Voter Mobilization Meets eGovernment:
Turnout and Voting by Mail from Online or Paper Ballot Request[1]

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Abstract: During the past two decades, the movement toward eGoverment has shifted many government services online. Despite initial hopes that the Internet could be leveraged to increase voter participation, eGovernment has changed little about the voting process. Our field experiment compares two treatments sent to voters via postal mail prior to the 2010 General Election in Maine: 1) recruitment to request a mail ballot via Maine's new online system, and 2) recruitment to request a mail ballot using Maine's traditional paper application. We find recruitment to vote by mail using a traditional paper ballot application significantly increased turnout. Contrary to the expectations of advocates of eGovernment, the mailer encouraging voters to use Maine's innovative new online ballot request system generated no significant increase in overall voter turnout. Our findings indicate why eGovernment continues to contribute less to democratic participation than anticipated.

I am convinced that within five to seven years, Americans will be casting ballots
on the Internet just as easily as they can buy stock on Ameritrade today.
~California's Gov. Gray Davis, January 20, 2000

In the year 2004, the next presidential campaign after this one, you will find, in
my opinion, the vast majority of states will already have Internet voting.
~ John Chambers, CEO of Cisco Systems, January 20, 2000

The question is not whether Internet voting will become a feature of this
democracy, but rather when, how, and to what end
~Thomas Mann, The Brookings Institution, January 20, 2000[2]

Just a dozen years ago, leading figures in politics, industry, and academia expected the Internet to

transform American elections, but the reality has fallen far short of their expectations. During the

past two decades, many government services have been made available online in the United

States. Citizens can pay taxes, obtain a wide array of information, renew driver's licenses, apply

for government benefits, and much more. There is little question that citizens use eGovernment

services: a Pew Charitable Trusts study conducted in 2010 found that 48 percent of Internet users

have looked for information regarding a policy issue with their local, state, or federal

government, 46 percent have looked to see what service a government agency provides, and 41

have downloaded a form from a government Web site (Smith 2010). Despite considerable

advances in other areas, a prominent review of the benefits of eGovernment found that "the least

progress appears to have occurred in enhancing democracy" (Dawes 2008, pg. s94).

The Internet revolution in elections expected by elites a dozen years ago has been

derailed in the United States largely because pilot projects raised serious questions about the

security and reliability of using the Internet in the voting process and public support for Internet

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[2] Statements made at "The Future of Internet Voting: A Symposium Co-sponsored by the
Brookings Institution and Cisco Systems Inc.", January 20, 2000.
[http://www.brookings.edu/events/2000/0120elections.aspx?p=1].

voting is weak (Alvarez & Hall 2004, 2008; Stewart 2011a; Alvarez, Hall, Levin & Stewart 2011).[3] Nonetheless, new developments the past few years have reinvigorated the idea of using the Internet to increase voter participation. Maine has created a system to allow registered voters to voluntarily request an "absentee by mail ballot."[4] The online mail ballot request system allows voters to request a ballot via the Maine Secretary of State's Web site. The ballot is mailed to the voter by the town clerk, and the citizen then mails the ballot back to the town clerk (i.e. voting was not conducted online). This online system for requesting a mail ballot provides a unique opportunity to study whether the Internet enhances democratic participation.

Much of the research about eGovernment focuses on the quantity and quality of services offered to citizens online (Scott 2006; Reddick 2005), but it is more important to look at whether eGovernment delivers the desired outcomes for citizens. Accordingly, we ask whether citizens are willing to adopt an eGovernment service related to voting and, if so, whether providing a government service online provides the expected boost to voter participation. We examine whether Maine's online system for requesting a mail ballot enhances citizen participation in elections, or if putting this part of the voting process online is more promise than substance. More specifically, we worked with a civic organization to conduct a large-scale voter mobilization field experiment on turnout and use-of-mail voting. The experiment compares two treatments sent to voters via postal mail before the 2010 General Election in Maine: 1)

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[3] Internet based voting has seen more success in Europe, but recent research has critiqued these Internet voting programs for failing to deliver the promised benefits of increased participation. (Alvarez, Hall & Trechsel 2009; Mendez 2010; Vassil & Weber 2011).

[4] Maine has long allowed any registered voter to request an absentee ballot without providing a reason for voting by mail. This system is referred to as no-excuse absentee voting, voting by mail, and other names in various jurisdictions (and by various scholars).

recruitment to request a mail ballot via Maine's new online system, and 2) recruitment to request a mail ballot using Maine's traditional paper application.

The expectation that the Internet will facilitate voter participation is predicated, at least in part, on the idea that voters will find the Internet more convenient than traditional means of interacting with the voting process. In Maine, the supposition is that voters will find requesting a mail ballot online to be more convenient (i.e. less difficult, time consuming, or otherwise costly) than the existing paper application process. Maine election officials also expected at least two administrative benefits from the online ballot request system: 1) a reduction of incomplete ballot request forms, since the online ballot request system forces voters to complete the form before submitting it; and 2) quicker communication to resolve problems in applications, since the online ballot request system requires an e-mail address for the voter.[5]

Many scholars have expressed skepticism about whether "convenience voting" reforms deliver the expected increase in participation (for a review, see Berinsky 2005; Gronke et al 2008). However, a series of recent field experiments across several states finds that mobilization efforts that educate and recruit citizens to vote by mail will increase turnout (Mann 2011, Mann & Mayhew 2011). Therefore, we do not presume that either the new online ballot request system or the existing paper-based mail ballot application process will have an impact on voting

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[5] These expectations were explained in personal conversations with senior staff in the Secretary of State's office in August 2010. The online ballot request system was not fully automated. A ballot request submitted online via the Web page created an email that was sent to the town clerk. Then the town clerk manually reviewed the ballot request. If the town clerk found an error in the ballot request form (e.g., an invalid address), the clerk was able to directly email the applicant. Compared to the speed of postal correspondence used to communicate about traditional paper vote by mail applications, this system was expected to correct errors faster and allow more ballot requests to be processed with the correct information.

behavior without an effort to educate and recruit voters to use it (i.e. there will be no impact without the recruitment/mobilization treatments in our experiment). Our partner organization has to "sell" citizens on voting by mail to get citizens to "buy" requesting a mail ballot and, ultimately, to "buy" turning out for the 2010 General Election.

This study makes three contributions to the study of voting behavior and eGovernment. First, we find that mobilizing citizens to vote by mail increases turnout. This finding is consistent with field experiments conducted in other states. Replication of consistent findings in different electoral contexts is the core of establishing external validity in experimental research.

Second, we find no evidence that the eGovernment innovation of Maine's online ballot request system has delivered the hoped-for benefits. When our partner organization recruited citizens to request a mail ballot, citizens were much more likely to comply with the request using the traditional paper ballot application process than the online ballot request system. We also find that promoting the traditional paper ballot application is more effective at increasing turnout than promoting the online ballot request system.

Third, the traditional paper-based mail ballot application increases unreturned ballots and rejected ballots. Since recruitment to use the traditional vote by mail application increases turnout, these "problems" are due to requests for mail ballots from citizens who otherwise would not vote. That is, these "problems" reflect net additional citizens taking steps towards voting. While there is no partial credit to those who start the process but fail to cast a ballot, the increase in these incomplete or unsuccessful moves towards voter participation suggests that vote by mail recruitment could have more impact than the treatments in this experiment. Improvements that reduce this attrition from unreturned and rejected ballots would cause a greater increase in turnout than we observe in our experiment.

This paper proceeds as follows: First, we briefly review how this experiment is situated in the evaluation of eGovernment innovation and voter mobilization tactics. Second, we describe the design of our field experiment. Third, we present our results. We conclude with a discussion of the implications of these results and why ours is not the final word on the efficacy of eGovernment at encouraging voter turnout. While the findings of this experiment will be disappointing to eGovernment advocates, future experiments are needed to determine whether there are better ways to promote the online ballot request system, and whether the results of this experiment are simply due to being early on the adoption curve for online technology in voting.

Pre-Election Day Voting and Voter Mobilization

"Throughout the history of suffrage in the United States, there have been a number of reforms designed to expand electoral participation" (Berinsky, Burns, & Traugott, 2001, p179). For much of the 20th century, these reforms were focused on expanding eligibility and reducing obstacles to voter registration. More recent reforms have focused on the process of voting, among them allowing early in-person voting and voting by mail. The changes during the past decade were largely prompted by the controversy in Florida over the 2000 Presidential Election and pushed along by the Help America Vote Act [HAVA] passed in 2002. HAVA mandated that states and localities upgrade many phases of election administration (e.g., Stewart 2011a; Hanmer et al. 2010; Alvarez et al. 2009). Prominent among these reforms was the expansion of the long-standing absentee voting process by dropping any requirement to provide an excuse to vote absentee. In Maine, this process is known as "vote absentee by mail," reflecting its origin in absentee voting and the open opportunity to cast a ballot through the mail.

The potential benefits expected from voting by mail are considerable. In a review of the literature on vote by mail reforms, Gronke, Galanes-Rosenbaum, and Miller (2007) describe the anticipated benefits of voting by mail to voters, election administrators, and the American political system: "Voting by mail increases turnout and results in more citizens having a stake in their government; more thoughtful voting, enhancing the democratic process; offers greater procedural integrity; and finally, saves taxpayer dollars" (p640). Reform advocates add that voting by mail overcomes typical problems faced by voters at polling places, including providing a paper trail, avoiding possibly malfunctioning voting machines, and eliminating confusion about where voters should cast their ballots (The Vote by Mail Project, 2011).

Recent research has shown that voting by mail lives up to some of the expectations of reformers. Voters in states where no excuse voting by mail is allowed report a preference for voting by mail because of its convenience (Southwell & Burchett 2000; University of Akron 2010). A study in Colorado calculated that voting by mail saved a fifth of the cost of administering elections (Cuciti & Wallis 2011). By developing the online ballot request system, election administrators in Maine sought to enhance voter convenience and administrative cost savings by allowing voters to request ballots online.

However, observational studies of reforms to allow no-excuse voting by mail have contradictory findings. Some scholars find that voting by mail reforms do increase turnout (e.g. Gerber, Huber and Hill 2011; Gronke et al. 2008; Karp and Banducci 2001). However, many other scholars find little or no effect on turnout from vote by mail reforms (Fitzgerald 2005; Berinsky 2005; Hanmer and Traugott 2004; Berinsky, Burns, and Traugott 2001). One study finds a decrease in turnout in federal general elections when citizens are involuntarily forced to vote by mail (Kousser & Mullin 2007).

Several recent field experiments have shown that the critical link between increased turnout and reforms to allow vote by mail is educating citizens about voting by mail, and recruiting them to do so. Civic and political organizations play a critical part in distributing this information to voters. In their efforts to mobilize voters to cast ballots, these organizations subsidize voters' costs of learning about more convenient methods of voting. Consequently, when civic and political organizations send information to citizens encouraging them to vote by mail, turnout is significantly increased (Arceneaux, Kousser & Mullin 2011; Mann 2011; Mann & Mayhew 2011).

What sets mobilization through voting by mail apart from other voter mobilization tactics is the focus on reducing cost rather than increasing motivation. Since Downs (1957) proposed that citizens engage in a rational calculation on whether to vote, scholars have focused almost exclusively on increasing motivations (i.e. benefits) to overcome a putatively fixed cost of voting. During the past decade, a growing literature on field experiments has demonstrated voter mobilization can succeed by increasing motivation through saying "thank you" (Panagopoulos 2011); exerting social pressure by threat of monitoring (Gerber, Green & Larimer 2008, 2010; Mann 2010; Panagopoulos 2010; Davenport 2010); making a personal connection on the phone (Nickerson 2007) or at the door (Arceneaux & Nickerson 2009b); appealing to ethic identity (Panagopoulos & Green 2011; Abrajano & Panagopoulos 2011; Michelson 2005; Ramirez 2005); increasing awareness of the election (Panagopoulos 2009); and other tactics (see Green & Gerber 2008 for a review).

The costs of voting were essentially fixed when citizens were required to go to a specific precinct polling place on Election Day to cast a ballot, which is why there has been such a focus on increasing motivation. But this cost of voting is no longer fixed. The relatively recent

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expansion of voting by mail allows mobilization tactics that reduce the cost of voting. We focus on this opportunity to reduce the cost of voting through recruitment to vote by mail. Since online transactions are widely expected to lower the cost further and increase the convenience of transactions with the government (Bekkers & Homburg 2007; Mendez 2010; Moynihan & Lavertu 2011), we expand upon the recent vote by mail recruitment field experiments by asking whether recruiting citizens to use the online request system is more efficacious.

A Hard Test for eGovernment

From a public administration perspective, the logic of eGovernment is straightforward. When executed correctly, eGovernment is mutually beneficial for both citizen and government. "[W]hen fully operational, digital governance increases civic knowledge, improves confidence in government and enhances the quality of information conveyed and received" (Milakovich 2011). For citizens, eGovernment is thought to lower barriers in citizens' abilities to contact and interact with their government. For public agencies, offering accountable and competent services online allows governments to lower transaction costs and streamline processes (Milakovich 2011).

This experiment is a uniquely difficult test of the efficacy of eGovernment services, because voting by mail is fully voluntary. Other eGovernment services are necessary for an affected segment of the population to master. For example, vehicle owners may choose to renew their vehicle registration online, but they must register their vehicle in some way, because driving without a valid license plate is illegal. Similarly, citizens may choose whether to file taxes online or on paper, but they are legally obligated to pay taxes. Some services offered online, such as applying for social welfare benefits, are legally voluntary. But for eligible citizens, financial need is at least as compelling as a legal mandate.

By contrast, voting is a unique government service, because there is neither de jure nor de facto mandate to use it. In Maine, voting by mail is a voluntary choice within that voluntary activity.[6] Citizens are free to skip voting in any and every election – and a large plurality does so in almost all elections. Although Maine's 2010 turnout was the highest in the nation, at 55.5% of the voting eligible population, many citizens decide not to vote even in this civic-minded state. Moreover, Maine citizens can vote on Election Day without interacting with either the online mail ballot request system or the traditional paper-based mail ballot request process. In the Maine 2010 General Election, 77% of all ballots were cast at Election Day polling places, and 23% of ballots were cast with pre-Election Day methods (McDonald 2011). In short, if the online ballot request system is to succeed, it must pull people in with convenience or other benefits, because voting is not obligatory, by mail or otherwise.

It should be noted that one of the frequently cited benefits of eGovernment services is moving citizens away from interactions with "street level bureaucrats" (i.e., clerks in government agency offices) to a centralized and standardized process (Reddick 2005). This shift is expected to reduce government costs and improve the quality of citizen interactions with government (Tolbert & Mossberger 2006). While "street level bureaucrats" play a major role in election administration in the form of poll workers (Kimball & Kropf 2006), the traditional vote by mail process already avoids them with paper-and-postal interactions with the central election office. Thus, voting by mail is a hard test for eGovernment, because there is little, if any, potential for gain in this regard.

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[6] Since Maine voters have the option to vote in person, it is distinct from the 100% mail ballot delivery systems used for all elections in Oregon, Washington, and occasionally in other jurisdictions.

Age, Voting by Mail, and eGovernment

The effects of our treatments may be conditional on the age of the recipient in two ways: First, no excuse voting absentee by mail in Maine (and elsewhere) has its roots in long-standing provisions to allow senior citizens to cast a ballot if infirmity, lack of transportation, or other reason prevents them from making it to their polling place. Based on this historical association in American political culture between age and voting absentee by mail, we might expect older voters to be more likely to respond to the encouragement to vote by mail, because they have difficulty making it to the polls or because any social stigma for using this method of voting declines with age.

Second, younger generations are more likely to be comfortable using the Internet for transactions of all types. Therefore, encouragement to use the online ballot request system may seem more credible and attractive to younger voters than older voters. If so, the encouragement to use the online ballot request system should have a larger impact among younger voters.

Method/Research Design

Our experiment tests whether the benefits of eGovernment enhance the effectiveness of vote by mail recruitment efforts by comparing two vote by mail recruitment treatments: 1) sending a mailer, including a paper vote by mail application, or 2) sending a mailer encouraging use of the online mail ballot request system created by the Maine Secretary of State's Office. This experiment was conducted in partnership with a non-partisan 501(c)3 civic organization that

sought to increase turnout in the 2010 General Election.[7] The Maine Secretary of State's Office provided guidance on the design of the treatments and assistance with the data.

Since the field experiment was conducted in partnership with a civic organization whose mission is to increase participation in voting, we have an extremely high degree of realism on Gerber and Green's four criteria for "an ideal field experiment": "(1) whether the treatment used in the study resembles the intervention of interest in the world, (2) whether the participants resemble the actors who ordinarily encounter these interventions, (3) whether the context within which subjects receive the treatment resembles the context of interest, and (4) whether the outcome measures resemble the actual outcomes of theoretical or practical interest" (Gerber & Green 2012; Chapter 2).

The registered voters in the population for our experiment were randomly assigned to three conditions: 1) a mailing with a vote by mail application that could be completed and mailed to the appropriate town clerk (Appendix Figure 1); 2) a mailing that included encouragement to use the Maine Secretary of State's online "vote absentee by mail" ballot request system (Appendix Figure 2); or 3) the control group, which received no contact from our partner organization. To request a mail ballot, people in the traditional vote by mail recruitment condition had to complete the enclosed application and mail it to the town clerk using an envelope pre-addressed to the appropriate town clerk. People in the online recruitment condition had to follow the link to the Secretary of State's Web site, where they completed and submitted an online request form.

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[7] Our agreement with this organization specified unrestricted publication rights using the data from this experiment, thus avoiding the potential for selection bias in reported results when organizations control the release of information (Nickerson 2011; Gerber 2011).

Our partner organization targeted 61,056 registered voters who met the following conditions: 1) the address was considered deliverable by the US Postal Service and no Change of Address had been filed with the USPS to avoid wasting mailings; 2) younger than 30 years old, unmarried women, non-white, or members of the organization and its allies to achieve their mission of increasing participation by groups under-represented in the electorate; and 3) had a predicted turnout probability between 30% and 70%, based on a predictive voter turnout model provided by Catalist LLC, a firm specializing in providing voter data to civic and political organizations. This criterion was based on previous research that voter mobilization contacts have maximum impact for registered voters with a 50-50 chance of turning out (Green and Gerber 2008 p. 174; Arceneaux and Nickerson 2009b).

Random assignment was done at the household level (54,595 households) to ensure that all voters in a household were assigned to the same condition. Table 1 shows that the random assignment produced groups with the expected balance across the observable covariates: 22,706 households (25,369 individuals) were sent the paper vote by mail application [*Mail Application*], 22,877 households (25,587 individuals) were mailed a postcard with information about requesting a vote by mail ballot online [*Online Application*], and 9,012 households (10,100 individuals) were in the *Control Group*.

Our partner organization's selection parameters draw attention to the question of external validity. The results from all field experiments are necessarily specific to the context in which they are conducted, and our experiment is no different. The opportunities to conduct this experiment in a partnership makes it more realistic in terms of what civic organizations actually do, but this means our subjects are not perfectly representative of all registered voters in Maine.

Nonetheless, the demographic profile in Table 1 shows that our experimental population is sufficiently diverse to provide broadly generalizable insights about voting behavior.

The effect of the treatments is measured using publicly available individual voter turnout records acquired from the Maine Secretary of State's Office after the 2010 General Election by Catalist LLC and individual records on requests for and return of absentee by mail ballots from the Maine Secretary of State's Web site (Maine Secretary of State 2011). This individual level voting behavior data allows us to measure the effects of each treatment on requests for mail ballots, method of ballot requests (online, written, or other), unreturned mail ballots, rejected mail ballots, overall turnout, and method of casting a ballot.[8]

In the results below, we first report the mean rate of voting behavior measures, then use regression analysis to estimate the effect of the two randomly assigned treatments. Since the random assignment was conducted at the household level, we cannot use the mean of individual behavior for hypothesis testing without accounting for (potential) intra-household correlation in voting behavior. Therefore, we use the regression analysis for our hypothesis testing, because it accounts for intra-household correlation in voting behavior by clustering the standard errors at the household level (Arceneaux and Nickerson 2009a).

We estimate each regression with and without covariates in the regression model. Although random assignment produces unbiased causal estimates of the Average Treatment

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[8] Voters who did not appear on the post-election voter rolls were coded as non-voters. We cannot exclude voters who drop from the voter rolls, because the administrative process for removing a record from the voter rolls is conditional on non-voting under the federal National Voter Registration Act of 1993. If the treatment increases turnout, it makes voters more likely to remain on the rolls. Thus, exclusion of non-voters from both the treatment and control groups will bias the estimate of the treatment effect.

Effect [ATE] without covariates, we add covariates because they reduce the standard errors for the treatment effects. As expected from the well powered and well balanced randomization, the estimates of the ATE with and without covariates differ only trivially and the standard errors shrink slightly in all results below. Our discussion of results refers to the model with covariates, as these estimates are slightly more efficient. It should also be noted that we report all "intent to treat" effects, because there is no way to measure contact (i.e. which voters received and read the mail) to calculate "average treatment among the treated" effects. Thus, care should be taken comparing these results to phone and canvass experiments that report average treatment among the treated effects.

We apply a two-tailed test of statistical significance for consistency across all of our hypothesis testing. For our basic hypotheses that each treatment will increase requests for mail ballots and increase turnout, it would be appropriate to use a one-tailed significance test, since theory indicates only positive or null outcomes are possible (i.e., there is no expectation that the treatments will reduce ballot requests or turnout). However, unlike much of the field experiments literature on voter mobilization, we anticipate that the treatments may have either positive or negative effects for other outcomes of interest. Therefore, a two-tailed test is required. At the request stage, we expect that the *Mail Application* will increase written requests for ballots and could decrease online requests by shifting voters who might otherwise use the online system. The *Online Application* is expected to have the inverse pattern. When examining voting behavior, the treatments might decrease the share of ballots cast Early In-Person and/or on Election Day if voters are shifted from these methods to voting by mail, or the treatments might increase these methods due to a general mobilizing effect across all methods. Since a two-tailed

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test is more conservative than a one-tailed test, we apply a two-tailed test in all hypothesis testing for consistency and ease of interpretation.

Results: Requests for Mail Ballots

For each experimental condition, Table 2 presents the raw mean rates of overall requests, written requests, online requests, other requests, and ballot requests that are rejected by the town clerk[9]. Both treatments cause an increase in requests for mail ballots above the 9.9% mail ballot request rate in the *Control Group*, but the effect of the *Mail Application* treatment is four times that of the *Online Application* treatment (5.2 percentage points vs. 1.3 percentage points). Compared to the *Control Group*, the *Mail Application* treatment nearly doubles the rate of written requests, and the *Online Application* treatment more than doubles the rate of online requests. Unsurprisingly, in comparison to the *Control Group*, neither treatment appears to have any effect on requests via the other channel for requests. The rejection of ballots was extremely rare (0.07%) and remained so for both treatments.

Table 3 reports the results of the regression analysis of effects with robust standard errors clustered by household to allow hypothesis testing.[10] The ATEs noted from Table 2 all appear to be highly statistically significant. Focusing on the ATEs with covariates included in the regression analysis, the *Mail Application* treatment increased the overall request rate by 5.3

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[9] "Other Requests" include those made by phone or in person at the town clerk's office. The primary reasons for town clerks to reject ballot requests are incomplete information in the application or conflicts with voter registration information (i.e. the application contains a different address, birth date, etc.).

[10] A full reporting of the covariates included in the second model for each outcome in Table 3, Table 5, and Table 6 is available in the Supplemental Information available online.

percentage points (p<0.001), which comes from a 5.7 percentage point increase in the written request rate (p<0.001), and no meaningful effect on the online request rate (p=0.259) or request rejection rate (p=0.949). The *Online Application* increased the overall request rate by 1.4 percentage points (p<0.001), which comes from a 1.1 percentage point increase in the online request rate (p<0.001), and a negligible effect on the written request rate (p=0.393) and request rejection rate (p=0.418). Finally, an F-test shows that the ATEs from the two treatments are significantly different, except for the rate of rejection of ballot requests by town clerks where neither treatment had a detectable effect.

Results: Voting Behavior

As above in the examination of ballot requests, Table 4 first provides the raw mean rates for each condition for overall turnout, use of mail voting, use of early in-person voting, use of Election Day voting, mail ballots not returned, and mail ballots rejected by the town clerk. Table 5 then uses regression with robust standard errors clustered by household to allow hypothesis testing. The control group turned out at 49.1%. Focusing on the treatment effects estimated by regression models that included covariates, Table 5 reports a 1.4 percentage points increase in turnout from the *Mail Application* treatment (p=0.024), but the effect of the *Online Application* treatment is indistinguishable from zero (p=0.469). The 4.6 and 1.2 percentage point increases in voting by mail are statistically significant for both treatments respectively (p<0.001; p=0.001), but the four-fold difference between them highly statistically significant (p<0.001). The *Mail Application* treatment significantly decreased early in-person voting (-0.6 percentage points; p=0.032) and Election Day voting (-2.5 percentage points; p<0.001), while the effect of the *Online Application* is small and not statistically significant on both methods of voting (p=0.958;

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p=0.331). For all of these voting behaviors, the effect from the *Mail Application* is significantly larger than the effect of the *Online Application* treatment.[11]

Results: Effect on Compliers Who Request a Ballot

The smaller effect on request rates from *Online Application* treatment (Table 3) potentially limits the effect on turnout (Table 5). However, it is possible that the *Online Application* treatment generates the same increase in turnout as the *Mail Application* treatment among those who comply with the treatment by requesting a mail ballot. To estimate this Complier Average Causal Effect (CACE), we use the random assignment to the treatments as an instrument for requesting a ballot (Angrist, Imbens, & Rubin 1996).

Table 6 reports the CACE for the two treatments. The increase in turnout for compliers with the *Mail Application* treatment is more than twice as large (9.1 percentage points, p=0.023) as the increase in turnout for compliers with the *Online Application* treatment (3.9 percentage points, p=0.470). This difference fails reach conventional standards of statistical significance (p=0.168), but the magnitude of the difference suggests that it is probably not inconsequential. Thus, the *Mail Application* treatment appears to be more effective at generating net turnout among compliers, as well as generating a higher ballot request rate.

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[11] It should be noted that the effect on each of turnout and the three methods of voting is the sum of the other three estimates. For example, the increase in voting by mail is the sum of the increase in turnout and the shifts to voting by mail from early in person voting and Election Day voting (with a bit of rounding error).

Results: Problems with Voting

Tables 4 & 5 also show that the *Mail Application* treatment significantly increased the failure to return a mail ballot by Election Day (1.0 percentage points; p<0.001) and the rejection of returned ballots by the town clerks (0.06 percentage points; p=0.025), while the *Online Application* treatment had no detectable effect on either failure to return the ballot or rejection of the ballot. The primary reason for rejecting ballots is a problem with the outer "ballot security envelope," usually failure to sign and date the security envelope or a mismatch with the signature on the voter registration file.

Several studies of election administration have expressed concern that expanding use of voting by mail increases these types of election administration problems, because they are presumed to indicate disenfranchisement of voters who would have successfully cast ballots by other means (e.g. Stewart 2011a; Alvarez et al 2009). Our findings show that these "problems" may be a glass half-full rather than half-empty. The increase in these problems is a sign that, in addition to increasing turnout, the *Mail Application* treatment moved another 1.06 percentage points of citizens part way towards casting a ballot. While failure to complete the act of voting is disappointing, mobilizing these citizens to at least start the process suggests they may be more likely to successfully vote in the future. In other words, the attrition from ballot requests to successfully casting a ballot indicates the unfulfilled potential of vote by mail recruitment rather than an inherent problem in voting by mail. An improved *Mail Application* treatment to recruit people to vote by mail could tap this unfulfilled potential to make vote by mail recruitment an even more effective voter mobilization tactic.

Results: Heterogeneous Effects across Age Groups

We examined the possibility of heterogeneity in the treatment effects across age groups based on separate expectations about older and younger voters. First, the evolution of absentee voting from a service to allow senior citizens to vote indicates that older voters might be more likely to respond to vote by mail recruitment. Second, younger voters might be more comfortable with conducting business on the Internet and thus more responsive to encouragement to use the online ballot request system. Therefore, we examined whether the average treatment effects varied across age groups. We divided the experimental population into age quintiles to look for heterogeneous treatment effects.[12]

Figure 1 shows the average treatment effects on use of voting by mail (and 95% confidence intervals) within each age quintile.[13] The request rates from the *Mail Application* treatment are higher across the board. Nonetheless, it appears that both treatments generated more voting absentee by mail among older voters, as expected. The treatment effect heterogeneity is not statistically significant for the *Online Application* treatment; and for the *Mail Application* treatment only the two oldest categories are significantly more likely to request a ballot than the youngest category. It is noteworthy that the ratio between the effects on oldest and youngest voters is approximately the same for both treatments, even though the quantities are different: Compared to the 18 to 30 year olds, the effects from both treatments are ~50% higher

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[12] The quintiles are defined by year ranges 18-30, 31-40, 41-50, 51-60, and over 60 that break the experimental population into five approximately equal sized groups.

[13] The effect on requests for mail ballots across age is nearly identical to use of voting absentee by mail (See Figure S-1 in the Supplemental Information). Table S-4in the Supplemental Information reports the results illustrated in Figures 1-3 and S-1.

among registered voters between 51 and 60 years old and ~100% higher among those older than 60.

The heterogeneity in effects on voting by mail does not translate neatly to overall turnout. Figure 2 shows the heterogeneity of effects on Election Day voting. The *Online Application* treatment appears to increase Election Day voting in the 41-50 and 51-60 age quintiles, although the increase in each group is only marginally statistically significant. In Figure 3, we see that neither treatment has a statistically significant effect on overall turnout except for the *Mail Application* treatment on voters older than 60. In short, the difference in overall average treatment effects described above appears to be largely due to the 3.6 percentage point differential in the effect on the oldest cohort in the experimental population.

The apparent parity between the treatments for the 41-50 and 51-60 age groups is largely due to the unintended and unexpected effect of the *Online Application* on Election Day voting. It can hardly be considered a success for eGovernment that encouragement to use the online ballot request system appears to have caused these voters to show up for traditional in-person voting on Election Day, thereby bypassing the eGovernment interaction and the voting absentee by mail system it was intended to promote. Moreover, this mobilization for Election Day voting is much larger than the weak 0.49 percentage point average effect from mailed non-partisan reminders to vote in other field experiments (Green and Gerber 2008, p186). It seems risky to bet on this increase in Election Day voting consistently closing the gap between the turnout effects of the *Mail Application* and *Online Application* treatments. If it were not for this peculiar effect on Election Day voting from the *Online Application* treatment, the gap in the effect on turnout between the treatments would be even larger.

Finally, it is also worth noting that there is no statistically significant heterogeneity, nor even a suggestive pattern, in either the rate of ballots rejected or ballots not returned.[14]

Comparison to Other Mobilization Tactics

The field experiments literature on voter mobilization often uses the cost per net vote as a metric to compare the efficacy of different voter mobilization tactics. Cost per net vote appears to facilitate comparison of otherwise incomparable activities. However, the often overlooked shortcoming is that cost per vote does nothing to account for differences in electoral context, thereby leaving an enormous amount of unobserved heterogeneity unaccounted for in cost per net vote comparisons. In this experiment, calculating the cost per vote produces a biased comparison because of another source of unobserved heterogeneity: external factors influencing the cost of the two treatments. The *Online Application* mailer was produced specifically for this experiment. The *Mail Application* mailer was printed as part of collaboration among several organizations that produced similar mailings in multiple states, and therefore the cost per mailing was lower because of economies of scale. Although it was a far more elaborate mailing to produce, the *Mail Application* treatment cost $0.35 per mailing, while the *Online Application* treatment cost $0.48 per mailing.[15] Consequently, a naïve calculation of cost per vote biases the estimated difference in the performance of these two treatments. Money can buy things, but it does not buy a solution to the problem of unobserved heterogeneity that confounds comparisons between experimental treatments.

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[14] See Figures S-2 & S-3 and Table S-4 in the Supplemental Information for the heterogeneity in the effect on the return and rejection of mail ballots.

[15] This cost includes design, printing and postage. Staff time to produce these mailings is not included, but was roughly equivalent, so it would not alter the relative differences.

Discussion

In a field experiment among 61,056 registered voters in Maine during the 2010 General Election, we found that recruitment to vote by mail using a paper-based application process significantly increased the use of voting by mail and, more importantly, increased turnout. These results confirm the findings of other recent field experiments (Mann 2011, Mann & Mayhew 2011). Contrary to the expectations of advocates of eGovernment, encouragement to use Maine's innovative new online mail ballot request system generated only a modest effect on requesting a mail ballot and no significant increase on overall voter turnout.

Analysis of heterogeneity in treatment effects confirms that responsiveness to voting absentee by mail is conditional on age, but it finds no support for the proposition that responsiveness to eGovernment for voting is conditional on age. The heterogeneity analysis shows that older voters are more responsive to both treatments in terms of requesting ballots and voting by mail, as expected. On the other hand, the heterogeneity analysis fails to show any evidence that younger, presumably more Internet savvy, voters will be more amenable to the online ballot request system. At best, the effect on overall treatment in this experiment shows parity between the treatments in the younger cohorts – and in the middle age cohorts that parity is dependent on an unanticipated increase in Election Day voting that is clearly not the intended outcome of the *Online Application* treatment or the online ballot request system. In short, the eGovernment approach to requesting a vote absentee by mail ballot fails to deliver increased participation even among the most favorable demographic group in the 2010 General Election in Maine.

The core finding of this experiment is that implementing eGovernment innovation for voting by mail did not deliver facilitate an increase in participation. However, definitive conclusions about allowing citizens to use the Internet to request mail ballots will require testing beyond this geographical location, election, and group of voters. The public administration literature on eGovernment is generally positive about the success of moving government functions online, but, these successes were not accomplished overnight, and the 2010 Election was the first in which Maine's online ballot request system was available. This experiment demonstrates that offering this service did not have the expected benefits in the short term. In future elections, voters may become more aware of and familiar with the online mail ballot request system, increasing voter confidence and participation. Replication of this experiment is needed in future elections to measure whether the efficacy of the online ballot request system increases in the long term.

Another possibility is that mail voting is a particularly challenging place to successfully apply eGovernment innovations, because vote by mail is more popular with older voters. The relative performance of the two treatments might shift if Web-savvy younger voters become more likely to vote by mail (as they have in other states with higher vote by mail use (Barreto et al 2006)). Alternatively, an eGovernment innovation like online voter registration (currently available in nine states) might more effective, because young people are disproportionately likely to need to register to vote. One avenue for future experiments is designing other treatments to utilize the online ballot request system. The postcard treatment encouraging use of the online system was designed to make many features of the two treatments as similar as possible (e.g., delivery mode, timing, voters' attention, experimental population, etc.), but it may not be the most effective way to encourage use of the online vote by mail application. Other forms of

communication might work better than the postcard at encouraging use of the online system. For example, the postcard requires a potentially cumbersome switch from paper to the Internet that could be eliminated if the treatment were an e-mail that includes a link to the mail ballot request page.[16] However, it is still a tall order to close the substantial gap to recruitment using the paper application.

Another potential avenue for future research is comparing recruitment using the paper application to the possibility of requesting a mail ballot via phone. Maine and several other states allow voters to call local election officials to request ballots.[17] A phone recruitment treatment could achieve the reductions in administrative problems with incomplete or erroneous ballot requests sought by Maine election administrators and make voting by mail much more convenient for voters.

Another future experiment could compare vote by mail recruitment and mobilization for in-person voting to determine which method generates a greater increase in turnout. Unfortunately, since we cannot measure how many people truly intend to vote in-person but fail to do so or are turned away from the polls, we have no way of comparing which mode of mobilization has a greater rate of attrition between initiation of attempting to vote and successfully casting a ballot.

This field experiment makes important contributions to both scholarly research on voting behavior and to professionals working in election administration and voter mobilization. Election

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[16] At the request of the Maine Secretary of State's Office, we used the official URL, which was rather lengthy. The common practice of creating a short, simple URL also might increase the use of the Web site when citizens see it in a mailer.

[17] To our knowledge, Florida, Maine, and New Mexico offer this option, but registered voters may have this option in other states as well.

administrators and scholars interested in the effect of convenience on voting behavior and/or the impact of eGovernment on citizen participation should note that using the Internet for mail ballot requests fails to deliver on expectations of increasing voting participation through eGovernment. Although eGovernment innovation is often presumed by elites to enhance convenience, we cannot assume that the Internet will be perceived by citizens as preferable to alternative traditional means of interacting with the government, or perhaps Internet convenience is offset by other factors (e.g., the cost of learning a new system, distrust of Internet services or transactions, etc.).

The findings can help guide election administrators and policy-makers as they choose how to invest scarce resources to confront the rapid growth of voting by mail, both in terms of the number of states offering it and the number of voters using it. Twenty-seven states currently allow voters to vote by mail without an excuse (National Conference of State Legislatures 2011), including recent additions in New Jersey (2007), Ohio (2008), Maryland (2009), and Illinois (2010). These states offer a variety of mechanisms for requesting a ballot (e.g., pre-printed applications, hand-written letters, in person visits to the local election office, phone calls, emails, etc). As election administrators and policy makers consider innovations like Maine's online ballot request system and make choices about how to best serve the public, this type of rigorous evaluation of alternative ballot request mechanisms is valuable for making efficacious investments of the public's resources.

Scholars of election administration, election administrators, and policy-makers should take note of the results regarding rejected requests for mail ballots, failure to return mail ballots, and rejected mail ballots. We suggest that the increase in these problems, at least when they

result from vote by mail recruitment efforts, is a sign of unfulfilled potential to increase turnout rather than indicating an inherent problem with voting by mail.

For scholars of voting behavior and people interested in planning voter mobilization efforts, our findings expand our knowledge of voting behavior in three ways. First, the results replicate field experiments in other states demonstrating the effectiveness of vote by mail recruitment for increasing turnout. This experiment provides additional insights by showing that the average increase in turnout from the *Mail Application* treatment is driven by middle age and especially older voters, while there is no apparent effect on the turnout of registered voters in the under 40 age cohorts. This suggests that people planning voter mobilization efforts should think carefully about targeting the younger cohorts with vote by mail recruitment programs. Second, the results are a reminder that variations in treatments can substantially influence outcomes even when the tactics appear similar to elites. Third, the results demonstrate that voters sometimes fail to respond to elite conceptions of what will mobilize them. Unless new tactics to take advantage of the online request system are developed and proven in future experiments, civic and political organizations interested in mobilizing voters should utilize the paper-based application into recruiting citizens to vote by mail rather than immediately rush to adopt the new technology of online ballot requests.

Figure 1: Heterogeneity by Age Quintiles
Treatment Effects on Voting by Mail
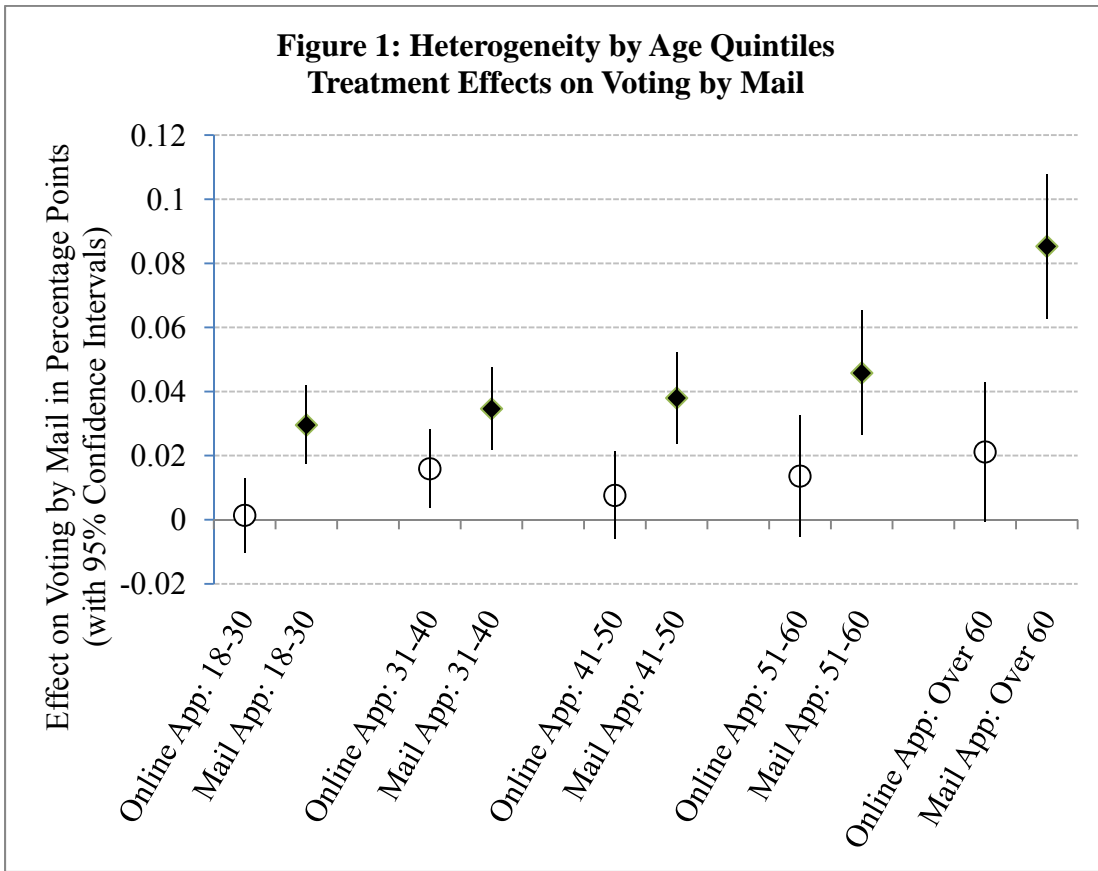
Note: The estimates of the average treatment effects and 95% confidence interval bars for each treatment in each age quintile are reported in Table S-4 of the Supplemental Information.

Figure 2: Heterogeneity by Age Quintiles
Treatment Effects on Election Day Voting
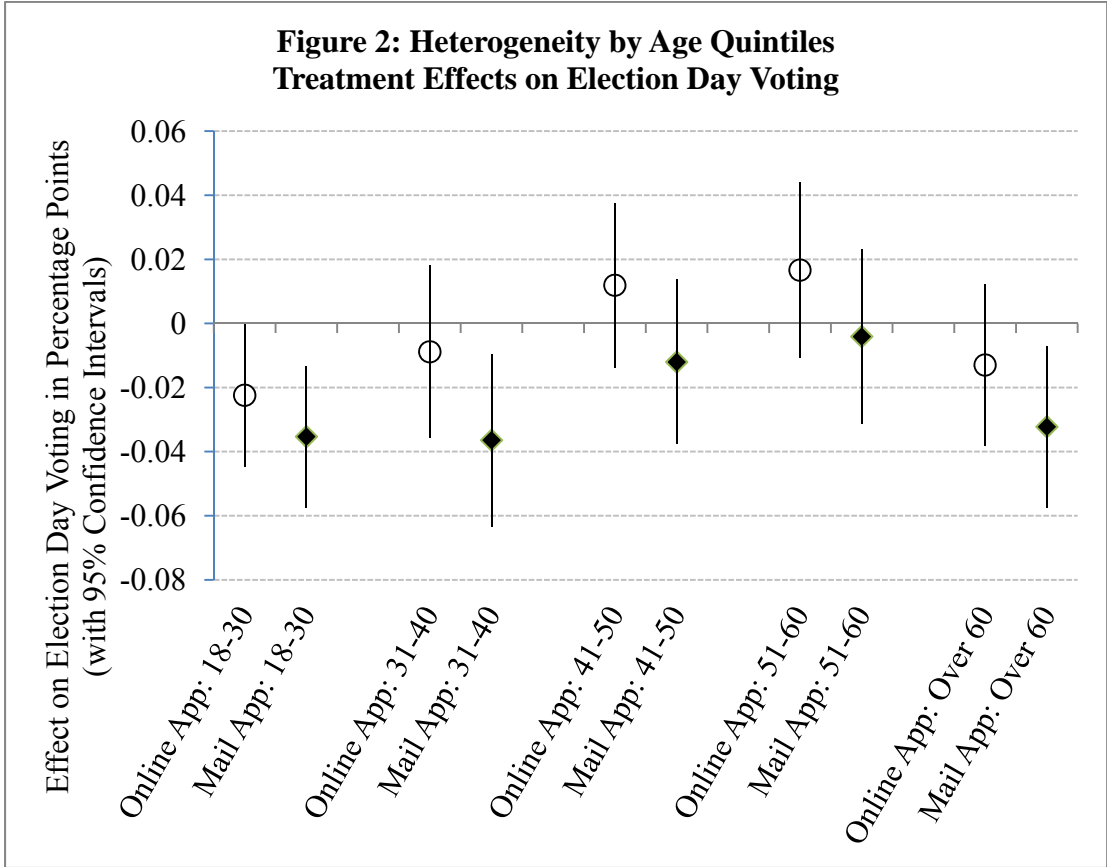
Note: The estimates of the average treatment effects and 95% confidence interval bars for each treatment in each age quintile are reported in Table S-4 of the Supplemental Information.

**Figure 3: Heterogeneity by Age Quintiles
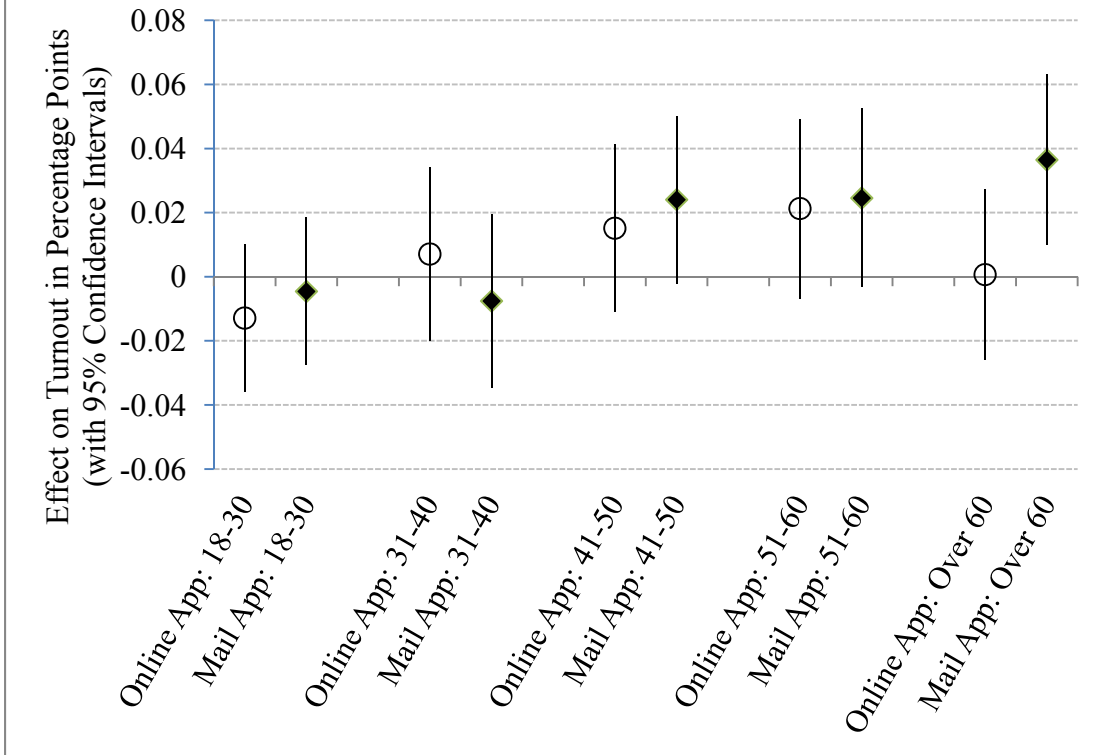Treatment Effects on Overall Turnout**

Note: The estimates of the average treatment effects and 95% confidence interval bars for each treatment in each age quintile are reported in Table S-4 of the Supplemental Information.

Table 1: Balance of Random Assignment of Voters into Treatments with Covariates

Assignment	Individuals (N)	Households (N)	Age	Female	Registered Democrat	Registered Republican	Non-White	Voted in 2008 General	Voted in 2006 General	Voted in 2004 General
Control Group	10,100	9,012	45.9	62.5%	33.2%	22.0%	4.9%	93.0%	11.1%	16.3%
Mail Application	25,369	22,706	45.7	62.3%	33.0%	21.8%	4.7%	93.1%	11.6%	16.4%
Online Application	25,587	22,877	45.7	62.8%	33.3%	21.9%	4.7%	93.0%	11.8%	16.7%
Multinomial Logistic Regression of Assignment on Covariates					χ^2= 7.85 (16 d.f.) p=0.953					

Note: The demographic characteristics report the proportion of all records assigned to each experimental condition. Age is reported as the mean calculated on Election Day 2010 using the date of birth provided in the voter registration records. The multinomial logistic regression indicates there was very little evidence of correlation between the assignment and the observable covariates.

**Table 2: Absentee Vote by Mail Ballot Requests Rates
by Experimental Condition**

	Overall Request Rate	Written Request Rate	Online Request Rate	Other Request Rate	Rejected Request Rate
Control Group	9.9%	7.7%	1.1%	1.1%	0.07%
Mail Application	15.1%	13.3%	1.0%	0.8%	0.07%
Online Application	11.2%	7.9%	2.3%	1.0%	0.04%

Note: Each column reports the proportion of voters in each experimental condition who requested a mail ballot. Written, Online and Other Request Rates sum to the Overall Request Rate. Other Requests includes requests made in-person or by telephone. Rejected Requests were applications declined by the town clerk as incomplete or otherwise invalid.

Table 3: Regression Estimates of Effects of Online and Mail Treatments on Requests for Absentee Vote by Mail Ballots

(Effect in Percentage Points - Robust Standard Errors Clustered by Household)

	Overall Request Rate		Written Request Rate		Online Request Rate		Rejected Request Rate	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Mail Application	5.2***	5.3***	5.6***	5.7***	-0.1	-0.2	-0.00	-0.00
	(0.41)	(0.40)	(0.37)	(0.37)	(0.13)	(0.13)	(0.03)	(0.03)
Online Application	1.3***	1.4***	0.2	0.3	1.1***	1.1***	-0.02	-0.02
	(0.39)	(0.38)	(0.34)	(0.34)	(0.15)	(0.15)	(0.03)	(0.03)
Request Rate in Control Group	9.9%		7.7%		1.1%		0.06%	
Covariates	N	Y	N	Y	N	Y	N	Y
F-Test of Equivalence of Treatments	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p=.264	p=.263
N (Households)	54,595		54,595		54,595		54,595	

*Note: * p<0.10, ** p<0.05, *** p<0.01, two-tailed test. The effects for each type of behavior are the estimated percentage point difference between the control group and each treatment condition from OLS regression. Robust standard errors are clustered by household due to random assignment by unique address; Covariates are listed in Table 1 and the full results are reported in the online Supplemental Information Table S1.*

Table 4: Voter Turnout by Experimental Condition

Assignment	Overall Turnout	Voting by Mail	Early In Person Voting	Election Day Voting	Mail Ballots Not Returned	Mail Ballots Rejected
Control Group	49.1%	9.2%	4.6%	36.4%	1.8%	0.04%
Mail Application	50.5%	13.7%	4.0%	34.0%	2.7%	0.10%
Online Application	49.6%	10.3%	4.6%	35.9%	2.0%	0.04%

Note: Each column reports the proportion of voters in each experimental condition recorded as engaging in the relevant voting behavior. Overall Turnout is the sum of Voting by Mail, Early In Person Voting, and Election Day Voting.

Table 5: Regression Estimates of the Effects of Treatments on Voting Behavior

(Effect in Percentage Points - Robust Standard Errors Clustered by Household)

	Turnout		Voting By Mail		Early In Person Voting		Election Day Voting		Mail Ballots Not Returned		Mail Ballots Rejected	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Mail Application	1.4**	1.4**	4.6***	4.6***	-0.6**	-0.5**	-2.4***	-2.5***	1.0***	1.0***	0.06**	0.06**
	(0.62)	(0.61)	(0.39)	(0.39)	(0.26)	(0.25)	(0.60)	(0.59)	(0.18)	(0.18)	(0.03)	(0.03)
Online Application	0.5	0.4	1.1***	1.1***	-0.0	-0.0	-0.5	-0.6	0.2	0.2	0.00	0.00
	(0.62)	(0.61)	(0.38)	(0.37)	(0.26)	(0.26)	(0.60)	(0.59)	(0.17)	(0.17)	(0.02)	(0.02)
Participation Rate in Control Group	49.1%		9.2%		4.6%		36.4%		1.8%		0.04%	
Covariates	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
F-Test of Equivalence of Treatments	p=.051	p=0.41	p<0.001	p<0.001	p<0.01	p<0.01	p<0.001	p<0.001	p<0.001	p<0.001	p=0.013	p=0.013
N (Households)	54,595		54,595		54,595		54,595		54,595		54,595	

Note: * p<0.10, ** p<0.05, *** p<0.01, two-tailed test. The effects for each type of behavior are the estimated percentage point difference between the control group and each treatment condition from OLS regression. Overall Turnout is the sum of Voting by Mail, Early In Person Voting, and Election Day Voting Robust standard errors are clustered by household due to random assignment by unique address; Covariates are listed in Table 1 and the full results are reported in the online Supplemental Information Table S2.

Table 6: Complier Average Causal Effects on Turnout of Requesting an Absentee Vote by Mail Ballot for each Treatment

(Effect in Percentage Points - Robust Standard Errors Clustered by Household)

	Turnout	
	(a)	(b)
Mail Application and Requested Mail Ballot	9.0**	9.1**
	(4.1)	*(4.0)*
Online Application and Requested Mail Ballot	4.1	3.9
	(5.5)	*(5.4)*
Participation Rate in Control Group	49.1%	
Covariates	N	Y
F-Test of Equivalence of Treatments	p=0.193	p=0.168
N (Households)	54,595	

*Note: * p<0.10, ** p<0.05, *** p<0.01, two-tailed test. The complier average causal effects for each type of behavior are estimated with 2SLS using random assignment to each experimental condition as an instrument for requesting a mail ballot. Effects are reported as percentage point difference between the control group and each treatment condition. Robust standard errors are clustered by household due to random assignment by unique address; Covariates are listed in Table 1 and the full results are reported in the online Supplemental Information Table S3.*
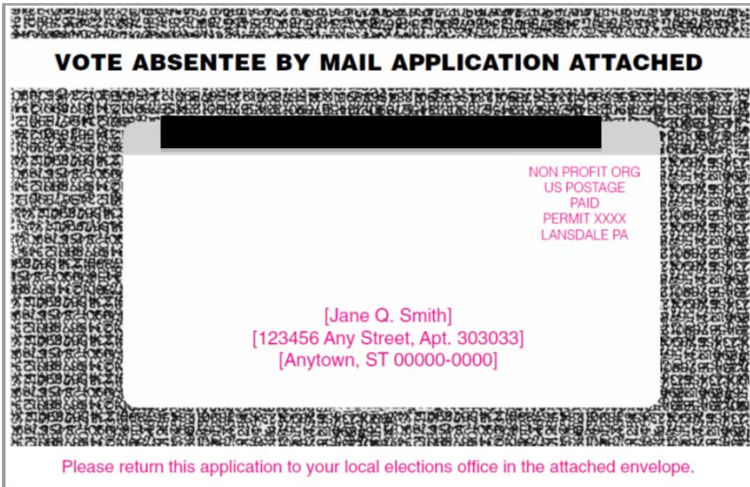
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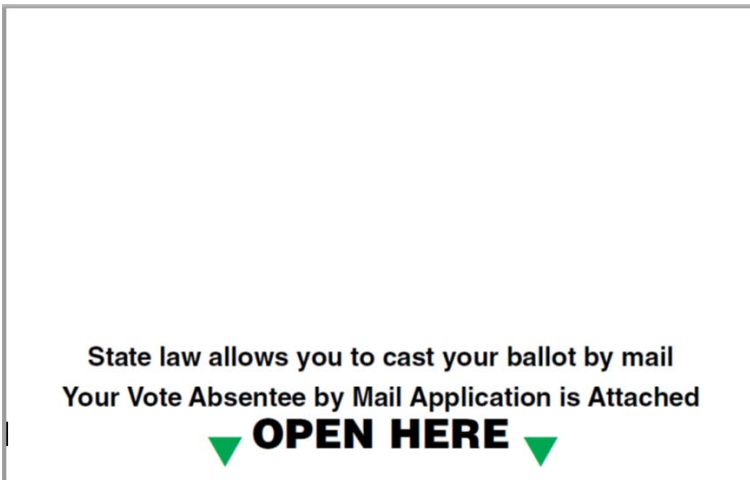Downs, Anthony. 1957. *An Economic Theory of Democracy*. New York: Harper and Row.

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Appendix Figure 1: *Mail Application* **Treatment Mailer**
Exterior Front
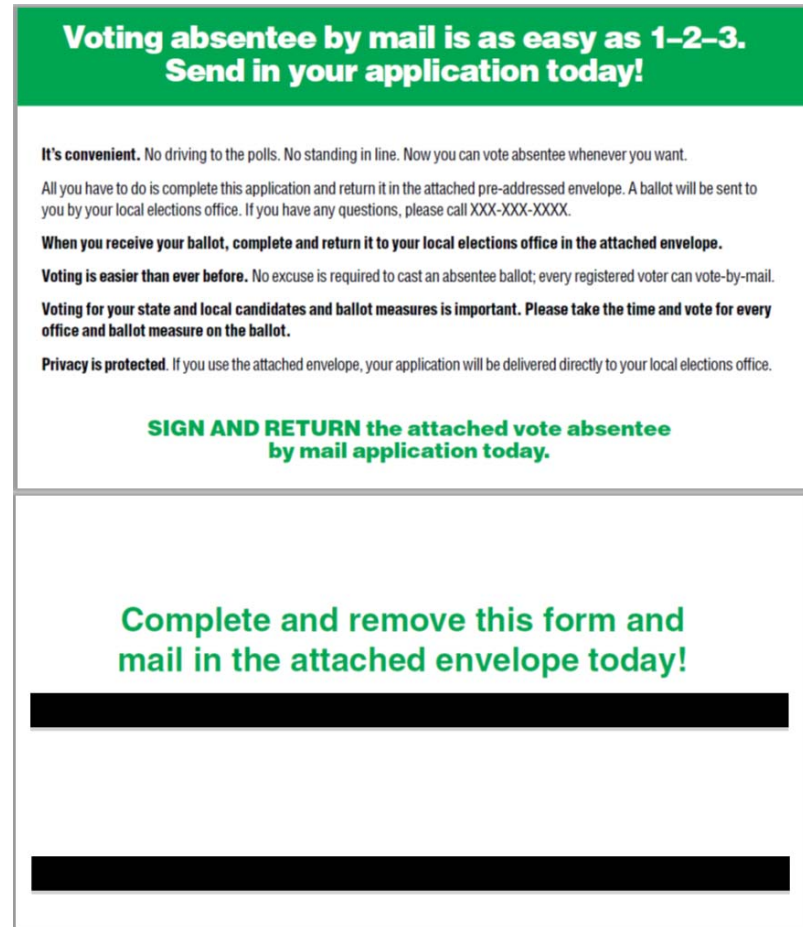
VOTE ABSENTEE BY MAIL APPLICATION ATTACHED

NON PROFIT ORG
US POSTAGE
PAID
PERMIT XXXX
LANSDALE PA

[Jane Q. Smith]
[123456 Any Street, Apt. 303033]
[Anytown, ST 00000-0000]

Please return this application to your local elections office in the attached envelope.

Exterior Back

State law allows you to cast your ballot by mail
Your Vote Absentee by Mail Application is Attached
▼ **OPEN HERE** ▼

Interior – 1st Fold
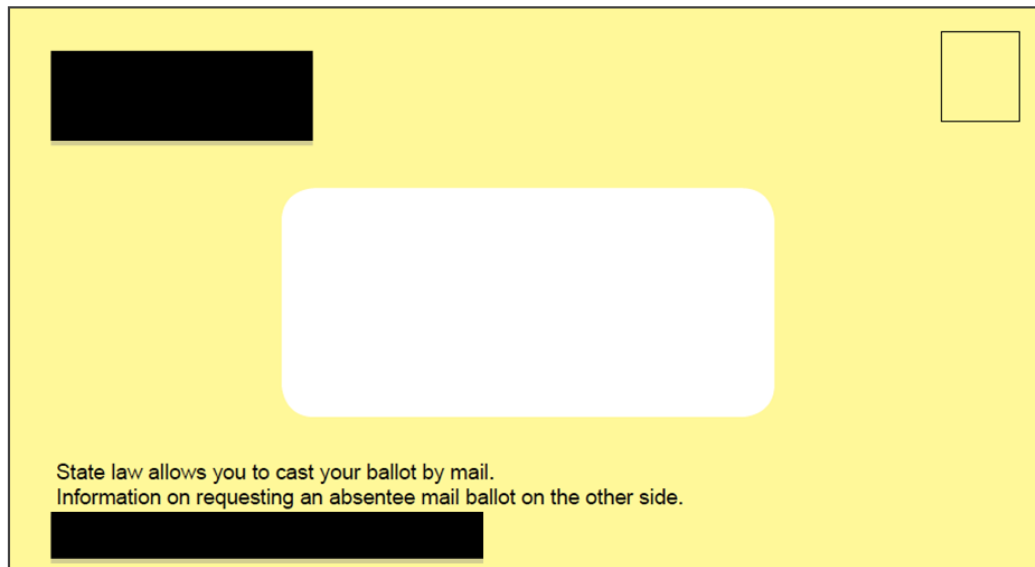
Voting absentee by mail is as easy as 1–2–3. Send in your application today!

It's convenient. No driving to the polls. No standing in line. Now you can vote absentee whenever you want.

All you have to do is complete this application and return it in the attached pre-addressed envelope. A ballot will be sent to you by your local elections office. If you have any questions, please call XXX-XXX-XXXX.

When you receive your ballot, complete and return it to your local elections office in the attached envelope.

Voting is easier than ever before. No excuse is required to cast an absentee ballot; every registered voter can vote-by-mail.

Voting for your state and local candidates and ballot measures is important. Please take the time and vote for every office and ballot measure on the ballot.

Privacy is protected. If you use the attached envelope, your application will be delivered directly to your local elections office.

SIGN AND RETURN the attached vote absentee by mail application today.

Complete and remove this form and mail in the attached envelope today!

Interior – 2nd Fold

It's as EASY as 1–2–3.

Voting absentee by mail is simple. Here's how it works:

STEP 1: You complete and mail the attached application form.

STEP 2: Your local election official mails you an absentee ballot.

STEP 3: You fill out the ballot and return it to your election official—by mail.

Avoid long lines, time off from work or other hassles — you can vote absentee by mail!

If you have already sent in an application to vote absentee by mail in the November 2, 2010 election, you do not need to send in this form. If you currently serve in the US military or live outside the United States, please do not use this form. For more information on voting for military service members and overseas citizens, see http://www.maine.gov/cgi-bin/online/AbsenteeBallot/index.pl.

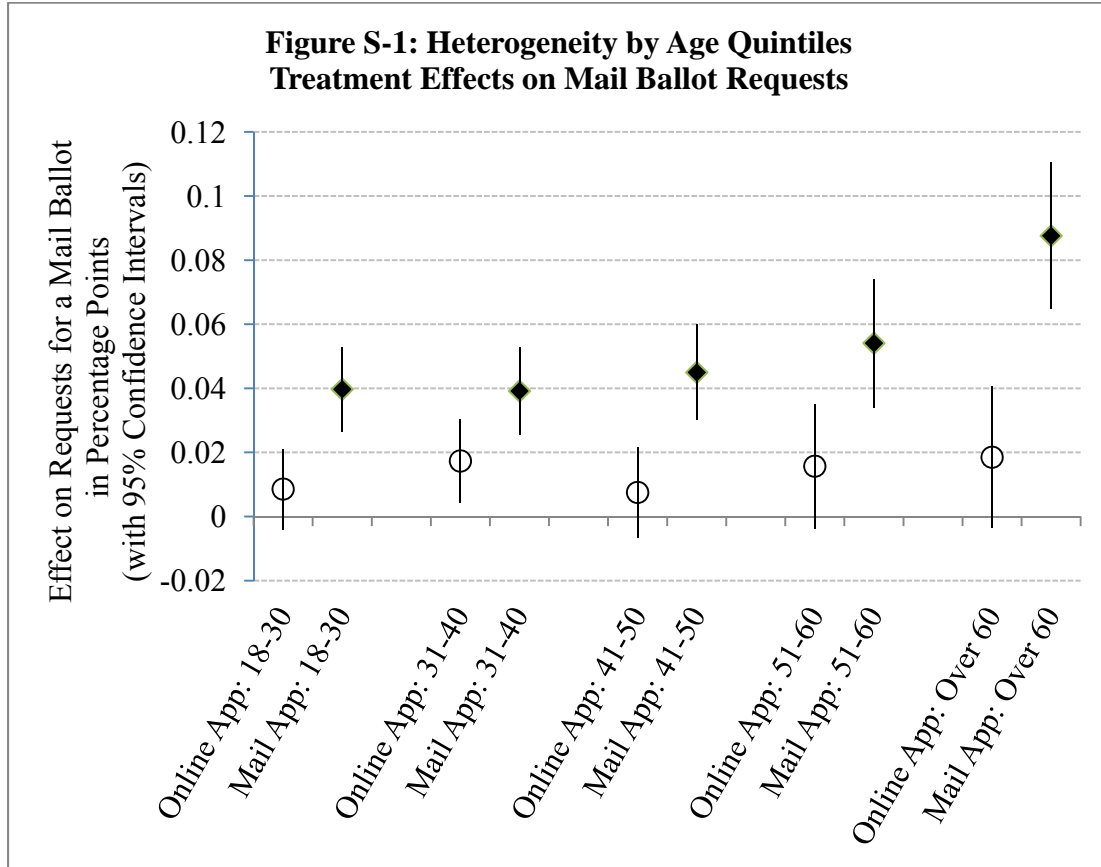| | **Postcard Application for Absentee Ballot**
November 2, 2010 General Election

Maine Election Law permits any registered voter
to cast an absentee ballot at any election. | **Application Received**
(Date/Time) |
| | | **Ballot Sent/Delivered**
(Date/Time) |

Full Name of Voter _____ DOB __ __ / __ __ / __ __ __ __
                                                    m m   d d   y y y y

Residence Address of Voter _____ _____
                                (Street Address)   (Municipality)

Mailing Address to which the ballot should be sent (if different from above): _____

_____

Signature of Voter _____   Date _____

NOTICE TO VOTERS

- **This application is for voters who want to receive and return their ballot by mail.** If you need help to read and/or sign this application, or if you want your ballot to be delivered to you by a third person, call your municipal clerk's office to request the expanded application form that is used for those purposes.
- For more information on absentee voting, call the Elections Division at (207) 624-7650, or visit the absentee voting website at http://www.maine.gov/sos/cec/elec/absent.htm

Pre-addressed Return Envelope

[Jane Q. Smith]
[123456 Any Street, Apt. 303033]
[Anytown, ST 00000-0000]
[County]

PLACE
FIRST-CLASS
STAMP
HERE

County Elections
123 Anystreet
Suite # 123
Anytown, ST 12345

Appendix Figure 2: *Online Application* **Treatment Mailer**
Front

Back

Figure S-1: Heterogeneity by Age Quintiles Treatment Effects on Mail Ballot Requests
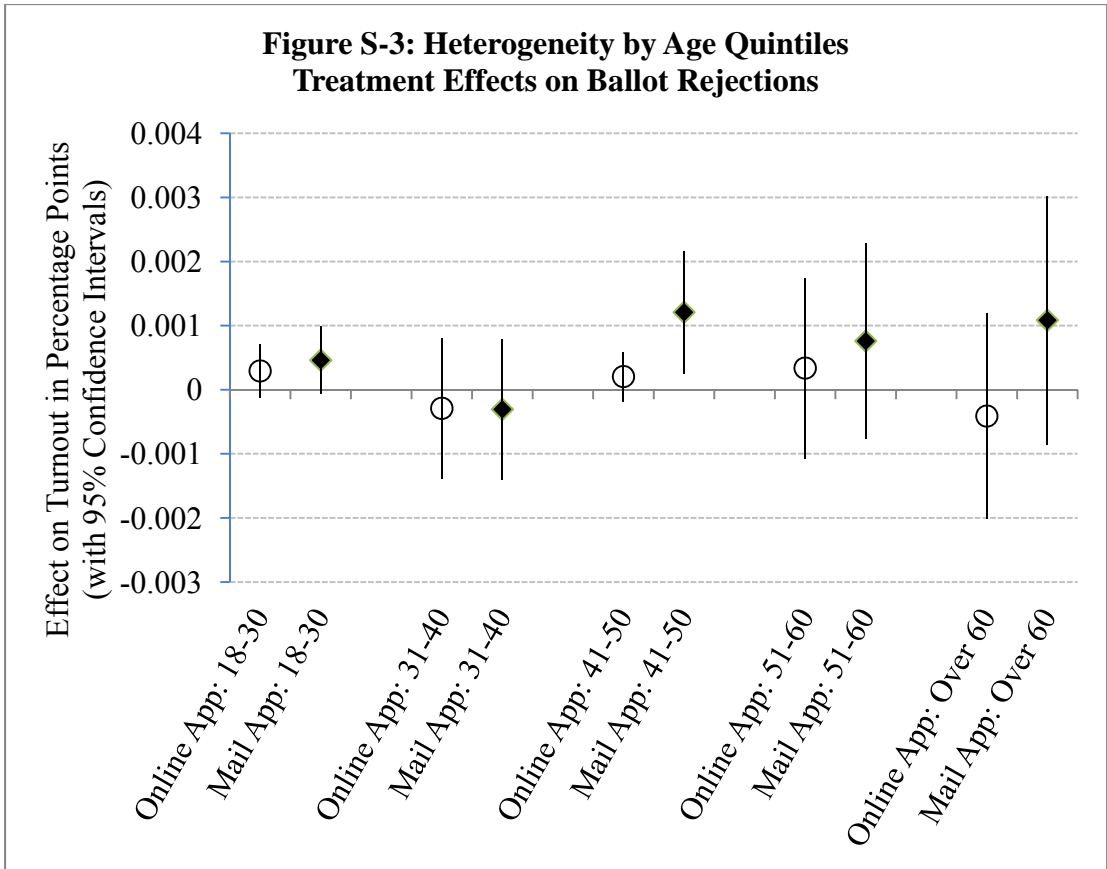
Note: The estimates of the average treatment effects and 95% confidence interval bars for each treatment in each age quintile are reported in Table S-4.

Figure S-2: Heterogeneity by Age Quintiles
Treatment Effects on Mail Ballots Not Returned
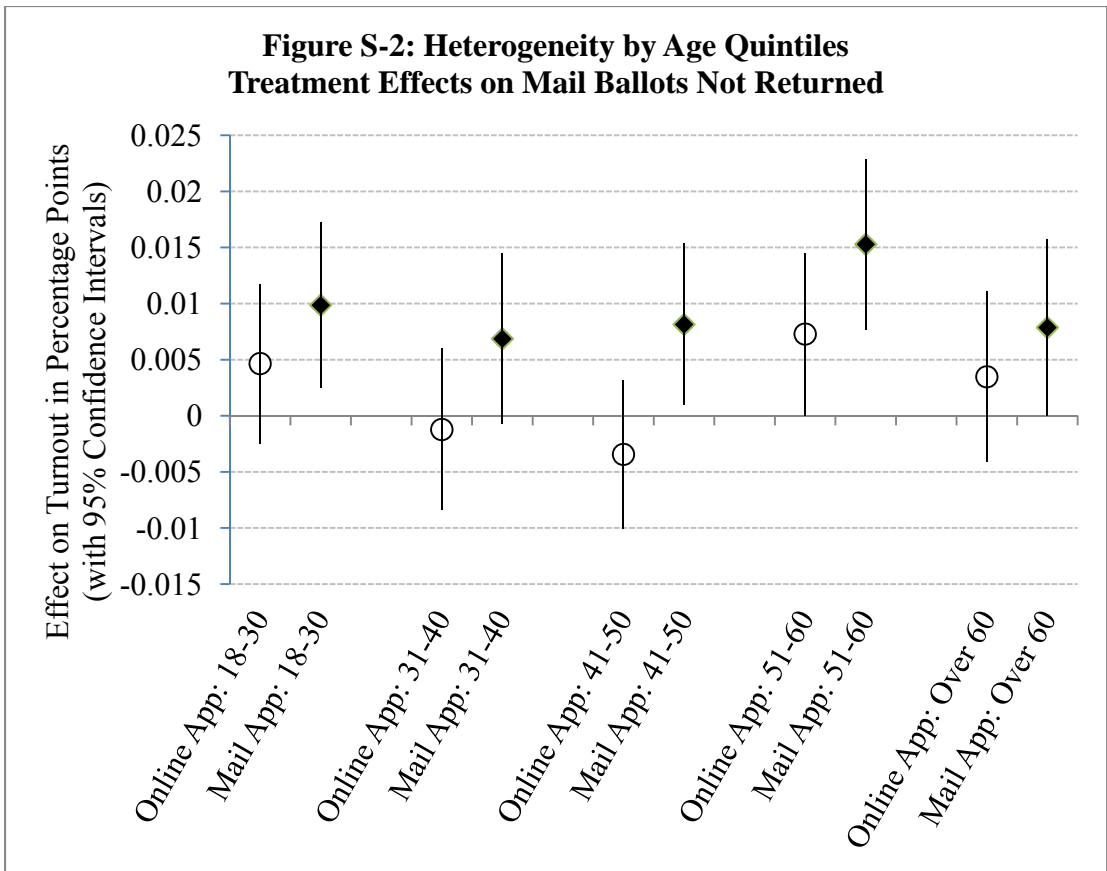
Note: The estimates of the average treatment effects and 95% confidence interval bars for each treatment in each age quintile are reported in Table S-4.

**Figure S-3: Heterogeneity by Age Quintiles
Treatment Effects on Ballot Rejections**

Note: The estimates of the average treatment effects and 95% confidence interval bars for each treatment in each age quintile are reported in Table S-4.

Table S1: Effects of Treatments on Requests for Mail Ballots

(Effect in Percentage Points - Robust Standard Errors Clustered by Household)

	Overall Request Rate		Written Request Rate		Online Request Rate		Rejected Request Rate	
	(a)	(b)	(a)	(d)	(e)	(f)	(i)	(j)
Mail Application	5.2***	5.3***	5.6***	5.7***	-0.1	-0.2	-0.00	-0.00
	(0.41)	(0.40)	(0.37)	(0.37)	(0.13)	(0.13)	(0.03)	(0.03)
Online Application	1.3***	1.4***	0.2	0.3	1.1***	1.1***	-0.02	-0.02
	(0.39)	(0.38)	(0.34)	(0.34)	(0.15)	(0.15)	(0.03)	(0.03)
Age		0.3***		0.3***		-0.0***		0.00
		(0.0)		(0.0)		(0.0)		(0.00)
Female		0.8***		0.4		0.1		-0.01
		(0.3)		(0.2)		(0.1)		(0.02)
Registered Democrat		0.9***		-0.6**		1.2***		0.01
		(0.3)		(0.3)		(0.1)		(0.02)
Registered Republican		1.2***		0.8**		0.3**		0.04
		(0.4)		(0.3)		(0.1)		(0.03)
Non-white		-0.3		-0.5		0.2		-0.02
		(0.7)		(0.6)		(0.3)		(0.04)
Voted in 2008 General		8.9***		7.4***		0.7***		-0.06
		(0.4)		(0.4)		(0.2)		(0.05)
Voted in 2006 General		1.6***		1.1***		0.4**		-0.02
		(0.5)		(0.4)		(0.2)		(0.03)
Voted in 2004 General		1.7***		0.4		0.8***		-0.01
		(0.4)		(0.4)		(0.2)		(0.02)
Constant	9.9***	-14.3***	7.7***	-13.7***	1.1***	1.2***	0.07	0.15**
	(0.3)	(0.7)	(0.3)	(0.6)	(0.1)	(0.2)	(0.03)	(0.06)
F-Test of Equivalence of Treatments	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p=.264	p=.263
N (Households)	54,595		54,595		54,595		54,595	

Note: * $p<0.10$, ** $p<0.05$, *** $p<0.01$, two-tailed test. The effects for each type of behavior are the estimated percentage point difference between the control group and each treatment condition from OLS regression. Robust standard errors are clustered by household due to random assignment by unique address.

Table S2: Effects of Treatments on Voting Behavior
(Effect in Percentage Points - Robust Standard Errors Clustered by Household)

	Turnout		Voting By Mail		Early In Person Voting		Election Day Voting		Mail Ballots Not Returned		Mail Ballots Rejected	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Mail Application	1.4**	1.4**	4.6***	4.6***	-0.6**	-0.5**	-2.4***	-2.5***	1.0***	1.0***	0.06**	0.06**
	(0.62)	(0.61)	(0.39)	(0.39)	(0.26)	(0.25)	(0.60)	(0.59)	(0.18)	(0.18)	(0.03)	(0.03)
Online Application	0.5	0.4	1.1***	1.1***	-0.0	-0.0	-0.5	-0.6	0.2	0.2	0.00	0.00
	(0.62)	(0.61)	(0.38)	(0.37)	(0.26)	(0.26)	(0.60)	(0.59)	(0.17)	(0.17)	(0.02)	(0.02)
Age		0.4***		0.3***		0.1***		-0.1		0.0		0.00***
		(0.0)		(0.0)		(0.0)		(0.0)		(0.0)		(0.0)
Female		-0.5		0.7***		-0.4**		-0.9**		0.2*		-0.01
		(0.4)		(0.2)		(0.2)		(0.4)		(0.1)		(0.02)
Registered Democrat		2.3***		0.7***		1.5***		0.2		0.3**		0.01
		(0.5)		(0.3)		(0.2)		(0.5)		(0.1)		(0.02)
Registered Republican		7.8***		1.3***		1.0***		5.5***		0.0		0.03
		(0.5)		(0.4)		(0.2)		(0.5)		(0.2)		(0.03)
Non-white		-2.5***		-0.4***		0.4***		-2.6**		0.5		-0.07***
		(1.0)		(0.6)		(0.4)		(0.9)		(0.3)		(0.01)
Voted in 2008 General		29.1***		8.8***		3.2***		16.6***		1.0***		0.10
		(0.7)		(0.4)		(0.3)		(0.7)		(0.2)		(0.02)
Voted in 2006 General		17.1***		1.9***		3.2***		12.2***		-0.1		0.03
		(0.7)		(0.4)		(0.3)		(0.7)		(0.2)		(0.04)
Voted in 2004 General		4.1***		1.3***		0.7**		1.2**		0.6***		0.05
		(0.6)		(0.4)		(0.3)		(0.6)		(0.2)		(0.04)
Constant	49.1***	1.1	9.2***	-15.3***	4.6***	-5.5***	36.4***	21.5***	1.8***	0.6*	0.04*	-0.19***
	(0.5)	(1.1)	(0.3)	(0.7)	(0.2)	(0.5)	(0.5)	(1.0)	(0.1)	(0.3)	(0.02)	(0.06)
F-Test of Equivalence of Treatments	p=.051	p=0.041	p<0.001	p<0.001	p<0.01	p<0.01	p<0.001	p<0.001	p<0.001	p<0.001	p=0.013	p=0.013
N (Households)	54,595		54,595		54,595		54,595		54,595		54,595	

Note: * $p<0.10$, ** $p<0.05$, *** $p<0.01$, two-tailed test. The effects for each type of behavior are the estimated percentage point difference between the control group and each treatment condition from OLS regression. Overall Turnout is the sum of Voting by Mail, Early In Person Voting, and Election Day Voting. Robust standard errors are clustered by household due to random assignment by unique address.

Table S3: Complier Average Causal Effects of Treatments on Turnout

(Effect in Percentage Points - Robust Standard Errors Clustered by Household)

	Turnout	
	(a)	(b)
Ballot Requested when Assigned to Mail Application	9.0**	9.1**
	(4.1)	(4.0)
Ballot Requested when Assigned to Online Application	4.1	3.9
	(5.5)	(5.4)
Age		0.3***
		(0.0)
Female		-0.6
		(0.4)
Registered Democrat		2.2***
		(0.5)
Registered Republican		7.7***
		(0.5)
Non-white		-2.5***
		(1.0)
Voted in 2008 General		28.6***
		(0.8)
Voted in 2006 General		17.0***
		(0.7)
Voted in 2004 General		4.0***
		(0.6)
Constant	49.1***	2.5***
	(0.5)	(1.1)
F-Test of Equivalence of Treatments	p=0.193	p=0.168
N (Households)	54,595	

*Note: * $p<0.10$, ** $p<0.05$, *** $p<0.01$, two-tailed test. The complier average causal effects for each type of behavior are estimated with 2SLS using random assignment to each experimental condition as an instrument for requesting a mail ballot. Effects are reported as percentage point difference between the control group and each treatment condition. Robust standard errors are clustered by household due to random assignment by unique address.*

Table S4: Heterogeneity of Effects of Treatments Across Age Quintiles

(Effect in Percentage Points - Robust Standard Errors Clustered by Household)

	Ballot Requests		Voting By Mail		Election Day Voting		Overall Turnout		Mail Ballots Not Returned		Mail Ballots Rejected	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Mail Application	4.0***	4.0***	3.0***	3.0***	-0.3**	-0.4**	-0.3	-0.4	1.0***	1.0***	0.05*	0.05*
	(0.7)	(0.7)	(0.6)	(0.6)	(1.1)	(1.1)	(1.2)	(1.2)	(0.4)	(0.4)	(0.03)	(0.03)
Mail Application x Age 31-40	-0.6	-0.6	0.5	0.5	0.1	-0.1	-0.0	-0.3	-0.3	-0.3	-0.08	-0.08
	(1.0)	(1.0)	(0.9)	(0.9)	(1.8)	(1.8)	(1.8)	(1.8)	(0.5)	(0.5)	(0.06)	(0.06)
Mail Application x Age 41-50	0.4	0.5	0.7	0.8	2.1	2.3	2.4	2.9	-0.2	-0.2	0.07	0.07
	(1.0)	(1.0)	(1.0)	(1.0)	(1.7)	(1.7)	(1.8)	1.8	(0.5)	(0.5)	(0.06)	(0.06)
Mail Application x Age 51-60	1.4	1.4	1.5	1.6	3.1*	3.1*	2.8	2.9	0.5	0.5	0.03	0.03
	(1.2)	(1.2)	(1.2)	(1.3)	(1.8)	(1.8)	(1.9)	(1.8)	(0.5)	(0.5)	(0.08)	(0.08)
Mail Application x Age 60+	4.6***	4.8***	5.3***	5.6***	0.4	0.3	4.0**	4.1**	-0.2	-0.2	0.06	0.06
	(1.4)	(1.3)	(1.3)	(1.3)	(1.7)	(1.7)	(1.8)	(1.8)	(0.5)	(0.5)	(0.10)	(0.10)
Online Application	0.9	0.9	0.2	0.1	-2.0*	-2.2**	-1.0	-1.3	0.5	0.5	0.03	0.03
	(0.6)	(0.6)	(0.6)	(0.59)	(1.1)	(1.1)	(1.2)	(1.2)	(0.4)	(0.4)	(0.0)	(0.02)
Online Application x Age 31-40	0.8	0.9	1.4	1.4	1.3	1.4	1.9	2.0	-0.6	-0.6	-0.06	-0.06
	(0.9)	(0.9)	(0.9)	(0.85)	(1.8)	(1.8)	(1.8)	(1.8)	(0.5)	(0.5)	(0.06)	(0.06)
Online Application x Age 41-50	-0.2	-0.1	0.5	0.6	3.2*	3.4**	2.4	2.8	-0.8*	-0.8*	-0.01	-0.01
	(1.0)	(1.0)	(0.9)	(0.90)	(1.7)	(1.7)	(1.8)	(1.7)	(0.5)	(0.5)	(0.03)	(0.03)
Online Application x Age 51-60	0.7	0.7	1.2	1.2	3.7**	3.9**	3.1*	3.4*	0.3	0.3	0.00	0.00
	(0.62)	(1.1)	(1.1)	(1.1)	(1.8)	(1.8)	(1.9)	(1.8)	(0.5)	(0.5)	(0.08)	(0.08)
Online Application x Age 60+	0.9	0.9	1.9	2.0	0.9	0.9	1.2	1.3	-0.1	-0.1	-0.07	-0.07
	(1.3)	(1.3)	(1.2)	(1.3)	(1.7)	(1.7)	(1.8)	(1.8)	(0.5)	(0.5)	(0.08)	(0.08)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Age 31-40	-1.8**	-4.3***	-1.4**	-4.0***	9.6***	16.0***	8.7***	12.1***	-0.5	-0.5	0.05	-0.02
	(0.7)	(0.8)	(0.7)	(0.8)	(1.5)	(1.6)	(1.6)	(1.6)	(0.4)	(0.5)	(0.05)	(0.07)
Age 41-50	0.6	-4.0***	1.0	-3.8***	5.2***	17.0***	7.1***	13.3***	-0.5	-0.5	0.00	-0.14
	(0.8)	(1.1)	(0.8)	(1.0)	(1.5)	(1.7)	(1.5)	(1.7)	(0.4)	(0.5)	-	(0.07)
Age 51-60	5.7***	-1.0	6.1***	-0.8	4.0***	21.1***	13.2***	22.0***	-0.7*	-0.7	0.05	-0.14
	(1.0)	(1.4)	(0.9)	(1.3)	(1.5)	(1.9)	(1.6)	(2.0)	(0.4)	(0.6)	(0.06)	(0.12)
Age 60 & Up	12.3***	1.8	12.3***	1.4	-2.3	23.2***	15.6***	27.8***	-0.1	-0.2	0.01	-0.21
	(1.1)	(1.9)	(1.1)	(1.9)	(1.5)	(2.3)	(1.6)	(2.5)	(0.4)	(0.8)	(0.07)	(0.17)
Age		0.2***		0.2***		-0.5***		-0.2***		0.0		0.0*
		(0.3)		(0.03)		(0.0)		(0.0)		(0.0)		(0.0)
Female		1.1***		1.0***		-1.2**		-0.6		0.3**		0.2*
		(0.2)		(0.2)		(0.4)		(0.4)		(0.1)		(0.1)
Registered Democrat		0.6*		0.4		0.8*		2.5***		0.3*		0.0
		(0.3)		(0.3)		(0.4)		(0.5)		(0.1)		(0.0)
Registered Republican		1.1***		1.2***		6.2***		8.3***		0.0		0.03
		(0.3)		(0.3)		(0.5)		(0.5)		(0.2)		(0.0)
Non-white		-0.07		-0.3		-0.3**		-2.7***		0.5		-0.1***
		(0.6)		(0.6)		(0.9)		(0.9)		(0.3)		(0.0)
Voted in 2008 General		9.0***		8.8***		16.5***		29.1***		1.0***		1.0***
		(0.4)		(0.4)		(0.7)		(0.7)		(0.2)		(0.0)
Voted in 2006 General		1.3***		1.5***		13.7***		18.1***		-0.1		0.02
		(0.5)		(0.4)		(0.7)		(0.7)		(0.2)		(0.0)
Voted in 2004 General		1.7***		1.3***		1.5**		4.4***		0.6**		0.1
		(0.4)		(0.4)		(0.6)		(0.6)		(0.2)		(0.0)
Constant	6.8***	-8.7	5.9***	-9.6***	33.2***	27.1***	40.7***	13.2***	2.1***	0.8	0.0	0.0
	(0.5)	(-1.1)	(0.4)	(1.1)	(1.0)	(1.5)	(1.0)	(1.6)	(0.3)	(0.5)	(0.0)	(0.0)
N (Households)	54,595		54,595		54,595		54,595		54,595		54,595	

*p<0.10, ** p<0.05, *** p<0.01, two-tailed test; Robust standard errors are clustered by household due to random assignment by unique address. Effects are reported as percentage point difference between the control group and each treatment condition. Robust standard errors are clustered by household due to random assignment by unique address.

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