

Online Appendix

Public Opinion Polls, Voter Turnout, and Welfare: An Experimental Study

Jens Großer & Arthur Schram (*American Journal of Political Science*, July 2010)

Online - appendix A – Experimental instructions

(This appendix presents the read-aloud instructions for treatment UF. Variations for the other treatments are presented in square brackets [*UM, IF, IM*]. These instructions have been translated from Dutch.)

Welcome to our experiment on decision-making. Depending on your *own choices* and the *choices of other participants*, you may earn money today. Your earnings in the experiment are expressed in *tokens*. 4 tokens are worth one Guilder. At the end of the experiment your total earnings in tokens will be exchanged into Guilders and paid to you in cash. The payment will remain *anonymous*. No other participant will be informed about your payment.

Please remain quiet and do not communicate with other participants during the entire experiment. Raise your hand if you have any questions. One of us will come to you to answer them.

Rounds, ‘your group’ and the ‘other group’:

The experiment consists of 100 rounds. At the beginning of the experiment the computer program will randomly split all participants into two different populations of 12 participants. In addition, at the beginning of each round the computer program will randomly divide the participants in each population into two groups. The group you are part of will be referred to as your group and the group in your population which you are not part of will be called the other group. You will not know which of the participants belongs to the other group and which to your group. You will have nothing to do with participants in the other population in this experiment.

Number of participants in ‘your group’ and the ‘other group’

At the beginning of *each round* the computer program will randomly determine the *number of participants* in your group and the number of participants in the other group. **At no point in time will you or anybody else receive information about the number of participants in your group and the number of participants in the other group.** [*In IF and IM instead: You and all other participants in both groups will then receive information about the number of participants in your group and the number of participants in the other group.*]

However, you and all other participants know that [*in IF and IM: There is the following structure of group sizes*]:

(1) Independent of the round, the sum of participants in *both* groups (your group and the other group) is always **12**.

(2) Both groups contain a *minimum* of **3** participants and a *maximum* of **9** participants.

Because the sum of participants in both groups is always twelve, there are the following **7** possible *combinations of group sizes*:

(3-9) (4-8) (5-7) (6-6) (7-5) (8-4) (9-3),

whereby the first number represents the group size of the first group and the second number the group size of the second group.

The arrangement of a population (12 participants) into two groups by the computer program proceeds in the following two steps:

(1) Both groups are randomly filled with **3** participants, the minimal number of participants per group (in total **6** participants). Each participant has the *same* chance of being selected.

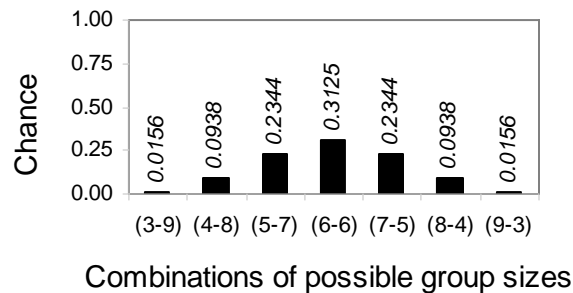
(2) Each of the remaining **6** participants is randomly put into one of the two groups, with a chance of 50% for each group.

[*For UM and IM instead:*

- (1) At the beginning of the first round both groups are randomly filled with **3** participants, the minimal number of participants per group (in total **6** participants). Each participant has the *same* chance of being selected. The chosen participants will be called 'FIX' - participants, because they will not change groups during the whole experiment.
- (2) At the beginning of each round each of the remaining **6** participants is randomly put into one of the two groups, with a chance of 50% for each group. These participants will be called 'VAR'-(=variable) participants, because they will randomly change groups during the whole experiment.

At the beginning of the first round you will receive information about your own type FIX or VAR. Your own type will not change during the whole experiment.]

The following figure shows for all seven possible combinations of group sizes the chance that a particular combination occurs.



Note again that group sizes will be randomly determined at the beginning of *each* round. Hence, the group sizes may change from one round to another.

Choices and earnings

In each round you and all other participants will face an identical choice problem. You will be asked to make one choice. You can choose between the following two alternatives:

- 'Choice A': no costs involved (**0 tokens**).
- 'Choice B': costs are **1 token**.

When making your choice, nobody else in your group or in the other group will know this choice. After *all* participants have made their choices, the computer program will count the number of *B*-choices in your group and in the other group and will compare the numbers in both groups. There are **3** possible outcomes that are relevant for your *revenue* in the following way. You will receive the revenue irrespective of the choice you made.

- (1) The number of *B*-choices in your group **exceeds** the number of *B*-choices in the other group. In this case *each* participant in your group (including yourself) will get revenue of **4 tokens**. *Each* participant in the other group will get **1 token**.
- (2) The number of *B*-choices in your group **is smaller than** the number of *B*-choices in the other group. In this case *each* participant in your group (including yourself) will get revenue of **1 token**. *Each* participant in the other group will get **4 tokens**.
- (3) The number of *B*-choices in your group **is equal to** the number of *B*-choices in the other group. In this case the computer program will randomly determine the group in which *each* participant gets revenue of **4 tokens** (each group has the same chance of 50% of being chosen). *Each* participant in the group that is not chosen will get **1 token**.

Your round earnings are calculated in the following way: $round\ earnings = round\ revenue - round\ costs$. Your total earnings are the sum of all of your round earnings.

The following table gives your possible round earnings:

Your possible round earnings:

| <i>Your choice</i> | <i>Your group has more B-choices</i> | <i>Your group has less B-choices</i> | <u>Equal number of B-choices in both groups</u> |
|--------------------|--|--|---|
| Choice A | 4 tokens | 1 token | 4 or 1 token (50% chance each) |
| Choice B | 3 tokens | 0 token | 3 or 0 token (50% chance each) |

Computer screen

The computer screen has four main windows.

- (1) The Status window shows [for *UM and IM*: your type (*FIX* or *VAR*),] the actual round number and the total earnings up to the previous round.
- (2) The Previous round window depicts the following information about the previous round:
 - (a) The number of *B-choices in your group* [in *IF and IM*: and, in brackets, the size of your group];
 - (b) The number of *B-choices in the other group* [in *IF and IM*: and, in brackets, the size of the other group];
 - (c) Your *choice*;
 - (d) Your *revenue*;
 - (e) Your *costs*;
 - (f) Your *round earnings*. Note that no information about the group sizes will be given [*this sentence not for IF and IM*].
- (3) In the Choice window you will find two *buttons*. Press the button “Choice A” or the button “Choice B” with the mouse, or press the key “A” or “B”. When you have chosen you will have to wait until all participants have made their choices.
- (4) The Result window shows the result of the *current* round, hence after each participant has made a choice. Each *yellow* rectangle shown represents one *B-choice* of your group and each *blue* rectangle represents one *B-choice* of the other group. After a few seconds the result will also appear in numbers.

At the top of the screen you will find a Menu bar. You can use this to access the Calculator and History functions. The calculator can be handled with the numerical pad on the right side of your keyboard or with the mouse buttons. The function ‘history’ shows all information of the last *sixteen* rounds as this had appeared in the window ‘Previous round’. At the bottom of your screen the Information bar is located. There you are told the current status of the experiment.

Further procedures Before the 100 rounds of the experiment start, we will ask you to participate in three training-rounds. You will have to answer questions in order to proceed further in these training-rounds. In the training-rounds you are not matched to other participants but to the computer program. **You cannot draw conclusions about choices of other participants based on the results in the training-rounds.** The training-rounds will not count for your payment. We will now start with the three trainings-rounds. If you have any questions, please raise your hand. One of us will come to you to answer them.

Online appendix B – Equilibrium predictions

Table B: Overview of equilibrium predictions, observed Turnout rates for rounds 21 to 100, and maximum likelihood estimates of the noise parameters

| Treatment | Levels of support | Observed turnout rates | Predictions | | | Estimated μ | # observations | Log-likelihood | | |
|-----------|-------------------|------------------------|-----------------|-------------|-------------|-----------------|----------------|-----------------|----------|-------------|
| | | | (Bayesian) Nash | QRE | | | | (Bayesian) Nash | QRE | Random play |
| | | | $\mu = 0$ | $\mu = 0.4$ | $\mu = 0.8$ | | | | | |
| UF | - | .297 | .098 | .302 | .381 | .39 | 5616 | -4286.62 | -3418.01 | -3892.71 |
| UM | - | <i>Allied</i> : .426 | .934 | .306 | .382 | .05 or 1.38 | 2880 | -4576.80 | -1964.64 | -1996.26 |
| | | <i>Floating</i> : .293 | .123 | .299 | .380 | .38 | 2880 | -2033.92 | -1741.13 | -1996.26 |
| | <i>All</i> | .359 | .529** | .303** | .381** | .65 | 5760 | -4094.34 | -3761.61 | -3992.53 |
| IF | 3 | .296 | .256 | .306 | .341 | .08 | 54 | -33.04 | -32.82 | -37.43 |
| | 4 | .301 | .173 | .320 | .369 | .29 | 336 | -221.73 | -205.42 | -232.90 |
| | 5 | .329 | .132 | .331 | .395 | .39 | 1050 | -798.61 | -664.82 | -727.80 |
| | 6 | .481 | .107* | .329 | .404 | 4.28 | 2016 | -2285.99 | -1395.95 | -1397.38 |
| | 7 | .437 | .091 | .306 | .384 | 1.58 | 1470 | -1619.11 | -1007.13 | -1018.93 |
| | 8 | .281 | .080 | .271 | .349 | .44 | 672 | -517.75 | -399.26 | -465.79 |
| | 9 | .241 | .074 | .234 | .313 | .43 | 162 | -111.11 | -89.41 | -112.29 |
| | <i>All</i> | .400 | .109** | .313** | .385** | .95 | 5760 | -5501.26 | -3875.74 | -3992.53 |
| IM | 3 | .296 | .256 | .306 | .341 | .08 | 54 | -33.04 | -32.82 | -37.43 |
| | 4 | .286 | .173 | .320 | .369 | .22 | 336 | -213.92 | -201.02 | -232.90 |
| | 5 | .393 | .132 | .331 | .395 | .79 | 1050 | -926.74 | -703.73 | -727.80 |
| | 6 | .585 | .107* | .329 | .404 | ∞ | 2016 | -2731.49 | -1397.38 | -1397.38 |
| | 7 | .448 | .091 | .306 | .384 | 1.96 | 1470 | -1658.27 | -1011.05 | -1018.93 |
| | 8 | .341 | .080 | .271 | .349 | .74 | 672 | -615.48 | -431.12 | -465.79 |
| | 9 | .302 | .074 | .234 | .313 | .73 | 162 | -136.43 | -99.30 | -112.29 |
| | <i>All</i> | .459 | .109** | .313** | .385** | 2.55 | 5760 | -6215.60 | -3972.84 | -3992.53 |

* Or, .893; **weighted overall participation probability.

Online - appendix C – Random effects probit estimations of voter turnout (pairwise treatment comparisons)

IF-IM comparison

| Constant and independent variables | Coefficients | | Comparison with experimental results |
|------------------------------------|--------------|------------|---|
| | IF-IM | | |
| Constant | 0.15 | (0.15) | |
| $t / 100$ | -0.13 | (3.11)*** | |
| <i>Mixed</i> | 0.31 | (1.88)* | The presence of allied voters in the <i>Mixed</i> sessions (IM) slightly increases turnout in informed electorates (p. 24). |
| AL_i | -0.12 | (0.61) | |
| $D_{i,t-1}$ | 0.00 | (0.04) | |
| $D_{i,t-1} \times Mixed$ | -0.05 | (0.61) | The lagged dependent variable has no influence in informed electorates. (p. 23) |
| $D_{i,t-1} \times AL_i$ | 0.05 | (0.50) | |
| $\Delta LS_{i,t}^<$ | -0.20 | (13.81)*** | In informed electorates, there are positive effects of the level of disagreement (p. 21). This is even stronger in the mixed treatment but less so for allied voters in a majority (table 2). Effects are stronger in minorities than in majorities (p. 21). |
| $\Delta LS_{i,t}^>$ | -0.13 | (11.41)*** | |
| $\Delta LS_{i,t}^< \times Mixed$ | -0.06 | (1.80)* | |
| $\Delta LS_{i,t}^> \times Mixed$ | -0.07 | (3.42)*** | |
| $\Delta LS_{i,t}^< \times AL_i$ | 0.02 | (0.71) | |
| $\Delta LS_{i,t}^> \times AL_i$ | 0.06 | (2.51)** | |
| $PIV_{i,t-1}^0$ | 0.01 | (0.28) | In informed electorates, the only effects of having previously been pivotal are for floating voters in <i>Mixed</i> and allied voters who voted in the previous round and were pivotal ex post (p. 22 and table 2). |
| $PIV_{i,t-1}^1$ | -0.00 | (0.06) | |
| $PIV_{i,t-1}^0 \times Mixed$ | 0.16 | (1.85)* | |
| $PIV_{i,t-1}^1 \times Mixed$ | 0.19 | (2.10)** | |
| $PIV_{i,t-1}^0 \times AL_i$ | -0.20 | (2.10)** | |
| $PIV_{i,t-1}^1 \times AL_i$ | -0.04 | (0.37) | |

Notes. Shaded cells depict interaction effects. The comparison with experimental results refers to page numbers in the manuscript. The structure of the regression equation is the same as in table 2. *Mixed* is a dummy variable equal to 1 for observations in IM, and 0 otherwise. Other variables are defined for table 2. Note that results for floating voters in IF are obtained by setting $Mixed = AL_i = 0$. Results for floating voters in IM are obtained for $Mixed = 1; AL_i = 0$ and for allied voters in IM for $Mixed = 1; AL_i = 1$.

UF-UM comparison

| Constant and independent variables | Coefficients | | Comparison with experimental results |
|------------------------------------|------------------------|--|---|
| | UF-UM | | |
| Constant | -0.83 (6.85)*** | | |
| $t / 100$ | -0.29 (6.47)*** | | |
| <i>Mixed</i> | -0.12 (0.56) | | The presence of allied voters increases turnout in uninformed electorates (table 2). This is entirely due to allied voters. |
| AL_i | 0.52 (2.19)** | | |
| $D_{i,t-1}$ | 0.47 (9.00)*** | | The lagged dependent variable has a positive effect on turnout. This effect is stronger for floating voters in the presence of allied voters (table 2). |
| $D_{i,t-1} \times Mixed$ | 0.35 (3.80)*** | | |
| $D_{i,t-1} \times AL_i$ | -0.42 (3.96)*** | | |
| $\Delta LS_{i,t}^<$ | 0.01 (0.34) | | As expected for uninformed electorates, there is no effect whatsoever of the level of disagreement (p. 21). |
| $\Delta LS_{i,t}^>$ | 0.00 (0.06) | | |
| $\Delta LS_{i,t}^< \times Mixed$ | -0.03 (0.82) | | |
| $\Delta LS_{i,t}^> \times Mixed$ | -0.01 (0.33) | | |
| $\Delta LS_{i,t}^< \times AL_i$ | 0.04 (1.06) | | |
| $\Delta LS_{i,t}^> \times AL_i$ | 0.01 (0.56) | | |
| $PIV_{i,t-1}^0$ | 0.28 (5.87)*** | | |
| $PIV_{i,t-1}^1$ | 0.20 (3.36)*** | | |
| $PIV_{i,t-1}^0 \times Mixed$ | -0.15 (1.82)* | | Having previously been pivotal positively affects turnout (p. 21). |
| $PIV_{i,t-1}^1 \times Mixed$ | -0.03 (0.30) | | |
| $PIV_{i,t-1}^0 \times AL_i$ | -0.01 (0.06) | | |
| $PIV_{i,t-1}^1 \times AL_i$ | 0.19 (1.66)* | | |

Notes. Shaded cells depict interaction effects. The comparison with experimental results refers to page numbers in the manuscript. The structure of the regression equation is the same as in table 2. *Mixed* is a dummy variable equal to 1 for observations in UM, and 0 otherwise. Other variables are defined for table 2. Note that results for floating voters in UF are obtained by setting $Mixed = AL_i = 0$. Results for floating voters in UM are obtained for $Mixed = 1; AL_i = 0$ and for allied voters in UM for $Mixed = 1; AL_i = 1$.

UF-IF comparison

| Constant and independent variables | Coefficients | Comparison with experimental results |
|---|------------------------|--|
| | UF-IF | |
| Constant | -0.82 (7.57)*** | |
| $t / 100$ | -0.30 (6.89)*** | |
| <i>Information</i> | 0.92 (6.19)*** | Polls increase turnout (p. 18) |
| $D_{i,t-1}$ | 0.47 (9.12)*** | Information cancels out the influence of the lagged dependent variable (p. 22). |
| $D_{i,t-1} \times \text{Information}$ | -0.48 (6.19)*** | |
| $\Delta LS_{i,t}^<$ | 0.01 (0.34) | |
| $\Delta LS_{i,t}^>$ | 0.00 (0.06) | The levels of disagreement only affect turnout if the electorate is informed, in which case effects are stronger in minorities than in majorities (p. 21). |
| $\Delta LS_{i,t}^< \times \text{Information}$ | -0.21 (9.94)*** | |
| $\Delta LS_{i,t}^> \times \text{Information}$ | -0.13 (7.94)*** | |
| $PIV_{i,t-1}^0$ | 0.28 (5.86)*** | |
| $PIV_{i,t-1}^1$ | 0.20 (3.35)*** | In uninformed electorates, there is a positive effect of having previously been pivotal (p. 21). |
| $PIV_{i,t-1}^0 \times \text{Information}$ | -0.26 (3.88)*** | |
| $PIV_{i,t-1}^1 \times \text{Information}$ | -0.19 (2.47)** | |

Notes. Shaded cells depict interaction effects. The comparison with experimental results refers to page numbers in the manuscript. The structure of the regression equation is the same as in table 2. *Information* is a dummy variable equal to 1 for observations with polls (IF) and 0, otherwise. Other variables are defined for table 2.

UM-IM comparison

| Constant and independent variables | Coefficients | | Comparison with experimental results |
|---|------------------------|--|---|
| | UM-IM | | |
| Constant | -1.03 (6.52)*** | | |
| $t / 100$ | -0.11 (2.50)** | | |
| <i>Information</i> | 1.35 (6.20)*** | | Polls increase turnout (p. 18) |
| AL_i | 0.51 (2.34)** | | Allied voters vote more than floating voters only in uninformed electorates (p. 27). |
| <i>Information</i> \times AL_i | -0.64 (2.07)** | | |
| $D_{i,t-1}$ | 0.82 (10.73)*** | | Polls cancel out the positive influence of the lagged dependent variable for both allied and floating voters. |
| $D_{i,t-1} \times \text{Information}$ | -0.88 (8.76)*** | | For allied voters, the positive influence is about half the size of floating voters in uninformed electorates (p. 22-23 and table 2). |
| $D_{i,t-1} \times AL_i$ | -0.42 (3.95)*** | | |
| $D_{i,t-1} \times \text{Information} \times AL_i$ | -0.47 (3.35)*** | | |
| $\Delta LS_{i,t}^<$ | -0.02 (0.64) | | The levels of disagreement only affect turnout if the electorate is informed, in which case effects are slightly stronger in minorities than in majorities (p. 21). |
| $\Delta LS_{i,t}^>$ | 0.01 (0.55) | | |
| $\Delta LS_{i,t}^< \times \text{Information}$ | -0.24 (6.03)*** | | |
| $\Delta LS_{i,t}^> \times \text{Information}$ | -0.21 (9.12)*** | | |
| $\Delta LS_{i,t}^< \times AL_i$ | 0.04 (1.01) | | |
| $\Delta LS_{i,t}^> \times AL_i$ | 0.01 (0.55) | | Being an allied voter has no effects on responding to information in polls (p. 27). |
| $\Delta LS_{i,t}^< \times \text{Information} \times AL_i$ | -0.01 (0.25) | | |
| $\Delta LS_{i,t}^> \times \text{Information} \times AL_i$ | 0.04 (1.31) | | |
| $PIV_{i,t-1}^0$ | 0.12 (1.82)* | | |
| $PIV_{i,t-1}^1$ | 0.16 (1.90)* | | |
| $PIV_{i,t-1}^0 \times \text{Information}$ | 0.05 (0.49) | | In <i>Mixed</i> sessions, having previously been pivotal has positive effects. For floating voters this holds even when polls are released; for allied voters a positive effect remains of having been pivotal and having voted previously (p. 22). |
| $PIV_{i,t-1}^1 \times \text{Information}$ | 0.03 (0.23) | | |
| $PIV_{i,t-1}^0 \times AL_i$ | -0.01 (0.07) | | |
| $PIV_{i,t-1}^1 \times AL_i$ | 0.20 (1.74)* | | |
| $PIV_{i,t-1}^0 \times \text{Information} \times AL_i$ | -0.20 (1.43) | | |
| $PIV_{i,t-1}^1 \times \text{Information} \times AL_i$ | -0.23 (1.54) | | |

Notes. Shaded cells depict interaction effects. The comparison with experimental results refers to page numbers in the manuscript. The structure of the regression equation is the same as in table 2. *Information* is a dummy variable equal to 1 for observations with polls (IF), and 0 otherwise. Other variables are defined for table 2. Note that results for floating voters in UM are obtained for $\text{Information} = AL_i = 0$. Results for floating voters in IM are obtained for $\text{Information} = 1; AL_i = 0$ and for allied voters in IM for $\text{Information} = 1; AL_i = 1$.