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Political Research Quarterly published online 16 August 2010

DOI: 10.1177/1065912910367494

The online version of this article can be found at:

<http://prq.sagepub.com/content/early/2010/10/06/1065912910367494>

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Political Research Quarterly
XX(X) 1–12
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DOI: 10.1177/1065912910367494
http://prq.sagepub.com


Costas Panagopoulos¹ and Donald P. Green²

Abstract

Because Hispanic voters are seldom targeted for campaign communication and because they listen to radio at higher rates than non-Hispanics, Spanish-language radio represents an attractive venue for testing whether nonpartisan mass media messages can mobilize voters. We conducted a large-scale, national field experiment testing the impact of nonpartisan Spanish-language radio advertisements on Latino voter turnout in the 2006 congressional elections. The experiment, encompassing 206 congressional districts, indicates that nonpartisan radio ads represent an effective and cost-efficient means of raising Latino turnout in federal elections.

Keywords

field experiment, voter mobilization, radio advertising, Latino voting behavior, electoral campaigns, congressional elections

Hispanic¹ participation in elections lags behind that of non-Hispanic groups. In 2008, 54 percent of voting-eligible Hispanic citizens were registered to vote in the 2006 midterm elections, compared to 71 percent of non-Hispanic whites and 61 percent of African Americans (U.S. Census Bureau, File 2008). Among eligible voters, 32 percent of Hispanics voted in 2006, compared to 41 percent of African Americans and 52 percent of non-Hispanic whites. Even among registered voters, Hispanics voted at rates lower than non-Hispanic whites and African Americans in 2006: 60 percent compared to 72 and 67 percent, respectively (File 2008). Although racialized politics (de la Garza, Menchaca, and DeSipio 1994) or elections with competitive Latino candidates on the ballot (Barreto 2007), for example, may energize Hispanic voters, most studies conclude that in comparison to other ethnic groups, Hispanic voters are, on average, less likely to engage politically. Lower levels of Hispanic participation are seen across a broad range of political activities such as contributing to candidates, volunteering in campaigns, and contacting elected officials (Verba, Schlozman, and Brady 1995; Garcia and Sanchez 2008).

Several theories have been advanced to explain Hispanics' relatively low levels of electoral engagement. Low

rates of citizenship (Michelson 2005) and low socioeconomic status are said to account for part of the discrepancy in participation (Garcia and Sanchez 2008, 139). Other scholars point to low levels of political information and interest in public affairs (Garcia and Sanchez 2008, 140). Although surveys reveal relatively high levels of civic duty, political efficacy, and patriotism—attitudes typically associated with higher turnout levels—Hispanics vote with lower frequency than other ethnic groups (de la Garza, Falcon, and Garcia 1996). This remains a puzzle, given that many of the structural and institutional barriers—including onerous registration requirements, English-language-only ballots, and literacy tests—that inhibited Hispanic participation historically have been dismantled.

Another set of theories focuses on mobilization-centered explanations to account for relatively low levels of Hispanic electoral participation. Limited resources

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compel campaigns to target their mobilization efforts to segments of the population they perceive to be most receptive, often at the expense of Hispanics, who tend to have low propensities to vote (Panagopoulos and Wielhouwer 2008; Gershtenson 2003; Rosenstone and Hansen 1993).² Although some argue that campaigns are increasingly courting Hispanic voters (Segal 2002), several studies reveal Hispanics are routinely neglected by campaigns' mobilization efforts relative to other ethnic and racial groups (Leighley 2001; Verba, Schlozman, and Brady 1995; Ramirez 2005; Hero et al. 2000). In the 2000 presidential election, for example, Democrats and Republicans aired more than 275,000 advertising spots on television in the nation's top seventy-five media markets; but only 3,900 of these, or 1.4 percent, were Spanish-language or bilingual advertisements (Oberfield and Segal 2008). Notwithstanding anecdotal evidence that both major parties courted Latino voters aggressively in the 2004 presidential election (Segal 2004), the 2004 American National Election Studies (weighted) indicates that only 16 percent of Hispanics overall were contacted by the political parties in that election cycle, compared to 26 percent of blacks and 49 percent of whites. When the sample is restricted to battleground states in 2004 to account for strategic targeting in the most competitive states, the discrepancy persists: 26 percent of Hispanics in battleground states were contacted in 2004, compared to 49 percent of blacks and 64 percent of whites in these states.

Another possibility is that pervasive Spanish monolingualism in the Latino community inhibits participation (Ramirez 2007; Uhlaner, Cain, and Kiewiet 1989). Census data indicate that 28.1 million Americans five years of age and older spoke Spanish at home in 2000. Almost half of these people—13.8 million—did not speak English well or at all. Just 28 percent of respondents to the 2006 Latino National Survey indicated they could carry on a conversation “very” or “pretty” well in English (Latino National Survey 2006).

Given these figures, it is not surprising that Hispanics rely heavily on Spanish-language media. In 2004, the Pew Hispanic Media Study found that about two-thirds of the adult Hispanic population in the United States got at least some news from Spanish-language media and that Latinos regard Spanish-language media more favorably than English-language media (Suro 2004). The 2006 Latino National Survey found that 45.9 percent of respondents reported they relied more heavily on Spanish-language television, radio, and newspapers for information about public affairs and politics, compared to 29.3 percent who relied more on English-language sources (23.8 percent indicated they relied equally on both).³ Spanish-language media may provide a crucial connection to politics. Reminiscent of black radio during the civil rights movement in the 1960s (Barlow 1998), Spanish-language

radio evidently played a key role in marshalling Latino support and participation for the massive immigration demonstrations against House Resolution 4437 during the spring of 2006 (Ramirez 2007).

Spanish-language appeals to Hispanic radio listeners may be effective not simply because they overcome language barriers but also because they may activate ethnic identification. While Latinos in the United States typically pursue acculturation (learning and adapting selected cultural traits and patterns of the dominant society), many simultaneously espouse pluralism (selectively keeping and expressing cultural and other traits of their Latino heritage). Moreover, Spanish-language outreach may serve an important symbolic function, revealing to Hispanic voters that campaigns recognize their importance in the American electorate (Abrajano 2010). Subervi-Velez (2008a, 53) contends that “even highly acculturated Latinos would not be immune to the candidacy and messages of a Latino candidate, nor to the appeals that non-Latino candidates make to them as Latinos.” Similarly, Guernica (1982, 5) argues that “U.S. Hispanics are most receptive to media content in the Spanish language. Spanish programming elicits an emotional response from the Hispanic audience that is missing in English-language media.”

Our research examines whether Spanish-language media can be used to raise Hispanic voter turnout. In an attempt to reach the Hispanic audience that is ordinarily ignored by political campaigns, we broadcasted nonpartisan radio advertisements in 206 uncompetitive congressional districts shortly before the November 2006 elections. Our focus on mass media represents something of a departure from recent work on Hispanic voter mobilization. A series of experimental studies demonstrate that grassroots mobilization efforts targeting Hispanic voters can raise turnout, while more impersonal tactics such as direct mail seem ineffective (Michelson 2003, 2005, 2006; Ramirez 2005). But grassroots campaigns are difficult to organize, and political campaigns have rarely directed large-scale canvassing efforts at the Hispanic community. In light of these constraints, the question is whether alternative forms of voter mobilization, such as mass media campaigns, generate Hispanic votes in a cost-effective manner. Recent experimental studies that examine the impact of mass media advertising on political behavior find positive effects (Panagopoulos and Green 2008; Panagopoulos 2006; Green and Vavreck 2008), but these statistical results are equivocal, and they have not targeted ethnic audiences. This study builds upon that work to deploy field experimental techniques to examine the impact of delivering political messages via radio advertisements that target Hispanic voters.

This article is organized as follows. First, we describe the growth of Spanish-language media and provide an

overview of the literature on mass media's effects on voter participation. Next, we describe the key features of our experimental design: the procedure by which the experimental sample was created, the way in which observations were randomly assigned to treatment and control groups, and the content and timing of the radio campaign. We then explain the statistical models used to test the hypothesis that these radio ads enhance turnout. We conclude by commenting on the theoretical and policy implications of our results and by suggesting directions for future research.

Hispanics and Radio

Changing demographics have fueled new trends in the mass media environment. Latinos' annual purchasing power of more than \$960 billion has attracted the attention of advertisers. Spanish-language radio has experienced tremendous growth—a tenfold increase in the number of Spanish-language radio stations in the United States since 1980, to 730 in 2007 (Castaneda Paredes 2003). Whereas radio generally has struggled to maintain listeners in recent years, Spanish-language radio audiences are booming (Arbitron 2007). Exposure to radio is currently higher among Hispanics than non-Hispanic whites, African Americans, or Asians (Multicultural Marketing Equation Study 2007). According to the 2004 Pew Hispanic Media Study cited above, only television surpasses radio as the main source of news amongst Hispanics (Suro 2004). Of special appeal to advertisers is the fact that Spanish-language radio listeners regard radio as a reliable source of information. For those interested in votes rather than sales, the unique features of Spanish-language radio give it enormous mobilization potential. It reaches voters who listen intently and who receive few competing political messages (de la Garza, Brishetto, and Vaughan 1983, 25-26; Subervi-Velez 2008b, 370).

Despite its potential importance, radio's effects on Latino political behavior has received little attention from researchers (Ramirez 2007; Subervi-Velez 2008b). The dearth of research on Spanish-language radio reflects a lack of scholarly attention to the political effects of radio more generally.

Although the mass media and radio in particular have for decades attracted scholarly attention (e.g., Berelson, Lazarsfeld, and McPhee 1954), the number of studies that systematically evaluate the effects of radio on voting behavior is surprisingly small. Geer and Geer (2003, 70) focus on voter reactions to positive versus negative radio advertising and acknowledge that radio's effects on voting behavior remain largely unaddressed. Nonexperimental studies find that candidates who broadcast ads on radio tend to do better than those who do not (McCleneghan 1987), but these studies leave open the

question of whether radio advertising affects outcomes or merely represents a marker for better-funded and more professionalized campaigns. Descriptive studies find that candidates make widespread use of radio at both the federal and municipal levels (Herrnson 2000; Strachan 2003). Using survey data from two states with competitive Senate races in 2002, Overby and Barth (2006) argue that political advertisements broadcast on radio exert greater influence than do television ads because radio ads impart more information as a result of greater repetition and length. But again, this nonexperimental evidence may not show convincingly that radio advertising works best.

The first field experiments to test the impact of radio advertisements on voting behavior were conducted in the context of municipal elections in 2005 and 2006. Panagopoulos and Green (2008) find that radio ads have positive but statistically insignificant effects on turnout. Applying a similar experimental approach to a different electoral context and target audience, this study takes up the question of whether radio mobilized Hispanic voters in the 2006 congressional elections. Given how seldom Hispanic voters are targeted by campaign communications, we anticipate detecting effects that are as large as, or larger than, previous studies.

Experimental Design

Political scientists have increasingly turned to field experiments to isolate the impact of various activities on voting behavior (Gerber and Green 2000; Green and Gerber 2008). Experimentation is a research method in which units of observation are assigned randomly to treatment and control groups. The method corrects many of the deficiencies of observational approaches, which often rely on self-reported media exposure, and permits researchers to draw valid inferences about causal effects. Field experiments, as distinct from laboratory experiments, study the effects of an intervention within a naturalistic setting and strive to use unobtrusive outcome measures. In this case, the units of observation are congressional districts, the intervention is a radio campaign, and the dependent variable is voter turnout as recorded in public records. This section describes the experimental design.

Sample construction. The overall sample included the population of congressional races with contested incumbents seeking reelection in November 2006. To isolate the effect of the intervention by avoiding competing communications, we excluded competitive races.⁴ We also excluded districts in states for which data about prior history of Hispanic voters was unavailable from commercial data aggregators. Due to cost constraints, we also excluded congressional districts that were mainly located in the Los Angeles or New York City media markets.⁵

The remaining sample included a total of 206 congressional districts in twenty-eight states. As detailed below, a total of 36 districts were randomly selected to be treated, and the remaining districts became the control group. Appendix 1, available at <http://prq.sagepub.com/supplemental/>, provides a complete list of treatment and control districts.

Radio treatment. Districts in the treatment group were exposed to 60-second radio advertisements that presented a nonpartisan get-out-the-vote message to listeners. The size of the media buy was varied in each district so that districts were exposed to 50, 75, or 100 gross ratings points (GRPs) of radio advertising.⁶ To conserve money, purchase of 75 or 100 GRPs was restricted to less expensive media markets.⁷ Districts randomly assigned to the treatment group whose cost per point was less than \$50 were treated with 100 GRPs. Districts randomly assigned to the treatment group whose cost per point was greater than \$59, but less than \$80, were treated with 75 GRPs. All other treatment districts received 50 GRPs. This design implies that our statistical analysis must control for the cost per point of radio ads because interdistrict variation in the volume of GRPs is random within, but not across, strata. (In effect, we will be analyzing three distinct randomized experiments, each occurring within populations with different advertising rates.) Total media expenditures to conduct the experiment in the thirty-six treatment districts amounted to \$156,650.

Radio advertisements were broadcasted from October 31 to November 6, 2006. Details about the size of the radio media buy in each district included in the treatment group are presented in Table 1. Advertisements were professionally recorded and produced by a partnering political consulting and media firm. A media consulting firm selected the radio stations within each market, favoring stations that reached a broad Spanish-speaking audience. California's 3rd district, located mainly in the Sacramento radio market, is a typical example. A total of 75 GRPs were purchased to reach Hispanic voters in this district. Ads were broadcast to capitalize on peak audience times during the workweek, early morning traffic (6-10 a.m.) and afternoon rush hour (3-7 p.m.) as well as throughout the day (10 a.m.-3 p.m.). Additional ads were aired during the weekend. In this district, a total of 36 GRPs were aired on KRCX-FM (99.9), and 23 GRPs were aired on KTTA-FM (97.9), both popular stations with a regional Mexican format. Seventeen GRPs were aired on KXSE-FM (104.3), a popular station with a Spanish contemporary music hits format.⁸

Recognizing that radio market propagation zones and congressional district boundaries do not overlap perfectly, we pursued media buys in each district to maximize exposure to Hispanic voters. On average, 75.4 percent of

Table 1. Treatment Districts and Random Assignments of Gross Ratings Points (GRPs)

State	District	GRP buy
California	1	50
California	3	75
California	13	50
California	18	100
California	21	75
California	41	50
California	44	50
California	49	50
California	52	50
California	53	50
Florida	10	75
Florida	24	50
Georgia	6	75
Georgia	7	75
Georgia	11	75
Maryland	8	50
Missouri	5	100
Nevada	1	75
New Jersey	2	50
New Jersey	3	50
New Jersey	4	50
New Mexico	2	50
New Mexico	3	100
North Carolina	2	100
North Carolina	4	100
North Carolina	9	100
Pennsylvania	13	50
Rhode Island	1	100
Rhode Island	2	100
Texas	1	100
Texas	3	50
Texas	7	50
Texas	12	50
Texas	14	50
Utah	3	50
Virginia	11	50

Hispanics in the targeted congressional districts resided in the radio markets treated. In the analysis below, we note how the failure to treat all Hispanics in targeted districts leads us to slightly underestimate the average effects of the radio treatment on those who live within the broadcast range of Spanish-language stations.

Voters in each district were urged to vote on Election Day, and the ads included the names, incumbency status, and party affiliations of the major-party candidates in each race. It should be stressed that the intervention was strictly nonpartisan in nature. Using issues that were believed to be of interest to Hispanic listeners, the radio scripts were designed to pique voters' interest in the contest and provide the names of the candidates, but scripts made no evaluative remarks.⁹ For example, a

Spanish-language translation of the following sample script was used for Florida's 24th congressional district (see Appendix 2, at <http://prq.sagepub.com/supplemental/>, for Spanish-language version):

Many people don't realize how important the upcoming congressional election is. But think about it. Our representative in Congress deals with the biggest issues confronting our country: immigration, taxes, education, war—it's all part of what makes Congress so important.

Here's where you come in: voting. If you're a registered voter, you have an opportunity to shape the direction of your country by electing your member of Congress. On Tuesday, November 7th people in Florida's 24th congressional district will vote to decide whether to re-elect Republican Congressman Tom Feeney or to support his opponent Democrat Clint Curtis.

Take part in shaping your country's future. Be sure to vote on November 7th.

Paid for by the Institution for Social and Policy Studies, a nonpartisan organization that encourages citizens to participate in public affairs.

The ingredients of this intervention were drawn from a variety of different theoretical strands in the voter mobilization literature in an effort to maximize the message's effect on voter turnout. The message reminds listeners of the candidates' names and the issues at stake, consistent with the theory that voters must overcome information costs and feel a sense of policy benefit (Downs 1957). The message also provides notice of the upcoming election, consistent with the theory that registered voters are predisposed to participate and simply need a timely reminder to nudge them to the polls (Dale and Strauss 2009). The message is read in Spanish to provide an inclusive message to Hispanic voters and increase their sense of importance and efficacy (Morton 1991; Putnam 2001). Finally, the fact that the listener encounters a paid ad aired on mass media may signal the importance of the election (Cox and Munger 1989). In sum, our approach was to assess whether a maximal treatment produced a detectable effect before launching experiments to determine which specific elements (language, medium, issues) are responsible for this effect.

Statistical Models and Results

Random assignment ensures that, in advance of the experimental intervention, the treatment and control groups have the same expected levels of voter turnout. One by-product of random assignment is that the background

attributes of the observations in the experimental groups should be similarly distributed. This expectation is easily evaluated using regression. The dependent variable is the assigned level of GRPs, as described in Table 1; and the independent variables are the assignment strata, the levels of prior turnout among Hispanics in November 2002, Hispanic turnout in November 2004, the partisan affiliation of the incumbent, the proportion of registered voters who are Hispanic in each district, and whether there was a statewide race in November 2006. We also apply, as an analytic weight, the proportion of registered voters who are Hispanic in each district (see below). This regression permits an F -test of the significance of these covariates, which, as expected, is insignificant at conventional levels, $F(5,198) = 1.13, p = .35$. Repeating the same exercise using non-Hispanic turnout in past elections and weighting by non-Hispanic population also produces the expected nonsignificant result, $F(5,198) = 0.76, p = .58$. Even so, there appears to be a slight tendency for districts with higher voting rates to appear in the treatment group, and so the results below present specifications with and without covariates. Having confirmed that random assignment produced the expected degree of balance between treatment and control groups, we now estimate the effects of the experimental ad campaign on Hispanic turnout.

The dependent variable in our analyses is the change in Hispanic turnout between the November 2002 and November 2006 midterm elections for each congressional district. We partnered with professional list vendors to identify registered Hispanic voters using surname evaluation software. We then obtained verified voting history for Hispanics in each district. The vendor aggregated its individual-level data and provided us with district-level turnout percentages for current and past elections.¹⁰ Focusing on Hispanics who were registered in the 206 congressional districts included in our study, on average 34.5 percent voted in the November 2006 elections. These same voters turned out for the 2002 and 2004 elections at rates of 30.0 and 55.8 percent, respectively.

To estimate the effects of the radio buys (as measured in GRPs), linear regression was applied to two nested models. The first model (equation 1) includes radio GRPs and the two strata dummies as regressors to account for the fact that random assignment was conducted within price strata.

$$\begin{aligned} \text{HispanicTurnout}_{j,2006} - \text{HispanicTurnout}_{j,2002} = \\ \beta_0 + \beta_1 \text{RadioGRPs}_j + \beta_2 \text{ModerateCostStratum}_j + \\ \beta_3 \text{HighCostStratum}_j + u_j. \end{aligned} \quad (1)$$

Equation (1) expresses the change in Hispanic turnout share from 2002 to 2006 as a linear function of the treatment, covariates, and a disturbance term (u_j). Because the quantity of radio GRPs is randomly assigned conditional

on cost strata, it is statistically independent of the disturbance, which satisfies the key assumption necessary for unbiased causal inference.

Equation (2) is expanded to include Hispanic turnout in 2004, the party of the incumbent, whether there was a statewide race, and the proportion of registered voters in each district who are Hispanics as additional covariates.¹¹ The latter variable was measured based on voter records that appeared on the voter file as of 2006.

$$\begin{aligned} \text{HispanicTurnout}_{j,2006} - \text{HispanicTurnout}_{j,2002} = & \\ \beta_0 + \beta_1 \text{RadioGRPs}_j + \beta_2 \text{ModerateCostStratum}_j + & \\ \beta_3 \text{HighCostStratum}_j + \beta_4 \text{HispanicTurnout}_{j,2004} + & \quad (2) \\ \beta_5 \text{GOPIncumbent}_j + \beta_6 \text{StatewideRace}_j + & \\ \beta_7 \text{HispanicVotersPercent}_{j,2006} + u_j & \end{aligned}$$

It should be stressed that *both* equations (1) and (2) satisfy the requirements for unbiased estimation of the average treatment effect, β_1 . The inclusion of covariates is optional in the analysis of experimental data, and we do not presume to have a complete model with an exhaustive list of control variables. Our focus is solely on the estimation of the treatment effect, and the advantage of including covariates in equation (2) is that they potentially reduce the standard errors associated with the estimate of β_1 (Maxwell and Delaney 2004). Note that β_1 is a so-called “intent-to-treat” parameter, in that it represents the effect of assignment to receive radio ads, regardless of whether the voters who were targeted actually heard the ads.

When analyzing Hispanic turnout, we also apply as an analytic weight the percentage of registered voters in each district who are Hispanic. This weighting scheme allows us to estimate the treatment effect on the average Hispanic voter. Failure to weight the data would, in effect, vastly overweight the behavior of Hispanic voters in districts with few Hispanics and vastly underweight the behavior of Hispanics in districts with large Hispanic populations. Our weighting approach is meant to be analogous to an analysis of individual-level turnout based on clustered random assignment (Green and Vavreck 2008).

The results of the two weighted regressions are shown in the first and second columns of Table 2. The estimated effect of the radio ads is positive, which is consistent with the underlying hypothesis that these radio ads boost turnout. The estimates generated by equation (1) imply that a purchase of 100 GRPs of radio advertising raises turnout among Hispanics by 5.3 percentage points ($SE = 1.9$). The estimated treatment effect generated by equation (2) implies a boost in turnout of 4.3 percentage points ($SE = 1.7$). Both estimates are significant at $p < .01$ using a one-tailed test, which is justified in this application by the fact that our expectation (bolstered by prior experimental results) was that our ads would increase turnout.¹²

One check on the validity of this claim is to analyze the behavior of non-Hispanic voters. Market research studies show that very few non-Hispanics listen to Spanish-language radio (Arbitron 2007); we therefore expect no treatment effects among non-Hispanics. This robustness check involves modifying equations (1) and (2) to include the relevant current and past voting rates for non-Hispanic voters in each district, this time weighting by the proportion of non-Hispanic voters in each district. The results of the analysis, presented in the third and fourth columns of Table 2, demonstrate that Spanish-language radio had no impact whatsoever on levels of non-Hispanic turnout.

The contrast between Hispanic and non-Hispanic responses to the radio intervention is illustrated in Figures 1 and 2. These graphs show the partial relationship (controlling for cost-per-point strata, past voter turnout, and other covariates) between advertising GRPs and voter turnout for each ethnic group. Each circle represents a congressional district. To illustrate the analytic weights assigned to each observation, the size of each circle is proportional to the size of the relevant ethnic population of registered voters in each district. For Hispanics, these weights vary markedly from district to district; for non-Hispanics, populations are fairly similar across districts. The graphs show a strong relationship between GRPs and Hispanic turnout and no relationship whatsoever for non-Hispanic voters. In sum, only the targeted audience responded to the radio ads.

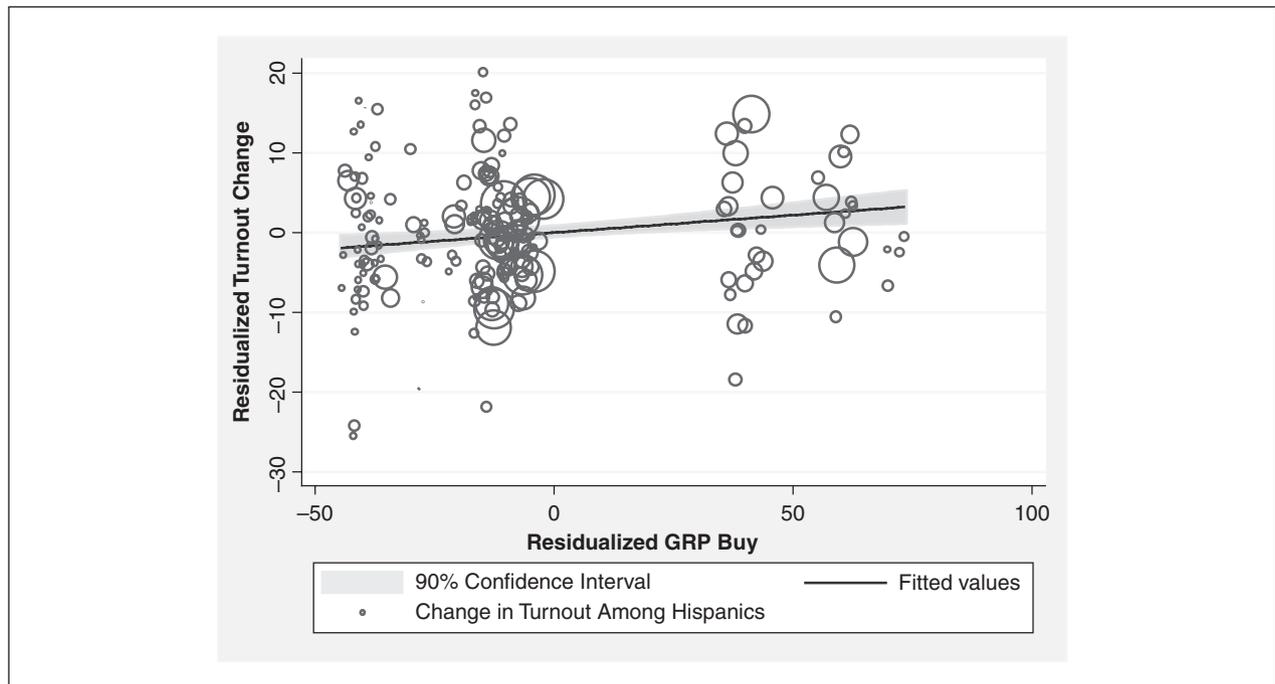
To appreciate the magnitude of the estimated effects, consider what they imply about the cost-effectiveness of radio advertising as a means of increasing Hispanic voter turnout. The smallest estimate implies that 100 GRPs increase turnout by 4.3 percentage points, suggesting that radio may be competitive with other get-out-the-vote tactics in terms of cost-effectiveness. Assuming the average congressional district has approximately 325,000 registered voters and that 7 percent of these voters are Hispanic (the average in our sample is 6.8 percent), then the average district includes 22,750 registered Hispanic voters. Raising turnout among these voters by 4.3 percentage points in an average district implies an increase of 978 votes per district. On the cost side of the equation, a purchase of 100 GRPs at an average rate of \$88 per point is an expenditure of \$8,800 per district. Paying \$8,800 to produce 978 votes—at \$9 per vote—is quite cost-effective by comparison to most conventionally used voter mobilization tactics. The typical direct-mail campaign generates votes at more than \$60 per vote; commercial phone banks often produce votes at a rate of more than \$100 per vote (Green and Gerber 2008; Cardy 2005). Even relatively efficient methods, such as door-to-door canvassing, produce votes at a rate of approximately \$30 per vote.

This cost-benefit calculation is based on the conservative assumption that a campaign follows our experimental

Table 2. Weighted Least Squares Estimates of the Effects of Radio Advertisements (in Gross Ratings Points) on Change in Voter Turnout Levels between 2002 and 2006

Independent variables	Hispanic voters		Non-Hispanic voters	
	Strata only	Strata and covariates	Strata only	Strata and covariates
Gross ratings points of radio ads (0-100)	0.053 (0.019)	0.043 (0.017)	-0.006 (0.025)	0.004 (0.025)
Turnout in 2004		0.056 (0.027)		0.041 (0.057)
Statewide race 2006		9.747 (3.223)		8.990 (2.346)
Incumbent Republican		-1.167 (0.986)		-0.287 (1.378)
Percentage registered voters, Hispanic		-0.170 (0.034)		
Percentage registered voters, non-Hispanic				0.067 (0.092)
Moderate cost per point stratum dummy	0.300 (1.888)	-0.323 (1.730)	-0.741 (1.683)	-1.107 (1.646)
High cost per point stratum dummy	-1.607 (1.528)	-0.183 (1.499)	0.625 (1.603)	-0.493 (1.756)
N	206	206	206	206
Root mean square of the residual (RMSE)	7.369	6.705	9.647	9.381
R ²	.07	.24	.00	.08

The dependent variable in the analyses is the change in percentage of registered Hispanic/non-Hispanic voters in each district who voted in November 2006 compared to November 2002. For the first two columns, data are weighted by the percentage of Hispanic registered voters in each congressional district. For the third and fourth columns, data are weighted by the percentage of non-Hispanic registered voters in each district.

**Figure 1.** Graphical representation of weighted least squares (WLS) regression results (full model for Hispanic voters, as shown in the second column of Table 2)

Sizes of the circles are proportional to the size of the Hispanic registered voter population in each congressional district. The results, which illustrate the regression analysis reported in the second column of Table 2, indicate that 100 gross ratings points (GRPs) translate into 4.3 percentage points' higher turnout.

template: it first targets a congressional district and then deploys ads on Spanish-language radio stations. This procedure is scientifically sound but an economically

inefficient way to target Hispanic voters; a better approach would be to select just those districts in which Spanish-language radio stations provide good coverage of the

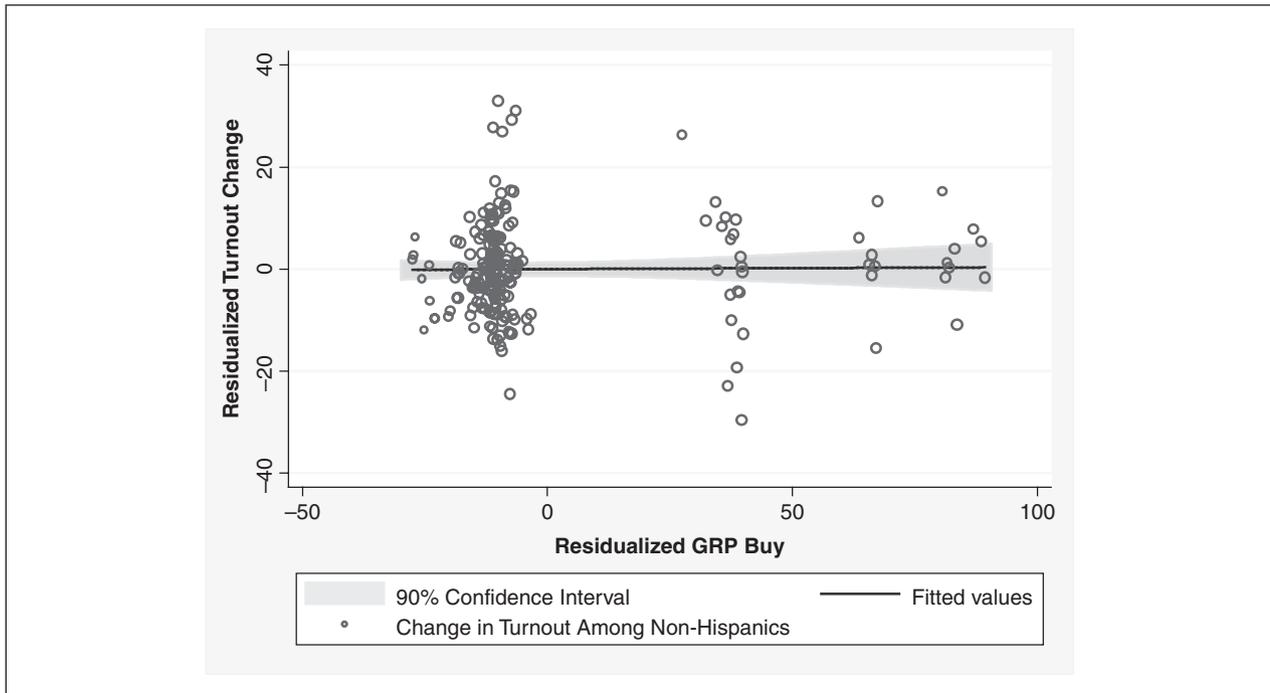


Figure 2. Graphical representation of weighted least squares (WLS) regression results (full model for non-Hispanic surname voters, as shown in the fourth column of Table 2)

Sizes of the circles are proportional to the size of the non-Hispanic surname registered voter population in each congressional district. The results, which illustrate the regression analysis reported in the fourth column of Table 2, indicate that 100 gross ratings points (GRPs) translate into 0.4 percentage points' higher turnout.

Hispanic population of the district. In three of the districts that we randomly assigned to the treatment group, we discovered that the available Spanish-language stations reached only a fraction of home addresses of Hispanic voters (although some may have heard the ads anyway en route to work, at work, or while away from home for other reasons). If anything, this kind of coverage problem causes us to understate the impact of our ads, because the analysis above focuses solely on the causal effect of assignment to treatment, regardless of whether people lived within range of the radio stations airing the ads. Correcting for this coverage issue, using methods that assume that those living outside the broadcast areas were unaffected by the ads (Angrist, Imbens, and Rubin 1996), makes the estimates in Table 2 larger.

Discussion and Conclusions

Although ethnic media represent an important source of political information for many ethnic groups (Ramirez 2007), they have seldom been the subject of experimental inquiry. The results of this study suggest that Spanish-language radio advertisements can have a profound effect on Latino voter turnout. Hispanics may be dismissed by campaigns as low-propensity voters, but evidently they

can be mobilized cost-effectively by voter outreach campaigns such as ours. Our results underscore the important distinction between the rate at which a group typically votes and the extent to which it can be mobilized by targeted appeals.

The current study reflects a limited exploitation of the full power of radio as a medium. Budgetary constraints, for example, restricted us to broadcasting a maximum of 100 GRPs in select localities. Future work could expand the reach and frequency of radio messages. Relative ease in radio ad production also makes it possible to vary message content in future experiments. Voters in the current study, for example, were exposed exclusively to nonpartisan get-out-the-vote messages. Additional research would allow us to investigate how the results may (or may not) change if the appeal were partisan in nature or involved not simply a direct encouragement to vote but rather a vignette that dramatizes the significance of the upcoming election (Green and Vavreck 2008).

From a theoretical standpoint, the results presented here have two important implications. First, they challenge the interpretive template that has been applied to field experiments on voter mobilization. Scholars such as Gerber and Green (2000) have argued that personal forms of voter mobilization such as door-to-door canvassing are

more effective than impersonal forms such as direct mail. Based on this line of reasoning, radio ads might be expected to be impersonal and therefore ineffective. The findings presented here present an anomaly for this hypothesis and invite a closer evaluation of the relevant differences among different forms of impersonal mobilization tactics: direct mail, e-mail, recorded phone calls, and messages conveyed by radio and television. One plausible explanation is that listeners are responsive to radio because they perceive it to be a more personal medium (Overby and Barth 2006). Second, and related, with the notable exception of messages conveyed via text messaging (Dale and Strauss 2009), reminders to vote—whether delivered via phone calls, leaflets, or e-mail—seem to have negligible effects on voter turnout (Green and Gerber 2008). Providing information on the upcoming election in the form of mailed voter guides also seems ineffective as a means of increasing turnout, even when they are mailed to ethnic subgroups in translated form (García Bedolla and Michelson 2009). Thus, the question arises as to why our advertisements, which combine a reminder and information, succeeded when similar content proved ineffective when communicated via other channels. It is conceivable that radio, or ethnic radio, in particular, makes these messages especially effective.

The findings presented here invite several lines of further research. One question is the relative effectiveness of Spanish- versus English-language appeals. This rather basic empirical question has received relatively little attention from experimental researchers. A second issue concerns the question of which listeners are most affected by radio appeals. One might suppose that low-propensity voters might benefit most from a reminder and encouragement to vote, but it is also possible that those with higher vote propensities are most receptive to messages of this kind. A related question concerns the electoral context. We focused our attention on low-salience congressional races, and the question remains whether the effects would be attenuated in a higher-salience election, where more is known about the candidates or whether, instead, the effects remain strong in areas where Hispanics are receiving relatively few Spanish-language campaign advertisements. Finally, our ads, while professionally produced, made little attempt to harness the creative potential of radio. It remains to be seen whether dramatizations of the sort that Green and Vavreck (2008) studied are more effective than simple narrative messages. A long list of questions remains for testing in lab, survey, and field settings, and the payoff is much larger than simply understanding the conditions under which radio mobilizes ethnic voters. One of the key questions that set in motion the first studies of radio more than a half

century ago remains important today: under what conditions does mass communication spur political action?

Acknowledgments

An earlier version of this article was presented at the 2008 annual meeting of the Midwest Political Science Association. The authors are grateful to the Institution for Social and Policy Studies at Yale University, which funded this research but bears no responsibility for the conclusions we draw. We also thank Bart Robbett, Kevin Berney, and Beau Picotte for invaluable assistance.

Declaration of Conflicting Interest

The author(s) declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research and/or authorship of this article: the Institution for Social and Policy Studies at Yale University funded this research.

Notes

1. Consistent with much of the literature in the field (Garcia and Sanchez 2008; Barreto 2007), we use the terms “Hispanic” and “Latino” interchangeably to describe persons living permanently in the United States whose ancestry can be traced to any of the Spanish-speaking countries of North, Central, or South America. This classification excludes persons of (European) Spanish and Brazilian descent.
2. Although experimental research suggests that those with midrange propensities to vote are the most responsive to mobilization (Arceneaux and Nickerson 2009), some non-experimental studies suggest low-propensity voters may actually be most responsive to mobilization (Stevens 2008).
3. Question wording: “For information about public affairs and politics, would you say you rely more heavily on Spanish-language television, radio, and newspapers, or on English-language TV, radio, and newspapers?”
4. Specifically, we excluded open seat contests and races classified as “toss-ups” by the Cook Political Report on October 18, 2006.
5. These sample restrictions do not affect the internal validity of our results but potentially limit external validity. We suspect that our intervention would be less effective in competitive districts, where competing campaign messages abound. When we estimate the interaction between the treatment effect (see below) and the actual vote margin in 2006, we find the expected positive coefficient (the bigger the victory, the bigger the radio effect) that falls well short of statistical significance.
6. There are 286 Arbitron Metro Markets in the United States corresponding to cities (or urban regions) of various sizes.

Reaching the audience in each market is measured in ratings points, with 1 ratings point being equal to 1 percent of the number of total listeners living in the market. When running an advertising campaign, summing the number of points for all ads aired over the duration of the campaign determines the gross ratings points (GRPs) that have been achieved. Theoretically, 100 GRPs means 100 percent of the market was exposed to the ad. But as some people may hear the spot multiple times and others not at all, advertisers have to measure other factors: *reach* (the percentage of the market that has heard the spot one or more times) and *frequency* (the number of times the audience has heard the spot). Thus, 100 GRPs can also mean 50 percent of the audience heard the spot an average of 2 times, or 25 percent heard it 4 times, or any other combination that equals 100. Advertisers also have the option to target advertising buys to specific populations. In this study, we target Hispanics. The radio advertisements we purchased reflect the share of the overall Hispanic audiences in the respective radio markets and not the general audience. Thus, 100 GRPs implies 100 percent of Hispanics in the radio market were exposed to the ad once, or 50 percent were exposed twice, and so forth. Because radio markets do not coincide with congressional district boundaries, there are a few instances where our nominal Hispanic GRPs exceeded our actual coverage.

7. The cost of broadcast Spanish-language radio advertisements targeting Hispanics in the various districts ranged from \$20 per point in the Tyler-Longview market in Texas to \$300 per point in the Miami, Florida, market. The average cost per point in the sample of districts was \$88.
8. Details about the ads purchased in each market are available from the authors upon request.
9. The 2006 Latino National Survey found that the four most important issues for Hispanics in the 2006 election cycle were (in order): the Iraq War, the economy (including jobs, unemployment, and, presumably, taxes), immigration, and education.
10. We lack access to the individual-level data that would enable us to examine how subgroups of Hispanics of varying baseline propensities to vote responded to our intervention.
11. The dummy variable marking statewide races is meant to take into account the mobilizing efforts of statewide campaigns or elevated interest in the election due to a statewide race. At the suggestion of a reader of an earlier version of this article, we included as additional covariates whether the challenger or incumbent was Hispanic. These covariates had no appreciable effect on our results. These results, along with other robustness checks and a replication data set, will be available at <http://vote.research.yale.edu/replication.html>.
12. As a robustness check, we analyze our experimental data using randomization inference. This procedure, which uses all possible random assignments to form a sampling distribution under the null hypothesis of no effect, produces more conservative p -values. Without covariates, $p = .063$; and with covariates, $p = .092$. These p -values fall to .020 and .047 when the number of GRPs is replaced by a dummy variable marking whether a district was assigned to the treatment group.

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