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Online Appendix for:

Identifying the Persuasive Effects of Presidential Advertising

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*Correspondence author. References omitted here appear in source paper. Consult the replication archive, available at http://research.yale.edu/huber, for additional coding details and model specification information.

1. Appendix A1

1.1. Identifying Battleground States

We judged the competitiveness of states by examining Federal Election Commission fillings on per capita national political party spending in the states. We expect that states with high levels of pass-through funding from the national party organizations (for, e.g., GOTV efforts) were considered to be part of the battleground by the presidential campaigns. In line with this expectation, the data cluster into two distinct groups: twenty-one states where the parties transferred more than $1.00 per voting eligible person (see footnote 1 for a list of these states) and the remainder. This method has face validity, as it identifies a similar list of states as those approaches used in the literature, including news organization picks (e.g., CNN 2000)[1] and the closeness of the two-party vote distribution in the 1996 election. The empirical findings reported here are robust across these approaches to measuring state-level competitiveness.

1.2. Advertising and Prior Voting Behavior

Here we provide a detailed explanation for why comparing advertising effects across and within battleground and non-battleground states likely produces biased causal estimates. First, across all of the media markets and state combinations in the National Annenberg Election Survey (NAES) sample, there is a strong correlation between the partisan balance of local advertising streams in the 2000 election and previous election outcomes. Specifically, Table A1a reports a series of regression models predicting Bush's margin over Gore in the rating-adjusted volume of presidential advertising for the nation's 75 largest media market and state combinations as a function of the 1996 election outcome in that geographic area. (We calculate Republican vote

[1] CNN. 2000. "Battleground States." Available at http://www.cnn.com/interactive/allpolitics/0010/battleground.states/battlegroundstates.html.

share as Republican Vote/[Democratic Vote + Republican Vote] in the media market and state combination using vote returns from the area's constituent counties.) These results show that in areas where Dole (Clinton) did better in 1996, Bush (Gore) outspent his opponent (Column 1). Furthermore, the relationship between previous election outcomes and advertising persists *even if one accounts for differences across states by using state fixed effects* (this effect is significant at $p<0.1$ for a one-tailed test, Column 2). In contrast, the results in Column 3 demonstrate that focusing on differences in media markets *within* non-battleground states attenuates this correlation.

<<Insert Table A1A about Here>>

There is also a strong positive correlation between advertising volume in the 2000 campaign and whether an area was closely contested in the previous presidential election or was part of a competitive state in 2000. In Table A1b we report a series of regression models predicting the overall rating-adjusted volume of presidential advertising for the same areas as in Table A1a. (1996 Closeness is measured as .5 - | .5 - Republican Vote Share in 1996 |, higher values indicate more competitive areas.) Column 1 shows that advertising in 2000 was much higher in highly contested battleground states and, within those states, in areas that were close in 1996. As above, this correlation persists even if one accounts for state-specific differences ($p=0.104$ with a one-tailed test, Column 2). The results in Column 3 indicate, however, that focusing on differences within non-battleground states upsets this relationship.

<<Insert Table A1B about Here>>

1.3. Advertising and Reported Campaign Contact

In Table A1c we show that advertising volume in the 2000 campaign is correlated with reported campaign contact, both across (Column 1) and within (Column 2) states. If this occurred because

Republicans both purchased more television advertisements and had more aggressive field activities in certain areas (while Democrats did the same in others), then an analysis of the effects of the partisan balance of advertising that ignored field activity would inappropriately attribute to advertisements the effects of these similarly partisan field activities. If the correlation were negative, perhaps if campaigns substituted for weak field organizations with aggressive advertising, then it would understate the effects of television advertising. Absent a true account of the partisan nature of local campaign field activities *within individual states*, however, one cannot know ahead of time. (These concerns also apply to innovative work by Shaw [1999], who uses aggregate state advertising purchases and non-advertising campaign expenditures to discern the effects of advertising.)

Note too that, as we discuss in the paper's introduction, including reported campaign contact risks attributing to the effects of field campaigns differences across individuals in the targeting of and receptivity to those campaigns. Alternatively, if field activity were actually relatively constant throughout a state but television advertising stimulated individuals to misreport having been contacted by the campaign, then including reported contact in an analysis of the effects of advertising could lead to either understating or overstating the effects of advertising on behavior. For instance, if individuals who misremembered advertisements were most affected by the advertisements, it would lead to understating the effects of advertisements, but if they were less affected relative to those who did not misreport campaign contact, it would lead to overstating the effects of advertisements. The results reported in Column 3 also show that within non-battleground states, where the field campaigns are inactive, advertising volume is uncorrelated with reported campaign contact. (We thank D. Sunshine Hillygus for supplying the data analyzed in Table A1c. These data are not from the NAES and are therefore coded slightly

differently. |Partisanship| and Education range from 0 to 1. Full coding rules are supplied in the Stata .do files included in the replication archive.)

<<Insert Table A1C about Here>>

1.4. List of included Media Market and State Combinations

(* Indicates only used in cross-sectional analysis, ^ indicates only used in panel analysis.)

Albany-Schenectady-Troy (MA, NY); Albuquerque-Santa Fe (AZ, CO*); Atlanta (AL, GA, NC*); Austin (TX); Baltimore (MD); Birmingham-Anniston-Tuscaloosa (AL); Boston (MA); Buffalo (NY); Charleston-Huntington (WV); Charlotte (NC, SC); Chicago (IN); Cincinnati (IN); Dallas-Ft Worth (TX); Dayton (IN); Denver (CO, NE*); Fresno-Visalia (CA); Greensboro-High Point-Winston Salem (NC, VA); Greenville-Spartanburg-Asheville-Anderson (GA, NC, SC); Hartford-New Haven (CT); Houston (TX); Indianapolis (IN); Jacksonville-Brunswick (GA); Kansas City (KS); Los Angeles (CA); Louisville (IN); Mobile-Pensacola (AL); New York (CT, NJ, NY); Norfolk-Portsmouth-Newport News (NC, VA); Oklahoma City (OK); Omaha (NE*); Philadelphia (NJ); Phoenix (AZ); Pittsburgh (MD, WV); Providence-New Bedford (MA, RI^); Raleigh-Durham (NC, VA); Richmond-Petersburg (VA); Roanoke-Lynchburg (VA); Rochester NY (NY); Sacramento-Stockton-Modesto (CA); Salt Lake City (UT); San Antonio (TX); San Diego (CA); San Francisco-Oakland-San Jose (CA); Syracuse (NY); Tulsa (KS, OK); Washington DC-Hagerstown (MD, VA, WV); Wichita-Hutchinson (KS).

2. Appendix A2 (Data Codebook)

(Unless otherwise noted, data are from NAES. Other codings are describe in the paper. All coding rules are also available in the replication archive.)

Summary statistics for all model variables appear in Table A2.

<<Insert Table A2 about Here>>

2.1. Coding of Independent Variables not described in text or tables

Ideology (-2=very liberal, -1=somewhat liberal, 0=moderate, 1=somewhat conservative, 2=very conservative)

Party identification (-2=strong Democrat, -1=weak Democrat, -1=Independent leans Democrat, 0=Pure Independent, 1=Independent leans Republican, 1=weak Republican, 2=strong Republican)

Attend Church (4=more than once a week, .3=once a week, 2=once or twice a month, 1=few times a year, 0=never)

Income (1=less than 10K, 2=10K-15K, 3=15K-25K, 4=25K-35K, 5=35K-50K, 6=50-75K, 7=75K-100K, 8=100K-150K, 9=150K+, 10=Don't Know/Refused)

Income Don't Know/No Answer (1=10 on Income Scale. 0 otherwise)

Education (1=8th grade or less, 2=some high school, 3=high school degree, 4=vocational school, 5=some college, 6=associates degree, 7=college degree, 8=some graduate school, 9=graduate degree)

Competitive House Race (see Freedman, Franz, and Goldstein 2004, from Cook Report.)

2.2. Model Specification

2.2.1. Political Engagement Models (Table 1)

Dependent Variables *Interested in Presidential Campaign*: (0=not much, 1=somewhat, 2=very

much); *Intention to Vote*: (0=no, 1=yes)

Panel Models

DV=*F*(Prior DV categories as indicators, excluding one category + Presidential Advertisements GRPs/1000 + Non-presidential Advertising GRPs/1000 + Abs[Ideology] + Abs[Partisanship] + Attend Church + Union + Income + Income Don't Know/No Answer + Employed + Education + Hispanic + White + Female + Age + Age^2 + Competitive House Race + Days in Panel + Campaign Event Fixed Effects + Week of (Re)interview Fixed Effects + State Fixed Effects + e) [SEs clustered by media market]

Cross-Sectional Models

Same as panel model, excluding Prior DV, Days in Panel, and Campaign Event Fixed Effects.

2.2.2. Knowledge models (Table 2A)

Dependent Variables Respondents were asked to place candidates on these six issues: Allow Personal Social Security Accounts, Support School Vouchers, Fund Universal Health Care for Children, Expand Patient Rights to Sue HMOs, Candidate Placement on Ideology Scale, Which Candidate Favors Bigger Tax cut (Correct answers [listed in Table 2A]=1, all other responses=0)

Panel and Cross-sectional models Identical to engagement models

2.2.3. Reinforcement Models (Table 2B)

Dependent Variables Respondents were asked to express their positions on these six issues: Allow Personal Social Security Accounts, Support School Vouchers, Fund Universal Health Care for Children, Expand Patient Rights to Sue HMOs, Candidate Choice, Which Party Manages Economy Better. (Correct answers for partisans [listed in Table 2B]=1, all other responses=0)

Panel and Cross-sectional models Identical to engagement models, but restricted to those who

identified with or "leaned" toward one party.

2.2.4. Persuasion Models (Table 3)

Dependent Variables *Bush Favorability* and *Gore Favorability* (0 to 100 thermometer scales), *Bush Likeability* and *Gore Likeability* (13 point scale created from four items asking respondents how well the following traits characterized each candidate: caring, honest, inspiring, and knowledgeable; higher values indicate trait more appropriate), *Bush Vote Preference:* (1=would vote for Bush if election held today, 0=undecided, -1=would vote for Gore if election held today)

Panel models

DV=*F*(Prior DV categories as indicators, excluding one category + Pro Bush Advertisements GRPs/1000 + Pro Gore Advertisements GRPs/1000 + Non-presidential Advertising GRPs/1000 + Ideology + Partisanship + Attend Church + Union + Income + Income Don't Know/No Answer + Employed + Education + Hispanic + White + Female + Age + Age^2 + Competitive House Race + Days in Panel + Campaign Event Fixed Effects + Week of (Re)interview Fixed Effects + State Fixed Effects + e) [SEs clustered by media market]

Cross-Sectional Models

Same as panel model, excluding Prior DV, Days in Panel, and Campaign Event Fixed Effects.

2.2.5. Mechanism Analyses (Table 4, Panel data only)

Identical to persuasion models, but include additional variables described in text and Table 4.

2.2.6. Moderation Analyses (Table 5, Panel data only)

Identical to persuasion models, but include additional variables described in text and Table 5.

2.2.7. Persuasion in County Vote Returns (Table 6)

DV=*F*(Advertising Measures + State Fixed Effects + e) [SEs clustered by media market]

Table A1A: Bush Advertising Margin (GRPs/1000) July 1 to November 7, 2000
by Media Market and State Combination

	(1)	(2)	(3)
	Bush Advertising Margin (GRPs/1000) July 1 to November 7, 2000		
States included in analysis	All States	All States	Non-Battleground States
Fixed effects for state?	No	Yes	Yes
Republican Vote Share (Two-party) in 1996	5.046**	6.072	2.222
	(2.496)	(4.219)	(5.286)
Battleground State 2000	-0.394		
	(0.568)		
Constant	-1.521	-2.168	-0.074
	(1.203)	(2.100)	(2.682)
Observations	138	130	73
R-squared	0.03	0.02	0.00

OLS coefficients with robust (Huber/White) standard errors in parentheses. State indicators not reported to save space. See Appendix A1 for data coding and full model specification. Specifications with state fixed effects include all states with multiple media markets. * denotes p<.10, ** denotes p<.05, *** denotes p<.01, 2-tailed tests. R-squared excludes state effects.

Table A1B: Presidential Advertising Volume (GRPs/1000) July 1 to November 7, 2000
by Media Market and State Combination

	(1)	(2)	(3)
	Presidential Advertising Volume (GRPs/1000) July 1 to November 7, 2000		
States included in analysis	All States	All States	Non-Battleground States
Fixed effects for state?	No	Yes	Yes
Election Closeness in 1996	18.747*	29.394	7.888
	(10.562)	(23.255)	(24.980)
Battleground State 2000	16.282***		
	(1.935)		
Constant	-2.211	0.368	2.478
	(4.439)	(9.957)	(10.620)
Observations	138	130	73
R-squared	0.37	0.02	0.00

OLS coefficients with robust (Huber/White) standard errors in parentheses. State indicators not reported to save space. See Appendix A1 for data coding and full model specification. Specifications with state fixed effects include all states with multiple media markets. * denotes p<.10, ** denotes p<.05, *** denotes p<.01, 2-tailed tests. R-squared excludes state effects.

Table A1C: Reported Campaign Contact and Advertising Volume

	(1)	(2)	(3)
	Reported Campaign Contact		
States included in analysis	All States	All States	Non-Battleground States
Fixed effects for state?	No	Yes	Yes
Presidential Advertising Exposure (GRPs/1000), September 1 to interview date	0.013**	0.026***	-0.001
	(0.006)	(0.009)	(0.009)
Battleground State 2000	0.278**		
	(0.118)		
Absolute value of partisanship score	0.428***	0.491***	0.412***
	(0.095)	(0.093)	(0.102)
Union household (1=yes)	0.226***	0.237***	0.177**
	(0.069)	(0.074)	(0.076)
Education (Scale, 0 to 1)	0.566***	0.558***	0.480***
	(0.126)	(0.130)	(0.153)
Female (1=yes)	0.129**	0.114*	0.144*
	(0.057)	(0.061)	(0.077)
Black (1=yes)	-0.193*	-0.200	-0.003
	(0.113)	(0.126)	(0.144)
Hispanic (1=yes)	-0.303	-0.371*	-0.133
	(0.199)	(0.201)	(0.174)
Age (years)	0.011	0.014	0.002
	(0.011)	(0.012)	(0.015)
Age squared	0.000	0.000	0.000
	0.000	0.000	0.000
Constant	-2.090***	-1.524***	-2.100***
	(0.290)	(0.336)	(0.383)
Observations	1796	1688	971
Log-likelihood	-875.05	-824.8	-437.55

Probit coefficients with robust standard errors in parentheses, clustered by media market. State indicators not reported to save space. See Appendix A1 for data coding and full model specification. * denotes p<.10, ** denotes p<.05, *** denotes p<.01, 2-tailed tests.

Table A2: Summary Statistics for Model Variables

Panel	N	Mean	Std. Dev.	Min.	Max.
Pro-Bush Advertising Exposure (GRPs/1000)	4312	0.766	1.915	0	15.427
Pro-Gore Advertising Exposure (GRPs/1000)	4312	0.285	1.574	0	19.484
Presidential Advertising Exposure (GRPs/1000)	4312	1.112	3.208	0	34.923
Other Campaign Advertising Exposure (GRPs/1000)	4312	10.684	13.182	0	80.340
Absolute value ideology score	4312	0.691	0.651	0	2
Absolute value of partisanship score	4284	1.250	0.623	0	2
Party ID (Scale, +2 Strong R to -2 Strong D)	4284	-0.010	1.396	-2	2
Religious services attendance (Scale, 0 to 4)	4286	1.895	1.315	0	4
Union Household (1=yes)	4288	0.161	0.367	0	1
Income (Scale, 1 to 9, 10=DK/NA)	4312	5.763	2.369	1	10
Income Don't Know/No Answer	4312	0.090	0.287	0	1
Employed (1=yes)	4309	0.682	0.466	0	1
Education (Scale, 1 to 9)	4304	5.622	2.247	1	9
Hispanic (1=yes)	4292	0.064	0.244	0	1
White (1=yes)	4258	0.836	0.370	0	1
Female (1=yes)	4312	0.541	0.498	0	1
Age (years)	4292	48.518	15.990	18	96
Competitive House District (1=yes)	4312	0.076	0.266	0	1
Days in Panel	4312	48.941	44.660	2	186
Event Indicator: Rep. Convention	4312	0.262	0.440	0	1
Event Indicator: Dem. Convention	4312	0.390	0.488	0	1
Event Indicator: 1st debate	4312	0.547	0.498	0	1
Event Indicator: 2nd debate	4312	0.511	0.500	0	1
Event Indicator: 3rd debate	4312	0.547	0.498	0	1

Cross-Section	N	Mean	Std. Dev.	Min.	Max.
Pro-Bush Advertising Exposure (GRPs/1000)	8298	0.454	1.053	0	5.238
Pro-Gore Advertising Exposure (GRPs/1000)	8298	0.207	0.901	0	6.670
Presidential Advertising Exposure (GRPs/1000)	8298	0.693	1.796	0	11.358
Other Campaign Advertising Exposure (GRPs/1000)	8298	6.349	6.149	0	38.387
Absolute value ideology score	8298	0.688	0.653	0	2
Absolute value of partisanship score	8226	1.200	0.633	0	2
Party ID (Scale, +2 Strong R to -2 Strong D)	8226	-0.077	1.355	-2	2
Religious services attendance (Scale, 0 to 4)	8219	1.911	1.322	0	4
Union Household (1=yes)	8241	0.153	0.360	0	1
Income (Scale, 1 to 9, 10=DK/NA)	8298	5.750	2.446	1	10
Income Don't Know/No Answer	8298	0.106	0.308	0	1
Employed (1=yes)	8279	0.720	0.449	0	1
Education (Scale, 1 to 9)	8255	5.392	2.274	1	9
Hispanic (1=yes)	8237	0.081	0.274	0	1
White (1=yes)	8149	0.815	0.388	0	1
Female (1=yes)	8298	0.545	0.498	0	1
Age (years)	8225	45.903	16.301	18	96
Competitive House District (1=yes)	8298	0.087	0.281	0	1