the statement "Being very successful is important to this person; to have people recognize one's achievements" on a scale of "1 Not at all like me" to "6 Very much like me." These responses are reverse-scored and rescaled to range from zero and one to achieve the demotivating belief used in the figure "Not important to me to be successful." ($N$ = 150,126).

**Figure E19:** Relationship Between Demotivating Beliefs (Humiliating to Receive Money Without Working for It) and Happiness – Holding Constant Zero-Sumness




*Notes:* The figure reports estimated relationships relevant for Proposition 3 of the model. It shows the relationship between respondents' demotivating beliefs and level of happiness for each zero-sum decile. Also shown is a fitted quadratic and 95% confidence intervals (based on clustering at the level of country) for each point. Country-wave fixed effects and demographic controls are netted out before creating the zero-sum deciles. The demotivating belief in this figure is reported based on how much respondents agree with the statement "It is humiliating to receive money without having to work for it" with one indicating "Strongly agree" and five indicating "Strongly disagree." These responses are reverse-scored and rescaled to range from zero and one to achieve the demotivating belief used in the figure "Humiliating to receive money without working for it." ($N$ = 60,352).

**Table E5:** Zero-Sumness and Envy in the Joy of Destruction Game: Multinomial Logit

| | Dependent Variable: Increase or Decrease Player 2's Payoff | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Pr(Choice = Decrease) | | | | |
| Player 2 is Winner | -0.258 | -0.464 | -0.447 | -0.092 |
| | (0.281) | (0.289) | (0.289) | (0.568) |
| Player 2 is Winner × Zero Sum | 1.186*** | 1.239*** | 1.477*** | 1.852** |
| | (0.434) | (0.444) | (0.495) | (0.924) |
| Zero Sum Environment | -0.113 | -0.167 | -0.217 | -0.418 |
| | (0.337) | (0.332) | (0.340) | (0.698) |
| Pr(Choice = Increase) | | | | |
| Player 2 is Winner | -0.333 | -0.375 | -0.282 | -0.214 |
| | (0.265) | (0.275) | (0.280) | (0.418) |
| Player 2 is Winner × Zero Sum | 0.280 | 0.231 | 0.204 | 0.051 |
| | (0.393) | (0.396) | (0.458) | (0.685) |
| Zero Sum Environment | -0.192 | -0.149 | -0.136 | -0.663 |
| | (0.257) | (0.258) | (0.270) | (0.441) |
| Mean dependent variable (control) | 0.22 | 0.22 | 0.22 | 0.22 |
| Observations | 733 | 733 | 733 | 733 |
| Clusters (individuals) | 124 | 124 | 124 | 124 |
| Pseudo R-squared | 0.011 | 0.042 | 0.052 | 0.453 |
| Player 1 Controls | N | Y | Y | N |
| Player 2 Controls | N | N | Y | Y |
| Player 1 FE | N | N | N | Y |

*Notes:* This table examines how random variation in the zero-sumness of the endowment creation activity shapes spiteful action in the "joy of destruction" game. It shows robustness to the analysis summarized in Table 3 using a multinomial logit model instead of a linear probability model. The table displays margins of responses at the means of the covariates. This game was administered at a lab setting in 2015 in Kananga, DRC. The table reports estimates of equation (9). In all columns, the dependent variable is equal to 1 if the participant chose to increase the payoff of the other player by 500 CF at a cost of 100 CF; 0 if they chose to do nothing; and -1 if the participant chose to decrease the other player's payoff (for the same cost). The explanatory variables are (*i*) an indicator variable equaling one if player 2 was any kind of winner in the endowment activity, i.e., received 15,000 CF or 5,000 CF, (*ii*) an indicator equaling one if the endowment activity was zero-sum, and (*iii*) the interaction of these two variables. An observation is a round of the JOD game, and a cluster is an individual participant who completed both lab visits. Player 1 controls include gender, age, age squared, and whether Player 1 was a winner in the endowment activity. Player 2 controls include gender, age, age squared, a dummy for a symmetric version of the game, and a dummy if the two players are coethnics. Standard errors are clustered at the respondent level. Table 3 shows an analogous table with an outcome that is a dummy for reducing the other player's payoff, estimated as a linear probability model. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E6:** Principal Component Analysis for Well-Being Measures in the DRC

| Measures of well-being | (1) 200 sample | (2) 1,000 sample |
|---|---|---|
| Respondent's education, 0-4 | 0.656 | 0.532 |
| Respondent's employment, 0/1 | 0.464 | 0.558 |
| Perceived relative wealth, 1-5 | 0.595 | 0.637 |
| Eigenvalue | 1.164 | 1.272 |
| Proportion of variance explained | 0.388 | 0.424 |
| Observations | 225 | 1,019 |

*Notes:* The table reports the estimated factor loadings from the principal components of the measures of well-being. The education variable takes a value of 0 if the respondent never attended school, 1 if they attended kindergarten, 2 if they attended primary school, 3 if they attended secondary school, and 4 if they attended university. The employment variable is a binary variable that takes the value of 1 if the respondent is employed. The perceived relative wealth variable takes a value of 1 to 5, corresponding to which step (i.e., quintile in the wealth distribution) the respondent perceives they are on. Columns 1 and 2 report the factor loadings of the first principal component using the 200-person and the 1,000-person samples, respectively, with the eigenvalue of the first principal component reported in the bottom panel.

**Table E7:** Zero-Sumness, Demotivating Beliefs, and Well-Being in the DRC: Individual Outcome Analysis

| | Dependent Variable: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Education, 0-4 | | | Employment, 0/1 | | | Perceived Relative Wealth, 1-5 | | |
| | 2015 (1) | 2019 (2) | Pooled (3) | 2015 (4) | 2019 (5) | Pooled (6) | 2015 (7) | 2019 (8) | Pooled (9) |
| Panel A: Zero-Sum Thinking | | | | | | | | | |
| Zero-sum index, 0-1 | -0.148 | -0.140 | -0.122 | -0.174 | -0.032 | -0.060 | 0.035 | -0.304* | -0.259* |
| | (0.225) | (0.117) | (0.105) | (0.172) | (0.083) | (0.074) | (0.362) | (0.159) | (0.148) |
| Observations | 205 | 984 | 1,189 | 205 | 984 | 1,189 | 205 | 984 | 1,189 |
| R squared | 0.364 | 0.177 | 0.210 | 0.106 | 0.074 | 0.079 | 0.041 | 0.013 | 0.035 |
| Mean dependent variable | 3.078 | 2.934 | 2.959 | 0.405 | 0.462 | 0.452 | 2.263 | 1.858 | 1.928 |
| Panel B: Envy | | | | | | | | | |
| Envy of others' success, 0-1 | 0.070 | -0.253* | -0.151 | -0.176 | -0.379*** | -0.335*** | -1.086*** | -0.778*** | -0.872*** |
| | (0.229) | (0.130) | (0.112) | (0.149) | (0.092) | (0.078) | (0.318) | (0.192) | (0.166) |
| Observations | 224 | 1,019 | 1,243 | 224 | 1,019 | 1,243 | 224 | 1,019 | 1,243 |
| R squared | 0.372 | 0.178 | 0.212 | 0.119 | 0.083 | 0.089 | 0.099 | 0.026 | 0.057 |
| Mean dependent variable | 3.080 | 2.933 | 2.960 | 0.397 | 0.459 | 0.448 | 2.268 | 1.857 | 1.931 |
| Panel C: Witchcraft | | | | | | | | | |
| Witchcraft beliefs, 0-1 | -0.226 | -0.159 | -0.154 | -0.431*** | -0.019 | -0.249*** | -0.897*** | -0.246 | -0.608*** |
| | (0.182) | (0.154) | (0.127) | (0.086) | (0.142) | (0.083) | (0.249) | (0.273) | (0.187) |
| Observations | 217 | 1,019 | 1,236 | 217 | 1,019 | 1,236 | 217 | 1,019 | 1,236 |
| R squared | 0.407 | 0.175 | 0.216 | 0.162 | 0.070 | 0.082 | 0.108 | 0.009 | 0.042 |
| Mean dependent variable | 3.092 | 2.933 | 2.961 | 0.392 | 0.459 | 0.447 | 2.263 | 1.857 | 1.928 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Year Dummy | N | N | Y | N | N | Y | N | N | Y |

*Notes:* This table, a complement to Table 4, examines the relationship between zero-sum views, envy of others, witchcraft beliefs, and material well-being in two samples in Kananga, DRC. The dependent variables are education, employment, and perceived relative wealth relative to others in Kananga. The first explanatory variable is the first principal component of the six zero-sum statements. The second and third are the same measures of envy and witchcraft beliefs studied in Table D4. For each outcome variable, we consider separately the 200-person (2015) sample, the 1,000-person (2019) sample, and a pooled specification that includes a dummy for the year of enumeration. We include controls for gender, age, and age squared in all columns. Coefficients are reported with robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E8:** Principal Component Analysis for Envy Measures in the DRC

| Envy survey questions | (1) 200 sample | (2) 1,000 sample |
|---|---|---|
| It is frustrating to see some people succeed in life easily | 0.547 | 0.509 |
| It is not fair that some people seem to have all the talent | 0.347 | 0.475 |
| The success of my neighbors makes me resent them | 0.544 | 0.509 |
| I sometimes wish that rich and powerful people lose their advantage | 0.532 | 0.506 |
| Eigenvalue | 2.046 | 2.406 |
| Proportion of variance explained | 0.511 | 0.602 |
| Observations | 224 | 1,019 |

*Notes:* The table reports the estimated factor loadings from the principal components of the measure of envy. Both sets of estimates are reported in one column with the eigenvalue of the first principal component reported in the bottom panel. The questions used in the principal components analyses are respondents' self-reported envy. In the 200-person sample, the respondents choose from one of five options: "Strongly agree", "Agree", "Neutral", "Disagree", and "Strongly disagree". In the 1,000-person sample, the respondents choose from one of six options: "Strongly disagree", "Moderately disagree", "Slightly disagree", "Slightly agree, "Moderately agree", "Strongly agree". Columns 1 and 2 report the factor loadings of the first principal component using the 200-person and the 1,000-person samples, respectively.

**Table E9:** Principal Component Analysis for Witchcraft Measures in the DRC

| Witchcraft survey questions | (1) 200 sample | (2) 1,000 sample |
|---|---|---|
| Aside from the Christian God, what is the strength of your belief in the existence of other gods and spirits, including ancestor spirits? | 0.436 | 0.569 |
| How often do you pray to gods and spirits other than the Christian God, including ancestor spirits? | 0.600 | 0.584 |
| How often do you attend rituals devoted to gods and spirits other than the Christian God, including ancestor spirits? | 0.586 | 0.579 |
| Using the figures provided, which set of figures best represents how close you feel to non-Christians in Kananga? | 0.326 | 0.010 |
| Eigenvalue | 2.416 | 2.640 |
| Proportion of variance explained | 0.604 | 0.660 |
| Observations | 217 | 1,019 |

*Notes:* The table reports the estimated factor loadings from the principal components of the measure of Witchcraft. Both sets of estimates are reported in one column with the eigenvalue of the first principal component reported in the bottom panel. The questions used in the principal components analyses are respondents' self-reported belief in Gods and spirits aside from the Christian God. In the 200 person sample, for the first question, respondents choose from one of five options: "Very strong", "Strong, "Weak", "Very weak", and "Nonexistent". In the 1,000-person sample, for the first question, respondents choose from one of five options: "With all my heart", "With a lot of strength", "With strength", "With a little bit of strength", and "With no strength at all". In the 200 person sample, for the second and third questions, respondents choose from one of six options: "Very frequently", "Frequently", "Sometimes", "Infrequently", "Very infrequently', and "Never". In the 1,000-person sample, for the second and third questions, respondents choose between one of five options: "A few times per week", "A few times per month", "A few times per year", "Very rarely", and "Never". In both samples, for the final question, respondents choose one number on a scale of zero to five. Columns 1 and 2 report the factor loadings of the first principal component using the 200-person and the 1,000-person samples, respectively.

**Table E10:** Principal Component Analysis for Christianity Measures in the DRC

| Christianity survey questions | (1) 200 sample | (2) 1,000 sample |
|---|---|---|
| What is the strength of your belief in the existence of the Christian God? | 0.543 | 0.463 |
| How often do you pray to the Christian God or Jesus? | 0.643 | 0.630 |
| How often do you attend church or other communal religious rituals? | 0.437 | 0.601 |
| Using the figures provided, which set of figures best represents how close you feel to devout Christians in Kananga? | 0.317 | 0.167 |
| Eigenvalue | 1.869 | 1.424 |
| Proportion of variance explained | 0.467 | 0.356 |
| Observations | 217 | 1,019 |

*Notes:* The table reports the estimated factor loadings from the principal components of the measure of Christianity. Both sets of estimates are reported in one column with the eigenvalue of the first principal component reported in the bottom panel. The questions used in the principal components analyses are respondent's self-reported devotion to the Christian God. In the 200-person sample, for the first question, respondents choose from one of five options: "Very strong", "Strong, "Weak", "Very weak", and "Nonexistent". In the 1,000-person sample, for the first question, respondents choose from one of five options: "With all my heart", "With a lot of strength", "With strength", "With a little bit of strength", and "With no strength at all". In the 200 person sample, for the second and third questions, respondents choose from one of six options: "Very frequently", "Frequently", "Sometimes", "Infrequently", "Very infrequently', and "Never". In the 1,000-person sample, for the second and third questions, respondents choose between one of five options: "A few times per week", "A few times per month", "A few times per year", "Very rarely", and "Never". In both samples, for the final question, respondents choose one number on a scale of zero to five. Columns 1 and 2 report the factor loadings of the first principal component using the 200-person and the 1,000-person samples, respectively.

**Table E11:** Zero-Sum Index of Six Survey Questions, Envy, and Witchcraft in the DRC – Clustered Standard Errors and Randomization Inference

| | Dependent Variable: Principal-Component Based Measures of: | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Envy of Others' Success | | Witchcraft Beliefs | | Christianity Beliefs | | Difference Between Witchcraft & Christianity | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Panel A: 200 Person Sample (2015) | | | | | | | | |
| Zero-sum index, 0-1 | 0.333 | 0.345 | 0.320 | 0.273 | -0.146 | -0.143 | 0.466 | 0.416 |
| | (0.070)*** | (0.085)*** | (0.094)*** | (0.095)*** | (0.067)** | (0.068)** | (0.131)*** | (0.131)*** |
| | [0.066]*** | [0.081]*** | [0.114]*** | [0.113]** | [0.069]** | [0.071]** | [0.146]*** | [0.145]*** |
| | {0.072}*** | {0.092}*** | {0.114}*** | {0.121}** | {0.078}* | {0.081}* | {0.145}*** | {0.156}*** |
| Observations | 204 | 204 | 197 | 197 | 197 | 197 | 197 | 197 |
| R squared | 0.118 | 0.166 | 0.073 | 0.128 | 0.062 | 0.118 | 0.078 | 0.148 |
| Randomization inference *p*-value | 0.000 | 0.000 | 0.002 | 0.009 | 0.029 | 0.043 | 0.001 | 0.005 |
| Panel B: 1,000 Person Sample (2019) | | | | | | | | |
| Zero-sum index, 0-1 | 0.156 | 0.154 | 0.035 | 0.035 | -0.051 | -0.051 | 0.086 | 0.087 |
| | (0.032)*** | (0.032)*** | (0.028) | (0.028) | (0.016)*** | (0.017)*** | (0.034)** | (0.034)** |
| | [0.032]*** | [0.032]*** | [0.027] | [0.027] | [0.017]*** | [0.017]*** | [0.034]** | [0.035]** |
| | {0.035}*** | {0.036}*** | {0.027} | {0.027} | {0.017}*** | {0.017}*** | {0.036}** | {0.036}** |
| Observations | 984 | 984 | 984 | 984 | 984 | 984 | 984 | 984 |
| R squared | 0.049 | 0.055 | 0.025 | 0.029 | 0.009 | 0.017 | 0.019 | 0.025 |
| Randomization inference *p*-value | 0.000 | 0.000 | 0.044 | 0.047 | 0.009 | 0.009 | 0.004 | 0.005 |
| Panel C: Pooled sample with survey-wave FE | | | | | | | | |
| Zero-sum index, 0-1 | 0.188 | 0.184 | 0.085 | 0.080 | -0.066 | -0.066 | 0.151 | 0.146 |
| | (0.030)*** | (0.031)*** | (0.028)*** | (0.027)*** | (0.018)*** | (0.018)*** | (0.036)*** | (0.036)*** |
| | [0.030]*** | [0.030]*** | [0.029]*** | [0.029]*** | [0.019]*** | [0.019]*** | [0.038]*** | [0.038]*** |
| | {0.032}*** | {0.033}*** | {0.031}*** | {0.030}*** | {0.019}*** | {0.020}*** | {0.040}*** | {0.041}*** |
| Observations | 1,188 | 1,188 | 1,181 | 1,181 | 1,181 | 1,181 | 1,181 | 1,181 |
| R squared | 0.180 | 0.188 | 0.232 | 0.249 | 0.126 | 0.137 | 0.251 | 0.267 |
| Randomization inference *p*-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y | Y |
| Ethnicity FE | N | Y | N | Y | N | Y | N | Y |

*Notes:* This table replicates the specifications and results presented in Table 2. However, coefficients are reported with standard errors clustered at the neighborhood-by-ethnicity level in parenthesis (), at the neighborhood-by-gender level in square brackets [], and at the neighborhood level in curly brackets {}. At the bottom of each panel, we also report the randomization inference *p*-value associated with each regression specification. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E12:** Zero-Sum Index of Ten Survey Questions, Envy, and Witchcraft in the DRC: 200 Person Sample

| | Dependent Variable: Principal-Component Based Measures of: | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Envy of Others' Success | | Witchcraft Beliefs | | Christianity Beliefs | | Difference Between Witchcraft & Christianity | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Zero-sum index, 0-1 | 0.347*** | 0.348*** | 0.314*** | 0.267*** | -0.124** | -0.131** | 0.439*** | 0.398*** |
| | (0.061) | (0.075) | (0.096) | (0.091) | (0.057) | (0.061) | (0.124) | (0.122) |
| Mean dependent variable | 0.315 | 0.315 | 0.229 | 0.229 | 0.754 | 0.754 | -0.525 | -0.525 |
| Std. dev. dependent variable | 0.194 | 0.194 | 0.269 | 0.269 | 0.192 | 0.192 | 0.392 | 0.392 |
| Mean independent variable | 0.391 | 0.391 | 0.392 | 0.392 | 0.392 | 0.392 | 0.392 | 0.392 |
| Std. dev. independent variable | 0.199 | 0.199 | 0.197 | 0.197 | 0.197 | 0.197 | 0.197 | 0.197 |
| Observations | 192 | 192 | 186 | 186 | 186 | 186 | 186 | 186 |
| R squared | 0.134 | 0.184 | 0.077 | 0.146 | 0.063 | 0.125 | 0.075 | 0.157 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y | Y |
| Ethnicity FE | N | Y | N | Y | N | Y | N | Y |

*Notes:* This table examines the relationship between zero-sum views and an individual's self-reported envy of others, beliefs in witchcraft and beliefs in Christianity for the sample of about 200 respondents collected in 2015 in Kananga, DRC. It reports estimates of equation (8). In all columns, the explanatory variable is the first principal component of the ten zero-sum statements described in Section 4.B. In columns 1 and 2, the dependent variable is the principal component of four survey questions measuring self-reported envy of others. The first three questions ask about experiencing frustration when people succeed in life easily, resentment when neighbors are successful, or feelings of injustice when some people seem to have all the talents. The fourth question asks if the respondent sometimes wishes that rich and powerful people lose their advantage. In columns 3 and 4, it is the principal-component-based measure of beliefs in witchcraft using four survey questions that ask about the strength of belief in traditional religion, frequency of prayer to ancestors, frequency of participation in rituals devoted to ancestors, and how close they feel to non-Christians who live in Kananga. In columns 5 and 6, it is a principal-component-based measure of beliefs in Christianity using four survey questions that ask about the strength of one's belief in the Christian God, frequency of prayer, frequency of attending church, and how close the respondent feels to Christians who live in Kananga. In columns 7 and 8, it is the differences in the principal-component-based measure of beliefs in witchcraft and Christianity. We include controls for age, and age squared, gender and its interactions with age and age squared in all columns. In columns 2, 4, 6, and 8, we also include ethnicity fixed effects. We report robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E13:** Principal Component Analysis for Network Measures in the DRC: 1,000 Sample

| Network survey questions | (1) Counting scenario-individuals | (2) Counting unique individuals |
|---|---|---|
| Fraction of tribe in network | 0.169 | 0.170 |
| Fraction of church in network | 0.576 | 0.583 |
| Fraction of nuclear family in network | 0.417 | 0.407 |
| Fraction of extended family in network | 0.376 | 0.369 |
| Fraction of religion in network | 0.570 | 0.574 |
| Eigenvalue | 2.126 | 2.083 |
| Proportion of variance explained | 0.425 | 0.417 |
| Observations | 941 | 941 |

*Notes:* The table reports the estimated factor loadings from the principal components of the network measures. The five variables used in the principal components analyses are the fraction of the individuals listed by the respondent when asked nine network questions on who belong to the respondent's same tribe, church, nuclear family, extended family, and religion. The network questions follow the social network questionnaires from the Aggregated Relations Data methodology introduced by Breza, Chandrasekhar, McCormack and Pan (2020). Respondents are asked to list the individuals they would go to (or who would come to them) in nine different situations. We collected information about the individuals they listed, including their tribe and religion, and whether they belonged to the respondent's church, extended family, or nuclear family. The nine situations considered are (1) borrowing or lending cooking fuel (coal), (2) borrowing or lending coffee, milk and/or sugar, (3) borrowing or lending CF3,000-CF5,000, (4) borrowing or lending US$50 to start a business, (5) giving or receiving advice about financial matters, (6) giving or receiving advice about a child's schooling, (7) giving or receiving advice about finding housing, (8) giving or receiving advice about health concerns, (9) listening to the radio or watching television together. We then calculate the fraction of all individuals listed who share the respondent's same tribe, church, nuclear family, extended family, or religion. Column 1 reports factor loadings counting scenario-individuals (i.e., an individual is counted multiple times if he/she is mentioned in multiple scenarios) whereas column 2 counts the number of unique individuals. The eigenvalue of the first principal component reported in the bottom panel. The exact survey questions used to define these variables are provided in Appendix S.IV.

**Table E14:** Zero-Sum Index of Six Survey Questions, Envy, and Witchcraft: Controlling for the fraction of a respondent's social group in their network

| | Dependent Variable: Principal-Component Based Measures of: | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Envy of Others' Success | | Witchcraft Beliefs | | Christianity Beliefs | | Difference Between Witchcraft & Christianity | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Panel A: PCA-based network measure: Share of connections that are ingroup | | | | | | | | |
| Zero-sum index, 0-1 | 0.168*** | 0.167*** | 0.032 | 0.032 | -0.043** | -0.044** | 0.075** | 0.076** |
| | (0.027) | (0.028) | (0.029) | (0.030) | (0.017) | (0.018) | (0.036) | (0.036) |
| Mean dependent variable | 0.150 | 0.021 | 0.021 | 0.021 | 0.871 | 0.871 | -0.850 | -0.850 |
| Std. dev. dependent variable | 0.155 | 0.155 | 0.113 | 0.113 | 0.111 | 0.111 | 0.176 | 0.176 |
| Mean independent variable | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 |
| Std. dev. independent variable | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 |
| Observations | 908 | 907 | 908 | 907 | 908 | 907 | 908 | 907 |
| R squared | 0.060 | 0.066 | 0.031 | 0.034 | 0.031 | 0.037 | 0.037 | 0.042 |
| Panel B: PCA-based network measure: Share of people who are ingroup | | | | | | | | |
| Zero-sum index, 0-1 | 0.171*** | 0.169*** | 0.033 | 0.033 | -0.046*** | -0.047*** | 0.078** | 0.080** |
| | (0.027) | (0.027) | (0.029) | (0.030) | (0.017) | (0.017) | (0.036) | (0.036) |
| Mean dependent variable | 0.150 | 0.021 | 0.021 | 0.021 | 0.871 | 0.871 | -0.850 | -0.850 |
| Std. dev. dependent variable | 0.155 | 0.155 | 0.113 | 0.113 | 0.111 | 0.111 | 0.176 | 0.176 |
| Mean independent variable | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 | 0.162 |
| Std. dev. independent variable | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 | 0.189 |
| Observations | 908 | 907 | 908 | 907 | 908 | 907 | 908 | 907 |
| R squared | 0.058 | 0.064 | 0.030 | 0.034 | 0.028 | 0.034 | 0.034 | 0.039 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y | Y |
| Sigma | Y | Y | Y | Y | Y | Y | Y | Y |
| Ethnicity FE | N | Y | N | Y | N | Y | N | Y |

*Notes:* This table examines the relationship between zero-sum perceptions and an individual's self-reported envy of others, beliefs in witchcraft, and beliefs in Christianity, for the sample of about 1,000 respondents collected in 2019 in Kananga, DRC. It reports estimates of equation (8). In all columns, the explanatory variable is the first principal component of the six zero-sum statements. In columns 1 and 2, the dependent variables are the first principal component of the four survey questions measuring self-reported envy of others' success. The first three questions ask about experiencing frustration when people succeed in life easily, resentment when neighbors are successful, or feelings of injustice when some people seem to have all the talents. The fourth question asks if the respondent sometimes wishes that rich and powerful people lose their advantage. In columns 3 and 4, the dependent variables are the principal-component-based measure of beliefs in witchcraft using four survey questions that ask about the strength of belief in traditional religion, frequency of prayer to ancestors, frequency of participation in rituals devoted to ancestors, and how close they feel to non-Christians who live in Kananga. In columns 5 and 6, the dependent variables are the principal-component-based measure of beliefs in Christianity using four survey questions that ask about the strength of one's belief in the Christian God, frequency of prayer, frequency of attending church, and how close the respondent feels to Christians who live in Kananga. In columns 7 and 8, the dependent variables are the difference in the principal-component-based measure of beliefs in witchcraft and Christianity. We include controls for age, age squared, gender and its interactions with age and age squared in all columns. Even columns include ethnicity fixed effects. We also control for the composition of the respondent's network using a principal component measure of the fraction of people in a respondent's network that is from the same tribe, church, nuclear family, extended family, and religion as the respondent. In Panel A, the PCA-based measure is calculated counting connections (i.e., an individual is counted multiple times if he/she is mentioned in multiple scenarios) whereas in Panel B, the PCA-based measure is calculated counting the number of individuals mentioned. Coefficients are reported with robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E15:** Zero-Sum Measures (Individual Questions), Envy, and Witchcraft in the DRC: Pooled Sample with Survey-Wave FE

| | Dependent Variable: Principal-Component Based Measures of: | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Envy of Others' Success | | Witchcraft Beliefs | | Christianity Beliefs | | Difference Between Witchcraft & Christianity | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Zero-sum index, 0-1 | 0.188*** | 0.184*** | 0.085*** | 0.080*** | -0.066*** | -0.066*** | 0.151*** | 0.146*** |
| | (0.024) | (0.025) | (0.026) | (0.026) | (0.017) | (0.017) | (0.034) | (0.034) |
| Gaining happiness requires taking it away from others, 1-4 | 0.045*** | 0.027*** | 0.034*** | 0.011** | -0.021*** | -0.007* | 0.056*** | 0.019*** |
| | (0.006) | (0.005) | (0.007) | (0.005) | (0.004) | (0.004) | (0.009) | (0.007) |
| A person can only gain power by taking it away from others, 1-4 | 0.035*** | 0.019*** | 0.037*** | 0.018*** | -0.022*** | -0.010*** | 0.060*** | 0.028*** |
| | (0.005) | (0.005) | (0.007) | (0.006) | (0.005) | (0.004) | (0.010) | (0.008) |
| In trade, if one party gains the other party loses, 1-4 | 0.020*** | 0.013*** | 0.011*** | 0.002 | -0.003 | 0.002 | 0.014** | 0.000 |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.003) | (0.003) | (0.006) | (0.005) |
| If one person in a village gets very wealthy, other people in the village will become poorer, 1-4 | 0.059*** | 0.041*** | 0.038*** | 0.010** | -0.031*** | -0.016*** | 0.069*** | 0.026*** |
| | (0.006) | (0.006) | (0.006) | (0.005) | (0.005) | (0.004) | (0.009) | (0.008) |
| In Kananga, people only make money when others lose money, 1-4 | 0.035*** | 0.021*** | 0.026*** | 0.009* | -0.022*** | -0.011*** | 0.047*** | 0.020*** |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.004) | (0.004) | (0.008) | (0.007) |
| In Kananga, businesses only make money when others lose money, 1-4 | 0.036*** | 0.023*** | 0.029*** | 0.010** | -0.018*** | -0.007* | 0.047*** | 0.017*** |
| | (0.005) | (0.005) | (0.006) | (0.005) | (0.004) | (0.003) | (0.008) | (0.006) |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y | Y |
| Ethnicity FE | N | Y | N | Y | N | Y | N | Y |

*Notes:* This table replicates Panel C of Table 2 for each of the six measures used to construct the zero-sum index. It reports estimates of equation (8). The first row displays the same estimates as Panel C whereas the remaining six rows represent each measure used to construct the zero-sum index. In columns 1 and 2, the dependent variables are the first principal component of the four survey questions measuring self-reported envy of others' success. The first three questions ask about experiencing frustration when people succeed in life easily, resentment when neighbors are successful, or feelings of injustice when some people seem to have all the talents. The fourth question asks if the respondent sometimes wishes that rich and powerful people lose their advantage. In columns 3 and 4, the dependent variables are the principal-component-based measure of beliefs in witchcraft using four survey questions that ask about the strength of belief in traditional religion, frequency of prayer to ancestors, frequency of participation in rituals devoted to ancestors, and how close they feel to non-Christians who live in Kananga. In columns 5 and 6, the dependent variables are the principal-component-based measure of beliefs in Christianity using four survey questions that ask about the strength of one's belief in the Christian God, frequency of prayer, frequency of attending church, and how close the respondent feels to Christians who live in Kananga. In columns 7 and 8, the dependent variables are the difference in the principal-component-based measure of beliefs in witchcraft and Christianity. We include controls for age, age squared, gender, and their interactions with age and age squared in all columns. All columns include survey-wave fixed effects. Even columns also include ethnicity fixed effects. Coefficients are reported with robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E16:** Zero-Sum Perceptions or Demotivating Beliefs and Economic Welfare

| | | Measure of demotivating beliefs used: | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hard work brings success, 0 = fully agree to 1 = fully disagree | People are poor because of laziness, 0 = agree or 1 = disagree | People have a chance to escape poverty, 0 = agree or 1 = disagree | Humiliating to receive money without working for it, 0 = strongly agree to 1 = strongly disagree | Important to me to be successful, 0 = very much to 1 = not at all | How important is work, 0 = very important to 1 = not at all |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Panel A: Income Decile (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.038*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.018*** | -0.046*** | -0.030*** | 0.004 | -0.053*** | -0.014** |
| | | (0.006) | (0.008) | (0.006) | (0.004) | (0.007) | (0.006) |
| Mean dependent variable | 0.410 | 0.415 | 0.382 | 0.383 | 0.416 | 0.420 | 0.416 |
| Std. dev. dependent variable | 0.258 | 0.252 | 0.278 | 0.281 | 0.273 | 0.242 | 0.260 |
| Mean independent variable | 0.403 | 0.369 | 0.708 | 0.601 | 0.364 | 0.392 | 0.168 |
| Std. dev. independent variable | 0.306 | 0.321 | 0.455 | 0.490 | 0.299 | 0.291 | 0.251 |
| Observations | 256,944 | 357,967 | 54,785 | 57,087 | 230,103 | 149,713 | 559,913 |
| Clusters | 99 | 110 | 50 | 48 | 86 | 78 | 116 |
| R squared | 0.163 | 0.146 | 0.197 | 0.195 | 0.160 | 0.129 | 0.149 |
| Panel B: Socioeconomic Class (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.045*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.032*** | -0.051*** | -0.038*** | -0.000 | -0.074*** | -0.009* |
| | | (0.004) | (0.006) | (0.004) | (0.005) | (0.006) | (0.005) |
| Mean dependent variable | 0.421 | 0.425 | 0.417 | 0.419 | 0.406 | 0.419 | 0.422 |
| Std. dev. dependent variable | 0.245 | 0.245 | 0.235 | 0.235 | 0.250 | 0.249 | 0.247 |
| Mean independent variable | 0.409 | 0.366 | 0.701 | 0.601 | 0.345 | 0.390 | 0.160 |
| Std. dev. independent variable | 0.307 | 0.321 | 0.458 | 0.490 | 0.295 | 0.290 | 0.248 |
| Observations | 207,165 | 304,313 | 60,637 | 63,173 | 97,051 | 146,644 | 372,497 |
| Clusters | 90 | 101 | 53 | 51 | 61 | 76 | 104 |
| R squared | 0.111 | 0.108 | 0.070 | 0.063 | 0.112 | 0.132 | 0.102 |
| Panel C: Family Savings (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.032*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.048*** | -0.051*** | -0.043*** | -0.019*** | -0.028*** | -0.003 |
| | | (0.005) | (0.006) | (0.004) | (0.006) | (0.005) | (0.004) |
| Mean dependent variable | 0.625 | 0.633 | 0.586 | 0.592 | 0.636 | 0.637 | 0.629 |
| Std. dev. dependent variable | 0.309 | 0.307 | 0.309 | 0.309 | 0.306 | 0.309 | 0.307 |
| Mean independent variable | 0.406 | 0.368 | 0.704 | 0.600 | 0.347 | 0.391 | 0.162 |
| Std. dev. independent variable | 0.308 | 0.322 | 0.456 | 0.490 | 0.296 | 0.290 | 0.249 |
| Observations | 203,716 | 303,283 | 57,957 | 61,861 | 98,178 | 143,652 | 368,758 |
| Clusters | 90 | 102 | 52 | 51 | 61 | 76 | 105 |
| R squared | 0.091 | 0.092 | 0.077 | 0.074 | 0.068 | 0.089 | 0.088 |
| Panel D: Educational Attainment (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.030*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.013** | -0.006 | -0.015*** | 0.010 | -0.069*** | -0.032*** |
| | | (0.005) | (0.009) | (0.005) | (0.007) | (0.008) | (0.007) |
| Mean dependent variable | 0.522 | 0.519 | 0.495 | 0.500 | 0.539 | 0.525 | 0.529 |
| Std. dev. dependent variable | 0.337 | 0.338 | 0.341 | 0.340 | 0.321 | 0.336 | 0.330 |
| Mean independent variable | 0.405 | 0.363 | 0.703 | 0.605 | 0.370 | 0.396 | 0.165 |
| Std. dev. independent variable | 0.309 | 0.321 | 0.457 | 0.489 | 0.298 | 0.291 | 0.248 |
| Observations | 219,524 | 226,471 | 60,784 | 63,245 | 256,055 | 146,705 | 453,395 |
| Clusters | 91 | 92 | 51 | 49 | 86 | 78 | 108 |
| R squared | 0.175 | 0.176 | 0.159 | 0.154 | 0.198 | 0.186 | 0.182 |
| Panel E: Manual vs. Cognitive Work Tasks (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.049*** | | | | | | |
| | (0.007) | | | | | | |
| Demotivating belief, $\theta$ | | 0.007 | - | - | 0.010 | -0.063*** | -0.004 |
| | | (0.009) | - | - | (0.011) | (0.010) | (0.007) |
| Mean dependent variable | 0.446 | 0.444 | - | - | 0.411 | 0.444 | 0.442 |
| Std. dev. dependent variable | 0.346 | 0.347 | - | - | 0.355 | 0.346 | 0.347 |
| Mean independent variable | 0.416 | 0.366 | - | - | 0.355 | 0.404 | 0.158 |
| Std. dev. independent variable | 0.301 | 0.313 | - | - | 0.293 | 0.290 | 0.244 |
| Observations | 116,885 | 120,257 | - | - | 42,292 | 119,046 | 121,223 |
| Clusters | 79 | 79 | - | - | 47 | 78 | 79 |
| R squared | 0.087 | 0.087 | - | - | 0.102 | 0.091 | 0.090 |
| Panel F: Supervising Someone at Work (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.046*** | | | | | | |
| | (0.007) | | | | | | |
| Demotivating belief, $\theta$ | | -0.040*** | - | - | -0.023*** | -0.101*** | -0.070*** |
| | | (0.008) | - | - | (0.005) | (0.009) | (0.008) |
| Mean dependent variable | 0.327 | 0.324 | - | - | 0.274 | 0.324 | 0.289 |
| Std. dev. dependent variable | 0.469 | 0.468 | - | - | 0.446 | 0.468 | 0.453 |
| Mean independent variable | 0.415 | 0.362 | - | - | 0.378 | 0.400 | 0.169 |
| Std. dev. independent variable | 0.302 | 0.315 | - | - | 0.298 | 0.291 | 0.248 |
| Observations | 119,888 | 123,491 | - | - | 150,469 | 122,245 | 233,670 |
| Clusters | 79 | 79 | - | - | 74 | 78 | 99 |
| R squared | 0.109 | 0.109 | - | - | 0.083 | 0.112 | 0.095 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y |
| Wave-country FE | Y | Y | Y | Y | Y | Y | Y |

*Notes*: The table reports OLS estimates of the relationship between zero-sum perceptions or demotivating beliefs and either the respondent's income decile (panel A), socioeconomic class (panel B), family savings (panel C), educational attainment (panel D), employment in cognitive vs. manual work tasks (panel E), or supervising someone at work (panel F). The estimates reported use all available data. An observation is an individual. In column 1, the independent variable, zero-sum thinking, is a scale ranging from zero to one, with one representing "People can only get rich at the expense of others" and zero representing "Wealth can grow so there's enough for everyone." The estimates from column 1 correspond to those presented in Table 6. In columns 2–6, the independent variables, demotivating beliefs, are categorical variables, where zero represents agreement (or full agreement), and one represents (full) disagreement with the statement reported in the column heading. In column 7, the demotivating belief measure uses the statement "How important is work," where zero indicates "very important," and one indicates "not at all." All specifications include country-wave fixed effects and demographic controls (age, age squared, gender, age interacted with gender, and age-squared interacted with gender). Coefficients are reported with standard errors clustered at the level of country in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E17:** Zero-Sum Perceptions or Demotivating Beliefs and Economic Welfare (Restricting to Observations with Non-Missing Zero-Sum Measure)

| | | Measure of demotivating beliefs used: | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hard work brings success, 0 = fully agree to 1 = fully disagree | People are poor because of laziness, 0 = agree or 1 = disagree | People have a chance to escape poverty, 0 = agree or 1 = disagree | Humiliating to receive money without working for it, 0 = strongly agree to 1 = strongly disagree | Important to me to be successful, 0 = very much to 1 = not at all | How important is work, 0 = very important to 1 = not at all |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Panel A: Income Decile (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.038*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.021*** | -0.047*** | -0.032*** | -0.004 | -0.052*** | -0.005 |
| | | (0.007) | (0.009) | (0.007) | (0.007) | (0.007) | (0.007) |
| Mean dependent variable | 0.410 | 0.411 | 0.382 | 0.385 | 0.410 | 0.423 | 0.413 |
| Std. dev. dependent variable | 0.258 | 0.258 | 0.281 | 0.283 | 0.253 | 0.242 | 0.257 |
| Mean independent variable | 0.403 | 0.365 | 0.703 | 0.603 | 0.351 | 0.389 | 0.163 |
| Std. dev. independent variable | 0.306 | 0.318 | 0.457 | 0.489 | 0.296 | 0.290 | 0.247 |
| Observations | 256,944 | 254,693 | 48,586 | 51,148 | 56,328 | 143,927 | 251,018 |
| Clusters | 99 | 99 | 47 | 46 | 46 | 78 | 99 |
| R squared | 0.163 | 0.162 | 0.205 | 0.205 | 0.125 | 0.128 | 0.159 |
| Panel B: Socioeconomic Class (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.045*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.033*** | -0.051*** | -0.039*** | -0.001 | -0.073*** | -0.010* |
| | | (0.005) | (0.006) | (0.004) | (0.006) | (0.006) | (0.006) |
| Mean dependent variable | 0.421 | 0.422 | 0.419 | 0.420 | 0.410 | 0.422 | 0.422 |
| Std. dev. dependent variable | 0.245 | 0.245 | 0.235 | 0.235 | 0.248 | 0.249 | 0.245 |
| Mean independent variable | 0.409 | 0.360 | 0.696 | 0.603 | 0.348 | 0.387 | 0.163 |
| Std. dev. independent variable | 0.307 | 0.317 | 0.460 | 0.489 | 0.295 | 0.289 | 0.249 |
| Observations | 207,165 | 205,451 | 54,047 | 56,905 | 56,970 | 140,762 | 204,577 |
| Clusters | 90 | 90 | 50 | 49 | 46 | 76 | 90 |
| R squared | 0.111 | 0.110 | 0.070 | 0.064 | 0.118 | 0.132 | 0.109 |
| Panel C: Family Savings (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.032*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.046*** | -0.050*** | -0.045*** | -0.026*** | -0.028*** | -0.006 |
| | | (0.006) | (0.006) | (0.005) | (0.007) | (0.005) | (0.005) |
| Mean dependent variable | 0.625 | 0.625 | 0.591 | 0.595 | 0.637 | 0.639 | 0.626 |
| Std. dev. dependent variable | 0.309 | 0.309 | 0.305 | 0.306 | 0.309 | 0.309 | 0.309 |
| Mean independent variable | 0.406 | 0.363 | 0.700 | 0.601 | 0.351 | 0.387 | 0.163 |
| Std. dev. independent variable | 0.308 | 0.319 | 0.458 | 0.490 | 0.296 | 0.289 | 0.249 |
| Observations | 203,716 | 202,014 | 51,346 | 55,587 | 57,482 | 137,808 | 198,261 |
| Clusters | 90 | 90 | 49 | 49 | 47 | 76 | 90 |
| R squared | 0.091 | 0.092 | 0.079 | 0.079 | 0.074 | 0.090 | 0.090 |
| Panel D: Educational Attainment (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.030*** | | | | | | |
| | (0.005) | | | | | | |
| Demotivating belief, $\theta$ | | -0.014*** | -0.005 | -0.014** | -0.001 | -0.067*** | -0.017* |
| | | (0.005) | (0.009) | (0.006) | (0.010) | (0.008) | (0.009) |
| Mean dependent variable | 0.522 | 0.523 | 0.502 | 0.506 | 0.493 | 0.529 | 0.524 |
| Std. dev. dependent variable | 0.337 | 0.337 | 0.335 | 0.336 | 0.341 | 0.336 | 0.336 |
| Mean independent variable | 0.405 | 0.364 | 0.698 | 0.607 | 0.358 | 0.392 | 0.160 |
| Std. dev. independent variable | 0.309 | 0.320 | 0.459 | 0.489 | 0.296 | 0.289 | 0.247 |
| Observations | 219,524 | 217,682 | 54,042 | 56,887 | 55,733 | 141,010 | 213,755 |
| Clusters | 91 | 91 | 48 | 47 | 47 | 78 | 91 |
| R squared | 0.175 | 0.174 | 0.158 | 0.154 | 0.188 | 0.184 | 0.175 |
| Panel E: Manual vs. Cognitive Work Tasks (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.049*** | | | | | | |
| | (0.007) | | | | | | |
| Demotivating belief, $\theta$ | | 0.007 | - | - | 0.011 | -0.062*** | -0.003 |
| | | (0.009) | - | - | (0.012) | (0.009) | (0.007) |
| Mean dependent variable | 0.446 | 0.447 | - | - | 0.417 | 0.447 | 0.446 |
| Std. dev. dependent variable | 0.346 | 0.346 | - | - | 0.355 | 0.346 | 0.346 |
| Mean independent variable | 0.416 | 0.367 | - | - | 0.356 | 0.400 | 0.157 |
| Std. dev. independent variable | 0.301 | 0.313 | - | - | 0.294 | 0.289 | 0.243 |
| Observations | 116,885 | 116,120 | - | - | 40,144 | 114,218 | 115,441 |
| Clusters | 79 | 79 | - | - | 47 | 78 | 79 |
| R squared | 0.087 | 0.085 | - | - | 0.095 | 0.088 | 0.085 |
| Panel F: Supervising Someone at Work (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.046*** | | | | | | |
| | (0.007) | | | | | | |
| Demotivating belief, $\theta$ | | -0.039*** | - | - | -0.029*** | -0.101*** | -0.062*** |
| | | (0.008) | - | - | (0.007) | (0.009) | (0.011) |
| Mean dependent variable | 0.327 | 0.327 | - | - | 0.333 | 0.328 | 0.326 |
| Std. dev. dependent variable | 0.469 | 0.469 | - | - | 0.471 | 0.470 | 0.469 |
| Mean independent variable | 0.415 | 0.363 | - | - | 0.354 | 0.397 | 0.158 |
| Std. dev. independent variable | 0.302 | 0.314 | - | - | 0.294 | 0.289 | 0.245 |
| Observations | 119,888 | 119,068 | - | - | 40,648 | 117,059 | 118,320 |
| Clusters | 79 | 79 | - | - | 46 | 78 | 79 |
| R squared | 0.109 | 0.109 | - | - | 0.104 | 0.111 | 0.108 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y |
| Wave-country FE | Y | Y | Y | Y | Y | Y | Y |

*Notes*: The table reports OLS estimates of the relationship between zero-sum perceptions or demotivating beliefs and either the respondent's income decile (panel A), socioeconomic class (panel B), family savings (panel C), educational attainment (panel D), employment in cognitive vs. manual work tasks (panel E), or supervising someone at work (panel F). The estimates reported only use observations that have non-missing zero-sum measure. Table E16 reports estimates using all available data. An observation is an individual. In column 1, the independent variable, zero-sum thinking, is a scale ranging from zero to one, with one representing "People can only get rich at the expense of others" and zero representing "Wealth can grow so there's enough for everyone." The estimates from column 1 correspond to those presented in Table 6. In columns 2–6, the independent variables, demotivating beliefs, are categorical variables, where zero represents agreement (or full agreement), and one represents (full) disagreement with the statement reported in the column heading. In column 7, the demotivating belief measure uses the statement "How important is work," where zero indicates "very important," and one indicates "not at all." All specifications include country-wave fixed effects and demographic controls (age, age squared, gender, age interacted with gender, and age-squared interacted with gender). Coefficients are reported with standard errors clustered at the level of country in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

**Table E18:** Zero-Sum Perceptions or Demotivating Beliefs and Happiness or Life Satisfaction (Restricting to Observations with Non-Missing Zero-Sum Measure)

| | | Measure of demotivating beliefs used: | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hard work brings success, 0 = fully agree to 1 = fully disagree | People are poor because of laziness, 0 = agree or 1 = disagree | People have a chance to escape poverty, 0 = agree or 1 = disagree | Humiliating to receive money without working for it, 0 = strongly agree to 1 = strongly disagree | Important to me to be successful, 0 = very much to 1 = not at all | How important is work, 0 = very important to 1 = not at all |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Panel A: Self-Reported Happiness (0-1) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.051*** | | | | | | |
| | (0.004) | | | | | | |
| Demotivating belief, $\theta$ | | -0.045*** | -0.046*** | -0.044*** | -0.018*** | -0.043*** | -0.045*** |
| | | (0.004) | (0.004) | (0.004) | (0.006) | (0.004) | (0.006) |
| Mean dependent variable | 0.686 | 0.686 | 0.646 | 0.649 | 0.698 | 0.708 | 0.685 |
| Std. dev. dependent variable | 0.247 | 0.247 | 0.252 | 0.252 | 0.240 | 0.244 | 0.246 |
| Mean independent variable | 0.404 | 0.367 | 0.696 | 0.601 | 0.351 | 0.391 | 0.163 |
| Std. dev. independent variable | 0.307 | 0.319 | 0.460 | 0.490 | 0.296 | 0.290 | 0.247 |
| Observations | 276,913 | 274,333 | 55,244 | 58,365 | 60,352 | 150,126 | 270,407 |
| Clusters | 99 | 99 | 50 | 49 | 47 | 78 | 99 |
| R squared | 0.149 | 0.148 | 0.184 | 0.183 | 0.103 | 0.124 | 0.147 |
| Panel B: Subjective Life Satisfaction (1-10) as Dependent Variable | | | | | | | |
| Zero-sum index, 0-1 | -0.641*** | | | | | | |
| | (0.039) | | | | | | |
| Demotivating belief, $\theta$ | | -0.474*** | -0.643*** | -0.583*** | -0.245*** | -0.510*** | -0.331*** |
| | | (0.042) | (0.060) | (0.058) | (0.057) | (0.061) | (0.054) |
| Mean dependent variable | 6.706 | 6.712 | 6.058 | 6.110 | 6.727 | 6.806 | 6.691 |
| Std. dev. dependent variable | 2.360 | 2.356 | 2.600 | 2.580 | 2.285 | 2.269 | 2.356 |
| Mean independent variable | 0.405 | 0.368 | 0.701 | 0.602 | 0.352 | 0.391 | 0.163 |
| Std. dev. independent variable | 0.307 | 0.319 | 0.458 | 0.490 | 0.296 | 0.290 | 0.247 |
| Observations | 277,456 | 274,845 | 54,318 | 58,684 | 60,271 | 150,406 | 270,864 |
| Clusters | 99 | 99 | 49 | 49 | 47 | 78 | 99 |
| R squared | 0.172 | 0.168 | 0.221 | 0.220 | 0.153 | 0.132 | 0.164 |
| Demographic Controls | Y | Y | Y | Y | Y | Y | Y |
| Wave-country FE | Y | Y | Y | Y | Y | Y | Y |

*Notes*: The table reports the relationship between zero-sum perceptions or demotivating beliefs and happiness (panel A) or life satisfaction (panel B) using OLS estimates. The estimates reported only use observations that have non-missing zero-sum measure. Table 7 reports estimates using all available data. An observation is an individual. In panel A, the dependent variable is happiness, which is measured based on a scale variable reporting respondents' answers to the question "Taking all things together, would you say you are," with zero indicating "Not at all happy" and one indicating "Very happy." In panel B, the dependent variable is life satisfaction, which is measured based on respondents' answers to the question "All things considered, how satisfied are you with your life as a whole these days?," with 1 indicating "Completely dissatisfied" and 10 indicating "Completely satisfied." The independent variables are a scale ranging from zero to one, with one representing "People can only get rich at the expense of others," and zero representing "Wealth can grow so there's enough for everyone" (column 1), and categorical variables, ranging from 0, representing agreement, to 1, indicating disagreement with the sentence – except the sentence "How important is work," where 0 means "very important" and 1 means "not at all" – (columns 2–7). All specifications include country-wave fixed effects and demographic controls (age, age squared, gender, age interacted with gender, and age-squared interacted with gender). Coefficients are reported with standard errors clustered at the level of country in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

## Supplementary Materials (Not for Online Publication)

# Appendix S. Data: Sources and Measurement

### *I. Surveys Conducted in the DRC*

The empirical analysis uses two samples from the city of Kananga in the Democratic Republic of the Congo (DRC). The first sample is from surveys undertaken in 2015 and comprises about 200 respondents. The second is from 2019 and has about 1,000 respondents. We provide details of the sampling and survey implementation here.

#### *200-Person Sample*

For the 200-person sample, the data were collected between June and September 2015. Sampling occurred in several steps. First, we conducted a screening survey in 85 neighborhoods across the city of Kananga: 60 were randomly sampled, and 25 were targeted because they contained ethnic minorities. The neighborhoods were chosen with probabilities proportional to their estimated populations.

In each neighborhood, enumerators sampled 33 households by walking along each street and counting houses according to a neighborhood-specific skip pattern. In targeted neighborhoods, enumerators similarly sampled households following a skip pattern. In total, enumerators conducted 2,496 screening surveys, of which 1,964 came from the 60 randomly chosen neighborhoods, and the remaining 532 came from the targeted neighborhoods.

From this screening survey sample, we then selected the sub-sample for this project: those who had not participated in a previous study were not planning to travel during the study period and belonged to an ethnic group with ten or more individuals in the random screening survey. We then randomly chose up to 18 individuals from each ethnicity. We prioritized sampling from the random sample, but if we did not reach 18 surveys for a particular ethnic group, we also sampled respondents from the targeted sample. The final sample comprises 223 individuals (193 from the random sample and 30 from the targeted sample).

Each respondent was invited to participate in a set of activities at their home. Home activities were conducted during two enumerator visits. During the first visit, enumerators conducted a 90-minute survey, on which our measures of zero-sum views and envy are based. In a second home visit, respondents completed a short survey module about religious beliefs, which contained our measures of the strength of beliefs in witchcraft and Christianity. Of the 223 individuals selected to participate, 222 completed the first survey, and 211 completed the second survey.

*1,000-Person Sample*

For the 1,000-person sample, the data were collected between June and September of 2019. We conducted a screening survey with 3,372 respondents in 225 neighborhoods across the city of Kananga. The neighborhoods were selected using two-stage clustered sampling, where the probability of selecting a neighborhood was proportional to its estimated population. In each randomly selected neighborhood, enumerators sampled 15 households by walking along each street and counting houses according to a neighborhood-specific skip pattern.

We then selected the sub-sample that satisfied two criteria: (1) the respondents' village of origin is in one of the five provinces of the Kasaï region (Kasaï Central, Kasaï, Kasaï Oriental, Sankuru or Lomami), and (2) their ethnicity is one of the four main ethnicities in their province of origin. The ethnicities are Luluwa, Luntu, Bindi and Kete in Kasaï-Central; Luluwa, Kete, Kuba, Lele in Kasaï; and Luba, Tetela, Songe in Kasaï-Oriental, Sankuru, and Lomami. The final sample includes 1,019 individuals. Each respondent was invited to participate in a survey at their home, which contained the same questions used to measure zero-sum views, envy, and strength of beliefs in witchcraft and Christianity.

*Both Samples*

The zero-sum, envy, witchcraft, and Christianity questions were identical in both surveys. The precise wording of the survey questions and their responses are reported below. We also offer respondents the option to respond with "Agree with neither statement" or "He/she does not know" and code these as missing in our analysis.

- Age: How old were you at your last birthday?
- Tribe: Bindi, Tshokwe, Kete, Kongo, Kuba, Lele, Luba, Luluwa, Luntu, Sala, Songe, Tetela.
- Zero-sum 1: Which Statement do you agree with? Statement 1: Gaining happiness requires taking it away from others. Statement 2: It is possible for everyone to be happy. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 2: Which Statement do you agree with? Statement 1: A person can only gain power by taking it away from others. Statement 2: A person can gain power without taking it away from others. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 3: Which Statement do you agree with? Statement 1: In trade, if one party gains the other party loses. Statement 2: In trade, it is possible for both parties to gain at the same time. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.

- Zero-sum 4: Which Statement do you agree with? Statement 1: If one person in a village gets very wealthy, other people in the village will become poorer. Statement 2: If one person in a village gets very wealthy, other people in the village will not necessarily become poorer. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 5: Which Statement do you agree with? Statement 1: In Kananga, people only make money when others lose money. Statement 2: In Kananga, no one need to lose money for others to make money. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 6: Which Statement do you agree with? Statement 1: In Kananga, businesses only make money when others lose money. Statement 2: In Kananga, no one need to lose money for businesses to make money. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Envy 1: It is so frustrating to see some people succeed so easily. 1 strongly disagree; 2 moderately disagree; 3 slightly disagree; 4 slightly agree; 5 moderately agree; 6 strongly agree.
- Envy 2: It somehow doesn't seem fair that some people seem to have all the talents. 1 strongly disagree; 2 moderately disagree; 3 slightly disagree; 4 slightly agree; 5 moderately agree; 6 strongly agree.
- Envy 3: The success of my neighbors makes me resent them. 1 strongly disagree; 2 moderately disagree; 3 slightly disagree; 4 slightly agree; 5 moderately agree; 6 strongly agree.
- Envy 4: I sometimes wish that rich and powerful people lose their advantage. 1 strongly disagree; 2 moderately disagree; 3 slightly disagree; 4 slightly agree; 5 moderately agree; 6 strongly agree.
- Witchcraft beliefs 1: Aside from the Christian God, what is the strength of your belief in the existence of other gods and spirits, including ancestor spirits? 1 With no strength at all; 2: With a little bit of strength; 3 With strength; 4 With a lot of strength; 5 With all my heart.
- Witchcraft beliefs 2: How often do you pray other gods and spirits including ancestor spirits? 1 never; 2 very rarely; 3 a few times per year; 4 a few times per month; 5 a few times per week.
- Witchcraft beliefs 3: How often do you participate in rites devoted to other gods and spirits, including ancestor spirits? 1 never; 2 very rarely; 3 a few times per year; 4 a few times per month; 5 a few times per week.
- Witchcraft beliefs 4: Using the figures provided, which set of figures best represents how close you feel to Pagans in Kananga?

- Christian beliefs 1: What is the strength of your belief in the existence of the Christian God? 1 With no strength at all; 2: With a little bit of strength; 3 With strength; 4 With a lot of strength; 5 With all my heart.
- Christian beliefs 2: How often do you pray the Christian God or Jesus? 1 never; 2 very rarely; 3 a few times per year; 4 a few times per month; 5 a few times per week.
- Christian beliefs 3: How often do you attend church? 1 never; 2 very rarely; 3 a few times per year; 4 a few times per month; 5 a few times per week.
- Christian beliefs 4: Using the figures provided, which set of figures best represents how close you feel to Christians in Kananga?

***II. Additional Survey Questions in the 200-Person DRC Sample***

The 2015, 200-person sample also included additional zero-sum questions that were used to help test and validate our baseline measure. These are reported below. We also offer respondents the option to respond with "Agree with neither statement" or "He/she does not know" and code these as missing in our analysis.

- Zero-sum 7: Which Statement do you agree with? Statement 1: Most of the wealth of the rich was created without taking it from others. Statement 2: Most of the wealth of the rich was obtained by taking it from others. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 8: Which Statement do you agree with? Statement 1: The success of the wealthy generally helps other people in the community. Statement 2: The success of the wealthy generally hurts other people in the community. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 9: Which Statement do you agree with? Statement 1: Most wealth is created without exploiting others. Statement 2: Most wealth is obtained by exploiting others. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 10: Which Statement do you agree with? Statement 1: If one farmer has a huge crop, his neighbor is likely to also have a huge crop. Statement 2: If one farmer has a huge crop, his neighbor is likely to have a small crop. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Zero-sum 11: Which Statement do you agree with? Statement 1: If God is looking out for my brother, He is less likely to be looking out for me. Statement 2: If God is looking out for my brother, He is more likely to also be looking out for me. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.

- Zero-sum 12: Which Statement do you agree with? Statement 1: If my ancestors' spirits are looking out for my brother, they are less likely to be looking out for me. Statement 2: If my ancestors' spirits are looking out for my brother, they are more likely to also be looking out for me. 1 Agree strongly with statement 1; 2 Agree with statement 1; 3 Agree with statement 2; 4 Agree strongly with statement 2.
- Respondent's employment status: 1 if What is your job, that's to say, what type of work do you do primarily? = 5 Unemployed-no work, 2 if What is your job, that's to say, what type of work do you do primarily? = 8 Farmer, 3 otherwise (formal employment)
- Mother's employment status: 1 if What is/was the main occupation of your mother? = 5 Unemployed-no work, 2 if What is/was the main occupation of your mother? = 8 Farmer, 3 otherwise (formal employment)
- Father's employment status: 1 if What is/was the main occupation of your father? = 5 Unemployed-no work, 2 if What is/was the main occupation of your father? = 8 Farmer, 3 otherwise (formal employment)
- Respondent had job in the last 5 years: Did you get a new job in the last five years? 0 No 1 Yes
- Member of nuclear family had job in last 5 years: Did one of your nuclear family members get a new job in the last five years? 0 No 1 Yes

***III. Zero-Sum Vignette Questions in the 200-Person DRC Sample***

The 2015 survey also included zero-sum vignettes. The exact wording of these is as follows. They first begin with the following preamble. We also offer respondents the option to respond with "Doesn't know" and code these as missing in our analysis.

"Now, we would like to tell you some short stories about people living in Kananga or nearby. After telling you these stories, I will ask you some questions about your opinion about the success or failure of these people. These are not mathematics questions like those you solve in school. Please just give the response that seems most likely in your opinion."

The remainder of the vignette questions vary by scenario and are reported below.

*Banana Retailers*

Think of two women, Kapinga and Tshilomba, selling bananas on the side of the road. They sell bananas for two days. On the first day, Kapinga sells 10 bananas and Tshilomba sells 20 bananas. On the second day, Kapinga sells 20 bananas.

- How many bananas do you think Tshilomba sold on the second day?

- Imagine that Tshilomba sold either 10 bananas or 40 bananas. Which outcome do you think is more likely? 1 10 bananas; 2 40 bananas.
- Do you remember how many bananas Kapinga sold on the first day? 1 gives the correct answer; 2 gives the correct answer after a while; 3 gives the wrong answer; 4 does not even try to answer

*Maize Farmers*

Think of two farmers, Lukusa and Badibanga, in a rural village far from Kananga. They grow crops each year. In one year, Lukusa harvests $50 worth of maize, and Badibanga harvests $100 worth of maize. In the following year, Lukusa harvests $100 worth of maize.

- How much money do you think Badibanga made for the maize he harvested in the second year?
- Imagine that Badibanga harvested either $50 worth of maize or $200 worth of maize. Which outcome do you think is more likely? 1 $50 worth of maize; 2 $200 worth of maize.
- Do you remember how much money Badibanga earned for the maize he harvested in the first year? 1 gives the correct answer; 2 gives the correct answer after a while; 3 gives the wrong answer; 4 does not even try to answer.

***IV. Network Data Used to Measure $\sigma$***

The following are the full original survey questions from the survey used to construct the variables which measure $\sigma$. We rely on the social network questionnaires from the Aggregated Relations Data methodology introduced by Breza et al. (2020) and ask the following questions to the respondents to ascertain the size and composition of their social network.

- I am now going to describe several situations. For each situation that I describe, I will ask you who you would go to in Kananga in this situation and who would come to you in Kananga in the same situation.

1. If your gas cylinder, kerosene or any cooking fuel gets over while cooking and you don't have it readily available at home, name the people you would go to in Kananga to borrow some and who would come to you in a similar situation.
2. If you need 1,000-5,000 FC because you're falling short for some payment, who would you borrow this money from and who would you come to you in a similar situation
3. If you need to borrow $50 to start your own business/activity, who would you borrow this money from and who would you come to you in a similar situation

4. If you had visitors and needed some coffee, milk or sugar to make coffee but the shop is closed, who would you borrow it from and who would come to you in a similar situation
5. If you need advice on financial matters, for example opening a savings account, buying gold, taking a loan, buying insurance, making investments, etc. who would you go to and who would come to you for similar advice?
6. If you needed advice on which school/college to put your children in, who would you go to and who would come to you for similar advice?
7. If you had to move to another house in Kananga, who would you ask for help to find a house and who would come to you for help to find a house?
8. If your child or another member of your family falls sick, who would you go to for advice and who would come to you for similar advice?
9. Who would send their children to your house for you to look after them and so that their do their homework, listen to the radio, watch television or play? And to whom would you send your children for the same reasons?

For each individual named for a scenario, the respondent is asked whether they are of the same tribe, if they are a member of their nuclear family, a member of their extended family, or a member of their church. The responses (i.e., a network member named for a scenario) are aggregated to obtain the following variables:

- Fraction of tribe in network: Fraction of responses (i.e., a network member named for a scenario) who are from the same tribe as the respondent.
- Fraction of church in network: Fraction of responses (i.e., a network member named for a scenario) who belong to the same church as the respondent.
- Fraction of nuclear family in network: Fraction of responses (i.e., a network member named for a scenario) who belong to the respondent's nuclear family.
- Fraction of extended family in network: Fraction of responses (i.e., a network member named for a scenario) who belong to the respondent's extended family.
- Fraction of religion in network: Fraction of responses (i.e., a network member named for a scenario) who are of the same religion as the respondent.

### *V. Rainfall Data Used to Validate DRC Zero-Sum Measure*

The following are the variables used to validate the DRC Zero-sum measure in the 200-person sample based on rainfall data from CRU TS4.07 (Climatic Research Unit (CRU) Time-Series (TS) version 4.07 of

high-resolution (0.5 by 0.5 degree) gridded data of month-by-month variation in climate) produced by CRU at the University of East Anglia available for the period January 1901–December 2022.

- Rainfall: First 20 years of life: Average annual rainfall in the respondent's village of origin in the first 20 years of their life (in mm/month).
- Rainfall: First 30 years of life: Average annual rainfall in the respondent's village of origin in the first 30 years of their life (in mm/month).

### *VI. GDP Data Used to Validate WVS Zero-Sum Measure*

The following variables are used in the analysis that validates the WVS Zero-sum measure using GDP data from the World Bank DataBank.

- GDP 20-year growth: Average annual growth in aggregate GDP (constant 2010 US$) in their country during the first 20 years of their life.
- GDP 30-year growth: Average annual growth in aggregate GDP (constant 2010 US$) in their country during the first 30 years of their life.
- GDP per capita 20-year growth: Average annual growth of per capita GDP (constant 2010 US$) in their country during the first 20 years of their life.
- GDP per capita 30-year growth: Average annual growth of per capita GDP (constant 2010 US$) in their country during the first 30 years of their life.

### *VII. Integrated Values Survey Questions*

The following are the full original survey questions for the World Values Survey and European Values Study[S1] variables used in the analysis. The respondents were also offered the option to respond with "Don't know" and we code these as missing in our analysis. The survey also records if the respondent does not answer or was not asked the question in certain cases or if the question was not applicable and these are also recorded as missing in our analysis.

- Income decile: 0 = bottom decile to 1 = top decile [X047_WVS and X047_EVS][S2] On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in.

[S1] In EVS, we replace country names Great Britain and Northern Ireland with United Kingdom. WVS does not distinguish Great Britain and Northern Ireland.

[S2] In WVS waves 1 through 4, the question text also instructed respondents to count income before taxes and other deductions. In EVS wave 1, respondents in Iceland and the US were shown eleven steps on the card instead of the usual ten. 113 respondents chose the eleventh step, which we recode as the tenth step.

- Family savings: 0=borrowed to 1=saved [X044] During the past year, did your family: 1 Save money; 2 Just get by; 3 Spent some savings; 4 Spent savings and borrowed money.
- Educational attainment: 0 = primary school or less to 1 = university or more [X025] 1 Inadequately completed elementary education; 2 Completed (compulsory) elementary education; 3 Incomplete secondary school: technical/vocational type/(Compulsory) elementary education and basic vocational qualification; 4 Complete secondary school: technical/vocational type/Secondary, intermediate vocational qualification; 5 Incomplete secondary: university-preparatory type/Secondary, intermediate general qualification; 6 Complete secondary: university-preparatory type/Full secondary, maturity level certificate; 7 Some university without degree/Higher education - lower-level tertiary certificate; 8 University with degree/Higher education - upper-level tertiary certificate.
- Cognitive vs. manual work tasks: 0=manual to 1=cognitive [X053][S3] Are the tasks you perform at work mostly manual or mostly cognitive? If you do not work currently, characterize your major work in the past. Use this scale where 1 means "mostly manual tasks" and 10 means "mostly cognitive tasks." 1 Mostly manual tasks to 10 Mostly non-manual tasks.
- Supervising someone at work: 0=no to 1=yes [X031] Do you or did you supervise other people at work? 0 No; 1 Yes.
- Class: 0 = lower class to 1 = upper class [X045] People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging one of them? 1 Upper class; 2 Upper middle class; 3 Lower middle class; 4 Working class; 5 Lower class.
- Hard work brings success: 0 = complete agreement to 1 = complete disagreement [E040] Now I'd like you to tell me your views on various issues. How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between. 1 In the long run, hard work usually brings a better life; 10 Hard work doesn't generally bring success - it's more a matter of luck and connections.
- People are poor because of laziness: 0 = agreement to 1 = disagreement [E131] Why, in your opinion, are there people in this country who live in need? Here are two opinions: Which comes closest to your view? 1 Poor because of laziness and lack of will power; 2 Poor because society treats them unfairly; 3 Other answer.

[S3] WVS wave 5 used the word "cognitive" while WVS wave 6 used the word "intellectual."

- People have a chance to escape poverty: 0 = have a chance to 1 = very little chance [E132] In your opinion, do most poor people in this country have a chance of escaping from poverty, or is there very little chance of escaping? 1 They have a chance; 2 There is very little chance; 3 Other answer.
- Humiliating to receive money without working for it: 0 = strongly agree to 1 = strongly disagree [C037] Do you agree with "Humiliating to receive money without having to work for it"? 1 Strongly agree; 2 Agree; 3 Neither agree or disagree; 4 Disagree; 5 Strongly disagree.
- Important to me to be very successful and have achievements recognized: 0 = very much to 1 = not at all [A194] Now I will briefly describe some people. Using this card, would you please indicate for each description whether that person is very much like you, like you, somewhat like you, not like you, or not at all like you? "Being very successful is important to this person; to have people recognize one's achievements." 1 Not at all like me; 2 Not like me; 3 A little like me; 4 Somewhat like me; 5 Like me; 6 Very much like me.
- How important is work: 0 = very important to 1 = not at all [A005][S4] For each of the following aspects, indicate how important it is in your life. Would you say it is very important, rather important, not very important or not important at all: Work. 1 Very important; 2 Rather important; 3 Not very important; 4 Not at all important.
- How satisfied are you with your life: 1 = completely dissatisfied to 10 = completely satisfied [A170] All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied" where would you put your satisfaction with your life as a whole? 1 Completely dissatisfied; 10 Completely satisfied.
- How happy are you: 0 = Not at all happy to 1 = very happy [A008] Taking all things together, would you say you are: 1 Very happy; 2 Quite happy; 3 Not very happy; 4 Not at all happy.

[S4]In WVS wave 2, work was put as the first of a list of five things that people could rate as important. The ordering changed for the following waves, such that work was listed towards the end.

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