Online appendix

Dominik Duell: "Follow the Majority? How Voters Coordinate Electoral Support to Secure Club Goods" in *Political Science Research and Methods*

A Theoretical appendix

A.1 Proofs

I begin the analysis with the following claim, which shows that a strategy profile where any member of MI plays R cannot be an equilibrium:

Claim 1 *There exists no equilibrium in which some $i \in MI$ choose R.*

Proof Consider all strategy profiles where $i \in MI$ is pivotal: such profiles are of the kind that i either (i) is decisive in the election between P and R, (ii) is decisive in securing $\mathcal{I}$ fully from candidate P, (iii) is decisive in securing 1/2 of $\mathcal{I}$ from candidate P (shared with MJ), or (iv) is decisive in securing 1/2 of $\mathcal{I}$ from candidate R (shared with MJ). In strategy profiles (i)-(iii), i strictly prefers choosing P over R. The strategy profile representing (iv) is of the form $(P, R, R; R, \alpha_i)$. Given this profile, α_i assigning probability 1 to $a_i = R$ yields a profile that is not sustainable in equilibrium because $j \in MJ$ playing P has an incentive to deviate to R to gain the full $\mathcal{I}$ for MJ from candidate R. Thus, a member of MI choosing R cannot be an equilibrium. By the assumption that U_i^C determines vote choice when i is indifferent, i chooses P because $\omega_i < \omega_M$ for all $i \in MI$ in all strategy profiles where i is not pivotal. ■

Equipped with the equilibrium prediction about MI choosing P in Claim 1, I arrive at the main proposition.

Proof of Proposition 1

To see that $(P, P, P; P, P)$ is an equilibrium, suppose that one voter in MJ deviates and votes for the other candidate. Then, her group will need to share the group benefit with MI because the winning candidate would now be supported by two voters from each group and that will mean a drop in her expected utility, making this deviation unprofitable. Holding everybody else fixed, no member of MI has a profitable deviation given that the voting outcome is fully determined by the unanimous vote of members of MJ and those members capture the group-level benefit.

To see that $(P, P, P; P, P)$ is also the unique pure strategy equilibrium in which candidate P wins the election (P-equilibrium), note first that by Claim 1, only strategy profiles where all members of MI choose P can be an equilibrium profile. This leaves only profiles $(R, P, P; P, P)$ and $(R, R, P; P, P)$ as other candidates for a P-equilibrium. Neither profile can be an equilibrium, however, because $i \in MJ$ choosing R has an incentive to deviate to P to secure $\mathcal{I}$ from candidate P in the former strategy profile and to secure sharing $\mathcal{I}$ from candidate P with MI in the latter profile.

To see that $(R, R, R; P, P)$ is an equilibrium (R-equilibrium), suppose members of MJ vote for R and members of MI vote for P. Solving for ω_i reveals that no member of MJ is willing to deviate to P as long as $\omega_i > (V - I)/\tau = \omega^L$. By Claim 1, and because the voting outcome is fully determined by the unanimous vote of members of MJ capturing the group-level benefit I, no member of MI has a profitable deviation.

Given uniqueness when the poorest member of MJ is very poor, an equilibrium in mixed strategies exist if and only if all members of MJ are not very poor, i.e. if their incomes are higher than $\omega_L = \frac{V-I}{\tau}$. To derive the mixed strategy equilibrium, let $EU_1(P)$ and $EU_1(R)$ be the expected utility of player 1 who is a member of MJ from playing P and R, respectively. Further, let p_2 and p_3 be the probabilities that the other two members of MJ, player 2 and player 3, play P, respectively, and recall that by Claim 1, the two members of MI play P with probability 1. Therefore $EU_1(P)$ and $EU_1(R)$ are given by

$$EU_1(P) = (U_1^P + \mathcal{I})p_2p_3 + (U_1^P + \frac{\mathcal{I}}{2})[p_2(1-p_3) + (1-p_2)p_3] + U_1^P(1-p_2)(1-p_3) \quad (1)$$

$$EU_1(R) = (U_1^P + \frac{\mathcal{I}}{2})p_2p_3 + U_1^P[p_2(1-p_3) + (1-p_2)p_3] + (U_1^R + \mathcal{I})(1-p_2)(1-p_3) \quad (2)$$

In order for player 1 to randomize it has to be that she is indifferent between playing P and R, i.e. that:

$$\begin{aligned} EU_1(P) = (U_1^P + \mathcal{I})p_2p_3 + (U_1^P + \frac{\mathcal{I}}{2})[p_2(1-p_3) + (1-p_2)p_3] + U_1^P(1-p_2)(1-p_3) = \\ (U_1^P + \frac{\mathcal{I}}{2})p_2p_3 + U_1^P[p_2(1-p_3) + (1-p_2)p_3] + (U_1^R + \mathcal{I})(1-p_2)(1-p_3) = EU_i(R) \end{aligned} \quad (3)$$

Simplifying gives us the indifference condition

$$(U_1^P - U_1^R)(1-p_2)(1-p_3) + \mathcal{I}[\frac{3}{2}(p_2 + p_3) - p_2p_3 - 1] = 0 \quad (4)$$

In equilibrium, player 2 must mix with probability

$$p_2^* = \frac{(U_1^P - U_1^R)(1-p_3) - \mathcal{I}(1 - 3/2p_3)}{(U_1^P - U_1^R)(1-p_3) - \mathcal{I}(3/2 - p_3)} \quad (5)$$

and player 3 with probability

$$p_3^* = \frac{(U_1^P - U_1^R)(1-p_2) - \mathcal{I}(1 - 3/2p_2)}{(U_1^P - U_1^R)(1-p_2) - \mathcal{I}(3/2 - p_2)} \quad (6)$$

Following similar steps, we can show that in equilibrium player 1 must mix with probability

$$p_1^* = \frac{(U_2^P - U_2^R)(1-p_3) - \mathcal{I}(1 - 3/2p_3)}{(U_2^P - U_2^R)(1-p_3) - \mathcal{I}(3/2 - p_3)} \quad (7)$$

The probabilities of playing P for players $i = \{1, 2, 3\} \in MJ$, $(\alpha_1^{*MJ}(P), \alpha_2^{*MJ}(P), \alpha_3^{*MJ}(P))$, for the equilibrium strategy α_i^{*G}, then, are the solution to the system:

$$\begin{cases} p_1 = \frac{\delta U_2(1-p_3) - \mathcal{I}(1-3/2p_3)}{\delta U_2(1-p_3) - \mathcal{I}(3/2-p_3)} \\ p_2 = \frac{\delta U_1(1-p_3) - \mathcal{I}(1-3/2p_3)}{\delta U_1(1-p_3) - \mathcal{I}(3/2-p_3)} \\ p_3 = \frac{\delta U_1(1-p_2) - \mathcal{I}(1-3/2p_2)}{\delta U_1(1-p_2) - \mathcal{I}(3/2-p_2)} \end{cases}$$

with $p_i = \alpha_i^{*MJ}(P)$ and $\delta U_i = U_i^P - U_i^R$ for $i \in MJ$.

■

A.2 Extensions

Consider a model where the distribution of the individual-level attribute income is not contingent on group identity. For this game, I will restrict analysis to the pure strategy Nash equilibria. Equilibrium strategy profiles of this game are of the form $(a_1^{\mathrm{MJ}}, a_2^{\mathrm{MJ}}, a_3^{\mathrm{MJ}}, a_1^{\mathrm{MI}}, a_2^{\mathrm{MI}})$ where a_i^{MJ}, $i = \{1, 2, 3\}$, are the pure strategies chosen by the three members of MJ and a_j^{MI}, $j = \{1, 2\}$, are the pure strategies chosen by the two members of MI.

To see that the profiles $(P, P, P; P, P)$ and $(R, R, R; R, R)$ are Nash equilibria in pure strategies, suppose one voter in MJ deviates and votes for the other candidate. Then, her group will need to share the group benefit with MI because the winning candidate would now be supported by two voters from each group and that will mean a drop in her expected utility, making this deviation unprofitable. Holding everybody else fixed, no member of MI has a profitable deviation given that the voting outcome is fully determined by the unanimous vote of members of MJ and those members capture the group-level benefit. Note, for the same reason, the strategy profiles $(P, P, P; P, R)$, $(P, P, P; R, P)$, $(R, R, R; P, R)$, and $(R, R, R; R, P)$ are also Nash equilibria in pure strategies.

The following proposition characterizes another R-equilibrium and another P-equilibrium whose existence is income dependent.

Proposition 2 *An equilibrium exists where all members of MJ vote for P if they are not very rich, i.e. if their incomes are lower than $\omega^H = \frac{V+I}{\tau}$, or R if they are not very poor, i.e. if their incomes are higher than $\omega^L = \frac{V-I}{\tau}$, while all members of MI vote for R and P, respectively.*

Strategy profiles fitting the description of income-dependent equilibria are (1) $\forall\, j \in MJ$ s.th. $w_j \leq \omega_H$ and $\forall\, i \in MI$, $(P, P, P; R, R)$ and (2) $\forall\, j \in MJ$ s.th. $w_j \geq \omega_L$ and $\forall\, i \in MI$, $(R, R, R; P, P)$.

Proof To see why (1) is an equilibrium, suppose members of MJ vote for P and members of MI vote for R. Considering a deviation, a member of MJ trades off receiving a payoff of $(1-\tau)\omega_i + V + I$ from voting with her fellow group members and ω_i from voting with the other group. Solving for ω_i reveals that any member of MJ is willing to vote for P as long as $\omega_i < (V + I)/\tau = \omega^H$. Equivalently, to see why (2) is an equilibrium suppose members of MJ vote for R and members of MI vote for P. Solving for ω_i reveals that any member of MJ is willing to vote for R as long as $\omega_i > (V - I)/\tau = \omega^L$. Holding the actions of everybody else fixed, no member of MI, again, has a profitable deviation given that the voting outcome is fully determined by the unanimous vote of members of MJ and those members capture the group-level benefit. ■

There are three sets of strategy profiles not characterized so far; all of these profiles are not a Nash equilibrium in pure strategies. To see why this statement is true, first, consider profiles where both members of MI and one member of MJ vote for the same alternative. These are the profiles $(P, P, R; R, R)$, $(P, R, P; R, R)$, $(R, P, P; R, R)$, $(R, R, P; P, P)$, $(R, P, R; P, P)$, and $(P, R, R; P, P)$. Here any of the two other members of MJ who voted for the other alternative have an incentive to deviate to secure to share $\mathcal{I}$ with the members of MI; otherwise members of MI would enjoy $\mathcal{I}$ exclusively. Second, consider profiles where both members of MI and two members of MJ vote for the same alternative. These are the profiles $(P, R, R; R, R)$, $(R, R, P; R, R)$, $(R, P, R; R, R)$, $(R, P, P; P, P)$, $(P, P, R; P, P)$, and $(P, R, P; P, P)$. Here the other member of MJ who voted for the other alternative has an incentive to deviate to secure $\mathcal{I}$ for MJ exclusively instead of sharing it with the members of MI. Third, consider any profile where members of MI are evenly split over alternatives P and R and members of MJ split one-to-two. These are the profiles $(P, P, R; P, R)$, $(R, P, P; P, R)$, $(P, R, P; P, R)$, $(P, P, R; R, P)$, $(R, P, P; R, P)$, $(P, R, P; R, P)$, $(R, R, P; P, R)$, $(P, R, R; P, R)$, $(R, P, R; P, R)$, $(R, R, P; R, P)$, $(P, R, R; R, P)$, and $(R, P, R; R, P)$. For such profiles the member of MI who is not voting for the winning alternative has an incentive to deviate to secure for MI sharing $\mathcal{I}$ with MJ; otherwise members of MJ would enjoy $\mathcal{I}$ exclusively.

B Experimental design appendix

B.1 Experimental sessions

Experimental sessions were carried out in an experimental social science lab at Technical University Berlin. Participants signed up via a web-based recruitment system, ORSEE (Greiner, 2015), that draws on a large, pre-existing pool of potential subjects. Subjects were not recruited from the author's courses. The recruitment system contains a filter that blocked subjects from participating in more than one session of a given experiment. The subject pool consists almost entirely of students from around the university.

Subjects interacted anonymously via networked computers. The experiments were programmed and conducted with the software z-Tree (Fischbacher, 2007). After giving informed consent according to standard human subjects protocols, subjects received written instructions that were subsequently read aloud in order to promote understanding and induce common knowledge of the experimental protocol. In accordance with the long-standing norms of the lab in which the experiment was carried out, no deception was employed at any point in the experiment. Before the voting game stage commenced, subjects were asked three questions concerning their understanding of the payoff tables provided to them in the instructions. 90% of participating subjects answered those questions correctly. At the end of the experiment, an exit survey was conducted. Subjects received a show-up fee of $7 (5 Euro) and performance-based payments of on average $22 (16 Euro) for an experiment that lasted about 1 hour. Payments from the voting game where taken from the higher round-payoff from two randomly selected rounds.

B.2 Group identity inducement stage

To induce identities subjects were shown 5 pairings of paintings, one by Paul Klee and one by Vassily Kandinsky, and were asked to choose their preferred painting in each pair. Based on which painter's work a subject prefers most of the time, he or she was assigned to be a *Klee* or a *Kandinsky* and subjects engaged in a collaborative quiz within their painter identity group.

B.3 Treatments

For robustness checks, I implement a series of supplemental treatments: I repeat treatments that resemble no appeal, group appeal, and income appeal treatments now with a mostly poor MJ and a mostly rich overall society (Poor MJ-No appeal, Poor MJ-Group appeal, and Poor MJ-Income appeal), and the group appeal treatment again but now with all members of MI assigned a high income (Rich MI-Group appeal treatment). The Poor MJ treatments include 12 rounds of the low group heterogeneity treatment (instead of just 8) but only 24 rounds of the medium group heterogeneity treatment. The Rich MI-Group appeal treatment is played for 30 rounds only: 10 rounds with low group heterogeneity and 20 rounds with medium heterogeneity. Across the seven treatments, I collect 13500 subject-round observations on 340 subjects in 68 societies.

Table B.2: Summary of all treatment conditions and treatment statistics.

Appeal treatments		**Societies**	**Subjects**	**Subject-round observations**			
				by level of ***group heterogeneity***			
				Total	*Low*	*Medium*	*High*
				(40 rounds)	(8 rounds)	(28 rounds)	(4 rounds)
Main treatments	No appeal	14	70	2800	560	1960	280
	Group appeal	16	80	3200	640	2240	320
	Income appeal	8	40	1600	320	1120	160
				(40 rounds)	(12 rounds)	(24 rounds)	(4 rounds)
Supplemental treatments	Poor MJ-No appeal	9	45	1800	540	1080	180
	Poor MJ-Group appeal	11	55	2200	660	1320	220
	Poor MJ-Income appeal	8	40	1600	480	960	160
				(30 rounds)	(10 rounds)	(20 rounds)	–
	Rich MI-Group appeal	2	10	300	100	200	–
Total		68	340	13500	3300	8880	1320

There is balance in treatment conditions compared to the no appeals treatment of the rich MJ treatments. The distributions of a variable that records subjects' "closeness" to their identity group are indistinguishable across conditions (See Table B.3). Out of the five comparisons between treatment condition and no appeal treatment over seven balance variables (age, Germans origin, attitudes towards welfare state, attitudes towards being taxed for increasing education spending, attitudes towards being taxed for welfare spending, feeling close to identity group, and whether subject remembered group identity), two returned a difference in distribution significantly different from zero: No appeal vs Poor MJ - Income appeal treatment in age and no appeal vs Rich MI-Group appeal treatment in feeling close to identity group.

Table B.3: Treatment balance: summary statistics of exit-survey responses

	No appeal					**Group appeal**				
Variable	Obs	Mean	Std. dev	Min	Max	Obs	Mean	Std. dev	Min	Max
Age	68	24.47	5.06	18	50	79	24.25	5.47	18	49
German	63	.59	.50	0	1	76	.71	.46	0	1
Welfare	68	2.26	.89	1	5	80	2.58	1.13	1	5
Taxed for education	68	.59	.50	0	1	80	.59	.50	0	1
Taxed for welfare	68	.18	.38	0	1	80	.11	.32	0	1
Feel close to group	68	5.54	2.95	0	10	80	5.41	3.06	0	10
Klee	70	.50	.50	0	1	80	.50	.50	0	1
Remember group ID	29	1	0	1	1	0	.	.	.	.

	Income appeal					**Poor MJ – No appeal**				
Variable	Obs	Mean	Std. dev	Min	Max	Obs	Mean	Std. dev	Min	Max
Age	37	25.76	5.43	20	45	41	25.39	4.86	18	43
German	31	.65	.49	0	1	40	.68	.47	0	1
Welfare	38	2.29	.98	1	5	45	2.58	1.18	1	5
Taxed for education	40	.68	.47	0	1	45	.71	.46	0	1
Taxed for welfare	40	.18	.39	0	1	45	.13	.34	0	1
Feel close to group	40	5.95	2.84	0	10	44	4.89	3.20	0	10
Klee	40	.50	.51	0	1	45	.49	.51	0	1
Remember group ID	40	1	0	1	1	45	1	0	1	1

	Poor MJ – Group appeal					**Poor MJ – Income appeal**				
Variable	Obs	Mean	Std. dev	Min	Max	Obs	Mean	Std. dev	Min	Max
Age	52	24.75	3.85	18	39	37	26.54	5.27	18	45
German	40	.68	.47	0	1	33	.52	.51	0	1
Welfare	53	2.32	.92	1	5	39	2.54	1.00	1	5
Taxed for education	55	.60	.49	0	1	39	.59	.50	0	1
Taxed for welfare	55	.22	.42	0	1	39	.18	.39	0	1
Feel close to group	54	6.19	2.51	0	10	40	5.93	3.08	0	10
Klee	55	.51	.50	0	1	40	.50	.51	0	1
Remember group ID	39	1	0	1	1	40	1	0	1	1

	Rich MI - Group appeal				
Variable	Obs	Mean	Std. dev	Min	Max
Age	8	24.38	2.50	21	28
German	8	.63	.52	0	1
Welfare	9	2.89	1.27	1	5
Taxed for education	9	.78	.44	0	1
Taxed for welfare	9	.11	.33	0	1
Feel close to group	10	7.70	2.79	2	10
Klee	10	.50	.53	0	1
Remember group ID	10	1	0	1	1

B.4 Experimental instructions for No appeal, Group appeal, and Income appeal treatments (English translation, original in German)

Introduction

This is an experiment on decision-making. In this experiment you will make a series of choices. At the end of the experiment, you will be paid depending on the specific choices that you made and the choices made by other participants. If you follow the instructions and make appropriate decisions, you may make up to 21 Euro. For convenience, your payoff be initially calculated in tokens and converted into Euros at the end of the experiment.

This experiment has 2 parts. Your total earnings will be the sum of your payoffs in each part plus the show-up fee of 5 Euro. We will start with a brief instruction period, followed by Part 1 of the experiment. We will then pause to receive instructions for Part 2. If you have questions during the instruction period, please raise your hand after I have completed this reading of the instructions, an experimenter will come to you and answers your questions. If you have any questions after the paid session of the experiment has begun, raise your hand, and an experimenter will come and assist you.

Part 1

Assigned painter groups

In Part 1 of the experiment, everyone will be shown five pairs of paintings by two artists, Paul Klee and Wassily Kandinsky. You will be asked to choose which painting in each pair you prefer. You will then be classified as member of the "KLEEs" (or "a KLEE" as a shorthand) or member of the "KANDINSKYs" (or "a KANDINSKY" as a shorthand) based on which artist you prefer most and informed privately about your classification. Your classification as KLEE or KANDINSKY is based on your preferences but also on how close your preferences are to the preferences of other participants' that received the same classification as yourself. Everyone's identity as a KLEE or as a KANDINSKY will stay fixed for the rest of the experiment (that is, in both Part 1 and Part 2 of the experiment). We will refer to the group of participants who share your classification as either KLEE or KANDINSKY as your *painter group.*

You will then be asked to identify the painter (Klee or Kandinsky) of five other paintings. For each of those paintings, you will be asked to submit two answers: your initial guess and your final answer. After submitting your initial guess, you will have an opportunity to see the initial guesses of your fellow KLEEs if you are a KLEE, or of fellow KANDINSKYs if you are a KANDINSKY, and then also an opportunity to change your answer when you are submitting your final answer.

If you are a KLEE and a half or more of KLEEs give a correct final answer then, regardless of whether your own final answer was correct or incorrect, you and each of your fellow KLEEs will receive 10 tokens. Similarly, if you are a member of the KANDINSKYs and a half or more of KANDINSKYs give a correct final answer then, regardless of your own final answer, each of the KANDINSKYs, including you, will receive 10 tokens. However, if you are a KLEE and more than a half of KLEEs give an incorrect final answer, then, regardless of whether your own final answer was correct or incorrect, you and each of the KLEEs will receive 0 tokens. And similarly, if you are a KANDINSKY and the final answers from more than a half of KANDINSKYs were incorrect, then you and each of your fellow KANDINSKYs will receive 0 tokens regardless of what answer he or a she gave personally.

In addition, if you and your fellow *painter group* members answer at least as many quiz questions correctly than members of the other group, you will receive an additional payoff of 10 tokens. That is, if you are a KLEE and you and your fellow KLEEs give more correct answers than the KANDINSKYs, you receive the additional payoff. If you are a KANDINSKY and you and your fellow KANDINSKYs give more correct answers than the KLEEs, you receive the additional payoff.

We will now run Part 1 of the experiment. After Part 1 has finished, we will give you instructions for Part 2.

Part 2
We will now move on to Part 2 of the experiment. Part 2 will consist of **40** different rounds.

Assigned decision groups
At the beginning of each round, you are randomly matched into groups of **five** participants. We will refer to those groups as your *decision group.* You will stay in your *decision group* for the duration of the experiment; that is, you will interact with the same 4 participants in all rounds of part 2 of the experiment. All participants interaction, however, will take place anonymously through a computer terminal so you do not know which participants are in your decision group.

Assigned income
At the beginning of each round, you are randomly assigned a level of *income* in tokens. This income determines your payoff from this part of the experiment; your payoff, however, will be mainly determined by your decisions and the decisions of other participants in your decision group. The income assigned to you is one from the following list of feasible incomes:

10, 22, 27, 38, 44, 56, 62, 73, or 90

You might be assigned any of the feasible incomes and you will be assigned a new income in every round; that means, your income may or may not change from round to round and throughout the experiment, you may or may not be assigned each one of the feasible incomes at some point.

Information about your decision group
In each round, after all participants have been assigned an income, you are informed about the income and painter group membership with the KLEEs or KANDINSKYs of all participants in your decision group. Everybody, is shown a graph plotting income and associated painter group memberships on a line ranging from 0 on the left end to 100 on the right end. KLEEs are displayed with the acronym "KL" and KANDINSKYs with the acronym "KA". An exemplifying plot of an artificially created distribution of income and painter group membership is shown on page 6 (Figure 1) of these instructions.

Choices within each round
In each round, you are offered a choice between two alternatives, *Alternative A* and *Alternative B.* Whichever alternative is chosen by a majority of participants in your decision group becomes the *winning alternative* of your decisions group.

Payoffs
How much money you receive for participating in this experiment will depend on the choices that you and the choices that other participants make during the experiment. For convenience, your payoff for each round will be initially calculated in tokens and reported to you at the end of each round. At the end of the session, the sum of payoffs you will have received for each round will be converted into Euro at the rate of

100 tokens = 10 Euro

You will receive the higher round payoff out of two randomly chosen rounds plus the payoff from part 1 and the show-up fee of 5 Euro.

In each round your payoff is computed as

$$\textbf{\textit{round payoff}} = \textbf{\textit{decision payoff}} + \textbf{\textit{identity payoff}}$$

Your decision payoff depends on your income and the winning alternative in your decision group. The following table displays your decision payoff given your income and the winning alternative.

Table B.4: **Decision payoff given income and winning alternative**

	Decision payoff given	
Your income	**Alternative A wins**	**Alternative B wins**
10	30	10
22	36	22
27	38.5	27
38	44	38
44	47	44
56	53	56
62	56	62
73	61.5	73
90	70	90

For example, say your income is 27 and Alternative A is the winning alternative; in this case your decision payoff would be 38.5 tokens. In case Alternative B wins, however, your decision payoff would be 27 tokens.

Your identity payoff depends on whether you and the KLEES, if you are a KLEE, or you and the KANDINSKYs, if you are KANDINSKY, represent a majority among participants that voted for winning alternative in your decision group. You and the KLEEs represent a majority if more KLEEs than KANDINSKYs voted for the winning alternative. You and the KANDINSKYs represent a majority if more KANDINSKYs than KLEEs voted for the winning alternative.

Should you and the KLEEs, if you are a KLEE, or you and the KANDINSKYs, if you are a KANDINSKY, represent a majority among participants that voted for the winning alternative in your decision group, your identity payoff would be

10 tokens

Should you and the KLEEs, if you are KLEE, or you and the KANDINSKYs, if you are a KANDINSKY, **not** represent a majority among participants that voted for the winning alternative in your decision group, your identity payoff would be 0 tokens. Should the number of KLEEs and KANDINSKYs that voted for the winning alternative be equal, all participants in your decision group would receive 5 tokens.

Suppose for example that you are a KLEE and there are three KLEEs in your decision group including yourself; suppose further that all participants in your decision group, including yourself, vote for Alternative A. Alternative A would be the winning alternative and you and the KLEEs would represent a majority among participants in your decision group that voted for the winning alternative. Your identity payoff would be 10 *tokens.*

Your payoff in this round would be the sum of your decision payoff and your identity payoff. In the aforementioned example with your income of 27, with Alternative A as winning alternative, and with you and the KLEEs representing a majority of votes for the winning alternative, your payoff would be

$$38.5 + 10 = 48.5 \textit{ Tokens}$$

Should, however, the 2 KANDINSKYs and one KLEE in our decision group vote for Alternative B, Alternative B would be the winning alternative and you and the KLEEs would not any longer represent a majority of votes for the winning alternative in your decision group; now, your payoff would be

$$27 \textit{ Tokens}$$

Again, your total earnings from this experiment are the higher *round payoff* out of two randomly chosen rounds plus the payoff from part 1 and the show-up fee of 5 Euro.

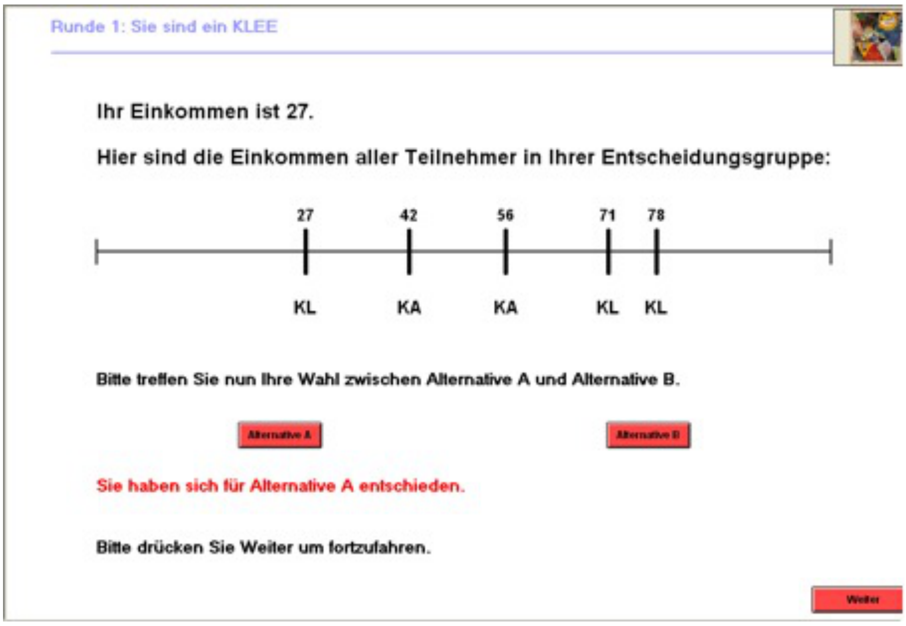
B.5 Income distributions

Table B.5: Income distributions by round

Round	*Rich MJ* treatments *MJ*				*MI*	*Group heterogeneity* treatment	*Poor MJ* treatments *MJ*				*MI*	*Group heterogeneity* treatment
1	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
2	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
3	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
4	44	62	73	27	38	Low heterogeneity	56	38	27	73	62	Low heterogeneity
5	44	62	73	27	38	Low heterogeneity	56	38	27	73	62	Low heterogeneity
6	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
7	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
8	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
9	22	62	73	27	38	Medium heterogeneity	56	38	27	73	62	Low heterogeneity
10	27	56	73	22	44	Medium heterogeneity	56	44	27	73	62	Low heterogeneity
11	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
12	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
13	44	62	73	27	38	Low heterogeneity	56	38	27	73	62	Low heterogeneity
14	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
15	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
16	22	62	73	27	38	Medium heterogeneity	56	44	27	73	62	Low heterogeneity
17	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
18	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
19	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
20	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
21	27	56	73	22	44	Medium heterogeneity	56	44	27	73	62	Low heterogeneity
22	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
23	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
24	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
25	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
26	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
27	44	62	73	27	38	Low heterogeneity	56	38	27	73	62	Low heterogeneity
28	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
29	44	62	73	27	38	Low heterogeneity	56	44	27	73	62	Low heterogeneity
30	44	62	73	27	38	Low heterogeneity	56	44	27	73	62	Low heterogeneity
31	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
32	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
33	22	62	73	27	38	Medium heterogeneity	78	38	27	73	62	Medium heterogeneity
34	27	56	73	22	44	Medium heterogeneity	73	44	27	78	56	Medium heterogeneity
35	44	62	73	27	38	Low heterogeneity	56	38	27	73	62	Low heterogeneity
36	44	62	73	27	38	Low heterogeneity	56	38	27	73	62	Low heterogeneity
37	10	56	90	22	44	High heterogeneity	90	44	10	78	56	High heterogeneity
38	10	56	90	22	44	High heterogeneity	90	44	10	78	56	High heterogeneity
39	10	56	90	22	44	High heterogeneity	90	44	10	78	56	High heterogeneity
40	10	56	90	22	44	High heterogeneity	90	44	10	78	56	High heterogeneity

B.6 Screen shot

Figure B.5: Screen shot of subjects' decision between Alternative A and Alternative B (German original). English Translation: Round 1: You are a Klee / Your income is 27./ Here are the incomes of all participants of your society: / Please make your choice between alternative A and alternative B now. / You chose alternative A. / Please press continue to proceed.



C Statistical appendix

C.1 Summary statistics

Table C.6: Relative frequency of strategy profiles by group heterogeneity and appeal treatments

		Group heterogeneity treatments		
Variable	**Appeal treatments**	Low	Medium	High
P wins, all vote P (P-equilibrium)	No appeal	0.01	0.21	0.16
	Group appeal	0.03	0.19	0.25
	Income appeal	0.03	0.15	0.31
P wins, MJ or MI split	No appeal	0.28	0.53	0.68
	Group appeal	0.24	0.51	0.61
	Income appeal	0.47	0.46	0.69
R wins, MJ or MI split	No appeal	0.29	0.16	0.14
	Group appeal	0.21	0.11	0.02
	Income appeal	0.12	0.19	0.00
R wins, MJ votes for R and MI votes for P	No appeal	0.42	0.10	0.02
	Group appeal	0.52	0.19	0.12
	Income appeal	0.38	0.20	0.00

Table C.7: Summary statistics of main variables by income and appeal treatments. Statistics are pooled across all levels of group heterogeneity, subjects, and rounds within one treatment.

		Main treatments			**Supplemental treatments**			
	Variable	**No appeal** Mean (SD)	**Group appeal** Mean (SD)	**Income appeal** Mean (SD)	**Poor MJ-No Appeal** Mean (SD)	**Poor MJ-Group Appeal**	**Poor MJ-Income Appeal** Mean (SD)	**Rich MI-Group appeal** Mean (SD)
vote R	All	.38 (.49)	.38 (.49)	.39 (.49)	.71 (.45)	.61 (.49)	.68 (.47)	.92 (.27)
	Very poor	.23 (.42)	.24 (.43)	.24 (.43)	.47 (.50)	.44 (.50)	.48 (.50)	.75 (.44)
	Moderately poor	.30 (.46)	.20 (.40)	.24 (.43)	.56 (.50)	.47 (.50)	.48 (.50)	.90 (.31)
	Moderately rich	.54 (.50)	.58 (.49)	.61 (.49)	.80 (.40)	.66 (.47)	.77 .(42)	.93 (.26)
	Very rich	.59 (.49)	.65 (.48)	.63 (.48)	.86 (.34)	.76 (.43)	.84 (.38)	.98 (.16)
R wins election	All	.34 (.48)	.37 (.48)	.38 (.48)	.83 (.38)	.58 (.49)	.74 (.44)	1.0 (0.0)
income	All	45 (20)	45 (20)	45 (20)	55 (19)	54 (19)	54 (20)	60 (17)
Number of Observations		2800	3200	1600	1800	2200	1600	300
Number of Subjects		70	80	40	45	55	40	10

C.2 Additional statistical analysis

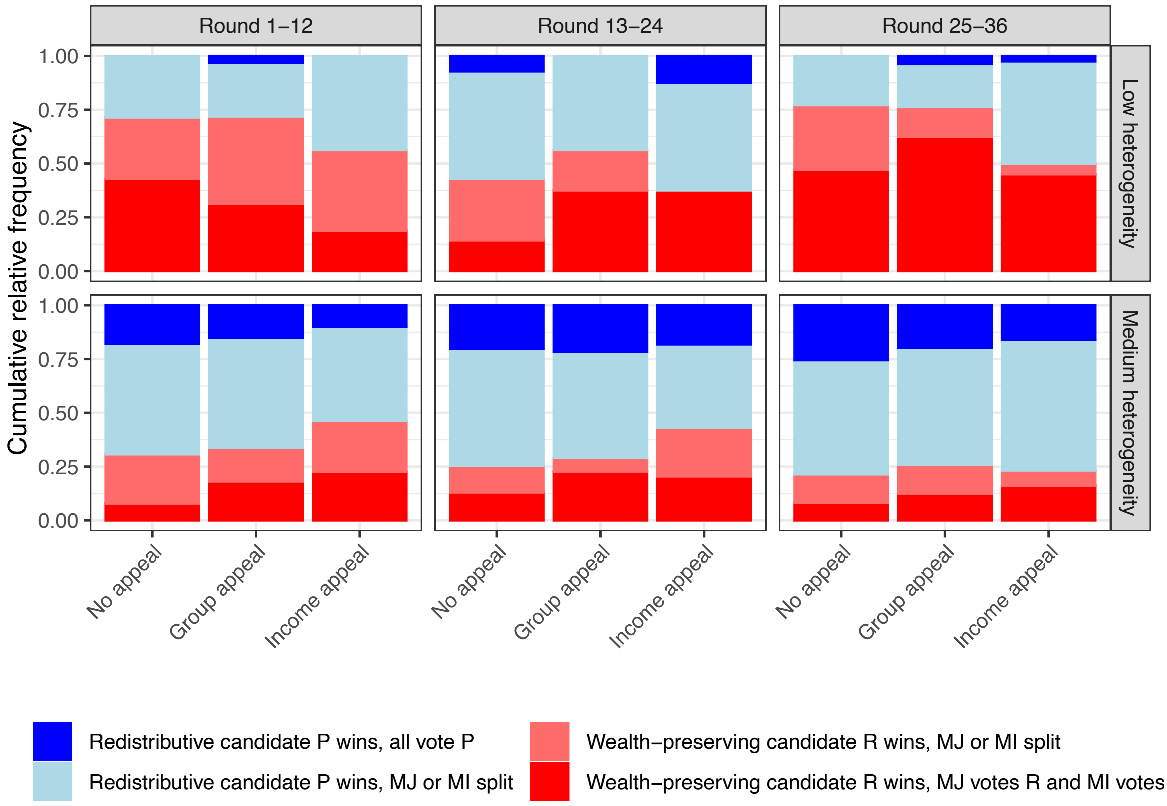
Whenever I present tests over statistics computed at the society-level (i.e., relative frequency of strategy profiles) and claim significance in the main text, a (1) Wilcoxon sign rank-tests lead to rejection of the null hypothesis at $\alpha = .05$ (if not other p-value is provided); and (2) the 95% confidence bounds of a society-level clustered bootstrap of the difference in relative frequency do not contain zero. The regression below confirms those results in a regression framework.

Table C.8: Multi-level random effects regression of indicator for strategy profile $(R, R, R; P, P)$ being played and of indicator for strategy profile $(P, P, P; P, P)$, P-equilibrium, being played on group heterogeneity treatment, appeal treatment, interaction of those treatments, and round of play including random intercepts for societies.

	$(R, R, R; P, P)$	$(P, P, P; P, P)$
Medium heterogeneity	-0.311^{***}	0.210^{***}
	(0.016)	(0.015)
High heterogeneity	-0.433^{***}	0.112^{***}
	(0.025)	(0.024)
Group appeal	0.096	0.022
	(0.076)	(0.068)
Income appeal	-0.045	0.022
	(0.091)	(0.083)
Medium heterogeneity × Group appeal	-0.010	-0.041^{**}
	(0.022)	(0.020)
High heterogeneity × Group appeal	0.011	0.067^{**}
	(0.033)	(0.031)
Medium heterogeneity × Income appeal	0.146^{***}	-0.082^{***}
	(0.026)	(0.025)
High heterogeneity × Income appeal	0.027	0.129^{***}
	(0.040)	(0.038)
Round	0.002^{***}	0.002^{***}
	(0.0004)	(0.0004)
Constant	0.377^{***}	-0.046
	(0.056)	(0.051)
Observations	7,600	7,600
Log Likelihood	−2,449.496	−2,033.280
Akaike Inf. Crit.	4,922.991	4,090.559
Bayesian Inf. Crit.	5,006.222	4,173.790
Var: Society (Intercept)	0.04	0.03
Var: Residual	0.11	0.10

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Figure C.6: Distribution of relative frequency of strategy profiles by group heterogeneity and appeal treatments in first third (round 1-12), second third (round 13-24), and final third (round 25-36) of the experiment. Observations on the high group heterogeneity treatment (round 37-40) are omitted.



To assess the experimental results presented, I investigate the possibility of learning effects and whether the finding of equilibrium coordination is robust to an alternative other-regarding preferences mechanism.

Subjects interact with others in fixed societies over several rounds. Any behavior observed and any treatment effect identified may result from or vary with learning. Averaging appeal treatments in elections where group heterogeneity of MJ is low shows that the relative frequency of the $(R, R, R; P, P)$ strategy profile increases significantly in the final third of the experiment over the first and second thirds. While that relative frequency is .33 in round 1-12 and .29 in round 13-24, it rises significantly to .53 in round 25-36.[21] The equilibrium coordination mechanism, given the time trend in voters' choices, surely indicates such learning effects as well. Realizing that such learning effects only arise for societies for which I can reasonably claim they follow equilibrium coordination but not for those who may follow group-majoritarian coordination, makes the observation of learning effects part of the evidence for equilibrium coordination being an instance of sophisticated decision-making and not an issue of a lack of robustness.

The effect of group appeals that trigger equilibrium coordination on the redistribution candidate P may be confounded by yet another mechanism: heightened other-regarding preferences in

[21]See Figure C.6 in the online Appendix for the distribution of strategy profiles played in the first, second, and final third of the experiment.

the form of increased inequity aversion (Fehr and Schmidt, 1999). If this effect of group appeal exists, it could arise from experimenter demand effects (i.e., social desirability). Convergence on P of MI and those MJ groups that follow equilibrium coordination could be a sign of a stronger preference for redistribution emerging with the group appeal (including concern for the identity group's poorest members). To show that there is no such effect, I reverse the income distribution creating a mostly poor MJ and a rich MI. Now, the target of equilibrium coordination in MJ is shifted to the wealth-preserving candidate R, and we should see effects of the group appeal accordingly. Conversely, if preferences for redistribution are behind the effects of group appeals on coordination, the group appeal should still lead to an increase in vote share of P. Overall, when reversing the income distribution, the vote share of candidate R increases significantly. While it was .38 in no appeal and group appeal treatments with a mostly rich MJ, it is now .71 in the Poor MJ-No appeal treatment and .61 in the Poor MJ-Group appeal treatment.

D Empirical anecdotes appendix

The 1997 mayoral election in Los Angeles, in which Republican businessman Richard Riordan was pitted against State Senator Democrat Tom Hayden, is a telling empirical anecdote illustrating equilibrium coordination. In their campaigns, both appealed heavily to Latino voters for their support by offering group-targeted benefits. Riordan pushed for massive transfers to Los Angeles's schools (Kaufmann, 2003, 162), which are dominated by Latino students, and Hayden took a strong stance against anti-illegal immigration initiatives (Newton, 1997). Despite the fact that only 43% of Latino voters supported Riordan in the previous mayoral race, on the election day in 1997, according to Los Angeles Times exit polls, he scored 60% of the Latino vote (Kaufmann, 2003, 164) in a city where Democrats outnumber Republicans two-to-one. His success with Latino voters was largely attributed to his ability to convince them that he would continue to strengthen the public education system (Kaufmann, 2003, 162) even though he may promote economic policies that would be to the detriment of many members of that sub-population, who are "more likely to be working class" (Sonenshein, 2004, 95). While many features of this particular race may determine why so many Latinos voted for Riordan, observers were surprised by how individual voters traded off individual-level benefits implied by the candidates' position on redistribution against group-targeted benefits implied by their position on education. One may have expected Latinos to coordinate on voting for the candidate offering group-targeted benefits but whose redistributive policies are also most beneficial for the majority of group members. Such group-majoritarian coordination did not occur.

For another more recent example of the existence of the described rationale, consider the run-up to the 2012 presidential election where President Obama's campaign grew concerned about the potential for a "huge white turnout" (Warren, 2012) and Republicans complained about the supposedly automatic support of minorities for the incumbent President.[22] In a race-salient election, everyone was aware of the fact that the opposing candidate may do a better job than usual in mobilizing in-group voters. This concern generates an even greater willingness to turn out for the co-racial candidate and is a perfectly reasonable strategic response to the salience of race, going well beyond electoral support driven by emotional attachment or shared interests. A speculative observation suggests that the Obama campaign may have been reluctant to openly appeal to minority voters as it could serve to raise awareness among the racial majority of the potential for a large minority turnout. One could argue that the fear of group-majoritarian coordination, a division of the electorate along race lines, led the Obama campaign to try to not further appeal to voters based on their race group.

References

Fehr, Ernst and Klaus Schmidt. 1999. "A Theory of Fairness, Competition, and Cooperation." *Quarterly Journal of Economics* 114(3):817–68.

Fischbacher, Urs. 2007. "z-Tree: Zurich Toolbox for Ready-made Economic Experiments." *Experimental Economic* 10(2):171–178.

Greiner, Ben. 2015. "Subject pool recruitment procedures: organizing experiments with ORSEE." *Journal of the Economic Science Association* pp. 1–12.

Kaufmann, KM. 2003. The mayoral politics of New York and Los Angeles. In *New York and Los Angeles: Politics, Society, and Culture–A Comparative View.* pp. 314–340.

[22] As a racial minority, Obama certainly engenders emotional attachment among African Americans and potentially other minorities, and his platform speaks more to the concerns of minorities than to the white majority of Americans.

Newton, Jim. 1997. "Mayor's Race Focuses Intently on Latino Vote.".
URL: *http://articles.latimes.com/1997-03-05/news/mn-35033_1_latino-voters*

Sonenshein, Raphael J. 2004. *The city at stake: Secession, reform, and the battle for Los Angeles.* Princeton University Press.

Warren, James. 2012. "Team Obama's Election Day Anxiety: Fear of a Big White Vote.".
URL: *http://www.thedailybeast.com/articles/2012/11/06/team-obama-s-election-day-anxiety-fear-of-a-big-white-vote.html*