4-2014

When Social Pressure Fails: Evidence from Two Direct Mail Experiments

Margaret Schwenzfeier

College of William and Mary

Follow this and additional works at: https://scholarworks.wm.edu/honorstheses

Part of the American Politics Commons

Recommended Citation

https://scholarworks.wm.edu/honorstheses/69

This Honors Thesis is brought to you for free and open access by the Theses, Dissertations, & Master Projects at W&M ScholarWorks. It has been accepted for inclusion in Undergraduate Honors Theses by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.
When Social Pressure Fails: Evidence from Two Direct Mail Experiments

Margaret J. Schwenzeier
College of William & Mary

Abstract

Within the past two decades, political scientists have utilized direct mail field experiments to assess the impact of various mail techniques on voter turnout. The most effective field experiments have used social pressure (publicizing or otherwise drawing attention to individuals’ voting histories) to increase turnout, but have not been widely used by political campaigns because of the potential for voter backlash. More traditional direct mail frequently employs issue-based negative appeals, but has not been shown to increase turnout. In this paper, I conduct a small field experiment to measure the effect of political direct mail that combines social pressure content with issue-based language, with the theory that linking policy outcomes directly with an individual’s turnout history will make issues more salient and increase turnout. I also conduct a lab experiment to assess the mechanism(s) behind the mailer by showing individuals one of three treatment letters and surveying them about their emotional states after reading the letter, their likelihood of voting, and their intent to support the sender of the mailer. In the field experiment, I find that the treatment mailer caused a statistically significant decrease in voter turnout. I assess the effect of a second social pressure mailer that contaminated my treatment and also decreased turnout. Results from the lab experiment are consistent with the finding from the field experiment: the treatment mailer appeared to cause strong emotional reactions but did little to increase support of the candidate compared to the control group.

Keywords: Field experiments, campaigns, voting, social pressure
Acknowledgements

First and foremost, I would like to thank Dr. Jaime Settle for her guidance, patience, and sense of humor throughout this process. Her mentorship has been invaluable during this project and beyond. Thank you to Dr. Ron Rapoport for his advice and constant enthusiasm, as well as to Dr. Julie Agnew for her willingness to serve on my committee. I am also grateful to Dr. Joel Schwartz for his encouragement and support of my research interests from the very beginning of my time at William & Mary. This project would not have been possible without the help of Jim Icenhour, Jen Tierney, and Brenner Tobe, who worked with me to make the field experiment portion of this study a reality. Thank you also to the Charles Center and the Government Department’s McGlennon Scholarship for their financial support of my research. Drew Engelhardt, Taylor Feenstra, and Keenan Kelley have been amazing sources of encouragement, copy edits, and company during my frequent trips to Wawa. Thank you as well to my family for their constant support. Finally, I also owe this thesis to Carol McKalips, whose campaign phone call in September 2009 started this all—thank you.
Few Americans vote consistently in elections for all offices, with a plurality of the electorate voting primarily in federal elections (Sigelman et. al 1985). Turnout for presidential elections is frequently in the 50-65% range, with midterm Congressional elections 10-15 points lower and statewide off-year elections in the 20-35% turnout range (FairVote 2012). Turnout for all elections is frequently lower among disadvantaged populations—the poor, minorities, and less educated individuals—and those who do not have the resources (time, money, or education) to vote (Brady, Verba, Schlozman 1995). These populations frequently have single-digit turnout in non-federal election years (Lijphart 1997).

Political campaigns mount sophisticated mobilization efforts to combat low turnout and encourage their supporters to head to the polls on Election Day, using phone calls, door-to-door canvassing, and advertisements. While the rise of political data and high-tech targeting strategies is transforming campaign field operations, direct mail continues to serve an integral role in the mobilization strategies of both parties. These efforts typically include multiple rounds of direct mail, coupled with television advertisements and other persuasion and mobilization efforts. In fact, both 2012 presidential campaigns spent more than twice as much money on direct mail advertising than on Internet advertising, a sum that was second only to the amount spent on broadcast advertising (Eggen 2012). Smaller campaigns, particularly for state and local offices, rely even more heavily on direct mail because of their inability to afford television advertising and the fact that television ads are difficult to target precisely to small districts.

Campaigns have increasingly turned to political science literature to inform their use of various mobilization techniques, including direct mail. Political data analysis organizations and books such as Get Out the Vote (Green and Gerber 2004) have disseminated best practices to political groups based largely on evidence from large-scale randomized field experiments. A particularly attractive avenue of research has been the many experiments
conducted within the past decade to explore the influence of social pressure language in political
direct mail. Green, Gerber, and Larimer (2008), for example, established that simply showing an
individual their voting history could increase turnout far beyond the negligible turnout increase
associated with traditional direct mail.\footnote{By traditional direct mail, a term used throughout this paper, I mean pieces of political mail that are issue- or candidate-oriented and encourage the recipient to vote based on the importance of the election or the merits of the candidate or issue, rather than appeals to social norms. These mailers are frequently formatted as glossy, full-color postcards or pamphlets.} Campaigns thus far have avoided social pressure

techniques, perhaps out of fear that showing an individual his or her voting history, the voting
history of his or her entire neighborhood, or threatening to publicize the names of nonvoters in
the local newspaper (Panagopoulos 2010) would do their candidates more harm than good.
Social pressure appeals have therefore remained the domain of party organizations and outside
political groups that send mail in support of or opposition to a candidate (Mann 2010; Matland
and Murray 2013; Issenberg 2012). Candidates themselves have continued to use issue-oriented
direct mail, which multiple studies have shown to have a small to null effect on voter turnout.

The purpose of this study then, is to explore whether mild social pressure appeals—
showing a voter only his or her own voting history—can be combined with the issue-based
language used in traditional direct mail to increase voter turnout in a format that can be utilized
by campaigns without risking backlash. To my knowledge, no study to date has conducted a field
experiment combining social pressure techniques with issue-based language designed to trigger
loss aversion, the idea that individuals are motivated to take action when faced with potential
electoral losses. Additionally, no study to date has utilized a lab experiment concurrently with a
field experiment to assess the emotional impact and mechanisms behind the effects of a social
pressure mailer. In this study, I conduct a small field experiment prior to the 2013 Virginia
general election during which I distribute a mailer with social pressure and issue-based language
to a randomly assigned treatment group of registered voters. During the same election, I conduct a lab experiment randomly assigning individuals to receive treatment mailers in the lab and take a short survey to assess the mailers’ effects.

Results of the field experiment indicate that not only does combining social pressure language with issue-based language fail to increase turnout, it actually appears to significantly decrease turnout among targeted voters. This negative average treatment effect was consistent across gender, voting history, and party identification. Results from the lab experiment give some insight into why this mailer decreased turnout—providing evidence that the mailers may cause highly negative emotions that could cause a backlash effect. Results from a second treatment mailer that was distributed by another organization during the same time period also offer preliminary insight into the effect of sending multiple social pressure mailers. The second treatment mailer, a standard social pressure appeal from an outside group, appears to have also decreased turnout. Individuals who received both treatment mailers do not appear to have suffered from an additive negative turnout effect.

The results of this study provide evidence that direct mail using social pressure techniques can decrease turnout in certain situations. Social pressure mail, whether or not it is combined with language that discusses issues at stake in the election, can cause heightened negative emotional responses—perhaps even indicating that individuals who vote despite receiving the mailer are less likely to vote for the sender’s party or candidate. The negative turnout findings in this study also serve as preliminary evidence that social pressure direct mail techniques do not always have a positive impact on voter turnout and merit more exploration and replication. These techniques should be used by campaigns and political organizations with caution: particularly as parties begin to send multiple social pressure mailers and voters may become fatigued or feel overly pressured to vote.
Direct Mail Effects

While the first field experiment designed to study the effectiveness of political direct mail was conducted by Gosnell in 1927 political scientists did not seriously return to the empirical study of campaign mobilization techniques until the late 1990s. Initial studies focused on traditional campaign direct mail: the glossy, colorful issue- and candidate-focused mailers typically designed by direct mail consulting firms. Findings regarding the effectiveness of direct mail have been mixed. Studies of the effectiveness of non-partisan mail have found small effects ranging from a 0.6% increase in turnout (Green and Gerber 2000), to a 1.6% increase (Green and Gerber 2004). Targeting specific populations has provided similar results, ranging from null (Ramirez 2005, among Latino voters), to a 4.4% increase among Texas Asian American voters (Gimpel, Shaw, and Cho 2006). Partisan traditional direct mail has been shown to have an even weaker and occasionally negative effect on turnout, depending on the emotional strength of the message (Gerber, Green, and Green 2003; Cardy 2005; Miller, Bostitis, and Baer 1981).

Pooling the results of 28 direct mail studies in their review of campaign mobilization techniques, Green and Gerber find that traditional direct mail generates one vote for every 500 pieces sent, for an average effect size of 0.2% (Green and Gerber 2004). Civic duty appeals have a similar effect (1.8%) and Hawthorne appeals (notifying voters by mail that their voter turnout is being studied) has been found to have a slightly larger effect, causing a 2.6% increase in turnout (Green and Gerber 2010).

These small or null effects are consistent with the political science literature that suggests that rational models of voting do not sufficiently explain why individuals participate on Election Day. Individuals do not appear to make rational calculations when deciding whether to vote or who to vote for (Blais 2000), making direct mail that involves issue-based or candidate-based
messaging largely ineffective since this information does not factor into whether an individual goes to the polls. Another explanation could be that issue-based direct mail appeals, much like television advertising and professional phone banks, are impersonal and therefore do little to mobilize voters (Gerber, Green, and Green 2003; Gerber and Green 2000).

Social Pressure

The most effective direct mail effects so far have utilized social pressure. Green and Gerber (2010) found that mailing individuals their voting history, along with a promise to follow up with an updated voting record after the election, had a 4.9% positive effect on turnout, while mailing individuals the voting history of every voter in their neighborhoods was found to increase turnout by a stunning 8.1%. Other social pressure studies have found similar social pressure effects (Panagopoulos 2011, Mann 2010). Increasing the perception that one’s turnout is public in other ways has also been found to influence turnout, either by specifically drawing attention to past participation or non-participation (Gerber, Green, and Larimer 2010) or even threatening to publish individuals’ names and turnout histories in local newspapers (Panagopoulos 2010). Social pressure effects may be long lasting, with a social pressure treatment in one election increasing turnout among treated individual in subsequent elections as well (Davenport et al. 2010).

The substantial effect of social pressure mail is consistent with broader political science literature indicating that voting is a social norm (Blais 2000) that is sensitive to the perceptions of others (Gerber and Rogers 2009). Social pressure messages serve as “social inducements” (Green and Gerber 2010) that prompt recipients to comply with the message encouraging turnout. The effects of the voting norm can be seen throughout the political behavior literature:

---

2 By social pressure, I mean messages that rely on an individual’s innate desire to be seen as conforming to group norms and to avoid social sanction (Green and Gerber 2010).
smaller communities in which individuals feel more closely monitored by those around them have been associated with higher voter turnout (Funk 2010, Panagopoulos 2011), social desirability is often cited as the reason why voter turnout is over reported by as much as 10% on surveys (Harbaugh 1996), and social recruitment has been shown to increase political campaign volunteerism (Schwenzfeier and Settle 2014). It is well established in the psychology literature that the extent to which individuals conform to a socially desirable behavior is mediated by the degree to which they feel their actions are monitored or visible to others (Cialdini and Trost 1998, Cialdini and Goldstein 2004).

Although social pressure appeals have been shown to be a more cost-effective use of direct mail than traditional messaging, political campaigns have been slow to adopt these techniques, perhaps out of fear of negative effects. Mann (2010) found no evidence of backlash effects, but campaigns have generally shied away from the appearance of infringing upon voters’ privacy due to the negative reaction of the media, partisan think tanks, and posts on social networking sites (Hurt 2013, Korte 2012, Markay 2012). Direct mail is also a lucrative consulting industry that may be largely reluctant to change its ways, particularly because social pressure mailers are generally printed on plain paper or cardstock and might be cheaper to produce (Issenberg 2012).

The effectiveness of social pressure mailers has been shown field experimentally (most notably in Gerber, Green, and Larimer 2008), but the mechanisms have not yet been demonstrated by asking individuals about their reaction to a mailer directly. My set of hypotheses, therefore, are that a lab experiment surveying individuals after giving them a social pressure mailer will result in similar findings to field experiment research on social pressure:
H1: Individuals who receive a social pressure Get Out the Vote (GOTV) mailer will be more likely to report that they intend to vote in an upcoming election than individuals who receive a control mailer.

H2: Individuals who receive a social pressure GOTV mailer will be more likely than individuals who receive a control mailer to report that their vote feels monitored and that they feel pressured to vote.

Consistent with Mann’s (2010) findings that overt social pressure messages have a negligible backlash effect,

H3: individuals who receive a social pressure message will not report more negative emotions than individuals who receive a control mailer.

Loss Aversion

It has also been established in economic, psychology, and political science literatures that human behavior is influenced by loss aversion, the theory that the potential for losses has a greater influence on decision-making than potential gains (Tversky and Kahneman 1991; Kahneman, Knetsch, and Thaler 1991; Payne, Bettman, and Johnson 1992; Soroka 2006). In studies of economic voting, for example, recent losses or the prospect of impending losses have a mobilizing effect on voters beyond the mobilizing effects of prospective gains (Weyland 2003).

Loss aversion, as it applies to voting, appears to differ slightly from general issue-based voting in that its effects come not from a rational-choice calculation, but from psychologically induced feelings that potential losses are personal in nature (Quattrone and Tversky 1988) or will negatively affect the in-group. Sears et al. (1980), for example, found little evidence to support the idea of self-interested voting or “issue publics” using public opinion data, but found that individuals tended largely to gravitate toward groups of similar others. These groups (political
parties, for example) may serve as reference points as voters evaluate potential losses and gains. It seems plausible, therefore, that issues may be made salient and mobilize voters if individuals perceive the issues as being more directly related to them personally or that their actions could have an impact to reduce policy losses for them or their group. Literature on loss aversion also fits well with the “consumption” benefits from voting (Rogers, Fox, and Gerber 2012; Blais 2000), which are the social benefits an individual receives from voting (as described above) as well as the avoidance of regret for not having voted in an election where one’s vote might have mattered (Fiorina 1974).

Loss aversion, then, appears to provide an avenue by which policy-oriented language in direct mail could be made salient to voters. By linking a mild social pressure appeal (showing an individual his or her own voting history, for example) with the policy consequences to that individual or party of not voting in an upcoming election, an individual could be made to feel more directly responsible for those issue outcomes and that their vote has a direct impact on their quality of life. My final hypothesis, then, is that:

H4: Direct mail that links an individual’s prior voting history with the policy consequences of abstention will result in increased voter turnout, on average, compared to a control group.

Experimental Design

To test these hypotheses, I conducted a field experiment as well as a small lab experiment during the fall of 2013.

Field Experiment

The field experiment was conducted in a board of supervisors district in a southeastern Virginia county with a district population of approximately 20,000 people. In the fall of 2013, I
obtained a list of all registered voters in the district. The Commonwealth of Virginia does not provide for voter registration by party, but the Democratic Party of Virginia (DPVA) maintains information regarding individuals’ primary participation, responses to canvasses and phone calls, and other individual-level variables in order to estimate an individual’s likely party. For this study, I selected all subjects on the list of registered voters who were listed by the DPVA as Independents, Likely Democrats, or Strong Democrats, for a total of 3,515 registered voters.

I used this list to randomly assign each household in the sample to either the treatment or control group. In households with more than one registered voter, I randomly selected a single individual to receive the treatment mailer. Individuals in the control household group comprise my entire control group (N = 2,183), those selected from treatment households make up the treatment group (N = 1,135), and individuals residing in treated households who were not selected have been excluded from my analysis. The treatment and control groups were balanced on most demographic variables, with the important exception of gender. Data on voters’ gender was unavailable in fall 2013 when the randomization was conducted, resulting in a statistically significant gender imbalance between the two groups. A full balance table can be found in Table 1 of the Appendix.

The 2013 elections in Virginia were very competitive. The state had close races for Governor and Attorney General (a race which ultimately resulted in a recount and was decided by less than 1,000 votes out of over two million cast). Local races in the area were also competitive and included the race in the board of supervisors district, as well as a competitive House of Delegates contest. The region experienced high levels of campaign activity, with statewide parties and candidates spending large amounts of resources on volunteer recruitment, persuasion, and Get Out the Vote (GOTV) efforts. Gubernatorial candidates and down-ballot candidates for House of Delegates sent multiple rounds of direct mail—in addition to extensive
television and radio advertising—to augment their phone calling and canvassing operations. As a result, this experiment was conducted in a crowded campaign environment, where any individual voter was likely to receive multiple campaign messages throughout the election season.

Working with the local candidate’s campaign, I designed and printed a treatment mailer in late October 2013. The treatment mailer consisted of a standard greeting and thanked the recipient for being a registered voter before continuing into a standard voting history section. This section showed each voter her own voting history and emphasized how important it was for Democrats and Independents to vote in the election. This section of the treatment is highly similar to previous direct mail social pressure literature, particularly the individual voting history treatment mailer in Green, Gerber, and Larimer (2008), which was found in that study to have an effect size of 4.9% increased turnout, on average. The second section of the mailer was the issues section, which featured three bullet point-format issue statements describing policy issues that were at stake if the Democratic candidate were to lose the election. These issues focused primarily on the local candidate’s platform, which included issues surrounding development and funding for infrastructure projects, none of which were readily identifiable as partisan. The letter then concluded by providing the reader with the date of the November 2013 election and encouraging the individual to “protect” their quality of life by participating in the election, in a similar format to prior direct mail effects literature. To comply with campaign finance regulations, the mailers featured a small text box at the bottom of each letter stating that the mailer was paid for and authorized by the candidate’s campaign. The full text of the mailer can be found in the Appendix (Figure 1). All treatment mailers were printed on plain white, 8.5 by 11-inch paper and delivered in white, nondescript envelopes. Each envelope contained a printed label with the voter’s name and address, along with a return address label and postage paid.
sticker. All mailers were sent exactly one week before Election Day 2013 to ensure that they were received shortly before the election.

The dependent variable for this field experiment was voter turnout. After Election Day, the DPVA provided me with an updated list of all registered voters in the district, complete with turnout records for the 2013 election. I used individuals’ Voter Activation Network (VAN) identification numbers to match voters in my treatment and control groups. VAN numbers are unique identification numbers used by NGP-VAN, a Democratic data firm, to consistently identify voters across elections and merge data. Using the VAN numbers, I was able to positively match all but 15 individuals in my sample. These missing individuals likely moved out of the district, registered elsewhere, lost their voting rights during the course of the field experiment and were removed from the voting rolls, or are the result of error in the voter file or record matching process.

Contaminating Social Pressure Mailer

At approximately the same time as the main social pressure field experiment described above was underway, a Democratic organization also distributed its own piece of social pressure direct mail to individuals in the district. This mailer was a classic social pressure appeal targeted at individuals, rather than randomly assigned. The mailer addressed the recipient as “Registered Voter” and provided details regarding the upcoming election while emphasizing that voter turnout was expected to be high. It also showed the recipient his or her own voting history, as well as the voting histories of other registered voters in the household, with a pledge to send an updated mailer with their 2013 turnout record after Election Day (Hurt 2013). This mailer is nearly identical to the “self” social pressure mailer used by Green, Gerber, and Larimer (2008) in their large direct mail study and is also nearly identical to the social pressure portion of the treatment mailer in the study conducted in this paper. The full text of one of the mailers,
uploaded to the social networking site Twitter by a recipient of the mailer, can be found in the Appendix (Figure 2).

Although I lack specific information regarding the criteria the organization used to target individual voters, I was able to obtain a list of voters who received the mailer that I then matched to voters in my sample using each individual’s street address. In the district, 640 voters were targeted to receive the mailer, 275 of which were assigned to the treatment group in the main study and 375 of which were in the control group. This resulted in the Democratic mailer “contaminating” this study’s field experiment by causing some individuals in the control group to receive a social pressure mailer, and some individuals in the treatment group to receive two social pressure mailers.

While this second mailer does not affect the fact that the main mailer in this study was randomly assigned (and therefore the treatment and control groups can still be considered identical in all characteristics other than receipt of the mailer), it may serve to reduce precision in this study because of the already small sample size and the crowded campaign environment in fall 2013. The coincidence of a second social pressure mailer also provides a unique opportunity to examine what happens when organizations each send social pressure mailers to overlapping target groups—an event that is sure to occur with more frequency as political campaigns increasingly use social pressure in their direct mail strategies.

Lab Experiment

While the field experiment in this study can provide evidence for causality and ample external validity, particularly in a competitive, busy election, it does not provide insight regarding how the mailer was received by targeted voters. Voters’ reactions to the mailer are important for understanding any observed field experiment effects because the dependent
variable in the field experiment, voter turnout, does not provide more information regarding how individuals reacted to the mailer and, crucially, whether they may have been upset by the mailer to the point where they may have voted for the other candidate.

A lab experiment exploring mechanisms behind the effectiveness of social pressure mail was conducted from October 17 through November 21, 2013. Participants were 178 undergraduate students participating in political science classes at a selective liberal arts college in the mid-Atlantic. Participants were nearly balanced on gender, with 94 males and 84 females, and the student subjects consisted of 106 Democrats, 48 Republicans, and 24 Independents. Subjects were divided into three treatment groups: political, environmental, and control. Prior to arriving at the laboratory, subjects completed a short pre-survey to collect basic demographic information, including partisan identification and vote history. A balance table of demographic characteristics among the three groups can be found in the Appendix (Table 2).

Upon arrival to the lab, individuals received a sealed envelope and were instructed to complete a short online survey and open the mailer when prompted to do so by the survey. Individuals in the political treatment group received a social pressure mailer identical to the one used in the field experiment, but customized to their party identification and voting history, as well as altered to include statewide partisan issues, rather than the locally important issues included in the field experiment mailer (Appendix Figure 3). The issue bullet points varied with the individual’s partisan identification. Individuals in the environmental group received a social pressure mailer that provided them with their dormitory’s carbon emissions data from the past eight years, rather than their own voting history. The mailer was customized to display the recipient’s own dormitory and listed the consequences of failing to reduce carbon emissions, similar to the issues section in the political treatment. The environmental mailer (Appendix: Figure 4) was designed to be as similar as possible to the political treatment so as to allow
comparison between groups regarding the mechanism of the mailers and allow a way to measure the impact of the social pressure and loss aversion language in a nonpolitical context, as well as a political context. Individuals in the control group received a short letter that instructed them to continue taking the survey.

After reading their treatment mailer carefully, subjects were asked a series of questions on seven-point Likert scales regarding their likelihood of voting and how the mailer made them feel. The first half of the survey asked questions regarding general behavior, while later questions specifically referenced the mailer in order to obtain self-reports regarding emotional reactions. These questions included whether subjects planned on voting in the 2013 election, how important they thought it was to participate in elections, how important they thought it was to reduce carbon emissions, how much others cared about whether they voted or worked to reduce carbon emissions, and how much they themselves cared about whether they voted or reduced carbon emissions. The direct questions asked subjects to rate how angry, afraid, anxious, and guilty the letter made them feel, as well as how pressured to vote or reduce carbon emissions, and how responsible they felt for global warming or the outcome of the election. Finally, the survey asked respondents whether they would be more or less likely to support the sender of the letter, as well as how likely they would be to tell a friend about the mailer.

Results

Field Experiment Results

To evaluate the overall effect of the original field experiment mailer (ignoring the second contaminating mailer for a moment), I conducted a simple difference of proportions test to evaluate whether the treatment and control groups differed significantly on average voter turnout. As can be seen in Figure 1, average voter turnout for the treatment group was 60.8%,
while average turnout for the control group was 63.3%, a difference of 2.6%. This difference is not quite

![Average Voter Turnout](image)

**Figure 1**: Average voter turnout between treatment and control groups in the field experiment

statistically significant at a standard level, with a p-value of 0.143. This result does suggest, however, that the effect of the mailer was in the opposite direction from the one hypothesized. Given the small sample size of the field experiment (compared to traditional direct mail field experiment that target tens of thousands or hundreds of thousands of individuals) and the fact
that the control group was contaminated by a second social pressure mailer, the large p-value for this treatment effect is likely an issue of statistical power.³

There does not seem to be evidence to support any heterogeneous treatment effects caused by the mailer. Both men and women appear equally negatively affected.⁴ While Independents in the sample turned out at higher overall rates than Democrats, Independents appear to have reacted to the mailer in much the same manner as Democrats. Difference of means tests for each party (Independent, Likely Democrat, and Strong Democrat) show lower average turnout for the treated individuals in each group, although the effects are not statistically significant given the much smaller sample size caused by subsetting the sample. Similar results hold for difference of means tests for frequent voters, infrequent voters, and non-voters, indicating that the treatment mailer had a negative or null influence on recipients regardless of their voting habits. It should be noted that age is not included in a test for heterogeneous treatment effects because it was not an available demographic variable in the original voter file.

The coincidental distribution of another piece of social pressure mail provided a unique opportunity to evaluate the effect of sending multiple mailings. To evaluate the effects of the contaminating mailer alongside the original mailer in this study, I divided the sample into four groups: pure control (individuals who received neither an original mailer nor a contaminating mailer), contaminated control (individuals who received a contaminating mailer, but not an original mailer), pure treatment (individuals who received only an original mailer), and

³ My initial power calculations conducted before launching the experiment were based off of prior literature (Gerber, Green, and Larimer 2008), and were calculated expecting a 5% increase in turnout, on average. The calculations also anticipated a much larger sample size. Using results from the actual experiment shows that this study is extremely underpowered, with a one-sided statistical power of 0.17 (h = 0.026, n1 = 1135, n2 = 2183, sig.level = 0.05).

⁴ Because the treatment and control groups were not balanced on gender, I conducted a regression result to look for an interaction of treatment and gender and did not find an effect.
contaminated treatment (individuals who received both mailers). I then conducted three
difference of means tests, comparing turnout in the three treatment groups to the pure control
group. As can be seen in Figure 2, both mailers appear to have had a negative effect on turnout,
on average, with the contaminating mailer having a statistically significant (p = .002) negative
effect of 9% compared to the pure control group. The pure treatment group, those individuals

![Figure 2: Difference in Voter Turnout Compared to Pure Control Group](image)

**Figure 2:** Difference of means tests comparing the voter turnout averages of the three treatment
groups to the base group (the pure control group). All three groups display lower average turnout
than the control group, indicating a negative treatment effect for both the original mailer and the
contaminating mailer. Error bars indicate 95% confidence intervals for the difference of means
estimates.

who only received the original treatment mailer in this study, also had an average turnout rate
3.7% lower than the pure control group average. With a p-value of .062, this result was
statistically significant at the .1 level. Interestingly, individuals who received two treatment
mailers voted at a rate 5.3% lower than the pure control group, on average, but did not appear to
display any additive negative effects from receiving both mailers. Again, this negative effect of the double mailers was statistically significant only at the .1 level (p = .097).

Because the contaminating mailer was targeted, however, the assumption that the four groups are identical except for the mailers they received no longer holds. The original mailer in this study was randomly assigned, but the contaminating mailer was targeted toward more frequent voters, therefore violating the principle of random assignment that is required in order to make causal inferences using experimental data. Table 1 displays the results of difference of means tests of the three treatment groups and the pure control group for several important demographic variables. To ensure that the results displayed in Figure 2 are not spurious results from unequal distributions of demographic variables among the treatment groups, I conduct a logistic regression of voting using the pure control group as the reference group and each of the three treatment groups as indicator variables (Table 3). I also include indicator variables for leaning Democrats, strong Democrats, gender, and voter turnout in 2012.

Figure 3 displays voter turnout logit predictions for each treatment group, holding all demographic variables at their means. This figure mirrors the treatment effects displayed in Figure 2. Predicted turnout for the pure control group was 66.2%, with the contaminated control group turnout predicted to be 47.7%, a huge turnout difference of 18%. The pure treatment group had a predicted turnout 3.7% below the pure control group (identical to the
<table>
<thead>
<tr>
<th>Variable</th>
<th>Pure Control</th>
<th>Contaminated Control</th>
<th>Pure Treatment</th>
<th>Contaminated Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>0.140</td>
<td>0.036***</td>
<td>0.187*</td>
<td>0.032***</td>
</tr>
<tr>
<td>Likely Democrat</td>
<td>0.485</td>
<td>0.458</td>
<td>0.492</td>
<td>0.414*</td>
</tr>
<tr>
<td>Strong Democrat</td>
<td>0.375</td>
<td>0.507***</td>
<td>0.321*</td>
<td>0.552***</td>
</tr>
<tr>
<td>Male</td>
<td>0.456</td>
<td>0.309***</td>
<td>0.397**</td>
<td>0.233***</td>
</tr>
<tr>
<td>Vote 2012</td>
<td>0.862</td>
<td>0.978***</td>
<td>0.843</td>
<td>0.985***</td>
</tr>
<tr>
<td>Vote 2010</td>
<td>0.622</td>
<td>0.372***</td>
<td>0.597</td>
<td>0.396***</td>
</tr>
<tr>
<td>Vote 2009</td>
<td>0.604</td>
<td>0.320***</td>
<td>0.577</td>
<td>0.338***</td>
</tr>
<tr>
<td>Vote 2008</td>
<td>0.865</td>
<td>0.885</td>
<td>0.850</td>
<td>0.873</td>
</tr>
<tr>
<td>N</td>
<td>1818</td>
<td>365</td>
<td>860</td>
<td>275</td>
</tr>
</tbody>
</table>

Note: Asterisks indicate a statistically significant difference between the group mean and the control group mean, * p<0.05, ** p<0.01, *** p<0.001

**Table 1:** Balance table of demographic variables for the four groups created by the contaminating second mailer, by treatment group. Pure control (no letters received), contaminated control (received the outside mailer), pure treatment (received only the original mailer), contaminated treatment (received both mailers).
Table 3: Logistic regression of 2013 voter turnout, based on treatment group and controlling for various demographic variables. Treatment group indicator variables are statistically significant and negative, indicating that the direct mail treatments had negative effects, even when controlling for demographic variables that could influence turnout.

<table>
<thead>
<tr>
<th></th>
<th>Dependent variable:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voted 2013</td>
<td></td>
</tr>
<tr>
<td>Contaminated Control</td>
<td>-0.762***</td>
<td>(0.121 )</td>
</tr>
<tr>
<td>Pure Treatment</td>
<td>-0.16095*</td>
<td>( 0.096)</td>
</tr>
<tr>
<td>Contaminated Treatment</td>
<td>-0.629***</td>
<td>( 0.138 )</td>
</tr>
<tr>
<td>Likely Democrat</td>
<td>-0.531 ***</td>
<td>(0.129)</td>
</tr>
<tr>
<td>Strong Democrat</td>
<td>-0.062</td>
<td>(0.133)</td>
</tr>
<tr>
<td>Male</td>
<td>0.175**</td>
<td>(0.081)</td>
</tr>
<tr>
<td>Voted 2012</td>
<td>3.326***</td>
<td>0.183</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.054***</td>
<td>(0.214)</td>
</tr>
<tr>
<td>Observations</td>
<td>3514</td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>3922.2</td>
<td></td>
</tr>
</tbody>
</table>

Note: * p<0.1, ** p<0.05, *** p<0.01

actual turnout difference). And again, predicted turnout for the contaminated control group was negative but not additive, with a predicted 15% decrease in turnout. Ninety-five percent confidence intervals for the three treatment groups show the predicted turnout for each treatment group to be statistically significantly different from the predicted turnout for the pure control group.
**Figure 3:** Difference of means tests comparing the logit predictions of voter turnout averages for the three treatment groups to the predicted turnout for the base group (the pure control group), holding demographic variables at their means. All three groups display lower average turnout than the control group, indicating a negative effect of the treatment group indicator variables. Error bars display 95% confidence intervals for the turnout mean estimates.

Based on these results, Hypothesis 4 that the treatment mailer would have a statistically significant positive effect on turnout was not supported and, in fact, the treatment mailer may have decreased turnout to a significant degree. The fact that both Figure 2 (the actual turnout means for each group) and Figure 3 (predicted turnout means for each group, controlling for potentially confounding variables) look very much alike adds to my confidence that the mailer had a negative effect.

**Lab Experiment Results**

Based on average survey responses among the three groups in the lab experiment (control, political treatment, and environmental treatment), the social pressure mailer does not
appear to have had a statistically significant effect on individuals’ intention to vote in the 2013 elections. When asked, “How likely do you think you are to vote in Virginia’s gubernatorial elections this November?” members of the control group averaged 4.9 on a seven-point Likert scale, while the political treatment averaged 5.3 and the environmental treatment 5.4. The same held true for survey responses regarding how likely subjects thought they were to work to reduce their carbon emissions, indicating that neither treatment had a statistically significant impact on individuals’ likelihood to respond that they would engage in the behavior encouraged by the mailer. Hypothesis 1 is not supported.

The second hypothesis—that individuals who receive the political treatment mailer will be more likely than individuals who receive the control mailer to feel monitored and pressured to vote—is supported by the survey data. As can be seen in Figure 4, individuals who received the political treatment mailer in the lab experiment were much more likely to report both that their voting turnout felt monitored and that they felt pressured to vote. This finding is mirrored by the environmental treatment group’s responses (not pictured in Figure 4) regarding whether their carbon emissions felt monitored and that they felt pressured to reduce carbon emissions, in which the environmental treatment group had much higher average treatment effect than the control group. This finding indicates that it is the message content and social pressure format of the mailer that makes individuals feel pressured, rather than simply talking about politics. The environmental group did report feeling that their vote felt slightly more closely watched than did the control group, however, which may indicate that while social pressure mail primarily triggers feelings of being monitored regarding the behavior at hand, the mailers may also raise general feelings of being watched.
Figure 4: Difference of means tests displaying difference of means between the political treatment group (circles) and the environmental treatment (triangles) to the control group on feelings of outside influence, measures of emotional reactions to the treatment letter, and future actions. The largest difference of means occurs for feelings of outside influence. The treatment mailers also appear to increase negative emotions, on average, more than they increase positive social actions such as the likelihood of supporting the sender of the mailer.
The third hypothesis, that individuals in the treatment groups would not have significantly more negative emotional reactions to the mailers was not supported. In fact, individuals in the political and environmental treatment groups all reported that their letters made them feel statistically significantly more angry, anxious, guilty, and afraid than individuals in the control group, on average. The largest difference in means for these negative emotions was anger in the political treatment group, in which subjects reported an average of 2.8 on a seven-point scale (with seven being “very angry”) to the control group’s average of 1.3. Interestingly, the strongest emotional reaction to the environmental mailer was guilt, with an average of 2.9 to the control group’s 1.2. These emotional reactions also appear to be of the same magnitude as or stronger than individuals’ reported “future actions” (i.e. their likelihood of telling a friend about the mailer and, crucially, whether they would be likely to support the sender of the mailer).

Discussion

Why does the treatment mailer in this study appear to have decreased turnout? To date, only two studies appear to address the possibility of voter backlash in social pressure field experiments. Christopher Mann’s 2010 study tested experimentally for voter backlash by comparing the turnout effects of social pressure mailers ranging from “heavy-handed” messages to those designed to minimize voter backlash. Using a sample of 95,788 unmarried female voters during Kentucky’s 2007 gubernatorial election, Mann tested Gerber et. al’s (2008) social pressure mailer that showed recipients their own voting history (the Self treatment), a Self plus Hawthorne treatment (in which individuals were informed of their voting history as well as the fact that they were part of an academic study), and a Self plus Help treatment (showing individuals their voting history as well as offering election information and rides to the polls). All three mailers increased turnout by 2.5-3.0 percentage points, leading Mann to conclude that reactance-reducing social pressure mailers were equally as effective as traditional social pressure
The effects of the three mailers were statistically indistinguishable, indicating that the heavy-handed mailer had no more negative an effect than the specially designed mailers.

Matland and Murray (2013), on the other hand, conducted a survey experiment and found evidence for direct mail backlash effects. Using a sample of individuals randomly selected for jury duty in Lubbock County, Texas, the authors showed subjects a hypothetical mailer encouraging them to vote that had a civic duty message combined with either a hypothetical voting history (treatment) or no voting history (control). The authors found that the treatment postcard increased subjects’ motivation to vote against the candidate listed on the mailer by one third of a point on a seven-point scale. They also found a slight decrease in individuals’ motivation to vote for the candidate, but the effect was not statistically significant. The authors conclude that social pressure mail causes increased negative affect and makes individuals less likely to support a candidate, but do not report findings that the mailers made subjects less likely to turn out to vote.

*Reactance Theory*

Reactance theory offers one possible explanation for the negative effect of the mailers in this study. Although compliance with social norms such as voting increases when individuals feel monitored, psychology literature has also found that efforts to increase compliance with social norms such as littering (Reich and Robertson 1979), smoking cessation (Miller et. al 2006) and reducing alcohol consumption (Bensley and Wu 1991) can suffer from psychological reactance and actually reduce rates of the positive behavior. Reactance occurs when an individual feels as if her freedom to make a decision is being infringed upon by an outside force (Brehm 1966). Reactance can reduce compliance with the behavior that is being promoted and can cause negative affect toward sender of the message (Wicklund 1974 as cited by Matland and Murray 2013).
The social pressure mailer in this study could have triggered reactance in the treatment group by making subjects feel as though their choice of whether or not to vote on Election Day was being infringed upon. Instead of complying with the GOTV message, individuals may have reacted by actively resisting the appeal and becoming less likely to vote. Results from the lab experiment support a reactance theory explanation for the negative effect of the original mailer in this study, which was identical to the mailer tested in the lab experiment: individuals in the political treatment group felt pressured to vote and like their voting behavior was being monitored to a much greater degree than the control group.

The section listing issues at stake in the election could also have caused voters to feel overly responsible for the outcome of the election and so pressured to vote that they reacted by not voting. However, reactance theory is only a partial explanation at best for this study’s negative treatment effect because it does not easily explain the larger negative effect of the contaminating treatment mailer, which did not have an issues section. This mailer was nearly identical to the Self treatment tested in Mann’s 2010 study of voter backlash and that has been shown to have large positive effects on turnout in many previous studies. If reactance theory explains the decrease in turnout in the field experiment, it is a partial explanation at best.

Potential Effects of Age

Given the large negative effect of the contaminating mailer, which has been found to have a positive effect in previous literature, it makes sense to examine the sample in this study for differences that could have caused the mailers to have such an unexpected negative impact on turnout. While the logit model controls for most demographic variables that could influence turnout, it fails to control for the potential interaction of the treatment and age variables on turnout. Age was not included in the voter file obtained for this study, so it is difficult to know whether the treatment groups are balanced on age, as well as whether the sample population as a
whole is older or younger on average than the general U.S. population or other populations that have been targeted in previous social pressure studies.

According to 2010 census data, the county where this field experiment was conducted had a median age of 44.9 years, compared to 37.2 in the U.S. population as a whole. The list of registered voters in the county was further reduced by restricting the sample in this study to individuals estimated by the Democratic Party of Virginia to be Independents, likely Democrats, or strong Democrats. The DPVA makes these designations based largely on past primary participation and responses to phone calls and door-to-door canvassers. Since older individuals are more likely to participate in primary elections (Bhatti, Hanse, and Wass 2012) and have landline phones to call for canvassing (Link et al. 2007), it is plausible that restricting the voter file by likely party biased the sample toward older voters.

The household sampling method used in this study is also more likely to select older individuals than sampling methods utilized in previous studies, which selected only single voter households (Mann 2010, Green and Gerber 2008). In this case, the sampling method used in this study did not bias the sample toward older individuals, but rather selected households regardless of the number of registered voters, potentially selecting a more representative (and therefore older) sample than studies using of single-voter households, which could be more likely to include younger, unmarried voters.

Are older individuals more likely to exhibit psychological reactance to social pressure mailers? According to Matland and Murray (forthcoming), evidence for an interaction between reactance and age is mixed, but older individuals tend to be more concerned with the sorts of issues of personal information and privacy that are created by social pressure mail. In a February, 2012 poll conducted by Pew Research Center for the People and the Press and the Roper Center, 62% of respondents over age 30 indicated that the Internet companies’ use of personal data to
target advertising was an invasion of privacy, while just 46% of respondents under age 30 agreed (Kohut et al. 2012). Older Americans appear to be slightly more concerned with privacy than younger Americans, and less aware that their personal data is available and used to target them on the Internet (Hoofnagle et al. 2010), perhaps indicating that they are more likely to react negatively to a mailer with unexpected knowledge of their voting history.

Based on geography, targeting of likely party, and household sampling method, the sample in this study may be slightly older than individuals in other social pressure studies and could be more likely to exhibit reactance to social pressure treatment mailers, although this has not been found so far in the literature. Future studies might explore this by explicitly collecting data regarding subject age and creating treatment groups that vary based on age as well as the heavy-handedness of the social pressure message.

Conclusion

The findings in this study add to the literature on backlash effects of social pressure mail, but by no means solve the problem of whether and under what conditions social pressure mail may decrease turnout. In this study, both social pressure mailers appeared to have negative effects on turnout, even when controlling for other demographic and vote history variables that could explain turnout differences. The decrease in turnout cannot be attributed solely to the novel approach used in this study to link issues with individuals’ voting histories, because the effect of the second mailer, which was a traditional social pressure message, was also strongly negative. Survey evidence from the lab experiment portion of the study support the idea of psychological reactance—individuals in the treatment groups reported strong negative emotions and felt as if their behavior was being closely monitored. It is plausible that the mailer caused individuals to
feel as if their decision about whether to vote on Election Day was being infringed upon, leading them to not vote at all.

The finding that the treatment mailers in this study had such strong negative effects is unexpected because it is contrary to the vast majority of social pressure and direct mail literature. The negative effects in the field experiment are all the more surprising given the scope of the mailer: while the mailer focused on a race for supervisor, it caused individuals to abstain from voting in a very competitive gubernatorial and attorney general election as well. The treatment groups in the field experiment were balanced (or were made balanced via regression) on as many demographic variables as were available in the voter file, which indicates that the negative effects of the social pressure mailers were likely caused by something unique about this sample or election. As discussed above, psychological reactance theory provides some insight regarding why individuals may have reacted to the mailer by not voting, but since one treatment was very consistent with prior literature that found positive effects, reactance cannot be the full explanation. It is possible that there was an interaction between the treatment mailers and age, which is a variable that was not included in the voting data obtained for this study. Since the target population is likely to be older than the general population and past literature is largely based on single-voter households, it is possible that the results from this field experiment reflect the fact that older individuals may react poorly to social pressure messages. Future studies exploring the impact of age on social pressure treatment effects might be able to more light on this question.

Another finding in this study that would be an interesting avenue for further research is the effect of receiving multiple social pressure mailers at once. In this study, individuals who received both social pressure mailers voted at a lower rate, on average, than those in the pure control group, but the negative effects observed for each mailer separately do not appear to have
been additive. One might expect that receiving two mailers that individually trigger negative emotions and reactance would result in even more negative emotions and a greater degree of reactance. This does not seem to be the case. The sample groups, particularly the two-mailer group, were very small, but the negative effect of receiving both mailers appears to have been somewhere in between the effect of the first mailer (with issue messaging) and the second, traditional social pressure mailer. Could this be very preliminary evidence of social pressure fatigue? To my knowledge, there is no literature exploring whether voters can become immune to social pressure mail effects, but it seems plausible that the second social pressure mailer an individual receives will lack the same sort of “shock value” that the initial mailer had. A second mailer containing an individual’s voting history may surprise her less or even moderate the effect of the first social pressure mailer by normalizing it (i.e. she may think that social pressure messaging is just the campaign norm, and as such will react less negatively).

Even with its small sample size and preliminary findings, this study provides insight into possible negative effects of direct mail that are rarely discussed in the social pressure literature thus far. In an effort to make their direct mail programs more cost-effective, political campaigns are increasingly shaping their best practices around the findings from political science literature on social pressure mobilization effects. If social pressure direct mail has the potential to cause large, negative turnout effects, it is incredibly important that the social pressure literature reflect this possibility and that political campaigns are made more aware of the risks of utilizing social pressure messaging in their races. Much more research should be conducted to explore the environmental and demographic conditions under which social pressure effects are negative, in order to best inform campaign practices so they do not accidentally decrease the turnout of targeted group of supporters. A more nuanced understanding of social pressure effects could also
allow for the discovery of populations who are likely to be strongly positively effected by the mailers and as such could be more heavily targeted.

Normatively, it is a moral grey area as to whether political scientists should conduct field experiments with potential real-world effects when they expect their treatment to decrease voter turnout. While the negative effects found in this study were unanticipated, they potentially had a lasting impact on the district in which the experiment was conducted. Based on a calculation of the large, negative effect of the second social pressure mailer and the marginally negative effects of the mailer created for this study, the local candidate participating in this study would have gained enough supportive votes to have won the election had the second social pressure mailer, or both mailers, not been sent.

Since political scientists have already touted the positive effects of social pressure mail, they may have the responsibility to thoroughly investigate the other side of social pressure—reactance. Who votes matters, and a more complete understanding of the positive and negative effects of social pressure direct mail could be integral to campaigns’ successful mobilization of supporters.
Appendix

Figure 1: Original field experiment treatment mailer

Dear [Name]

Thank you very much for being a registered voter. Registering to vote and participating in the electoral process is very important for the future of our country. Our records indicate, however, that you did not vote in some or all recent statewide elections.

This record from the publicly available list of registered voters shows your previous election participation, as well as a blank space that we will update after Election Day 2013.

[Table]

<table>
<thead>
<tr>
<th>Date</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/04/08</td>
<td>Voted</td>
</tr>
<tr>
<td>11/03/09</td>
<td>Voted</td>
</tr>
<tr>
<td>11/02/10</td>
<td>Voted</td>
</tr>
<tr>
<td>11/08/11</td>
<td>Voted</td>
</tr>
<tr>
<td>11/06/12</td>
<td></td>
</tr>
<tr>
<td>11/05/13</td>
<td></td>
</tr>
</tbody>
</table>

It is very important for Democrats and Independents to vote in state and local elections!

Here are just a few examples of the negative impact Republicans have had since they took control of the [Board of Supervisors] and could continue to have if voters like you fail to participate in November:

- Approving 93% of the more than 6,200 new homes proposed by developers
- Ignoring the fact that 80% of residents want more controlled growth in the county
- Voting for projects that do not include funding for needed infrastructure

Your participation in the November 5 local elections is crucial to ensure that Republicans on the Board of Supervisors cannot continue to pursue these harmful policies!

PROTECT YOUR QUALITY OF LIFE – VOTE!
**Figure 2:** Social pressure mailer sent by an outside Democratic group that “contaminated” the treatment groups in this study

---

**PUBLIC VOTING RECORD ENCLOSED**

Dear Registered Voter,

This year’s election for Governor, Lieutenant Governor, Attorney General and House of Delegates is Tuesday, November 5th. Polls will be open from 6 AM to 7 PM, and turnout is expected to be high. Our records show that you and others in your neighborhood are regular voters.

The chart below shows your household’s public voting record in past elections as well as an empty space which we will fill in to indicate if you vote in this year’s election on Tuesday, November 5th. We intend to mail you an updated chart after the election that will show whether or not you voted.

We will leave the space blank if you do not vote.

**VOTE TUESDAY, NOVEMBER 5th**

<table>
<thead>
<tr>
<th>Name</th>
<th>Nov ’09</th>
<th>Nov ’12</th>
<th>Nov ’13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Voted</td>
<td>Voted</td>
<td>______</td>
</tr>
<tr>
<td></td>
<td>Voted</td>
<td>Voted</td>
<td>______</td>
</tr>
</tbody>
</table>
Dear [Name]

Thank you very much for voting in the 2012 presidential election. Thanks to your participation, Mitt Romney came very close to winning the Commonwealth of Virginia and the presidency. Our records indicate, however, that you did not vote in some or all recent statewide elections.

This record from the publicly available list of registered voters shows your previous election participation, as well as a blank space that we will update after Election Day 2013.

11/05/08 11/03/09 11/07/11 11/06/12 11/05/13
Voted 7

It is very important for Republicans and Independents to vote in state elections!

Here are just a few examples of the negative policies Democrats have supported since 2009 and would try to implement if voters like you fail to participate in November and Democrats take control of the state government:

• Weakening voter ID laws and threatening the security and validity of our elections
• Raising taxes on small businesses and hardworking Virginians
• Passing excessive environmental regulations that will raise energy costs for Virginia families and result in job losses
• Reducing the ability of parents to make the educational choices that are right for their families
• Increasing government involvement in healthcare through the implementation of Obamacare’s Medicaid expansion
• Overturning the Commonwealth’s right to work law, slowing job creation

Your participation in the November 5 state elections is crucial to ensure that Virginia Democrats cannot pursue these harmful policies!

PROTECT YOUR RIGHTS – VOTE!
Dear [Name]

Student energy consumption is a major source of carbon emissions on the campus of William & Mary and reducing energy use and carbon emissions is very important for the future of the environment and our country. Our records indicate, however, that campus carbon emissions have been on the rise for your dorm since 2008.

This record from the publicly available 2012 Greenhouse Gas Emissions Audit shows previous carbon emissions data for students like you, as well as a blank space that we will update after the 2013 audit.

<table>
<thead>
<tr>
<th>Carbon Emissions (in Metric Tons CO2 per student)</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.9</td>
<td>7.1</td>
<td>7.4</td>
<td>7.6</td>
<td>8.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is very important for all students to do their part to reduce carbon emissions!

Here are just a few examples of the negative impact carbon emissions have had on our environment and could continue to have if students like you fail to conserve energy and reduce carbon emissions this year:

- Hotter average temperatures statewide, including a 2012 average temperature of 61.7 degrees in Richmond, Virginia—the warmest time period in 67 years
- Increased incidence of wildfires, totaling more than 450 wild fires in Virginia in 2012 alone
- More frequent extreme weather events such as hurricanes, flooding, and snowstorms
- An ever-expanding dead zone in the Chesapeake Bay that is unable to support plant or animal life
- Unsafe levels of air pollution, leading to increased incidence of asthma, heart attacks, and other medical problems for Virginians
- Rising sea levels, threatening low-lying Virginia cities like Norfolk and Virginia Beach

Your contribution to reducing William & Mary’s carbon emissions is crucial to slow global warming and ensure that carbon emissions cannot continue to negatively impact Virginia.

PROTECT YOUR ENVIRONMENT – REDUCE EMISSIONS!
**Table 1:** Results of difference of means tests to test for balance between treatment and control groups. Statistically significant differences are labeled.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Treatment</th>
<th>Control</th>
<th>Difference</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>0.150</td>
<td>0.123</td>
<td>0.027</td>
<td>0.034*</td>
</tr>
<tr>
<td>Likely Democrat</td>
<td>0.473</td>
<td>0.480</td>
<td>-0.007</td>
<td>0.704</td>
</tr>
<tr>
<td>Strong Democrat</td>
<td>0.377</td>
<td>0.397</td>
<td>-0.020</td>
<td>0.260</td>
</tr>
<tr>
<td>Male</td>
<td>0.357</td>
<td>0.432</td>
<td>-0.075</td>
<td>0.000***</td>
</tr>
<tr>
<td>Vote 2012</td>
<td>0.878</td>
<td>0.882</td>
<td>-0.004</td>
<td>0.720</td>
</tr>
<tr>
<td>Vote 2010</td>
<td>0.548</td>
<td>0.580</td>
<td>-0.032</td>
<td>0.075</td>
</tr>
<tr>
<td>Vote 2009</td>
<td>0.519</td>
<td>0.557</td>
<td>-0.038</td>
<td>0.039*</td>
</tr>
<tr>
<td>Vote 2008</td>
<td>0.856</td>
<td>0.868</td>
<td>-0.013</td>
<td>0.323</td>
</tr>
</tbody>
</table>

| N                 | 1135      | 2183    |

* p<0.05, ** p<0.01, *** p<0.001

**Table 2:** Balance table of demographic variables for the lab experiment, by treatment group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Political</th>
<th>Environmental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democrat</td>
<td>0.732</td>
<td>0.594</td>
<td>0.585</td>
</tr>
<tr>
<td>Republican</td>
<td>0.232</td>
<td>0.246</td>
<td>0.264</td>
</tr>
<tr>
<td>Independent</td>
<td>0.036</td>
<td>0.145</td>
<td>0.113</td>
</tr>
<tr>
<td>Political Interest</td>
<td>0.661</td>
<td>0.725</td>
<td>0.660</td>
</tr>
<tr>
<td>Male</td>
<td>0.429*</td>
<td>0.522</td>
<td>0.642</td>
</tr>
<tr>
<td>Voted 2012</td>
<td>0.768</td>
<td>0.768</td>
<td>0.755</td>
</tr>
<tr>
<td>White</td>
<td>0.714</td>
<td>0.710</td>
<td>0.755</td>
</tr>
</tbody>
</table>

| N              | 56        | 69           | 53      |

Note: Asterisks indicate a statistically significant difference between the group mean and the control group mean, * p<0.05, ** p<0.01, *** p<0.001


Harbaugh, William T. 1996. “If people vote because they like to, then why do so many of them lie?” Public Choice 89:63-76.

Hoofnagle, Chris Jay, Jennifer Kind, Su Li, Joseph Turow. 2010. “How Different are Young Adults from Older Adults When it Comes to Information Privacy Attitudes and Policies?” Working Paper.

Hurt, Alyson (AlyKat). “I know the fact of my voting is prob public record – but this feels like a weird kind of intimidation. Sender: DPVA pic.twitter.com/k7A3XidO6T” 31 October, 7:41pm (Tweet).


Quattrone, George A. and Amos Tversky. 2013. “


