# **Appendix A**

# Chapter 3 Appendix

### **A1 Sample Demographics**

The table shows summary statistics of participant demographics. The demographics were self-reported on their computers immediately after participants completed all elections in their session.

Characteristic	$N = 250^{1}$
Gender	
Female	175 (70%)
Male	72 (29%)
Other or prefer not to say	3 (1.2%)
Party ID (Leaners grouped with party)	
Democratic	143 (57%)
Republican	65 (26%)
Pure independent	28 (11%)
Other or prefer not to say	14 (5.6%)
Race/Ethnicity	
White, non-Hispanic	129 (52%)
African American, non-Hispanic	38 (15%)
Non-white, Hispanic	33 (13%)
Other or prefer not to say	26 (10%)
White, Hispanic	24 (9.6%)

 $^{1}n(\%)$ 

### A2 Comprehension Quiz

After the training screens, subjects took a comprehension quiz with eight true-or-false questions:

- If my position is 2, Candidate A's position is 4 and Candidate B's position is 8, I will receive more money if Candidate A wins than if Candidate B wins. [True]
- 2. I am paid more money if the candidate closest to me wins, regardless of which candidate I voted for. [True]

- 3. I earn more money if I accurately estimate the position of a candidate, regardless of which candidate wins. [False]
- 4. I earn more money if the other participants I have communicated with vote for the candidate who is closest to them, regardless of which candidate wins. [False]
- 5. The private information provided to me about the position of a candidate may not perfectly reflect the true position of the candidate. [True]
- Candidate A's position in each election is a random draw from numbers 1, 2, 3, 4, 5, 6, or 7, where each of these numbers has an equal chance of being selected. [True]
- 7. Each candidate's position will be the same in every election [False]
- 8. My own position will be the same in every election [False]

The modal subject got seven out of eight questions correct with a mean score of 85% correct. After the quiz, subjects were given the opportunity to ask questions and clarify their mistakes. Subjects were not allowed to begin the elections used for analysis until they affirmed that they understood the answer to all questions.

## **A3 Experimental Materials**

#### Script read at the beginning of every session:

Welcome to our study on elections and voting. In order to ensure unbiased results, please do not discuss this study with other students or participants.

In today's study you will receive \$7 just for participating. You also can earn more money depending on your decisions, the decisions of others, and random chance. Your earnings in the study will be expressed as tokens, where 100 tokens are worth \$1. At the end of this study your winnings will be exchanged into dollars and paid to you in cash. Your payment is yours and no other participant will be informed about your payment.

Please turn off your cellphones. Remain quiet and do not talk with other participants during the entire session. If you have questions, please raise your hand; one of us will come to answer them.

This session will last for about one and a half hours. During this session, you will play a series of election contests between two computer-generated candidates. At the beginning of each election, each candidate will be assigned an integer

#### Appendix A

position between 1 and 11. Each of you will also be assigned a position on that same scale. These positions will be chosen at random at the beginning of each election.

Candidate A's position is equally likely to be any integer from 1 to 7; Candidate B's position is equally likely to be any integer from 5 to 11. This means that on average, Candidate A's position will be less than Candidate B's position, but there may be an election where Candidate B's position is less than Candidate A's. You will never be told the candidates' positions with certainty. Instead, your task in each election is to learn the positions of the candidates and elect the one that is closest to your own position.

The amount of tokens you gain will depend on how close the winning candidate's position is to your own position. You will receive 100 tokens if the winning candidate's position is the same as yours. You receive ten fewer tokens for each unit of distance between your position and the winning candidate's. You can also pay or receive tokens based on whether you choose to communicate with other participants. The tokens you receive for each election will add to your cumulative total which determines your final payment.

Each election occurs in three phases. First, you receive private information about the positions of the candidates. Second, you can request, send, and receive social information about the candidates from fellow participants in the study. Finally, you cast your vote.

Please turn to your computer screens for a demonstration. We have prepared a practice election to help you get familiar with the rules of the study. These screens look identical to those you will see during the study, but for this practice election you cannot gain or lose tokens. As we proceed, please do not enter any information or click any buttons until instructed.

This is the first screen you will see each election. Your position in this election is shown in the top-left corner of the screen. For this practice election, each participant is given a position of 6. In the study, your position can change every election and may be any number from 1 to 11.

You will also receive private information about the positions of each candidate. In this practice screen, each of you will receive two pieces of information. In the study, you may receive 0, 1, or 2 pieces of information. The amount of information each participant receives is chosen at random each election.

Appendix A

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Nor gardipart number is 1 Tree produces to 1 Totar information level is 0		Tour participant number is 24 Tour postern is 4 Tour information level is 2			Plastrail
Your information level is 0 for this election so receive additional information about the candi positions on this screen	rou will not tates'		You received the following inf candidates' positions:	ormation about the	
			Candidate A's position is 6. Candidate A's position is 9.	Candidate IPs position is 5 Candidate IPs position is 6	
Enter your best estimate of each candidate	a position:		Enter your best estimate of	each candidate's position	10
Candidate A Caro	idate B		Candidate A	Candidate B	
10 gandan a sanagadan ( 16.7 Pagadan a sanagadan ( 16.7			(* 1) (* 2) (* 4) (* 6) (* 6) (* 6) (* 6) (* 6) (* 6) (* 6) (* 7) (* 6) (* 7) (* 7) (* 7) (* 7) (* 7) (* 7) (* 7) (* 8) (* 7) (* 8) (* 7) (* 7) (* 8) (* 7) (*	en 1927 C 4 C 2 C 4 C 4 C 4 C 4 C 4 C 4 C 4 C 4 C 4 C 4	
					OK

Figure 16 Screen 1: Enter initial judgement about each candidate's position

Each piece of information is an independently drawn signal about the candidates' true positions. These signals accurately represent the candidates' true positions on average, but any one piece of information may not exactly match the candidate's position. The signal you receive will be within three units of the candidate's true position and each value within that range is equally likely. For example, if the candidate's true position is 1, you are equally likely to receive any signal from -2 to 4.

Once you have thought about this information, you must enter your best estimate of each candidate's position. Remember, Candidate A's true position can be anywhere from 1 to 7, and B can be anywhere from 5 to 11.

Read the information, enter your initial estimates, and press OK to continue.

On this screen, you can choose to communicate with another participant in your group. You must choose whether you would like to send information, request information, or avoid communication in this election.

During the study, the cost of communication will vary. Some participants must pay 5 tokens to communicate. Others will gain 5 tokens if they choose to communicate. Still others will neither gain nor lose tokens in exchange for communication. These costs will be randomly assigned each election.

For this practice election, the screen shows what it would look like if you had to pay for communication.

To help you decide what to do, the table displays the position of each participant

Appendix A

						even and a second second
Your participant nu	mber is 1					
Your position is 8						
Your information le	rvel is 0					
	Would you like to s	end information	to or request informa	tion from one of th	ese participants?	
	You will pay 5 toke	ins if you choose	e to send or request	information		
	Destinized II	Destroy	Information Court	Cond Information	Descuel Information	
	Participant #	Position	Information Level	Send Information	Request Information	
	2	6	1	Send to this participant	Request from this participant	
	10	7	1	Send to this participant	Request from this participant	
	12	11	0	Send to this participant	Request from this participant	
	17	7	0	Send to this participant	Request from this participant	
				(		
	22	9	1	Send to this participant	Request from this participant	
			I do not want to communicat	alter -		

Figure 17 Screen 2: Decide whether you wish to send or request social information

and their information level, which reflects the amount of private information they just received about the candidates.

Now, press a button to make your choice and proceed to the next screen.

On this screen, you will send information about the positions of each candidate to any participant you chose to send information to or who requested information from you. To help you decide what to tell them, this screen provides you with information about the recipient's position and information level. It also reminds you of your previous estimates of the candidates at the top of the page.

The information you send must be an integer signal about each candidate's position. You may provide any information you wish within the range of the candidate's possible positions. You are not required to send the same information to each participant.

Please enter the information you wish to send and press OK to continue.

Screen 4: On this screen you are shown the information you received from your



Figure 18 Screen 3: Send social information



Figure 19 Screen 4: Update your judgments

Appendix A

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Nor participant number in 1 Nor proteins is 8 Nour alternation level is 3		Nor participant norther to 5 Norar partitions to 11 Norar administration level is 2	
You previously estimates You previously estimates	Candidate A's position is 2. Candidate B's position is 8.	You previously estim You previously estim	ated Candidate A's position is 4. sted Candidate B's position is 7.
If you were force candidate would	to choose, which ou ward to whi?	If you were fo candidate wo	sed to shoose, which bid you want to win?

Figure 20 Screen 5: Express your preference

fellow participants.

You will not receive this new social information if you did not request information and no one chose to send any information to you.

Once you have considered any new information you have received, you must enter your best estimate of each candidate's position.

Please read the new information, update your estimates, and press OK to continue.

Screen 5: On this screen, you must decide which candidate you prefer. Remember, you receive more tokens the closer the winning candidate's position is to your own. To help you decide, you are reminded of your own position in the upper left corner of the screen. And at the center of the screen, you are reminded of your estimates of the candidates' positions.

Enter your preference now.

Screen 6: On this screen, you must decide whether to vote. You can choose either to vote for your preferred candidate or abstain from voting.

Again, you are reminded of your own position and your estimates of the candidates' positions.

Now, press a button to make your choice and proceed to the next screen.



Figure 21 Screen 6: Decide whether to vote

08304		Lindon	
1 0.5.07 29	Remaining time (sec) 28	1 0217 28	Remainingtime (sec) 5
Tour participant scraber is 1 Your partices # Your information book is 2		Nargenisper handline is 11 The animities 42 The animities in an animities 11	
Candidate B won the ele	ction!	Candidate B won the ele	action!
You receive 188 blocks because Candidate B's position was 0 units 1 You page 8 blocks because you show to commence Your total profit for the election is 100 - 5	om yeur position = 95 tokens	Vor receive 589 Mans because Candidate II's poston was 0 units	from your position
	Netfactor		Nort Declar

Figure 22 Screen 7: Election Results

Screen 7: This is the last screen you will see in an election. It will show you which candidate won the election. You will also learn the number of tokens you earned in this election.

Remember, you receive 100 tokens if the winning candidate's position is the same as yours. You receive ten fewer tokens for each unit of distance between your position and the winning candidate's. So you would receive 90 tokens if the winner's position is one unit from yours, 80 tokens if the winner's position is two units away, 70 tokens if three units away, and so on.

If you received or lost tokens for communicating with other participants, those totals will be shown here too.

The study will consist of a series of elections just like this. At the end of the study, you will be asked a few questions about your experience in the study along with some questions about demographic information and your general political leanings.

### Models

	-		
	Model 1	Model 2	Model 3
Fixed			
Expertise Gap	-0.25	-0.25	-1.67
	(0.08)	(0.13)	(0.92)
Communication Gap	-0.08	0.03	-2.01
	(0.08)	(0.13)	(0.92)
Extremity	-0.03	0.23	
	(0.02)	(0.04)	
Expertise Gap * Extremity	0.10	0.07	
	(0.03)	(0.05)	
Communication Gap * Extremity	0.02	-0.09	
	(0.03)	(0.05)	
Intercept	-0.53	0.62	3.72
	(0.07)	(0.13)	(0.74)
Variance			
SD(Intercept) - Subjects	0.35	0.64	
SD(Intercept) - Elections	0.00	0.26	1.07
Number of Observations	4700	4180	150
AIC	9584.6	4815.2	945.0
Log Likelihood	-4783.291	-2399.621	-467.496

Multilevel regression estimates.

**Note:** Model 1: Negative binomial regression where the dependent variable is the number of messages a subject sent in an election. The observations represent subjects in an election (250 subjects \* 188 elections = 4,700). The estimated standard deviation = 0 across elections suggests a singular fit. This result may indicate the lack of variation in the intercept across elections or it may instead suggest that our multilevel structure is unnecessarily complex. To investigate, we performed principle component analysis of the covariance matrix for the varying intercepts (see Bates, Kliegl, Vasishth, & Baayen, 2018). The analysis indicates all of the variation can be reduced to a single dimension captured by the varying intercept across subjects. Estimating this more parsimonious model yields otherwise identical estimates.

Model 2: logistic regression where the dependent variable is whether the subject supported the correct candidate in the election. The observations represent subjects in an election after removing the 520 cases in which the subject is equally close to both candidates in the election.

Model 3: linear regression where the dependent variable is the vote margin for the candidate that maximized the group's profit in the election. The observations represent the 150 elections in which the candidates were not equally distant from the median preference (188 total elections - 38 equally distant = 150).



Figure 23 The Effect of Extremity on Message Quality: Extremity increases the average bias in the messages that subjects send to others (Panel A) and decreases the chances that they share their true beliefs about the candidates (Panel B).

**Note:** Panel A displays the message bias averaged over all messages sent by subjects at each level of extremity. Message bias is the absolute difference between the subject's first judgment about the candidate's position and the signal they sent another subject about that position. For each level of extremity, Panel B displays the percent of all messages that were exactly equal to the sender's first judgment. In both panels, the vertical lines indicate 95% confidence intervals.

	Model 1	Model 2
Fixed		
Extremity	0.05	-0.08
	(0.01)	(0.03)
Intercept	0.75	1.13
	(0.07)	(0.15)
Variance		
SD(Intercept) - Subjects	0.78	26
SD(Intercept) - Elections	0.14	0.22
Number of Observations	5186	5186
AIC	17478.6	5501.7
Log Likelihood	-8734.289	-2746.866

Multilevel regressions of message quality on extremity. Extremity increases message bias (Model 1) and decreases the chances that subjects share their true beliefs with others (Model 2).

**Note:** Model 1: linear regression with dependent variable as the absolute difference between the sender's true belief and the message they sent. Model 2: logistic regression with dependent variable as whether the sender told the receiver their true belief about the position of the candidate. Each observation represents a message sent about the position of one of the candidates.

## **Appendix B**

# Chapter 4 Appendix

### Sample Demographics

The table shows summary statistics of participant demographics. The demographics were self-reported on their computers immediately after participants completed all elections in their session.

Characteristic	$N = 126^{1}$
Gender	
Female	77 (61%)
Male	47 (37%)
Other or prefer not to say	2 (1.6%)
Party ID (Leaners grouped with party)	
Democratic	64 (51%)
Republican	39 (31%)
Pure independent	17 (13%)
Other or prefer not to say	6 (4.8%)
Race/Ethnicity	
White, non-Hispanic	59 (47%)
Non-white, Hispanic	24 (19%)
African American, non-Hispanic	19 (15%)
Other or prefer not to say	13 (10%)
White, Hispanic	11 (8.7%)

 $^{1}n(\%)$ 

### **B1** Comprehension Quiz

After the training election, but prior to the the paid elections, subjects are asked the following True/False questions:

- 1. If my position is 2, Candidate A's position is 4 and Candidate B's position is 3, I should vote for Candidate A
- 2. I am paid if the candidate closest to me wins, regardless of which candidate I voted for

- 3. The private information provided to me about the position of a candidate may not perfectly reflect the true position of the candidate
- 4. Candidate A's position in each election is a random draw from numbers 1, 2, 3, 4, 5, or 6 where each of these numbers has an equal chance of being selected.
- 5. Each candidate's position will be the same in every election
- 6. My own position will be the same in every election

Subjects averaged a score of 90% correct on these items (Standard Deviation = 13%). Subjects are not allowed to proceed to the elections used for analysis until they have identified any mistakes they made and understand the correct answers.

,	to have received new incentives. Your prefit in the following elections will be determined as follows:		You have received new incentions, Your profit in the following elections will be determined as follows:	
	Profile Endowment - Outcome of electron		Profile Endowment + Outcome of election + Candidate A performance	
-	epueseet Thu with hickner 100 points at the segmenting of each electron		Indexment, You wit income 100 points at the beginning 244xX environ	
002	altere di destato de la contra se contra se parte a genera de la contra con e contra contra con e la contra contra de la contra Contra de la contra de		Notice of each of the contract of the contract Notice of the contract of the Notice of the contract of the Notice of the contract of the Notice of the contract of the Notice of the contract of the cont	
			Condition (and interest of the of Lynness of Condition Laws	
		-		
,	so have received new incentives. Your prefils in the following elections will be determined as follows:		You have reached new incentives. Your prefit in the following decisions will be deformined as follows:	
	Photo-Endowment + Outcome of electron + Candidate estimates		Phills-Endewment + Outcome of electron + Correct roles	
	advantant, hive with recipient at the beginning sheach electron		toolwavest, his wit score to point at the signing pread, eviden	
002	scene of whether This conducts where publics is created as public much the statistic public and 3 public. The statistics and it is not total the statistic on writing by 2 public. That conditions were spaced as to public due to public writing and the and a much whether the public.		Outcome of advectors The conclusion whereas provides is to excert the conclusion the website provide and Specific The conclusion Outcome the conclusion of an optical and the SP (2010). The conclusion of the conclusion of the conclusion of the specific of Neural and the conclusion of the specific of the SP (2010). The conclusion of the conclusion of the specific of the specific of Neural and the conclusion of the specific of Neural and the specific of the spe	
6	namen andere a la sub carlante a su a de anna a su al anca a de ante a de ante a de ante a de ante a su a de a Name a de ante a su a de ante a su a de ante a de a			
		a.		u.

## **B2** Experimental Materials

Figure 24 The incentives screen. Subjects learn their incentive structure. The images show the incentives for a subject with the Control, Partisan, Accuracy, and Prosocial Motivations.

-Election 1 out of 15				Remaining time (sec) 0				
A new election has been a Farthis selection year continents 2								
A new exclosinal deglin i of this exclosity party book on 5 2.								
	You will not receive private information about this election							
	Church this information		11-1					
	Given uns miormation	, what do you mink the cano	source positions are?					
	Candidate A:	Candid	ate R					
- Instantions				Nest				
Read the information, enter your initial estimates of each	h candidate's position and then pres	s Next to continue.						
1 outof 15				Remaining time (sec) 25				
	A new election	has begun. For this election, yo	ur position is 2.					
	You have be	een given four pieces of private	information					
Г	These prov	de estimates of each candidat	e's position:					
-	First estimate	2	4					
-	Second estimate	5	3					
	Third Estimate	4	2					
	Fourth estimate	6	6					
L								
	Given this information	, what do you think the cano	didates' positions are?					
	Candidate A	Candid	ado R					
- Instructions				Nest				
Read the information, enter your initial estimates of each	h candidate's position and then pres	s Next to continue.						

Figure 25 The first screen in an election. Subjects receive between zero and four pieces of private information and then enter an estimate of each candidate's position. The top image shows a subject receiving no private information; the bottom shows a subject receiving four pieces.

Election 1 out of 15				Remaining time (sec): 28
In this election, your position is 5				
	You may now request social To request information from	information from one other part a participant, check the box in th	icipant. he corresponding row.	
	POSITION	AMOUNT OF PRIVATE INFO	REQUEST INFO?	
	1	1	T Make request	
	2	3	IT Make request	
	3	4	I Make request	
	4	1	I Make request	
	5	0	THIS IS YOU	
	6	2	I Make request	
	7	3	I Make request	
			I do not want social information	
				Next
Instructions     Check the corresponding box of the participant from	n whom you wish to receive social info	rmation and then press Nexz to contin	Je.	

Figure 26 The second screen in an election. Subjects choose a discussant from whom to request information. Subjects can see potential informants' positions and the amounts of private information they received.

-Election 1 out of 15					Remaining time (sec): 17
In this election, your position is 7 You previously thought the candidates' positions were:	The following particip You do not need to se	ant(s) requested inform and the same information	nation from you. What do	you want to tell them?	
Candidate A 3 Candidate B 4	POSITION	PRIVATE INFO	CANDIDATE A	CANDIDATE B	
	1	1			
	2	3			
- Instructions					Next
Enter the information you wish to send and then p	ress Nexr to continue.				

Figure 27 The third screen in an election. Subjects send information to those whom requested it from them. Senders can see requestors' positions and the amounts of private information they received. In the upper left corner of the screen, they are reminded of their judgment of each candidate's position.

- Election - 1 out of 15		Remaining time [sec]: 17
In this election, your position is 1 You previously thought the candidates' positions were: Candidate A 3 Candidate B 5		
	You requested social information from the participant at Position 5. This participant has received 1 piece of private information. This participant has sent you the following information:	
	Candidate B's Position is 3. What do you now think the candidates' positions are?	
☐ Instructions —— Read the information, enter your updated estimates and then or	ess Next to continue.	Next
noon on environment, enviro pour uportere escandides and their p		

Figure 28 The fourth screen in an election. Subjects receive the information sent by their informants and then update their estimate of each candidate's position. In the upper left corner of the screen, they are reminded of their previous judgment of each candidate's position.



Figure 29 The fifth screen in an election. Subjects must vote for one of the candidates. In the upper left corner of the screen, they are reminded of their position as well as their most recent judgment of each candidate's position.



Figure 30 The sixth and final screen in an election. Subjects learn which candidate was closest to them, which candidate won the election, and how many points they earned in the election. After viewing this screen, the candidates' and subjects' positions are redrawn and a new election begins.

All participants were given this handout when they were initially seated:



# Appendix C Checklists

We use the following checklists when administering in-person, small-group experiments using z-Tree software.

### **Planning Checklist**

(Things to do prior to the experimental sessions)

- 1. Obtain IRB approval
- 2. Reserve lab space
- 3. Complete request for university cash advance
- 4. Prepare experimental files:
  - (a) training file(s)
  - (b) treatment file(s)
  - (c) questionnaire file(s)
- 5. Recruit participants
- 6. Obtain checks or withdraw cash for participant payments

### **Bring Checklist**

(Things to bring to each experimental session)

- 1. Pens
- 2. Cash or checks for participant payments
- 3. Receipts
- 4. Sign-in sheet
- 5. Script
- 6. Handout(s)
- 7. Cover Letter/Consent Form
- 8. Envelope with random numbers (used e.g., when more participants show up than required)
- 9. USB Drive with following files:
  - (a) training file(s)
  - (b) treatment file(s)
  - (c) questionnaire file(s)

#### Appendix C

### Session Checklist

(Steps to run an experimental session)

- 1. Reset all computers that are already running
- 2. Turn on all computers that are off
- 3. Clean workstations
- 4. Prepare sign-in sheet
- 5. Open z-Tree
- 6. Open [number of participants per session] z-leaves
- 7. Using z-Tree, confirm exactly [number of participants per session] z-leaves are open (zTree -> Run -> Clients' Table)
- 8. Distribute to each workstation:
  - (a) Receipt
  - (b) Cover Letter/Consent Form (two copies per station)
  - (c) Handout(s)
  - (d) Pen
- 9. Sign-in each participant
- 10. Seat each participant
  - If more people arrive than needed, use the random numbers to determine who to dismiss.
  - · Before dismissing someone, pay them the show-up fee
  - Before dismissing someone, collect a receipt for the show-up fee
- 11. Encourage participants to read the consent form
- 12. Collect signed consent forms
- 13. Count signed consent forms, ensuring you have received [number of participants per session] signed forms
- 14. Begin reading script
- 15. Run training round(s)
- 16. Run treatment rounds
- 17. Run questionnaire
- 18. Pay each participant (show-up fee plus amount earned during the session)
- 19. Collect a receipt for total amount paid to each participant
- 20. Save all experimental data to USB drive.
- 21. Log out of all computers
- 22. Clean workstations
- 23. Ensure doors are locked upon exit