

# Appendix

## Data and Preference Variables

We collected our MTurk data in three waves. We fielded Wave 1 ( $N = 91$ ) on January 21, 2016, Wave 2 ( $N = 476$ ) from January 25 to 28, 2016, and Wave 3 ( $N = 188$ ) from February 5 to 8, 2016. For context, the second wave took place a few days prior to the Iowa Caucus and the third wave just before the New Hampshire Primary.

We implemented the survey in Qualtrics and solicited respondents using Amazon’s Mechanical Turk (“MTurk”). We elicited preferences from MTurk respondents using two methods, pairwise comparisons and rank orderings. Respondents in Wave 1 and Wave 2 were randomly assigned to one of the two methods. All respondents in Wave 3 provided pairwise comparisons. In the pairwise elicitation method, respondents ( $N = 469$ ) gave their preferences among all possible combinations of the six highest-polling Republican candidates at the time: Jeb Bush, Ben Carson, Chris Christie, Ted Cruz, and Donald Trump. Between all three waves, the top six candidates remained the same. The first one to drop out of the top six candidates was Chris Christie, who dropped out of the race after the New Hampshire primary on February 10th. Pairwise survey items followed the format in Figure A1.

Who would you prefer as President of the United States, Ben Carson or Chris Christie?

Prefer Ben Carson
Prefer Chris Christie
It doesn't matter to me (I'm indifferent)



Figure A1: Example of Pairwise Preference Item

Respondents in the rank ordering condition ( $N = 286$ ) assigned each of these same six candidates a rank between 1 and 6, with one representing the most-preferred candidate and ties permitted. Figure A2 shows the survey interface. We code pairwise preferences based on this ordering. For example, if a respondent gives candidate A a rank of 2, then the respondent prefers A to candidate B if B is ranked 3 or greater. We code the respondent as indifferent if both candidates are placed in the same rank.

To code preferences from the ANES Pilot data, we use feeling thermometer scores (a method used by Niemi and Wright (1987) and Radcliff (1993)) for five of the six candidates covered in our MTurk data: Bush, Carson, Cruz, Rubio, and Trump. (ANES respondents did not rate Christie.) We generated pairwise preferences by comparing feeling thermome-

Please rank the Republican candidates in terms of who you would most like to see be President. Drag and drop the candidate's names into the boxes indicating your first, second, third, fourth, etc favorite candidate. If you prefer two candidates equally then place both of those candidates in the same box.

Items	1st Choice	2nd Choice
Jeb Bush		
Donald Trump		
Chris Christie		
Ben Carson		
Marco Rubio		
Ted Cruz		
	3rd Choice	4th Choice
	5th Choice	6th Choice



Figure A2: Rank Ordering Preference Item

ter scores for each possible combination of candidates. Equal scores indicate indifference, whereas a higher score for one candidate indicates a strict preference for that candidate.

Like most polls, perfect identification of primary voters is impossible because we cannot use voting records to validate turnout. Pollsters and scholars typically deal with this problem by relying on self-reported participation or intended participation. This is the approach we took in our MTurk survey, asking voters how likely they were to vote in the Republican primary on a five-point scale ranging from “Not very likely” to “Very likely.” We screen out survey respondents who indicated that they were unlikely to vote in the Republican primary and, where applicable, those who indicated that they were likely to vote in the *Democratic* primary. The ANES Pilot data contain no items related to voting intent. Instead, we take the respondent’s party identification as a proxy, including only respondents who identified with the Republican Party, including “leaners.”

## Sample Characteristics

As discussed in the text, Table A1 shows that the distribution of top choice candidates in our MTurk data and in the ANES Pilot sample closely match the polling averages during our survey period. Demographic characteristics of both samples are reported in Table A2. Compared to the ANES Pilot sample, our MTurk sample is much younger (70.4% under 33 in MTurk, 40.7% in ANES), more highly educated (46.7% with bachelor’s or graduate degrees in MTurk, 29.1% in ANES), somewhat poorer (21.1% with incomes over \$80,000 in MTurk, 34.4% in ANES), and more female (55.8% in MTurk, 50% in ANES).

Table A1: Comparison of Top Choice Preferences

Top Choice	MTurk sample	ANES Pilot sample	Average Poll	Range
Bush	6.6	4.3	5.4	(3-10)
Carson	8.5	8.6	8.0	(4-14)
Christie	3.7	3.2	3.0	(1-5)
Cruz	13.6	16.8	17.7	(11-23)
Fiorina	2.1	3.0	2.1	(1-5)
Kasich	3.1	3.0	3.8	(1-11)
Paul	9.4	4.8	2.9	(1-5)
Trump	35.3	36.4	36.7	(25-43)
Rubio	12.1	10.0	13.2	(8-21)
Other	2.9	1.4	1.7	(0-6)
Undecided	2.8		7.1	(1-15)

Poll Average: 16 January - 15 February 2016, 26 Surveys

## Post-Stratification Survey Weights

To account for the unrepresentativeness of our sample, we generated post-stratification weights based on four demographics: gender, income, age, and education. Each of the variables was dichotomized in order to limit the number of categories and ensure that there

Table A2: Sample Demographics

	MTurk		ANES Pilot	
	Count	Percent	Count	Percent
<b>Age</b>				
18-24	107	14.2	34	7.7
25-33	424	56.2	145	33.0
45-64	204	27.0	171	38.9
65+	20	2.7	90	20.5
<b>Education</b>				
Less than High School	7	0.9	37	8.4
High School Diploma	93	12.3	161	36.6
Some College	205	27.2	85	19.3
Associate's Degree	97	12.9	29	6.6
Bachelor's Degree	260	34.4	79	18.0
Graduate/Professional Degree	93	12.3	49	11.1
<b>Income</b>				
Under \$30,000	188	24.9	109	24.8
\$30,000 to \$50,000	199	26.4	89	20.3
\$50,000 to \$80,000	208	27.6	90	20.5
Over \$80,000	159	21.1	151	34.4
<b>Sex</b>				
Male	334	44.2	220	50.0
Female	421	55.8	220	50.0

were no empty cells, for a total of 16 strata. We created these strata for our MTurk sample and for the 2016 ANES Time Series Sample. We use likely Republican primary voters in the ANES Time Series data as a proxy for the target population, as there is no other demographic information on this population of which we are aware. To create the weights, we divided the proportion in each stratum of the ANES Time Series data by the percentage we observed in the MTurk sample. Thus, the weights represent the inverse probability of being selected into our sample. When we perform pairwise comparison using the weighted ANES-weighted MTurk, our key findings remain. Moreover, Trump’s performance improves substantially in both the top-choice selections and pairwise comparisons. Indeed, as Table A8 illustrates, Trump comes the closest to Condorcet victory when we apply these survey weights.

### Robustness Checks

Tables A3 and A4 present the numerical results corresponding to Figure 1 in the text and are the basis for the first two columns in Table 2. The remaining tables provide the numerical estimates that support the robustness findings in Table 2: Table A5 (column 3), Table A6 (column 4), Table A7, (column 5), and Table A8 (column 6).

Table A3: MTurk Sample, Unweighted

	Pct Strictly Preferring Trump	Pct Strictly Preferring Other
Bush	53.8 [50.2, 57.3]	38.4 [34.9, 41.9]
Carson	49.4 [45.8, 53.0]	42.6 [39.1, 46.2]
Christie	55.2 [51.7, 58.8]	36.0 [34.4, 41.3]
Cruz	47.6 [44.1, 51.3]	46.4 [42.8, 49.9]
Rubio	47.8 [44.2, 51.4]	47.2 [43.6, 50.7]

95% confidence interval in brackets

Table A4: ANES Pilot Sample

	Pct Strictly Preferring Trump	Pct Strictly Preferring Other
Bush	61.3 [56.8, 65.9]	34.5 [30.1, 39.0]
Carson	47.7 [43.0, 52.4]	46.6 [41.9, 51.3]
Cruz	50.6 [46.0, 55.4]	43.9 [39.2, 48.5]
Rubio	51.1 [46.4, 55.8]	44.5 [39.9, 49.2]

95% confidence interval in brackets

Table A5: MTurk Sample, Pairwise Only

	Pct Strictly Preferring Trump	Pct Strictly Preferring Other
Bush	51.8 [47.3, 56.4]	36.9 [32.5, 41.3]
Carson	46.1 [41.5, 50.6]	42.2 [37.7, 46.7]
Christie	51.2 [46.6, 55.7]	39.0 [34.6, 43.5]
Cruz	45.0 [40.5, 49.5]	46.5 [42.0, 51.0]
Rubio	45.0 [40.5, 49.5]	47.8 [43.2, 52.3]

95% confidence interval in brackets

Table A6: MTurk Sample, Rank Orderings Only

	Pct Strictly Preferring Trump	Pct Strictly Preferring Other
Bush	57.0 [51.2, 62.8]	40.9 [35.2, 46.6]
Carson	54.9 [49.1, 60.7]	43.4 [37.6, 49.1]
Christie	61.9 [56.2, 67.6]	36.0 [30.4, 41.6]
Cruz	52.1 [46.3, 57.9]	46.2 [40.3, 52.0]
Rubio	52.4 [46.6, 58.3]	46.2 [40.3, 52.0]

95% confidence interval in brackets

Table A7: MTurk Sample, No Paul Supporters

	Pct Strictly Preferring Trump	Pct Strictly Preferring Other
Bush	56.0 [52.3, 59.7]	37.6 [33.9, 41.2]
Carson	51.4 [48.0, 55.5]	41.1 [37.4, 44.8]
Christie	58.0 [54.3, 61.7]	36.0 [32.4, 39.6]
Cruz	49.9 [46.1, 53.6]	44.4 [40.7, 48.2]
Rubio	49.7 [46.0, 53.4]	45.6 [41.9, 49.4]

95% confidence interval in brackets

Table A8: MTurk Sample, Weighted

	Pct Strictly Preferring Trump	Pct Strictly Preferring Other
Bush	65.6 [59.8, 71.4]	27.4 [22.1, 32.6]
Carson	62.2 [56.2, 68.3]	30.6 [25.1, 36.0]
Christie	65.9 [60.2, 71.7]	30.9 [25.3, 36.5]
Cruz	55.6 [49.1, 62.0]	37.6 [31.6, 43.6]
Rubio	56.3 [50.0, 62.5]	38.5 [32.5, 44.4]

95% confidence interval in brackets

## Plurality Rule

As noted in footnote 10, majority rule counts indifferent voters while plurality rule ignores them. Here, we analyze social preferences in favor of Trump using plurality rule instead of majority rule. Table A9 presents the results. If anything, throwing out indifferent voters strengthens the appearance of support for Trump. Using the point criterion, Trump is a Condorcet winner in both the unweighted MTurk and unweighted ANES samples. However, using the interval criterion, the main result is qualitatively the same as in our main analysis. There is enough uncertainty about the aggregate preference between Trump and Carson, between Trump and Cruz, and between Trump and Rubio that Trump is a member of the core but not a Condorcet winner.

## Bootstrap Simulations

We also check the robustness of our conclusions by using simulation methods. We draw 1,000 bootstrap samples of 1,000 Republican voters using the ANES pilot data, then compute the percentage of samples for which Trump is a Condorcet winner or a member of the core. Trump is a Condorcet winner in only 17% of our bootstrapped samples but a member of the majority rule core in 95% of them. This discrepancy matches our findings in Figure 1 and is due to the fact that there is a non-trivial portion of respondents who are indifferent between Trump, Cruz, and Rubio.

Using plurality rule, Trump is a Condorcet winner in 63% of our bootstrapped samples and a member of the core in 65%. The small difference is due to the fact that ties are rare (the electorate is indifferent only when the number of voters that strictly prefer Trump is equal to the number that strictly oppose him).

Strikingly, Trump is *never* a Condorcet loser. For Trump to be a Condorcet loser, he must have strictly less support than *every* other candidate in pairwise contests. In our simulations, Trump may sometimes lose to another candidate, but never to all other candidates.



Table A9: Plurality Rule

	Pct Strictly Preferring Trump	
	MTurk	ANES
Bush	58.3 [54.7, 62.0]	63.7 [59.1, 68.3]
Carson	53.7 [50.0, 57.4]	50.1 [45.3, 54.9]
Christie	59.3 [55.7, 63.0]	– –
Cruz	50.7 [47.0, 54.4]	53.1 [48.3, 57.9]
Rubio	50.3 [46.7, 54.0]	52.8 [48.1, 57.6]

95% confidence interval in brackets

Even if we restrict our attention to Ted Cruz and Marco Rubio as the best candidates to defeat Trump, in 1,000 bootstrapped samples, Trump strictly loses to Rubio once and never to Cruz (and hence never loses to both).

## Indifference

Table A10 shows that primary voters in our (pooled, unweighted) MTurk sample were more likely to express a preference (less likely to be indifferent) between Trump and the other candidates than between any other pair of candidates.

Table A10: Indifference Between Candidates (MTurk sample)

	Bush	Carson	Christie	Cruz	Rubio
Trump	7.8%	7.9%	6.9%	6.0%	5.0%
Bush		12.1%	17.0%	11.7%	14.7%
Carson			12.2%	11.9%	12.7%
Christie				13.2%	14.2%
Cruz					16.6%