Supplementary Materials

Betting on the Underdog:

The Influence of Social Networks on Vote Choice

Additional Information on Experimental Design

We conducted the experimental sessions in the computer lab of WULABS of the Vienna University of Economics and Business, Austria on May 29, 2018. The experimental module was programmed using the oTree library, a web-based platform using the Python Django framework (Chen et al., 2016).

In total, we ran four sessions of 24 players per session. Participants were recruited from the lab's student pool and consisted mainly of first-year business school students. We used the laboratory's standard recruitment procedures, inviting 32 individuals per session by email. The participants who showed up were greeted by a research assistant and randomly assigned a card corresponding to a computer upon arrival, in order to avoid selection biases such as early or late show ups. As the experiment was designed for 24 participants, invited individuals who were not selected to participate were awarded a show-up fee of 5 Euros. The selected participants gave their consent by signing an electronic form that stated the purpose and main procedures of the game. Each session took approximately 45 minutes to complete.

Each experimental session began with an introduction to the electoral scenario. We informed participants that two parties are facing each other (called A and B during the experiment), and that the election results would be determined by the choices made by sub-groups of six participants. The payoff structure was explained with a concrete example. Note that in the manuscript and below, we relabel the parties S and U for simplicity, to emphasize which one represents the 'safe option' and which one is the underdog.

Consistent with the structure introduced in Table 1 of the main text, the lowest payoff occurs when a participant votes for the Underdog and the party receives fewer than five votes, in which case they receive only the payoff associated with x_i, a random number between 1 and 9. Voting for the safe option, Party S, yields a minimum reward of 10. Finally, the highest reward is achieved when the Underdog reaches the threshold (5 out of 6 votes or more), in which case the participant receives $c + x_i$, the constant plus the random number they have been assigned (for a total payoff between 11 and 19).

Half of the 24 participants in each session were randomly assigned to one of two treatment conditions (among the three types, i.e., control, random, or homophilic network). Within each treatment condition, the twelve participants were randomly assigned to sub-groups (or electorates) of six voters for each round of the experiment. Thus, each election comprised a new electorate of six voters.The participants were informed about this procedure on the computer screens before each election. After each round, or election, we informed players about the result of the election and the payoff they received. The payoffs collected through the 20 rounds were converted to monetary rewards at the end of the experiment (100 points in the game correspond to 5 Euros). Participants were rewarded 9 Euros on average.

Upon completion of the twenty rounds, we asked participants to fill a short survey and informed them of their total gains. The questions measured basic socio-demographic variables. The survey also included an item evaluating their predisposition toward risk, using a question proposed by Dohmen et al. (2010). This survey question reads "How willing are you to take risks in general?" and asks respondents to report their willingness on a 0-10 scale.

Table A1 provides descriptive statistics for the survey variables. We also conducted balance checks to verify that randomization into treatment conditions produced covariate balance. We report the results in Table A2. The models in Table A2 are logistic regressions with the treatment assignment as a dependent variable. Except for one covariate (gender in the random network treatment group), the covariates appear unrelated to the treatments. We replicated the main models presented in the paper with demographic covariates as controls, and the results are substantively the same. Finally, we report screenshots of the experimental module in Figures A1-A5 below.

Table A1: Descriptive Statistics

Variable	Category/Statistic	Value
Experimental Group	Control	24
	Random network	24
	Homophilic network	48
Age	18-24 years old	73
	25-34 years old	22
	35-44 years old	1
Gender	Female	63
	Male	33
Education	High school degree	50
	Some higher education	13
	Bachelor degree	26
	Above bachelor	7
Tolerance to Risk	Mean	5.375
	Std. Deviation	1.98
Total Sample		96

The table presents descriptive statistics for the sample of experimental participants, across all sessions.

Table A2: Balance Checks

	Treatment Group	
	Homophilic Network	Random Network
Aged 25 and above	−1.237	0.469
	(0.643)	(0.764)
Bachelor degree	0.477	−0.227
	(0.990)	(1.063)
High school degree	−0.220	1.019
	(1.036)	(1.126)
Some higher education	−0.053	−0.175
	(1.152)	(1.355)
Gender = Male	−0.448	1.647**
	(0.468)	(0.560)
Tolerance to risk	−0.006	−0.181
	(0.110)	(0.130)
Constant	0.467	−1.460
	(1.251)	(1.377)
Observations	96	96
Log Likelihood	−62.882	−47.352
Akaike Inf. Crit.	139.764	108.703

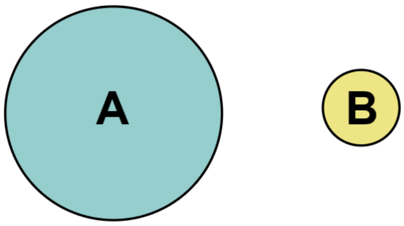
The table reports binary logistic regressions with the treatment group assignment as a dependent variable. Standard errors are in parentheses. *p<0.05; **p<0.01; ***p<0.001

Figure A1: Instructions (Screen 1)

Instructions

The Parties

Imagine that you are voting in an election with two political parties: A and B. Party A has a strong support in the population and is already expected to win seats in a fictional legislature. Party B can still win seats, but only if it receives at least 5 votes from 6 people currently playing in this experiment, including yourself.



The Points

In each election, you start with 10 points. If you vote for Party A, you receive these 10 points with certainty.

You can accumulate more points if B receives at least 5 votes among the 6 players.

Your Personal Bonus

In each election, all players will be given a personal number of bonus points between 1 and 9, chosen at random. You will not know the bonus points allocated to all the other players.

If party B gets 5 votes or more, you gain the initial 10 points **plus** your personal bonus. However, if you choose B and that party does not get at least 5 votes, you only get the bonus and **lose** the initial 10 points. (See the example below.)

Your Task

Your task is to end up with as many points as possible across 20 elections. These points will be converted in real money after the experiment, using the conversion 100 game points = 5.0 EUR.

Example

Suppose that your personal bonus is: 2

The following table shows you the points you would win based on your decision and the outcome of the election:

Choice	Payoff
You vote for A and B receives 4 votes or less	10
You vote for B and B receives 4 votes or less	2
You vote for A or B and B receives 5 votes or more	12

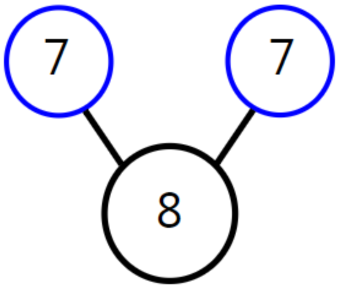
Next

Figure A2: Homophily Treatment (Screen 2)

Election # 1

You are playing with five other participants in this room. Your voting group is modified randomly at each election.

To help you make a decision, the personal bonuses of two other players in your election are shown in the blue circles.



Your personal bonus

Vote Decision

Who do you vote for?

Vote for A   Vote for B

(Note: Clicking one of the two buttons will register your choice. You will not be able to return.)

Points you could win in this round:

Choice	Payoff
You vote for A and B receives 4 votes or less	10
You vote for B and B receives 4 votes or less	8
You vote for A or B and B receives 5 votes or more	18

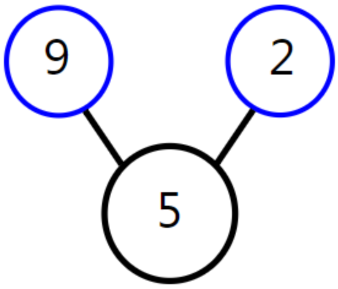
Click here to display the instructions for the game.

Figure A3: Random Treatment (Screen 2)

Election # 1

You are playing with five other participants in this room. Your voting group is modified randomly at each election.

To help you make a decision, the personal bonuses of two other players in your election are shown in the blue circles.



Your personal bonus

Vote Decision

Who do you vote for?

Vote for A   Vote for B

(Note: Clicking one of the two buttons will register your choice. You will not be able to return.)

Points you could win in this round:

Choice	Payoff
You vote for A and B receives 4 votes or less	10
You vote for B and B receives 4 votes or less	5
You vote for A or B and B receives 5 votes or more	15

Click here to display the instructions for the game.

Figure A4: Control Treatment (Screen 2)

Election # 1

You are playing with five other participants in this room. Your voting group is modified randomly at each election.

1

Your personal bonus

Vote Decision

Who do you vote for?

Vote for A   Vote for B

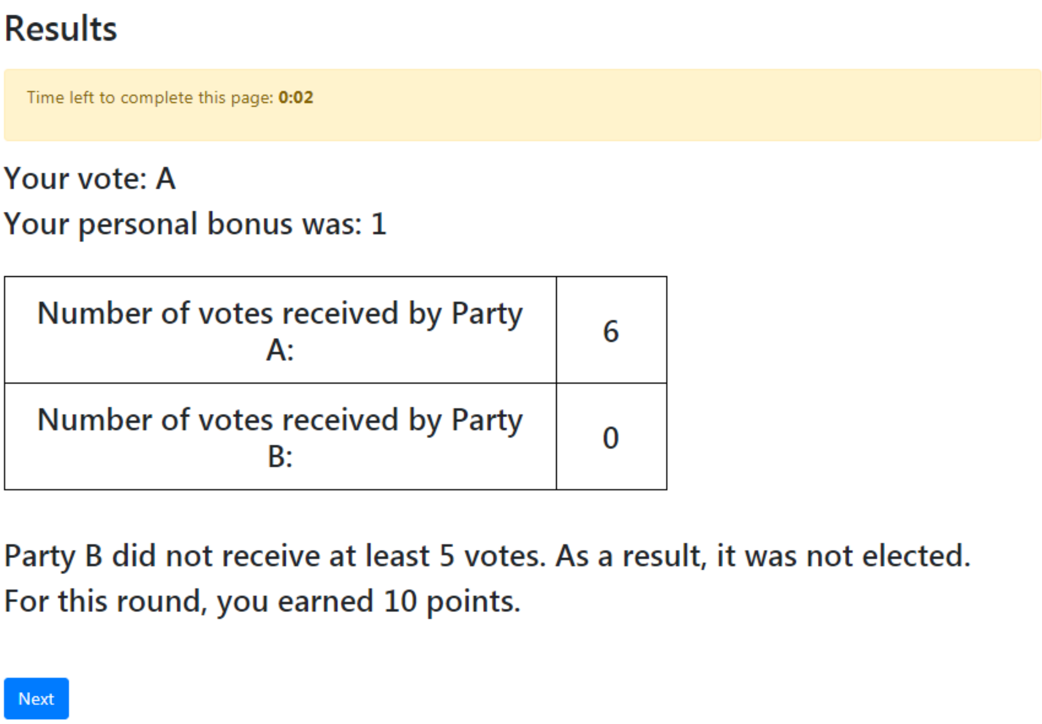
(Note: Clicking one of the two buttons will register your choice. You will not be able to return.)

Points you could win in this round:

Choice	Payoff
You vote for A and B receives 4 votes or less	10
You vote for B and B receives 4 votes or less	1
You vote for A or B and B receives 5 votes or more	11

Click here to display the instructions for the game.

Figure A5: Results Example (Screen 3)



Additional Results

This section provides additional results in support of the empirical findings presented in the main text. The two subgroups in the homophilic treatment are defined in terms of the private payoffs (the x_i variable), to reproduce the shared affinities of voters in reinforcing networks. A rigorous test of our hypotheses would consist of estimating treatment effects for a constant x_i, as we did in the multivariate models presented in the main text. Put another way, the conditional average treatment effect corresponds to

$$\mathbb{E}[y_i(1) - y_i(0)|x_i]$$

where $y_i(1)$ is the binary vote choice in the treatment group and $y_i(0)$ in the control group. This quantity isolates the effect of network information from the effect of the voter's strength of preference for the underdog. Table A3 below reports cross-tabulations based on subsamples of participants: we compute the proportion of underdog votes only for participants with $x_i > 5$ for the High Signal treatment, and only for participants with $x_i < 5$ in the Low Signal treatment.

Table A3: Cross-tabulation of the vote for the underdog, for restricted subsamples

	Vote Choice	
	Safe Option (S)	Underdog (U)
Subsample: $x_i < 5$		
Control	94.47%	5.53%
Homophilic Treatment (Low Signal)	94.92%	5.08%
Observations	593	
Subsample: $x_i > 5$		
Control	63.60%	36.40%
Homophilic Treatment (High Signal)	49.31%	50.69%
Observations	591	

Once the individual payoffs are taken into account, the difference in proportions is statistically significant only for the subgroup receiving high signals from the homophilic network. In other words, voters are equally likely to choose the safe option when their own sincere preference for the underdog is weak, whether or not they observe reinforcing preferences in their network ($p \approx 0.85$; bootstrapped cluster-robust p-value). As mentioned in the main text, this finding is consistent with the observed tendency of players to choose the safe option in previous stag hunt game experiments (Skyrms, 2013). On the other hand, when the network brings together voters with a strong preference for the underdog, network signals have a significant impact on the decision to coordinate on the underdog. In that case, the (conditional) average treatment effect is roughly 14.3 percentage points ($p \approx 0.01$). The fact that homophilic networks induce stronger coordination effects in the latter group explains why, when considering the homophilic treatment group as a whole (i.e., both those receiving high and low signals), the support for the underdog is higher overall than in the other two comparison groups (Table 2 of the main text).

The logistic regressions in Table 3 of the main text report a similar finding, while also controlling for risk tolerance and the round of the experiment. Holding constant the private signal x_i to 5 and the round to 5, the difference in the predicted probability of voting for the underdog, contrasting the homophily (high signal) with the control group, is 14.1 percentage points (see Table A4). The difference varies from 5.4 to 18.2 percentage points when changing the value of the private signal of the participant from 2.5 to 7.5, respectively.

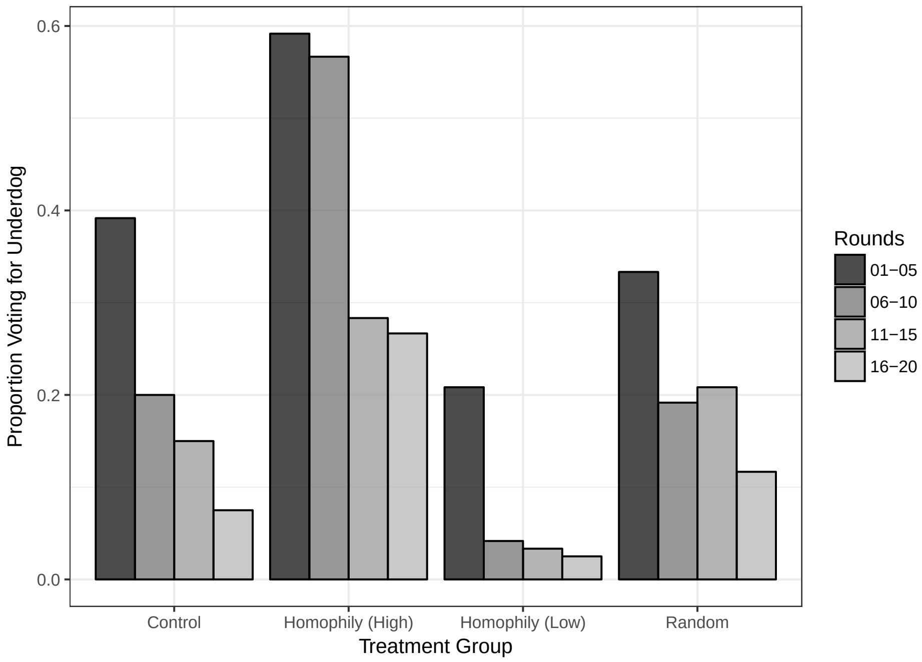
Table A4: Difference in Predicted Probabilities (Table 3, Model 3)

x_i	Homophily (High)	Control	Difference
5.0	0.331	0.190	+0.141
2.5	0.109	0.055	+0.054
7.5	0.668	0.486	+0.182

The table reports predicted probabilities of voting for the Underdog under two treatment conditions, as well as the difference in predicted probabilities between groups, computed from Model 3, Table 3 in the main text. The probabilities are calculated after setting the level of risk tolerance to the middle of the scale (the value of 5), the round number to 5, and by varying the value of the private signal x_i and the treatment condition.

Note that our design ensures that the distribution of preferences is the same across all treatment groups. Even when participants received a signal that two peers also have a high payoff for selecting the underdog, the ex-ante distribution of payoffs remained exactly the same as that

Figure A6: Vote for underdog by experimental group and round



used in the other treatment groups. In short, the homophilic treatment should have little impact on purely rational grounds, as it changes nothing about the baseline calculations. Moreover, we randomized individual payoffs at every single election, such that participants observed first hand that the assignment of a high or low payoff was equally likely. Nonetheless, we still observe a clear difference in behavior between treatment conditions across rounds. Figure A6 plots the distribution of support for the underdog over time. Although learning effects are noticeable, the tendency to use homophilic network signals for equilibrium selection appears to last for the duration of each session.

References

Chen, Daniel L., Martin Schonger, and Chris Wickens (2016). otree—an open-source platform for laboratory, online, and field experiments. *Journal of Behavioral and Experimental Finance 9*, 88–97.

Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde (2010). Are risk aversion and impatience related to cognitive ability? *American Economic Review 100*(3), 1238–60.

Skyrms, Brian (2013). *The Stag Hunt and the Evolution of Social Structure*. Cambridge: Cambridge University Press.