

Election Day Vote Centers and Voter Turnout

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Abstract

Election Day vote centers are non-precinct based locations for voting on Election Day. The sites are fewer in number than precinct-voting stations, centrally located to major population centers (rather than distributed among many residential locations), and rely on county-wide voter registration databases accessed by electronic voting machines. Voters in the voting jurisdiction (usually a county) are provided ballots appropriate to their voter registration address. It is thought that the use of voting centers on Election Day will increase voter turnout by reducing the cost and/or inconvenience associated with voting at traditional precinct locations.

Since 2003 Election Day voters in Larimer County, Colorado have balloted at one of 32 vote centers. Precinct voting in Larimer ended in 2003. To test our hypothesis that Election Day Vote Centers positively influence turnout among non-habitual voters, we have collected individual vote histories on all voters in Larimer and a control county (i.e., Weld, Colorado) that uses precinct voting on Election Day for the years 1992-2003. A random sample of voters (N=10,000) is selected from each county and matched on three variables including age, gender and, vote history. We test our main hypothesis with this matched sample of voters.

Election Day Vote Centers

We have assumed that voting is a costless act, but this assumption is self-contradictory because every act takes time. In fact, time is a principal cost of voting: time to register, to discover what parties are running, to deliberate, to go to the polls, and to mark the ballot. Since time is a scarce resource, voting is inherently costly (Anthony Downs, An Economic Theory of Democracy 1957:265)

Efforts to increase voter turnout through changes in the administration of elections have focused on several reforms including: Election Day voter registration, relaxed absentee voting, by mail and in-person early voting. These efforts have not significantly increased voter turnout. Why? Fundamental to all of these reforms is the belief that the costs of voting outweigh any measurable benefit individuals obtain from either voting and/or the outcomes from voting. Teixeira (1992) has critiqued this perspective on electoral reform suggesting that costs of voting are exaggerated and that declining voter turnout reflects an increasing lack of perceived benefits from voting and political participation in general. Moreover, the public's declining interest in politics is matched by a reduced effort on the part of candidates and parties to engage the larger electorate in political campaigns, focusing their efforts on smaller more homogeneous base of core partisan supporters.

In this paper we offer a slightly different perspective on the costs of voting. Like Downs (1957) we believe the cost of voting is largely tied to the time and inconvenience associated with the act of voting. We suggest that previous electoral reforms may not have effectively addressed this aspect of the cost of voting and thus failed to adequately remedy the 'inconvenience' of voting. We examine an alternative conceptualization of the cost voting with a new electoral

reform, Election Day Vote Centers (EDVC). EDVC is partially designed to reduce the inconvenience and inaccessibility of Election Day voting.

The costs of voting and previous electoral reform

Previous research has identified four major influences on individual decisions to participate – social and demographic traits, psychological resources, electoral rules, and the mobilization efforts of parties and their candidates (Leighley 1995). Electoral reforms directed at increasing voter participation have centered on simplifying voter registration and increasing opportunities to vote (e.g., voting by mail and in-person early voting). The rationale underlying early voting and related electoral reforms (e.g., Motor Voter and voting by mail) has been the belief that providing more opportunities to vote (i.e., the number of days, hours or sites at which to vote) increases voter participation.

Reducing the number of days prior to an election in which voters can register to vote and allowing individuals to register to vote when renewing their driver's licenses or at the polls on election day has increased voter registration (Wolfinger and Rosenstone 1980; Squire, Wolfinger and Glass, 1987). But studies of the direct effect of voter registration and balloting reforms on voter turnout suggest minimal responses on the part of the electorate. National legislation (i.e., National Voter Registration Act of 1993) to enable individuals to register to vote when they renew or obtain a driver's license has had only a modest impact on voter turnout (Knack 1995; Rhine 1996).

Liberalized voting by mail (Berinsky, Burns and Traugott 2001) and in-person early voting (Stein and Garcia-Monet 1997; Stein 1998) were also found to have an insignificant or marginal effect on increasing the likelihood an individual will vote.

Empirical evidence regarding who is affected by contemporary electoral reforms is either mixed or weak. Nagler (1991: 1402) concludes that restrictive registration laws do not deter poorly-educated individuals from registering any more than the highly-educated. This implies that liberalizing these laws may increase registration overall, but will not equalize participation across classes. Conclusions regarding election reforms beyond registration are similar. Stein (1998) reports that resource-poor voters did not benefit from the adoption of in-person early voting, while Berinsky et al., (2001) find that voting by mail has little effect on the “resource-poor” (2001:178). Stein (1998) also reports that early voters appear to be more partisan, ideological, interested in politics, and *disproportionately likely to have voted in the past*. Simply put, electoral reforms have only been used by those who otherwise would have been most likely to vote without them.

The modest impact electoral reforms have had on voter participation remains partially unexplained. Teixeira (1992) suggests an important obstacle to voter participation is voter motivation and interest in the political process. “This suggests that attempts to reconnect American to politics should focus especially on ways to encourage psychological involvement in politics and promote a sense that the government is responsive to the ordinary citizen (1992:156).” We offer a slightly different perspective on the cost of voting that might provide a less daunting but potentially efficacious remedy for increasing voter turnout.

The cost of access and inconvenience

The major costs of voting include the resources and time that must be expended to vote. These resources, including time, are scarce and are competed for by other demands and preferences. The 2005 Current Population Survey asked a sample of U.S. citizens why they did not vote in the 2005 Presidential election. The modal response (20%) was ‘too busy, conflicting

schedule.” For most eligible voters voting on a specific day competes unsuccessfully for our time with other demands and preferences. Electoral reforms that focus on lessening the competition between voting on Election Day and other demands and preferences for our time fail, however, to significantly enhance the likelihood voters will ballot. Why? Are there other ways to conceptualize the costs of voting that operate to obstruct voting?

Another obstacle to voting is the inconvenience and inaccessibility of voting opportunities on either Election Day or before. These obstacles or nuisances include: Waiting in long lines to vote; inaccessible voting places (distance to travel, limited parking, etc.) and unfamiliar voting technology. There is considerable empirical evidence to suggest that these costs of voting have a significant negative impact on the likelihood of voting.

Gimpel and Schuknecht (2003) find that the geographical accessibility of polling places has a significant and independent effect on likelihood individuals will vote: “even after controlling for variables that account for the motivation, information and resource levels of local precinct populations, we find that accessibility does make a significant difference to turnout (2003:471).” Dyck and Gimpel (2005) extend this same finding for Election Day voting to the likelihood that individuals will cast an absentee ball by mail, or going to an early-voting site before Election Day. Haspel and Knotts (2005) report that voting is extremely sensitive to distance between the voter’s residence and polling place. They find “small differences in distance from the polls can have a significant impact on voter turnout (2005:560).” Moreover, they find that the likelihood of voting is more sensitive to the distance from the one’s polling place is than information and familiarity about where one’s voting place is located. Moreover, Haspel and Knots find that turnout increases after moving a voter’s polling place through the consolidation of polling places. The authors explain that “it appears that the gain in turnout that

accrues from splitting precincts outweigh the loss due to any confusion over the location of the polling place (2005:569),” in part because distance from the new/consolidated polling place was reduced.

Brady and McNulty’s study of Los Angeles County’s precinct consolidation in 2003 confirms Haspel and Knotts finding. “The change in polling place location has two effects: a transportation effect resulting from the change in distance to the polling place a disruption effect resulting from the information required to find a new polling place (Brady and McNulty 2004:40).” These two effects are roughly equal for the voter who had experience an increased distance of about a mile.

Together these findings suggest that the convenience and accessibility of a voter’s Election Day voting place is a significant incentive to voting. If this assessment is true could Election Day balloting be organized and administered to eliminate this and other obstacles to voting and thus enhance voter turnout? The popularity of early voting (Southwell and Burchett 2000) and other forms of convenience voting (i.e., voting by mail) suggests that many voters prefer the convenience afforded by early voting i.e., accessible voting locations, short-lines and assistance in using new or unfamiliar voting technologies. There is some reason to believe that voter turnout might marginally increase if we imported these ‘conveniences’ to Election Day balloting.

Evidence of the effects of Election Day Voting Centers

In 2003 Larimer County, Colorado replaced precinct based polling places with Election Day Voting Centers (EDVC). Election Day Voting Centers are non-precinct based locations for voting. The sites are fewer in number than precinct-voting stations, centrally located to major population centers (rather than distributed among many residential locations), and rely on

county-wide voter registration databases accessed by electronic voting machines. Voters in the voting jurisdiction (usually a county) are provided ballots appropriate to their voter registration address.

Election Voting Centers are often located in places more central to the both residential and work place locations, the latter often more accessible and convenient to voters as they commute to work, school, shopping and other activities. Voting centers are equipped for electronic voting machines and staffed with personnel to assist voters. Essentially Election Day Voting Centers operate the same way early voting does in many states, except it occurs on Election Day.

To date Larimer County, Colorado is the only county in the United States to use employ Election Day Voting Centers. Prior to 2003 election centers were used only for early voting in Larimer County. Though Election Day Voting Centers have only be in operation for a relatively short period of time there is sufficient experience with this mode of balloting for us to attempt a preliminary analysis of the impact of Election Day Vote Centers on voter turnout in Larimer County.

An aggregate level analysis Election Day Vote Centers

Figure 1 reports voter turnout rates between 1990 and the 2004 for low turnout primary elections in Larimer County and adjacent Weld County, where Election Day Voting Centers do not exist. By a consistent margin voter turnout was higher in Weld than Larimer County between 1990 and 2000. Between 2000 and 2005 turnout in Larimer County increased at a fast rate and surpassed turnout in Weld County in 2004. Note that both Larimer and Weld counties experienced a significant increase in voter turnout for primary elections after 2000 and continuing through 2003 when Election Day Vote Centers were adopted in Larimer. Turnout in

Larimer County, however, increased at a faster rate than in Weld County after Larimer County's adoption of Election Day Vote Centers in 2003. How much of the increase in turnout in Larimer County can be attributed to Election Day voting centers?

[Figure 1 about here]

An individual level analysis of Election Day Vote Centers

The aggregate level findings reported in figure 1 suggest that Election Day Vote Centers in Larimer county Colorado may account for the increase in voter turnout in Larimer County after 2002. To further assess the impact of Election Day Vote Centers on turnout we looked at individual level data in order to better control for potentially confounding variables. The results of the analyses are consistent with the findings reported above. Adjusting for potentially confounding variables, there is evidence at the individual level that Election Day Voting Centers have led to higher turnout in elections in Larimer county than would have otherwise been the case.

In order to control for potentially confounding variables we analyze data on individual registered voters in Larimer and Weld counties from 1992 to 2004.¹ The data files included all registered voters in the two counties, their age, gender, registration date, and vote history. The dependent variable of interest is whether or not an individual voted in an election. The main treatment of interest is whether or not the election used Election Day Voting Centers, and the anticipated effect is to increase the probability that an individual votes. The statistical model used to estimate the impact of Election Day Voting Centers on the probability of turnout is a logit model (Greene 2002).

¹ We are very grateful to Bob Nelson and Voter Contact Services for providing us access to their data used in this analysis.

Several different models were specified in order to control for potentially confounding variables and to assess the effect of Election Day Voting Centers. The results reported below use data from a matched sample of treated voters in Larimer county and control observations drawn from Weld. The results were very similar to those obtained using simple random samples of registered voters in Larimer and Weld counties without matching.

The observable control variables in the data are age, gender, and previous voting history. These variables have been shown to be related to individual turnout in previous studies of electoral participation discussed above. Females have been shown to be slightly more likely to turnout than men. Individuals are also more likely to vote the older they are, and there is also evidence that voting may be habit forming as individuals that have voted previously have been shown to be more likely to vote in subsequent elections in quasi-experimental designs (Gerber, Green and Shachar 2003).

To control for these factors, discrete variables were created to capture whether or not the individual is female, their age at the date of the election, and the number of previous elections in which they voted.² These variables were created for all voters in Larimer and Weld counties. Due to the size of the data files (each contain data on over 100,000 registered voters and over 20 elections per voter) and computational limitations, simple random samples of voters were drawn from the data. We first draw a sample of 3000 registered voters from Larimer County, with histories on three elections using Election Day Voting Centers (2003 coordinated, 2004 primary, and 2004 general elections).

A sample of 10,000 potential controls were drawn from Weld county with histories on elections from 1992 to 2004. The individual-election observations in Larimer were then exactly

² This variable is imperfectly measured as individuals that had voted in elections outside of Larimer county would not have those vote histories recorded in the data and would thus have their histories under reported in the data.

matched with a control observation in Weld on the basis of the age, gender, and habit covariates. For example, a 38-year-old female that had voted in 5 previous elections in Weld was matched with a 38-year-old female in Larimer that had voted in 5 previous elections. In the event that multiple controls matched, one was randomly selected. In the event that multiple treated observations had identical covariate values, they were matched to separate control observations. Out of the 3000 initial individual-election observations using Election Day Vote Centers, 2872 (> 95%) were exactly matched to a control observation without election day centers.³

Using data from the matched sample, we performed several analyses that suggest a positive relationship between the use of Election Day Vote Centers and an increased probability of individual turnout. We also conduct an analysis that explores how Election Day Vote Centers can potentially interact with habit forming consequences of electoral participation to create long term positive effects on participation as well.

Table 1 reports the number of treated and control subjects that voted and those that did not. The top numbers are the absolute number of registered voters in the sample falling in that cell, and the bottom number is the relative frequency of that cell within columns. The bottom numbers are the results of Fisher's exact test of the no-effect hypothesis. From this test, we can infer that Election Day Vote Centers have a positive effect on the individual turnout, as it is unlikely that the results are purely an artifact of chance variation.

[Table 1 about here]

We also estimate several logistic models of whether or not an individual voted in an election. The first model only includes a constant and parameter for the treatment variable in the

³ Matched sample designs have been shown to better account for observable confounding factors and more accurate estimates of causal effects. Matched sample designs are also less sensitive to model specification than statistical models that only include control variables and could potentially compare groups of observation that differ not just in whether or not they received a treatment of interest (Rosenbaum 2002, Rosenbaum and Rubin 1983).

linear component of the logit function. The estimates appear in the first column of Table 2. From this model, we can see that Election Day Vote Centers seem to be positively related to turnout. The other two columns in Table 2 report estimates from logit models with a greater number of independent variables. The second model includes variables for age, gender, and vote history as well as the treatment. These results also suggest a positive relationship between election centers and higher turnout.

The last column in the table shows estimates from a model that includes an interaction term between habit and treatment. We anticipate that the effect of Election Day Vote Centers might be greatest for new or intermittent voters, as highly regular voters might be more likely to participate regardless of vote centers or precinct locations on election day. The multiplicative interaction term is specified as habit multiplied by treatment (Habit*Treatment), so the interaction term is expected to be negative. We can see from the last column in Table 2 that younger and more intermittent voters are more likely to vote with Election Day Vote Centers. The overall effect of voting centers remains positive and significant, and the effect might be greater with less regular voters.⁴

While hypothesis tests of regression coefficients are common in social science research, significance testing has recently been criticized by some researchers. One criticism is that statistical significance typically involves distinguishing an effect from zero, which can vary depending on sample size and does not necessarily provide much useful information about the actual impact of the treatment of interest. It might suggest that the effect of a variable is positive or negative, but does not necessarily provide any information as to the magnitude of the variable's impact, which might be of importance to researchers and policy makers (Gill 1999, King, Tomz, and Wattenburg 2000).

⁴ A similar interaction term with age was also negative and significant.

To provide a substantive interpretation of these results, we calculated the predicted probabilities that an individual votes under treatment and control conditions and subtracted the two.⁵ The results reported in Table 3 show the effect of vote centers on the probability that registered voters turnout in a given election. The upper and lower bounds in the table show the range where there is a 95% probability of containing the true difference between treatment and control conditions. Based on these results, there is thus a 95% probability that the effect of election day voting centers is to increase turnout (among registered voters) by 2.5 to 7.1%.⁶

The substantive effects of Election Day Vote Centers suggest that the treatment has a non-negligible impact on the probability that a registered voter turns out. The change in the probability of participation from precinct polling locations to election day voting centers is greater than increasing an individuals' age by 15 years, and nearly as great if they had participated in two additional previous elections. That the effect is stronger for newer and more intermittent voters also suggests that voting centers might be particularly useful when combined with voter registration efforts. As voter registration drives are likely to bring in younger and less experienced voters, the use of election day voting centers might make it more likely for those individuals to turn out in an election. Even without voter registration efforts, the impact of election centers seems significant when looking at the anticipated change in turnout in absolute terms. Table 3 shows the anticipated difference in absolute turnout in elections with and without

⁵ The estimates used to calculate these effects were taken from model two. The covariate values used to calculate substantive effects were taken from the matched sample data, so that lower, median, and upper values were calculated for each observation using those covariate values and the simulated parameters, which were then summarized over the data set. The results in the table are median values from these calculations.

⁶ Technically, the marginal posterior probability distributions can only be calculated by explicitly including prior information into the statistical model, according to Bayes' rule. However, typical applications of Bayesian statistics in the social sciences assume diffuse prior distributions that are overwhelmed by moderately sized data sets, leading to almost numerically identical estimates. In order to conduct hypothesis tests of maximum likelihood estimates, it is assumed that the estimates were derived from an infinite amount of data as the MLE estimates only follow a known distribution in the limit. The assumption not only entails a known distribution of the likelihood estimates (which is useful for hypothesis testing), but also that any prior information would be overwhelmed by the data leading to the same numerical results that would be obtained by a Bayesian model. In this study, a Bayesian logit model with diffuse normal priors returned very similar results.

voting centers in Weld county. From this table, we can see that in Weld county there is a 95% probability that election centers would lead to an increase in turnout of between 2900 and 8200 more voters at the polls, with no change in registration.

[Table 3 about here]

A simulation of voter turnout under cumulative use of Election Day Voter Centers

Given the finding in previous research that voting can be habit forming, election centers might have a longer term effect of increasing turnout as well. The previous analysis suggests that Election Day Vote Centers might have a short term effect of increasing turnout. If individuals are more likely to vote in the upcoming election, they are also more likely to have more electoral experience in subsequent elections making them even more likely to vote. There might thus be a long term effect of Election Day Vote Centers of increasing turnout as well. Election Day Vote Centers have not been in place long enough to study their effects over time, however. To explore this question, we used the results of the statistical model to simulate voter turnout in treatment and control conditions over a series of elections.

The computer simulation starts with a population of 1000 18 year olds (52% female, consistent with the data) with no voting experience and tracks turnout levels as the populations age and gain experience during 43 years until the population reaches age 60. For each year, levels of participation are recorded and vary depending on the probability that the individuals vote. Figure 2 shows the levels of turnout for treatment and control conditions over time. We can see from the simulation that there seems to be a long term effect of Election Day Vote Centers such that the gap between the treatment and control conditions gradually widens until there is a difference of over .15 when the populations are around 45 years old. After that point, there is a gradual decrease that probably reflects the fact that as the population ages the

individuals are more likely to vote regardless of the treatment. While there is a slight decline in the effect of voting centers as the population ages, the effect is still positive and appears to be significant.

[Figure 2 about here]

The analyses presented in this essay suggest that Election Day Vote Centers might be an effective way of encouraging electoral participation. The findings seem to be robust to model specification, as the estimates were replicated using different models, with different samples of data. Table 4 shows the different coefficient estimates for models using data from a random sample of 5000 registered voters in Larimer and Weld counties without matching. From these data, we see that the coefficient estimates are similar to those obtained with the matched sample. A further analysis was done using only a random sample of registered voters from Larimer to see the effect of Election Day Vote Centers. The estimates from the statistical model appear in Table 5, and are also similar to those from the matched sample.

Summary and conclusions

The effect of Election Day Vote Centers seems to have a positive and significant effect on the individuals' electoral participation. The positive effect of Election Day Vote Centers is consistent across different model specifications and different samples of registered voters from Larimer and Weld counties. While the results are encouraging and suggest that the use of election day voting centers might facilitate individual electoral participation, the results cannot be taken as the conclusive word on the impact of vote centers obviating the need for future research. Inferences based on observational data can potentially be affected by hidden biases that cannot be accounted for with the available data. The data used in these analyses are also taken from two counties in Colorado. If there are unique conditions in those counties not universally

found elsewhere, then Election Day Vote Centers could potentially have a different effect than seems to be the case in Larimer. The number of elections using voting centers also covers a narrow time span, making it more difficult to study any potential long term effects of the use of election day voting centers, and also how vote centers might interact with registration drives as there is further evidence that vote centers matter more for younger and less experienced voters. Yet there are potential advantages to using Election Day Vote Centers that seem to increase individual electoral participation based on the available empirical evidence.

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Figure 1: Turnout in Larimer and Weld Counties: 1975-2005

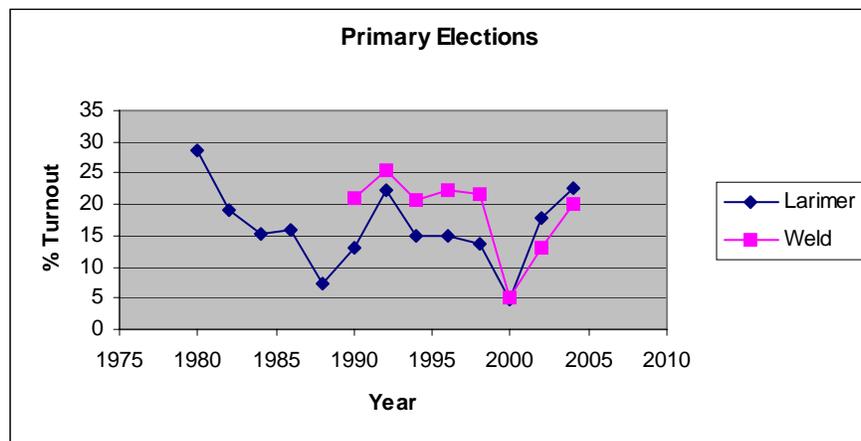


Table 1: Voter Turnout by Treatment

Treatment	Turnout		Total
	Did not Vote	Voted	
Precinct	1791	1081	2872
	62.36%	37.64%	100%
Election Day Vote Center	1643	1229	2872
	57.21%	42.79%	100%
Total	3434	2310	5744
	59.78%	40.22%	100%

Fisher's exact = .000

Table 2: Logit estimates using matched sample with 95% confidence intervals

Variable	Model 1			Model 2			Model 3		
	Coeff. (S.E.)	Low	High	Coeff. (S.E.)	Low	High	Coeff. (S.E.)	Low	High
Constant	-.505 (.04)	-.58	-.43	-1.91 (.097)	-2.1	-1.72	-2.15 (.10)	-2.35	-1.94
Treatment	.215 (.05)	.11	.32	.273 (.06)	.154	.392	.697 (.08)	.534	.859
Female				.015 (.06)	-.104	.135	.016 (.06)	-.104	.135
Age				.014 (.002)	.009	.02	.014 (.002)	.01	.018
Habit				.171 (.007)	.157	.185	.227 (.01)	.205	.248
Habit*Treat							-.10 (.01)	-.127	-.075
N	5744			5744			5744		
R ²	.002			.168			.178		

Table 3: Impact of Election Day Vote Centers

	Lower 2.5%	Median	Upper 97.5%
Percent change in turnout	+ .025	+ .047	+ .071
Absolute change in turnout	+ 2905	+ 5462	+ 8252

(for Weld)

Figure 2

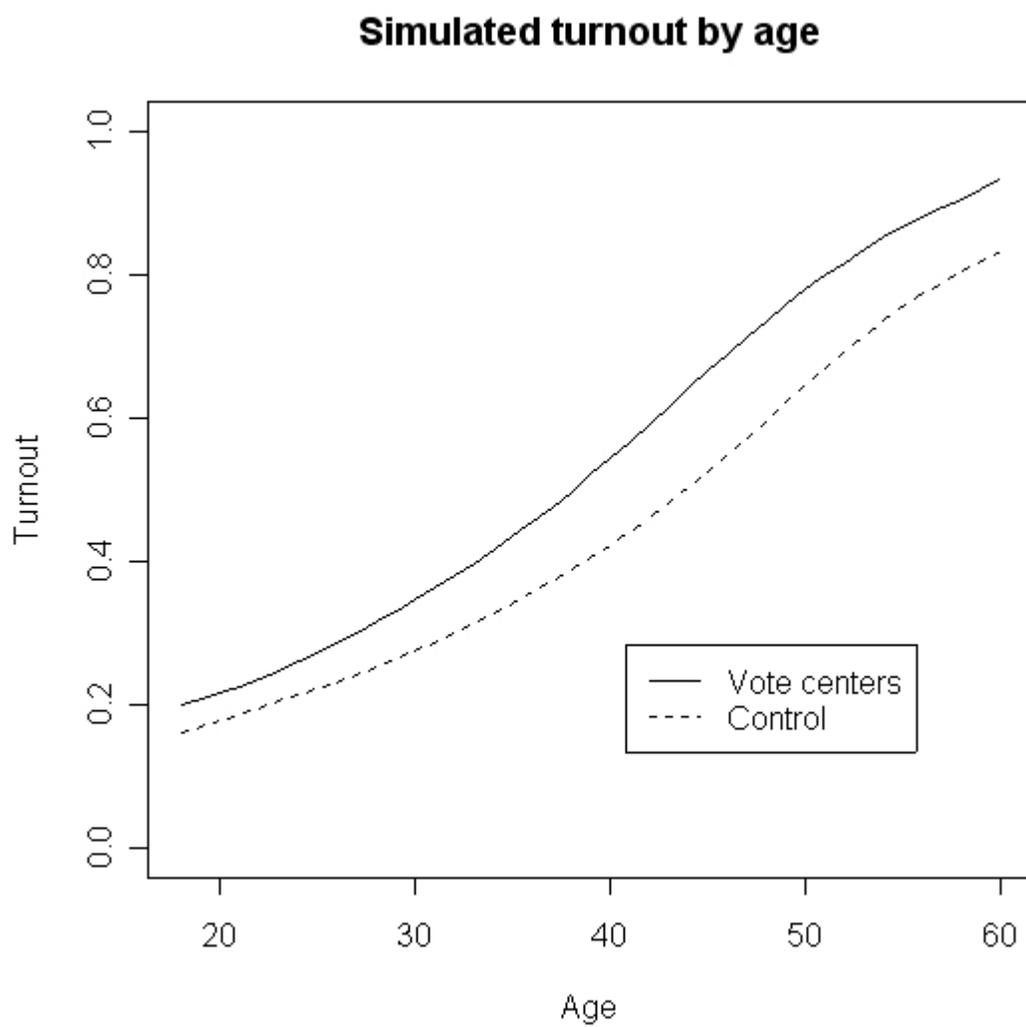


Table 4: Logit estimates
using sample of Larimer and Weld voters with 95% confidence intervals

Variable	Model 1			Model 2			Model 3		
	Coef (S.E.)	Low	High	Coef (S.E.)	Low	High	Coef (S.E.)	Low	High
Constant	-2.60 (.02)	-2.65	-2.56	-2.51 (.03)	-2.56	-2.46	-2.56 (.03)	-2.61	-1.84
Treatment	.55 (.03)	.49	.60	.65 (.03)	.60	.71	1.19 (.03)	1.12	.85
Female	.03 (.02)	-.0004	.06	.03 (.02)	-.001	.06	.03 (.02)	-.002	.13
Age	.02 (.001)	.016	.018	.02 (.001)	.016	.018	.02 (.001)	.016	.02
Habit	.234 (.002)	.230	.239	.237 (.002)	.233	.241	.26 (.002)	.25	.26
Larimer				-.20 (.02)	-.23	-.16	-.21 (.02)	-.25	.26
Hab*Treat							.136 (.005)	-.127	.146
N	118007			118007			118007		
R ²	.199			.200			.204		

Table 5: Logit estimates

using sample of Larimer voters with 95% confidence intervals

Variable	Model 1			Model 2			Model 3		
	Coef (S.E.)	Low	High	Coef (S.E.)	Low	High	Coef (S.E.)	Low	High
Constant	-1.22 (.01)	-1.24	-1.20	-2.62 (.03)	-2.68	-2.56	-2.72 (.03)	-2.78	-2.65
Treatment	.98 (.02)	.93	1.03	.60 (.03)	.55	.66	1.10 (.03)	1.04	1.17
Female				.01 (.02)	-.03	.05	.01 (.02)	-.03	.05
Age				.02 (.001)	.017	.019	.02 (.001)	.016	.019
Habit				.22 (.003)	.21	.23	.25 (.003)	.24	.26
Hab*Treat							.13 (.005)	-.12	.14
N			70373						70373
R ²			.021						.199