Appendix - for on-line publication only

B Numerical examples

Our objective here is to generate some simple numerical examples demonstrating that the proposed functional form for inequality aversion used in generating the primary results is consistent with the behavior demonstrated by subjects in the ultimatum game, the primary experimental tool used to measure inequality aversion.

Consider a simplified framework: only two players, a total amount to be divided y, and preferences that exhibit inequality aversion. First, let the utility of each player be described as follows.

$$U_i = E_i + \alpha_i \cdot h(y, E_i) + \gamma \cdot f(y, E_i), \tag{156}$$

where $\alpha_i \in [0, 1]$,

$$h(y, E_i) = ((y - E_i) - E_i)^2, \tag{157}$$

$\gamma \in (0, 1)$, and

$$f(y, E_i) = y \cdot \log(1 + (\frac{E_i}{y} - \frac{1}{2})), \tag{158}$$

We analyze 100 versions of the standard ultimatum game, in each version varying the weight placed by players on inequality aversion, α_i. Figure E1 shows the total number of players who reject an offer at the value specified on the x-axes (the upper panel) and the distribution of offer rejection thresholds chosen by players (the lower panel). Figure E2 shows the empirical distribution of offer rejection thresholds among the experimental subjects, and can observe this is quite similar to the simulated distribution; the primary difference is the more limited mass at the top of the distribution.

Figure E1: Total number of players who reject an offer and the distribution of rejection thresholds when preferences exhibit inequality aversion and reciprocity
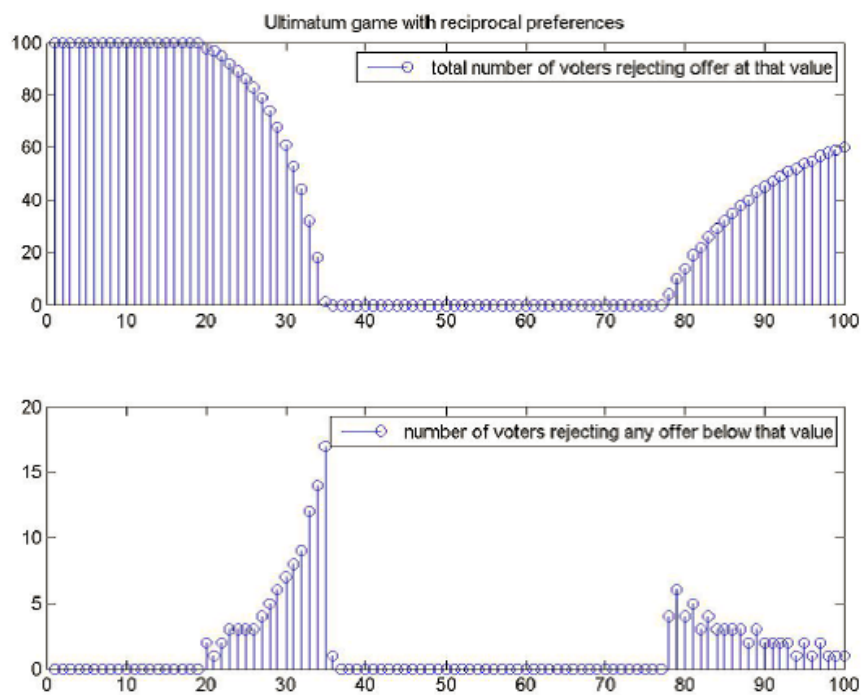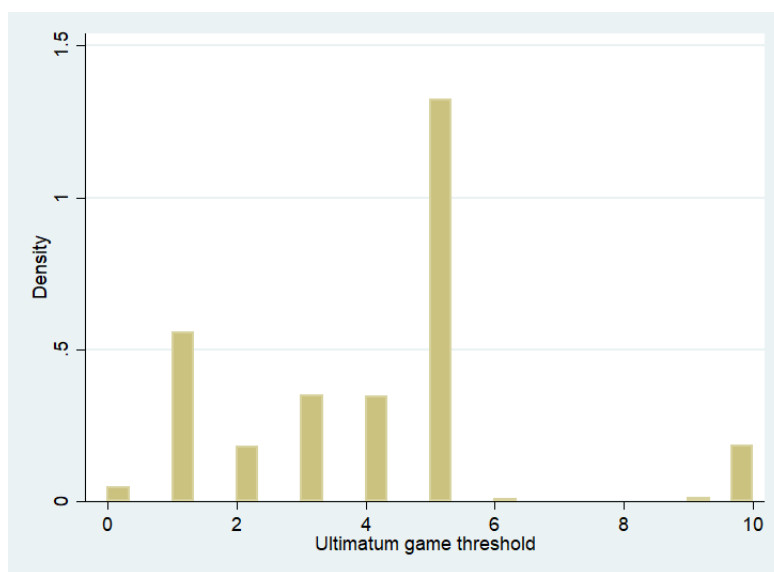

Figure E2: Empirical distribution of ultimatum game thresholds

C Structure of social preference games

In the first part of the experimental session, social games, subjects were informed they possessed a hypothetical endowment in the dictator game E_d and allowed to freely choose how much to send to another, unidentified, subject. Next, they were provided with a (different) hypothetical endowment for the trust game, E_t, and they could choose whether to send E_t or zero to another, unidentified subject; they were advised that this amount would be tripled, and the recipient would then have the opportunity to choose how much to return to the sender. Subjects were allowed to specify their behavior as both senders and receivers. They were also asked to estimate how much, on average, subjects would send in both the dictator and trust games.

Finally, they were provided with a new hypothetical endowment in the ultimatum game, E_u, and were asked to specify how much they would propose to send to a partner, and the minimum amount they would accept when sent by a partner. The ultimatum game was implemented only in 2014.

In games conducted in 2014 and 2015 in the U.S., the trust game was implemented with a larger set of choices: the subject could choose to send any integer amount of the endowment ($4) to the partner; this amount was again tripled. The subject could then specify how much of the endowment he would return if he received each hypothetical level of transfer.

D Comparing game sessions in the U.S. and Kenya

The relative ratios of key game parameters were maintained fixed across experimental sessions in the U.S. and Kenya to ensure that the choices faced by subjects were uniform. The voter endowment, y, was set to be $20 in the U.S. and 500 shillings (approximately $5.80) in Kenya. Thus all parameters in the voting game in the U.S. can be multiplied by 25 to yield the corresponding parameter (in shillings) in Kenya.

Half of the endowment was taxed away, and 30% of tax revenue was vulnerable to expropriation. Accordingly, the common treasury was equal to 15% of the total endowment of the five voters, $15 in the U.S. and 350 shillings in Kenya. The politician's salary was also $20 shillings or 500 shillings, of which half was forfeited if the politician was not reelected.

Vote payments were 10% of the voters' endowment: $2 in the U.S. and 50 shillings in Kenya. The reelection bonus was set to be between 0 and 10% of the politician's salary, again $2 in the U.S. and 50 shillings in Kenya. Subjects were not informed of the distribution of the reelection bonus, but were simply informed that it was a positive amount between 0 and the specified upper limit.[30]

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[30]In both cases, the reelection bonus was chosen from a uniform distribution between 0 and the upper limit,

In determining subject earnings in Kenya relative to the U.S., the objective was threefold: first, to comply with the Busara lab's policies on minimum subject payments, which is around \$3-\$6 for a (maximum) four-hour experimental session, depending on the distance traveled by subjects; second, to ensure that incentives in the game (particularly the vote payment) were large enough to be salient to the subjects; and third, to maximize the subject pool relative to available funds. The subject pool at Busara is predominantly drawn from nearby informal settlements, particularly the Kibera slum, where 50 shillings is the price of a bag of maize flour or one-way transportation to the city center; 50 shillings is also the lowest available denomination of paper money. Accordingly, this was viewed as an important psychological break point above which a payment would be regarded as significant, and all other game parameters were set relative to this minimum vote payment.

Recruitment in each experimental site employed the labs' centralized database. In the U.S., subjects were contacted by email with information about the study and an invitation to sign up; in Kenya, they were contacted by text message. In both cases, the experimental session was described as focusing on political behavior. Subjects could sign up on-line (in the U.S.) or by text message (in Kenya). In the event the number of subjects who showed up for a particular session was not divisible by six (the polity size), excess subjects were paid the show-up fee and invited to sign up again.

There were, however, some minor differences in the structure of the U.S. and Kenya sessions. These differences were largely dictated by the requirements of adopting a relatively complex game protocol to accommodate a population with more limited literacy and numeracy in Kenya. Differences in the game session are described in the order in which activities were conducted.

D.1 Social Games

In the U.S., the dictator endowment E_d was equal to \$10, the trust endowment E_t was equal to \$4, and the ultimatum game endowment was equal to \$10; in Kenya, the comparable magnitudes were 100 Ksh, 40 Ksh, and 120 Ksh. Thus while the relative endowments in the trust and dictator games are comparable across U.S. and Kenya, the ratio of the endowment in the social games to the voter's endowment in the subsequent voting game is lower in Kenya. This choice was made primarily to maximize the sample size given budget constraints, and is presumed to have limited relevance given that subjects have no information about the voting game at this point in the experimental session.[31]

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rounded to the nearest \$.25 in the U.S. and the nearest 10 shillings in Kenya.

[31]The endowment in the ultimatum game is also slightly higher in Kenya.

In both the U.S. and Kenya, subjects were required to choose an amount that was an integer (in the U.S.) or divisible by 10 (in Kenya), i.e. the choice was not fully continuous. Subjects in the U.S. inputted their choice directly, while Kenyan subjects selected a button from an interactive touch screen.

In the U.S., subjects were not paid on the basis of their choices in social games. In Kenya, subjects were paid on the basis of their choices in this game; they were randomly assigned to one of four or six roles (dictator sender, dictator receiver, trust sender, or trust receiver in 2013, and dictator sender, dictator receiver, trust sender, trust receiver, ultimatum sender, or ultimatum receiver in 2014) and paid their earnings from that role. They also received 50 Ksh bonuses if they correctly estimated the average amount sent in the dictator and trust games.

D.2   Introduction to the Voting Game

Subjects in the U.S. and Kenya were not provided with identical introductory materials and comprehension questions. In the U.S., subjects began with an overview of the game described on screen in the experimental terminal. They answered simple questions about the game structure, and were then asked to consider a number of game scenarios, identify whether or not the politician would be reelected in that scenario, and calculate the associated payoffs. After each set of comprehension questions, they were shown the correct responses and were required to remain on the associated screen for a minimum of sixty seconds. Subjects were also provided with a scripted oral explanation of the game and an explanatory graphic. While they were free to pose questions directly to the supervising research staff, they were not required to interact with anyone else.

In Kenya, information was provided primarily orally and graphically given the more limited literacy of the subject population. While the same comprehension questions about basic game structure were employed, subjects were not asked to calculate a full set of payoffs given specific scenarios. The focus in comprehension questions was clarifying the structure of the payoffs, the available choices faced by both voters and politicians, and the use of a majority vote in determining reelection outcomes. Subjects were also asked to calculate how much would be redistributed to voters given various expropriation choices by the politician.

All comprehension questions were posed using multiple-choice touch screens. If a subject answered a question incorrectly, a supervising staff member was required to unlock the screen in order to allow the subject to make a new selection, and would use this opportunity to discuss the question and clarify any misconceptions. Ultimately, the number of incorrect choices made by the subject prior to the correct choice was recorded. The written explanatory materials were provided in English, as this is standard practice in the laboratory, and subjects would have been exposed to English-language instruction in school. However, staff members could speak Swahili in providing explanations as necessary.

D.3   Voting Game Without Payments

The only difference between the voting game without payments as played by the subjects in the U.S. and Kenya was in the specification of the choice made by the voter and the politician. As described above, in the U.S., subjects could specify the maximum amount they would allow the politician to expropriate and still reelect him/her, naming any integer between 0 and $15, inclusive. Similarly, they could specify the amount that they would expropriate if acting as a politician.

In Kenya, subjects were asked to respond to a series of questions inquiring whether or not they would vote to reelect a politician who expropriated a specified amount, where the amounts were 0, 75, 150, 250, 300, and 375. Ksh. As politicians, they were allowed to choose how much to expropriate from the same set of choices. The reason for this alternate design, particularly for the voters' decision, was to increase comprehension by presenting the voters with a series of binary choices.

These responses are employed to construct a variable corresponding to the subject's maximum threshold for reelection that is equal to the median of the maximum threshold at which the subject stated he would reelect and the minimum threshold at which he stated he would not reelect: for example, the reelection threshold for a subject who would reelect a politician who expropriated 75 shillings, but not a politician who expropriated 150 shillings, was set at 112.5 shillings.

D.4   Introduction to Voting Games with Payments

There were no major differences in the overview material and comprehension questions provided here. The same information was delivered on-screen in the U.S. and orally and using graphics in Kenya. The structure of comprehension questions followed the model described above: in the U.S., subjects were required to review the correct answers independently, while in Kenya, subjects were required to interact with a laboratory staff member following any incorrect response.

D.5   Voting Game with Payments

Here, subjects again made their choices as voters and as politicians by specifying an integer choice in the U.S. and responding to a series of questions about thresholds in Kenya.

D.6   Questionnaire

The questionnaire was generally parallel in both countries, though slightly shorter in the Kenya sessions given the time required for experimental activities.

D.7 Subject Compensation

As an example of how subject compensation was calculated, consider a session with two game rounds: the voting game without payment, and the voting game with four payments. In each round, subjects specify their choices as both voters and politicians without any information about other subjects' choices. At the conclusion of the session, subjects receive the following information.
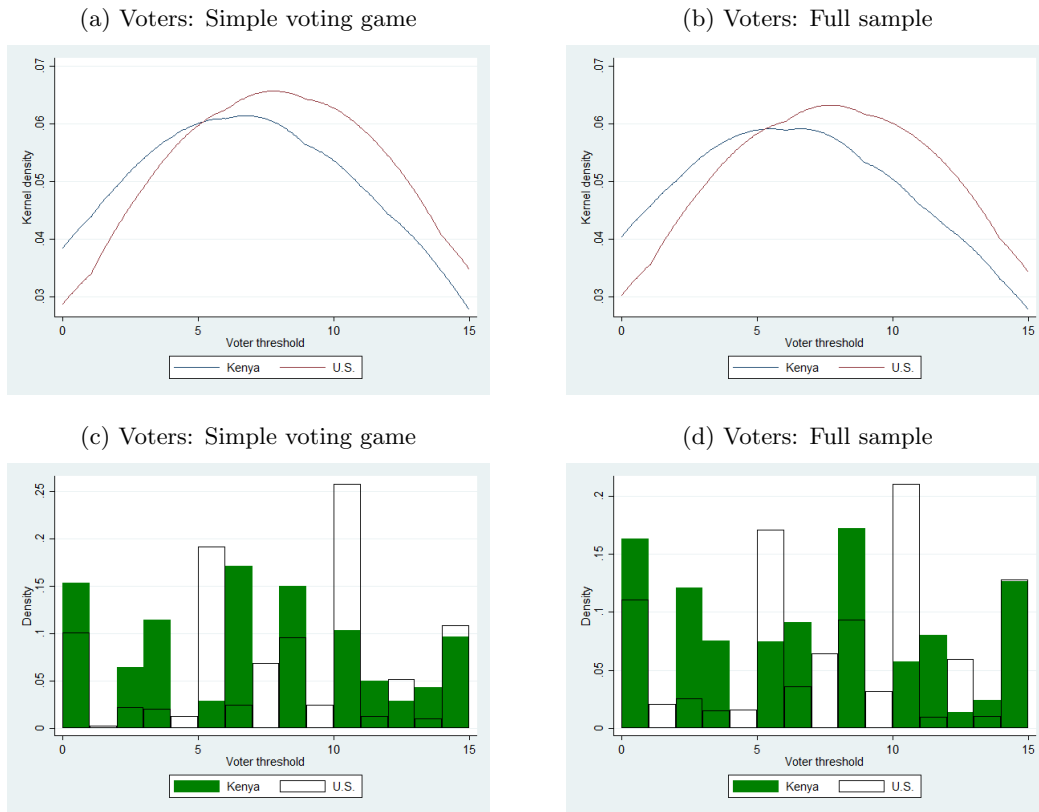
1. The game round randomly chosen as the basis of payment: either the voting game without payment, or the voting game with payment.

2. The game role to which they were randomly assigned: a politician, a voter who did receive a payment, or a voter who did not receive a payment.[32]

3. The game outcome: how much the politician expropriated, subjects' reelection thresholds, and whether the politician was reelected. (For subjects selected to receive payments, the thresholds they specified conditional on payment are used to determine whether the politician is reelected. For subjects not selected to receive payments, the thresholds they specified unconditional on payment are employed.)

4. Subjects are then informed of their individual earnings, and receive payment.

Total time required for the game session was around 75–90 minutes in the U.S., and around 180 minutes in Kenya. In the U.S., subjects were paid in cash at the conclusion of the game; payments were distributed in envelopes to maintain confidentiality and ensure that subjects could not compare their payoffs. In Kenya, subjects received at the conclusion of the session the show-up fee of 200 Ksh in cash as well as a bonus of 50 Ksh if they arrived on time or early on the day of the experimental sessions. The full payoff from their choices in the experimental session was subsequently distributed (within 1-2 days) via the electronic money transfer system Mpesa.

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[32]In experimental sessions with more than six subjects, subjects were randomly constituted into polities of six prior to randomly assigning game roles.

E   Appendix Figures and Tables

Figure E3: Subject choices in the U.S. and Kenya

(a) Voters: Simple voting game

(b) Voters: Full sample

(c) Voters: Simple voting game

(d) Voters: Full sample

Notes: These kernel densities and histograms show the subjects' choice of a maximum threshold for politician expropriation in the U.S. and Kenya. All subject choices are normalized to lie on the scale employed in the U.S. sessions, from 0 to \$15. In Figures E3a and E3c, the sample is restricted to the simple voting game with no payments. Figures E3b and E3d employ data from all game rounds observed.

Table E1: Sessions conducted

Session type	Framing	Game round I	Game round II	Game round III	Location
A1	Public payments	0 payments	1 payment	4 payments	U
A2	Public payments	0 payments	4 payments		K
B1	Public gift	0 payments	1 payment	4 payments	U
B2	Public gift	0 payments	4 payments		K
C1	Limited - prior	0 payments	4 payments	5 payments	U
C2	Limited - prior	0 payments	4 payments		K
D1	Limited - posterior	0 payments	4 payments	5 payments	U
D2	Limited - posterior	0 payments	4 payments		K
E	Big pot	0 payments	5 payments		U, K
F1	Unequal endowments	0 payments ("uneq")	5 payments		U, K
F2	Unequal endowments	0 payments	0 payments ("uneq")	5 payments	U

Notes: There were several aberrations in conducting experimental sessions. In 2013, a session of type A1 in the U.S. was conducted inadvertently omitting the game round with no payments. In 2014, a session of type C1 in the U.S. was conducted inadvertently omitting the game round with four payments. Also in 2014, four sessions including 24 subjects of type F1 in the U.S. were conducted substituting the big pot all payment game for the simple all payment game for game round II. These game rounds were dropped. In addition, politician choices in the unequal endowments sessions are not analyzed.

Table E2: Sessions conducted

Session type	Framing	Location	Sessions	Subjects	Subject-game rounds	Subject-decisions	Monotonic only
A1	Public payments	U	8	78	234	378	378
A2	Public payments	K	6	96	192	288	258
B1	Public gift	U	10	102	306	510	510
B2	Public gift	K	6	90	180	270	231
C1	Limited - prior	U	11	66	192	252	252
C2	Limited - prior	K	4	60	120	180	111
D1	Limited - posterior	U	9	60	180	240	240
D2	Limited - posterior	K	4	60	120	180	156
E	Big pot	U, K	13	96	192	192	190
F1	Unequal endowments	U, K	7	60	120	180	162
F2	Unequal endowments	U	8	48	144	192	192
Total			86	816	1980	**2862**	**2680**

Note: 30 sessions were conducted in 2013, 41 in 2014 and 15 in 2015. 366 subjects were included in experimental sessions in 2013 (180 in the U.S., and 186 in Kenya); 360 subjects were included in experimental sessions in 2014 (180 in the U.S., and 180 in Kenya); and 90 subjects were included in experimental sessions in 2015, all in the U.S.

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Table E3: Demographic characteristics of subjects

	U.S. mean	Kenya mean	U.S. obs.	Kenya obs.	p-value
Age	33.46	32.53	444	323	.349
Education	15.58	10.55	444	365	.000
Gender	.50	.62	443	365	.000
Marital status	.11	.45	444	365	.000
Voted in last presidential election	.72	.86	425	366	.000
Attempted to persuade others (in same election)	.46	.51	424	366	.202
Attended event in support of candidate (in same election)	.20	.59	426	366	.000
Joined a protest event in last year	.16	.17	426	366	.779

Notes: For each characteristic, the mean is reported by experimental site; the p-value reports a test for equality of the specified covariate comparing across the U.S. and Kenyan sample. 450 subjects are observed in the U.S.; questionnaire data was missing for six subjects, and some subjects failed to provide responses to other questions. 366 subjects are observed in Kenya, but age data for some subjects was missing from the laboratory's subject database.

Table E4: Definition of dummy variables

Session type	Framing	Game round I	Game round II	Game round III	Location
A1	Public payments	All zero	$P^1_{gs} = 1$	$P^4_{gs} = 1$	U
A2	Public payments	All zero	$P^4_{gs} = 1$		K
B1	Public gift	$Gift_{gs} = 1$	$Gift_{gs} = 1, P^1_{gs} = 1$	$Gift_{gs} = 1, P^4_{gs} = 1$	U
B2	Public gift	$Gift_{gs} = 1$	$Gift_{gs} = 1, P^4_{gs} = 1$		K
C1	Limited - prior	$Lim_{gs} = 1, Cons_{gs} = 1$	$Lim_{gs} = 1, Cons_{gs} = 1$	$All_{gs} = 1$	U
C2	Limited - prior	$Lim_{gs} = 1, Cons_{gs} = 1$	$Lim_{gs} = 1, Cons_{gs} = 1$		K
D1	Limited - posterior	$Lim_{gs} = 1$	$Lim_{gs} = 1$	$All_{gs} = 1$	U
D2	Limited - posterior	$Lim_{gs} = 1$	$Lim_{gs} = 1$		K
E	Big pot	$Big_{gs} = 1$	$Big_{gs} = 1, All_{gs} = 1$		U, K
F1	Unequal endowments	$Ineq_{gs} = 1$	$All_{gs} = 1$		U, K
F2	Unequal endowments	All zero	$Ineq_{gs} = 1$	$All_{gs} = 1$	U

	(1)	(2)	(3)	(4)	(5)	(6)
			Voter reelection threshold			
Recipient	.988 (.140)***	.990 (.137)***			.968 (.189)***	.980 (.184)***
Recipient x one payment			.278 (.205)	.278 (.205)		
Recipient x four payments			1.132 (.166)***	1.132 (.166)***		
Payment	-.831 (.196)***	-.803 (.190)***			-.858 (.290)***	-.844 (.267)***
One payment			-.681 (.314)**	-.686 (.254)***		
Four payments			-.887 (.189)***	-.871 (.188)***		
All payments			.507 (.304)*	.645 (.228)***		
Recipient x gift					.045 (.273)	.033 (.271)
Payment x gift					.093 (.387)	.125 (.344)
$\beta_1 + \beta_2$	.157 (.19)	.188 (.188)				
$\beta_1 + \beta_3$			-.403 (.272)	-.408 (.228)*		
$\beta_2 + \beta_4$			.245 (.217)	.261 (.214)		
Sample			Session types A-D			
Mean dep. var.	7.37	7.37	7.37	7.37	7.37	7.37
Fixed effects		Subject		Subject		Subject
Obs.	2298	2298	2298	2298	2298	2298

Notes: The dependent variable is the maximum threshold of expropriation at which the subject will vote to reelect the politician, and the sample includes subjects reporting non-monotonic behavior. The independent variables are a dummy variable for receiving a payment and receiving a payment in a game with one or four payments; the dummy variables for the game including payments or including one or four payments; a dummy for the game including payments for all subjects; the recipient and payment dummies interacted with a dummy for the gift framing; and the all payment dummy interacted with a big pot dummy. $\beta_1 + \beta_2$ reports the sum of the coefficients on recipient and payment. $\beta_1 + \beta_3$ and $\beta_2 + \beta_4$ report the sum of the recipient and payment dummies interacted with the one payment and four payment dummies, respectively.

Fixed effects are as specified in the table; specifications without subject fixed effects include a Kenya dummy, a dummy for ordering of the payment questions, and comprehension index fixed effects. All specifications include standard errors clustered at the experimental session level. Asterisks indicate significance at the ten, five, and one percent level.

Table E6: Voter behavior - high-comprehension sample

			Voter reelection threshold			
	(1)	(2)	(3)	(4)	(5)	(6)
Recipient	.968 (.149)***	1.010 (.145)***			.897 (.191)***	.958 (.186)***
Recipient x one payment			.200 (.239)	.200 (.239)		
Recipient x four payments			1.187 (.171)***	1.187 (.171)***		
Payment	-.706 (.200)***	-.764 (.199)***			-.576 (.264)**	-.694 (.256)***
One payment			-.398 (.286)	-.655 (.272)**		
Four payments			-.808 (.198)***	-.839 (.199)***		
All payments			.365 (.270)	.683 (.227)***		
Recipient x gift					.201 (.298)	.140 (.298)
Payment x gift					-.397 (.413)	-.199 (.402)
$\beta_1 + \beta_2$	.262 (.178)	.246 (.178)				
$\beta_1 + \beta_3$			-.198 (.261)	-.455 (.246)*		
$\beta_2 + \beta_4$			.379 (.199)*	.348 (.199)*		
Sample			Session types A-D			
Mean dep. var.	7.12	7.12	7.12	7.12	7.12	7.12
Fixed effects		Subject		Subject		Subject
Obs.	1966	1966	1966	1966	1966	1966

Notes: The dependent variable is the maximum threshold of expropriation at which the subject will vote to reelect the politician, and the sample is restricted to exclude those subjects scoring in the bottom decile of game comprehension. The independent variables are a dummy variable for receiving a payment and receiving a payment in a game with one or four payments; the dummy variables for the game including payments or including one or four payments; a dummy for the game including payments for all subjects; the recipient and payment dummies interacted with a dummy for the gift framing; and the all payment dummy interacted with a big pot dummy. $\beta_1 + \beta_2$ reports the sum of the coefficients on recipient and payment. $\beta_1 + \beta_3$ and $\beta_2 + \beta_4$ report the sum of the recipient and payment dummies interacted with the one payment and four payment dummies, respectively.

Fixed effects are as specified in the table; specifications without subject fixed effects include a Kenya dummy, a dummy for ordering of the payment questions, and comprehension index fixed effects. All specifications include standard errors clustered at the experimental session level. Asterisks indicate significance at the ten, five, and one percent level.