Encouraging Small Donor Contributions: A Field Experiment Testing the Effects of Nonpartisan Messages

Supplemental Materials for Online Appendix

Investigating Heterogeneous Treatment Effects

We conducted a series of simulations in order to determine whether the study's treatment effects varied by subgroup. Given the skewness of the contributions data, we used the following approach, suggested in Gerber and Green (2012, Chapter 9), for detecting heterogeneous treatment effects in experimental data. We regressed the outcome variable on the treatment variable and the subgroup variable in a null model, and on those same variables plus a variable made up of their interaction in an alternative model. We then obtained an F-statistic from a comparison of the sum of squared residuals of the two models. In order to determine the significance of the F-statistic, we generated a full schedule of potential outcomes under the assumption that the coefficients from the null model are the same for each subject ("constant effects"). We then repeated our random assignment 1,000 times, estimated the null and interaction regressions for each assignment, and calculated the F-statistic. We obtained a p-value by observing the percent of F-statistics simulated under the null model that are greater than the observed F-statistic.

Readers should use caution when interpreting treatment-by-covariate interactions. First, subgroup analysis is fundamentally descriptive. Subgroups are not assigned randomly, and so, while subgroup membership may be predictive of treatment effects, the detected interactions may not have a causal interpretation.

Second, because we conducted so many tests, there is a high probability that at least one interaction model will appear significant merely by chance (Gerber and Green 2012, 299-300). Though we report the results of all the models that approach the typical 5 percent significance level, a more conservative method would employ a Bonferroni correction and divide the target significance level by the number of tests. We tested the interactions of 5 treatments with 5 covariates and used 2 outcomes variables (5 x 5 x 2 = 50). The appropriate conservative target p-value with a Bonferroni correction is 0.05/50 = 0.001.

We tested the Voice, Special Interest, Civic Duty, Policy, and NYC Matching Program Information treatments interacted with covariates for previous donor status, previous donation amount, Democratic registration, gender, and age. We regressed two outcome variables on each combination: post-treatment donating and post-treatment donation amount. Of the 50 p-values that came from these tests, none approached the Bonferroni-corrected value of 0.001. In the tables below, we report the three interaction models whose F-tests produced p-values below or very near the typical 5 percent significance level. In particular, we note that previous donors who received the Policy treatment gave much more money on average than previous donors who did not receive it ($170). This large effect for the previous donor subgroup may hint at the difficulties inherent in trying to bring new groups into the donor pool.

Table A1: NYC Pooled Sample – Weighted Least Squares Regression of Total Donation Amount on Policy Treatment Interacted with Previous Donor Status

Randomization Inference F-test p-value: 0.014

	DV: Total Donation Amount	Std. Error
(Intercept)	0.50	0.037
NYC: Policy	-0.34	0.079
Previous Donor	21.22	1.49
NYC: Policy * Previous Donor	169.84	156.79

Note: Heteroskedasticity-robust standard errors are reported. Data are weighted by inverse probability of assignment. Randomization inference F-tests based on 1000 simulations.

Table A2: NYC Pooled Sample – Weighted Least Squares Regression of Total Donation Amount on Policy Treatment Interacted with Gender

Randomization Inference F-test p-value: 0.057

	DV: Total Donation Amount	Std. Error
(Intercept)	1.36	0.086
NYC: Policy	0.30	1.02
Gender (Female = 1)	-0.71	0.10
NYC: Policy * Gender	6.78	7.66

Note: Heteroskedasticity-robust standard errors are reported. Data are weighted by inverse probability of assignment. Randomization inference F-tests based on 1000 simulations.

Table A3: NYC Pooled Sample – Weighted Least Squares Regression of Total Donation Amount on Policy Treatment Interacted with Age

Randomization Inference F-test p-value: 0.051

	DV: Total Donation Amount	**Std. Error**
(Intercept)	1.23	0.18
NYC: Policy	14.39	14.81
Age (Years)	-0.0039	0.0028
NYC: Policy * Age	-0.19	0.19

Note: Heteroskedasticity-robust standard errors are reported. Data are weighted by inverse probability of assignment. Randomization inference F-tests based on 1000 simulations.

NYC Public Matching Program

New York City maintains a public campaign donation matching program designed to help candidates run competitive campaigns regardless of their access to large donors and give small contributions a larger impact. First created in 1988, the program currently matches individual donations up to $175 at a 6-to-1 match. Thus, an eligible candidate who receives the maximum match-eligible donation ($175) from an individual would receive an additional $1050 from the city's program for his or her campaign. Candidates who participate in the public matching program must comply with an overall campaign spending cap, which is different for each city office (http://www.nyccfb.info).

In order to qualify for public financing, candidates must face an opponent on the ballot and meet a two-part threshold to demonstrate a basic level of public support. The threshold consists of minimum requirements for amount of money raised and number of individual contributors and is different for each city office. Individual contributors that help a borough president or city council candidate meet this threshold must reside in the candidate's borough or city council district, respectively. Subsequent donors whose contributions are matched may reside anywhere in New York City. The total amount any participating candidate may receive in matching funds is capped at 55 percent of the campaign spending limit (http://www.nyccfb.info).

Donor Prediction Model Performance

Our calculated probabilities proved to be predictive of post-treatment donations. Using only members of the control group (N = 976,355), who were unaffected by our treatments, a regression of actual donating (based on matched post-treatment donations) on predicted probability of contributing reveals a positive and statistically significant relationship (see Table A4). The regression coefficient, 0.061 (SE=0.003), implies that moving from a zero predicted probability to a 100 percent predicted probability of donating on our measure results in an increase in actual probability of donating of 6.1 percent. Readers should recall that we used many more donations to make the prediction model than we used to test it. The post-treatment donations come only from the period from October 10^{th} to mid-November, 2013, while the donations that were used to create the model came from the entire 2009 election period and a good part of the 2013 election period. As a result, we would expect our model to under-predict the probability of donating over this short post-treatment period.

Table A4: NYC Pooled Sample – OLS Regression of Donating on Predicted Probability of Donating within Control Group

DV: Made Donation	**Estimate**	**Std. Error**
(Intercept)	-0.00022*	0.00011
Predicted Probability of Donating	0.061*	0.0026

Note: Heteroskedasticity-robust standard errors are reported.
* p < 0.5; N = 976,355; R-squared: 0.0015

In order to convey a sense of how predicted probabilities and actual donation rates match up, Table A5 presents the actual proportion of donors by each predicted probability group in the At-large sample (the larger New York City sample). Although the actual proportions of donors are lower than the nominal predicted probability within each block, there is nonetheless a clear positive trend among the predicted probability groups toward higher levels of donations. As the predicted probability of donating increases by an order of magnitude from 0.02 to 0.2, the actual proportion of donors follows suit, rising from 0.0012 to 0.012.

Table A5: NYC At-Large Sample – Predicted Probabilities of Donating and Actual Proportions of Donors Making a Contribution

Predicted Probabilities	Total Control Subjects	Matched Donors	Proportion of Donors
0.02-0.03	400733	463	0.0012
0.03-0.04	195705	396	0.0020
0.04-0.05	112131	315	0.0028
0.05-0.06	71697	224	0.0031
0.06-0.07	48288	196	0.0041
0.07-0.08	32013	125	0.0039
0.08-0.09	24053	111	0.0046
0.09-0.10	18491	104	0.0056
0.10-0.11	14838	84	0.0057
0.11-0.12	11811	80	0.0068
0.12-0.13	9522	68	0.0071
0.13-0.14	7603	56	0.0074
0.14-0.15	6094	55	0.0090
0.15-0.16	5138	57	0.011
0.16-0.17	4206	32	0.0076
0.17-0.18	3294	32	0.0097
0.18-0.19	2656	30	0.011
0.19-0.20	2289	31	0.014
0.20-0.21	1817	29	0.016
0.21-0.22	1471	17	0.012

N = 976,355

Experimental Design

Tables A6 and A7 show the breakdown of the treatment and control groups by block in the field experiment.

Table A6: NYC Target Council Districts Experimental Design			
Propensity Blocks	**Treatments**	**Control**	**Totals**
Block 1	Voice = 300 Voice+info = 300 Spec_Int = 300 Spec_Int+info = 300 Civic_Duty = 300 Civic_Duty+info = 300 Policy = 300 Policy+info = 300 Block Total = 2,400	62,315	64,715
Block 2	Block Total = 2,400	30,065	32,465
Block 3	Block Total = 2,400	14,788	17,188
Block 4	Block Total = 2,400	7,727	10,127
Block 5	Block Total = 2,400	4,198	6,598
Totals	**12,000**	**119,093**	**131,093**

Note: Each of the 8 treatment groups has 1500 subjects.

Table A7: NYC At-Large Sample Experimental Design			
Propensity Blocks	**Treatments**	**Control**	**Totals**
Block 1	Voice = 50 Voice+info = 50 Spec_Int = 50 Spec_Int+info = 50 Civic_Duty = 50 Civic_Duty+info = 50 Policy = 50 Policy+info = 50 Block Total = 400	338,881	339,281
Block 2	Block Total = 400	166,036	166,436
Block 3	Block Total = 400	97,658	98,058
Block 4	Block Total = 400	64,194	64,594
Block 5	Block Total = 400	44,286	44,686
Block 6	Block Total = 400	32,138	32,538
Block 7	Block Total = 400	24,164	24,564
Block 8	Block Total = 400	18,595	18,995
Block 9	Block Total = 400	14,922	15,322
Block 10	Block Total = 400	11,891	12,291
Block 11	Block Total = 400	9,590	9,990
Block 12	Block Total = 400	7,659	8,059
Block 13	Block Total = 400	6,149	6,549
Block 14	Block Total = 400	5,195	5,595
Block 15	Block Total = 400	4,238	4,638
Block 16	Block Total = 400	3,326	3,726
Block 17	Block Total = 400	2,686	3,086
Block 18	Block Total = 400	2,320	2,720
Block 19	Block Total = 400	1,846	2,246
Block 20	Block Total = 400	1,488	1,888
Totals	**8,000**	**857,262**	**865,262**

Note: Each of the 8 treatment groups has 1000 subjects.

Pre-Treatment Variable Descriptive Statistics by Experimental Group

Table A8: Subject Age by Experimental Group and Block – Mean and Standard Deviation				
	Treatment Mean	**Treatment SD**	**Control Mean**	**Control SD**
NYC Target Sample Blocks				
Block 1	57.43	14.27	57.84	14.36
Block 2	59.30	13.38	59.34	13.32
Block 3	60.64	13.30	60.45	13.10
Block 4	61.66	12.80	61.58	13.13
Block 5	62.83	13.16	62.15	12.85
NYC At-Large Sample Blocks				
Block 1	53.40	14.89	54.08	14.87
Block 2	56.56	14.32	56.68	14.42
Block 3	58.23	13.47	58.42	14.00
Block 4	60.37	13.70	59.57	13.71
Block 5	61.26	13.92	60.44	13.51
Block 6	61.82	13.03	60.94	13.18
Block 7	60.16	12.60	61.35	12.86
Block 8	61.62	12.67	61.77	12.63
Block 9	63.13	12.17	61.78	12.44
Block 10	62.04	11.57	61.55	12.24
Block 11	62.27	12.47	61.78	11.92
Block 12	62.61	11.08	61.52	11.77
Block 13	62.76	11.13	61.78	11.51
Block 14	62.05	11.71	61.77	11.40
Block 15	61.48	10.84	61.87	10.98
Block 16	61.15	11.36	62.06	11.02
Block 17	62.87	10.72	61.69	10.62
Block 18	62.17	10.78	61.71	10.60
Block 19	61.34	10.22	61.52	10.59
Block 20	63.01	10.53	61.94	10.27

Table A9: Percent Female by Experimental Group and Block – Mean and Standard Deviation				
	Treatment Mean	**Treatment SD**	**Control Mean**	**Control SD**
NYC Target Sample Blocks				
Block 1	0.50	0.50	0.49	0.50
Block 2	0.44	0.50	0.44	0.50
Block 3	0.43	0.50	0.43	0.50
Block 4	0.43	0.50	0.43	0.50
Block 5	0.47	0.50	0.44	0.50
NYC At-Large Sample Blocks				
Block 1	0.49	0.50	0.51	0.50
Block 2	0.50	0.50	0.51	0.50
Block 3	0.50	0.50	0.51	0.50
Block 4	0.49	0.50	0.51	0.50
Block 5	0.51	0.50	0.51	0.50
Block 6	0.48	0.50	0.51	0.50
Block 7	0.48	0.50	0.51	0.50
Block 8	0.53	0.50	0.51	0.50
Block 9	0.53	0.50	0.51	0.50
Block 10	0.54	0.50	0.50	0.50
Block 11	0.49	0.50	0.49	0.50
Block 12	0.42	0.49	0.48	0.50
Block 13	0.46	0.50	0.48	0.50
Block 14	0.45	0.50	0.46	0.50
Block 15	0.44	0.50	0.46	0.50
Block 16	0.45	0.50	0.47	0.50
Block 17	0.43	0.50	0.44	0.50
Block 18	0.45	0.50	0.45	0.50
Block 19	0.42	0.49	0.43	0.49
Block 20	0.44	0.50	0.42	0.49

Table A10: Percent Registered Democrat by Experimental Group and Block – Mean and Standard Deviation				
	Treatment Mean	**Treatment SD**	**Control Mean**	**Control SD**
NYC Target Sample Blocks				
Block 1	0.45	0.50	0.46	0.50
Block 2	0.45	0.50	0.46	0.50
Block 3	0.47	0.50	0.47	0.50
Block 4	0.52	0.50	0.53	0.50
Block 5	0.58	0.49	0.55	0.50
NYC At-Large Sample Blocks				
Block 1	0.67	0.47	0.72	0.45
Block 2	0.77	0.42	0.75	0.43
Block 3	0.80	0.40	0.79	0.41
Block 4	0.84	0.36	0.82	0.38
Block 5	0.85	0.36	0.85	0.35
Block 6	0.86	0.35	0.88	0.33
Block 7	0.89	0.32	0.90	0.30
Block 8	0.92	0.27	0.92	0.28
Block 9	0.92	0.27	0.93	0.26
Block 10	0.95	0.22	0.94	0.25
Block 11	0.95	0.23	0.94	0.23
Block 12	0.94	0.23	0.95	0.21
Block 13	0.96	0.20	0.95	0.22
Block 14	0.97	0.16	0.95	0.21
Block 15	0.95	0.22	0.96	0.20
Block 16	0.97	0.18	0.97	0.18
Block 17	0.98	0.16	0.97	0.18
Block 18	0.98	0.14	0.98	0.16
Block 19	0.96	0.20	0.97	0.17
Block 20	0.97	0.18	0.97	0.16