

Does The Media Matter?
A Field Experiment Measuring the Effect of Newspapers on
Voting Behavior and Political Opinions*

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Alan Gerber
alan.gerber@yale.edu
Yale University

Dean Karlan
dean.karlan@yale.edu
Yale University

Daniel Bergan
daniel.bergan@yale.edu
Yale University

Abstract

There is substantial evidence that media sources have identifiable political slants, but there has been relatively little study until recently of the effects on political views and behaviors of media bias or access. This paper reports the results of a natural field experiment to measure the effect of exposure to newspapers on political behavior and opinion. The Washington DC area is served by two major newspapers, the Washington Times and the Washington Post. We randomly assigned individuals either to receive a free subscription to the Washington Post, to receive a free subscription to the Washington Times, or to a control group. We then conducted a public opinion survey after the 2005 Virginia gubernatorial election. We find that those assigned to the Post treatment group were eight percentage points more likely to vote for the Democratic candidate for governor than those assigned to the control group. We find similar but weaker evidence of shifts in public opinion on specific issues and attitudes.

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Television broadcasts and newspaper stories are arguably the most important source of information about the conduct of governments and politicians. The media's central role in determining what information the public has justifies the recent increased attention to how the media shapes public knowledge, attitudes, and behavior (Besley and Burgess 2002; Dyck and Zingales 2002; Hamilton 2003). Media sources may influence the public not only by choosing the slant of a particular report (DellaVigna and Kaplan 2007), but also merely by choosing what to report (George and Waldfogel 2006).

There is substantial evidence that media sources have identifiable political slants, but there has been relatively little study of the effects of media bias on the views and behavior of media consumers, or of the effect of mere exposure to news (irrespective of the slant, for example Gentzkow (2006)). While it is possible that news with a distinctive political perspective will move readers' opinions, it is also possible that readers will compensate for the leaning of the source and thus not shift their opinions towards that of the source. This could be because readers incorporate their perception of the bias when they update their beliefs, or simply because the sources are deemed not credible. It is even possible that readers will be inspired to contest the biased source, and thereby overcompensate for any bias. Further, it may be that media bias may have a real effect on readers or viewers, but that the effects of bias are much smaller than the effect of information provision or the heightened salience given to the issues or events selected for coverage. In other words, whether a particular topic is covered may be more important in shaping opinions than the slant of the media source.

This paper reports the results of a natural field experiment¹ to measure the effect of newspapers on political behavior and opinion. The Washington DC area is served by two major newspapers, the Washington Times and the Washington Post. The conventional wisdom regarding the political slant of these papers' news coverage is supported by a recent study. Groseclose and Milyo (2005) propose an innovative measure locating different media outlets on the right-left political spectrum based on the similarity of the experts used by the media outlet and those cited by conservative and liberal members of Congress. They find that the Washington Times is by far the most conservative of the six papers they assess, on average citing a mix of think tanks and

¹ As per the taxonomy put forth in Harrison and List (2004).

other research organizations similar to those cited by members of Congress with an Americans for Democratic Action (ADA) score of 35 (lower scores signify more conservative voting on House and Senate roll call votes). In contrast, the Washington Post is much more liberal; the Post cites experts similar to those cited by members of Congress with an ADA score of 66. Indeed, relevant for this study, the Washington Post endorsed the Democratic candidate for governor and the Washington Times endorsed the Republican.

The presence of a liberal and conservative paper serving the same region creates an outstanding opportunity to study the effect of media bias in a naturalistic setting within a single population. Approximately one month prior to the Virginia Gubernatorial election in November 2005 we administered a short survey to a random selection of households in Prince William county, a northeastern Virginia county. We used the survey to establish whether the household already subscribed to the Post and/or the Times and to obtain some pre-treatment information about demographics and political attitudes. From the set of households reporting that they received neither the Post nor the Times, we randomly assigned households to get subscriptions to either the Post or the Times, or to a control group which was not sent either paper. See Table 1 for a summary of the sample size and assignment to treatment and control groups. Treatment group households received the newspapers for approximately three weeks prior to the Governor's election and for several weeks after the election. During the week after the election, we conducted a follow-up survey in which we asked individuals whether they voted in the November election, which candidate they selected or preferred, their attitudes toward the President, the political parties, and national political issues, their attitudes toward news events of the previous weeks, and their knowledge about recent news events. No explicit link was made to the participants to associate the free subscriptions to the phone surveys.

Given the relatively short length of the intervention we might have failed to detect real treatment effects. However, while households received the newspapers for less than one month prior to the post-election survey and the study was large but not immense, we found several statistically significant or borderline significant effects. There was evidence that getting the Post increased the probability a subject supported the Democratic candidate for Governor in Virginia, and weak but reasonably consistent evidence that getting *either* paper shifted subjects away from the President and Republican party. Looking at the newspaper coverage, there was clear evidence of a slant in the news

consistent with the conventional wisdom about the papers. However, the month prior to the post-election survey was a difficult period for President Bush, one in which his overall approval rating fell by approximately 4 percentage points nationwide. It appears that heightened exposure to both papers' news coverage, despite opposing ideological slants, moved public opinion away from Republicans.

Section 1 reviews the literature on the effect of media on political attitudes and behavior. Section 2 describes the experiment in more detail. Section 3 presents the results. Section 4 discusses the implications of the findings, limitations of the research, and directions for future work.

Section 1. Literature Review

Studies of media and political behavior fall roughly into four methodological categories: observational studies of the correlation between news consumption and political attitudes and behavior, laboratory experiments, quasi-experimental methods, and field experiments.

There is extensive observational research linking attitudes and behavior to media exposure. The most common approach is to ask survey respondents about their media exposure and their political views and behaviors. The content of the media is then evaluated and media users are compared to those who reported low usage; differences in attitudes and reported behavior are ascribed to media exposure. It is common to find associations between media usage levels and attitudes and reported behavior (Clarke and Fredin 1978; Miller, Goldenberg and Ebring 1979; Bybee, Mcleod, Luetcher and Garramone 1981; Garramone and Atkin 1986; Lieske 1989; Brians and Wattenberg 1996; Dalton, Beck and Huckfeldt 1998; Hibbing and Theiss-Morse 1998). A recent example of this work is Kull et al (2003), which compares those who view Fox News to those who do not. They report that Fox News viewers were more likely to have misperceptions about the Iraq war. Such investigations are unlikely to provide an accurate measurement of a causal effect, since a person's choice of which shows and how much to watch are correlated with the subject's political attitudes. The tendency for individuals to seek out information that agrees with their pre-existing views has been documented (Brock 1965; Sweeney and Gruber 1984). Indeed, recent theoretical work on the economics of media competition is premised on the notion that consumers seek out media sources that share

their political perspective. In Mullainathan and Shleifer (2005), consumers prefer news that agrees with their prior views, while in Gentzkow and Shapiro (2005) consumers think that outlets that share their political perspective are more reliable and therefore provide more valuable information. This selection effect will cause an upward bias in the assessment of media influence.

Several studies have proposed identifying the effects of media through natural experiments, such as the arbitrary boundaries of media coverage, agenda-setting strategies of particular news sources, and newspaper strikes.

Mondak (1995a; 1995b) exploits a 1992 newspaper strike in Pittsburgh; comparing the Cleveland and Pittsburgh areas, Mondak finds newspaper exposure does not increase political knowledge, but does increase political discussion. Mutz and Soss (1997) take advantage of one newspaper's attempts to set the public agenda by increasing coverage of low-income housing for one year. In four successive cross-sectional phone interviews of readers of the agenda-setting newspaper, another daily newspaper, or no newspaper, the authors find no effect of the agenda setting on public support for low-income housing, or personal concern about public housing. However, readers of the agenda setting newspaper were more likely to perceive public support for public housing; among those high in attention to local news, there was also an increase in perceived importance of low income housing to others in the community.

Some quasi-experimental studies of media effects take advantage of the arbitrary boundaries of media markets in order to avoid selection bias. Zukin and Snyder (1984) use the arbitrary boundaries of media markets within the state of New Jersey to explore the effects of media coverage on knowledge. The authors find that New Jerseyans in the northern part of the state who were exposed to the New York media market were more likely to be knowledgeable about the New York mayoral race. Gentzkow (2006) uses the expansion of television to identify its impact on voter turnout. He shows that television caused a sharp drop in newspaper and radio, and the shift to television accounts for between a quarter and a half of the total decline in voter turnout from the 1950s to the 1970s. DellaVigna and Kaplan (2007) use the introduction of Fox News Channel in some cable systems but not others to measure the effects of the conservative channel's news coverage on percentage of the Republican party vote share in Presidential elections (as well as Republican share in Senate races and voter turnout). They estimate that Fox News caused about a half a percentage point shift towards Bush in the 2000 presidential

election, and convinced three to eight percent of their viewers to vote Republican. These estimates are similar to what we find in this experiment.

The natural experiments are often more persuasive than more standard attempts to control for differences across those treated and those not treated using control variables. However, the success of natural experiments depends on the plausibility of the identifying assumptions. Some of the studies may involve unobserved differences among consumer of different news sources. For example, in Zukin and Snyder's (1984) study, New Jerseyans who live in the New York media market may have a greater interest in the mayoral race because they reside closer to New York City and may obtain news about the mayoral race through other sources. Many of the studies listed above rely on treatments that are assigned by geography; geography may be associated with unobservable characteristics that are related to news consumption.

A number of studies have measured the effect of media exposure using laboratory experiments. Since the media exposure is randomly assigned, these experimental studies are not vulnerable to the problem of unmeasured differences across the exposed and unexposed group. In the most well-known laboratory studies of media effects one randomly selected group of volunteers is shown a news program and a second group is shown an edited broadcast with stories on different topics (from the same station, recorded months earlier) inserted into the broadcast (Iyengar, Peters and Kinder 1982; Iyengar and Kinder 1987). The authors find that while the content of television news does not affect opinion about particular policies, news coverage can affect evaluations of the importance of different issues. The laboratory method avoids the selection bias of observational studies by randomizing the groups' exposure to media sources, but the generality of the results is unclear as the laboratory artificially compels individuals to consume certain types of media.

The appeal of field experiments versus observational techniques or laboratory experiments stems from the field experiment's use of random assignment of the treatment and the ability to measure behavior responses unobtrusively in naturalistic settings. This allows us to establish a clearer causal link from the media to the behavioral response of interest. The importance of these considerations will vary across contexts. Field experiments, naturally, are not immune to questions about generalizability. We discuss specific cautions with regard to this study in section 4.

Section 2. Experimental Design and Data

Households were drawn from a sample of residents in Prince William County, Virginia, a county 25 miles outside of Washington, DC. The county was suitable for our study because it is within the circulation of both the Times and the Post but far enough away from the Washington, DC area that the sample is not dominated by citizens involved professionally with politics. We sampled individuals from two lists: a list of registered voters and a consumer database list. Roughly equal proportions were included in the sample from each list.²

We performed a baseline survey in September, 2005. We asked individuals if someone at the household received either the Post or the Times; we excluded those answering “yes” from the study. This perhaps is the most important issue to note regarding the formation of the sample frame. We are studying individuals who do *not* already subscribe to a newspaper, hence are examining the effect of exposing individuals who on average are less exposed to the media than the average individual. We also asked a number of other questions about newspaper readership and politics. The survey is in Appendix A. Only individuals who completed the initial phone survey were included in the experimental sample; individuals who refused to answer any one of the questions in the survey were not assigned to a treatment or control group.

Individuals who were included based on the above criteria (that is, individuals in households that receive neither the Post nor Times, participated in the survey and did not refuse to answer any of the questions on it) were randomly assigned to one of three groups: the Post, the Times and a control group. To improve expected covariate balance across groups, prior to randomization the sample was stratified into groups based on who they planned to vote for, whether they subscribe to another (non-Post, non-Times) newspaper, whether they subscribe to news magazines, and whether they were asked whether they wished they read the paper more (50% of individuals were asked this). The proportion of subjects placed in treatment and control groups was constant across the strata. To maximize the amount of time treatment households received the newspapers, individuals were randomized into treatment and control groups in two waves. Once a

² The two waves of the study are described below; 54% of the first wave and 46% of the second wave consisted of names drawn from the registered voter list. The remainder in each wave consisted of the consumer list. The two waves were implemented a week apart. This was done due to capacity constraints in starting new subscriptions at the newspapers.

sufficient number of eligible households had been produced from the initial surveys (N=2104), the first random assignment took place. 605 households were assigned to get the Post, 595 households were assigned to get the Times, and 904 households were assigned to the control condition. One week later, after the baseline survey was completed, we conducted the second round of random assignment. Here 1,243 households were assigned to treatment and control conditions in proportions similar to the initial round of random assignment.³ Table 1 contains the assignments for each round and the total number of households assigned to each of the treatment and the control conditions.

Households were given the option to cancel the free subscription and as a result not every household assigned to the treatment group got a newspaper.⁴ 59 (out of 965) Post and 54 (out of 950) Times group households stopped the free subscription. In total, approximately 94% of the households assigned to the treatment group did get the Times or Post. In subsequent analysis we will focus on intent to treat effects and include treatment group subjects who cancelled in the analysis. Adjusting our analysis to account for the refusals and calculating average treatment-on-treated effects rather than intent-to-treat effects would have only minor effect on the reported results, increasing the reported treatment effects slightly and leaving statistical significance unchanged.⁵

When we sent the list of Washington Post treatment households to the Post we were informed that, notwithstanding the response provided during the screening call, 75 (out of 965) were already on the Post subscription list (although it may be the case that these households were receiving only Sunday delivery). The Times, which has a much lower subscription rate, and reported 5 households already subscribing in both waves of the study. As group assignment was random, this suggests that some portion of the

³ Some additional data was collected that is not included in the subsequent analysis. Prior to the first random assignment 50 households were removed at random from the set of households with a completed baseline survey for a small pilot study to gauge the refusal rate and get some experience with the logistics of starting and stopping newspaper delivery. These households are excluded from the analysis.

⁴ See Appendix C for the text of the postcard mailed to each individual in the treatment groups.

⁵ A final potential complication was to verify that the papers we had ordered were actually delivered. To monitor delivery a research assistant observed a random sample of the treatment group households during the first wave. The Post had been delivered to the treatment households, but the Times was not observed at all of the addresses. We followed up by speaking with the Times circulation department and called a small random sample of households in the Times treatment group to verify that the papers had been delivered. There were 76 addresses to which the Times was unable to deliver. The Post was able to deliver to nearly all of the addresses; the Post was only unable to deliver to one address in the first round of the study. Undeliverable addresses are included in all analysis.

control group and Times treatment group, perhaps around 8%, was getting the Post, at least on Sunday, and a much smaller portion of the Post treatment group and the control group was getting the Times. Since the treatment effect estimates are based on the difference in treatment rates between the treatment and control group, this suggests the treatment effect should be interpreted as the effect of boosting the household exposure rate to the Post by at most 92 percentage points, rather than 100 percentage points. Thus any observed difference between the Post treatment group and the other groups will tend to underestimate, most likely by a small amount, the impact of exposure to the Post.

Previous researchers have found that, as is widely believed, the Post leans left and the Times leans right (Groseclose and Milyo 2005). Our analysis of coverage in the weeks prior to the Virginia Governor's election shows the papers' news coverage conformed to this assessment. Table 3 summarizes the above-the-fold front-page stories by topic for the Post and the Times (Appendix Table 1 lists every headline, and Appendix Table 2 lists every headline on the Metro page that related to the Virginia gubernatorial election). While both papers gave extensive attention to the Iraq war, the Times had three above the fold headlines mentioning Iraqi efforts at forging a constitution and only 1 mention of Iraq detainees; the pattern for the Washington Post was the opposite, 3 stories on detainees and 1 on the constitution. The Post gave much greater attention to the Republican scandals; the Plame leak case was given very extensive coverage in the Post and much less prominence in the Times. In place of the Post's emphasis on the leak and other administration scandals, the Times gave more coverage than the Post to the filling of the impending Supreme Court vacancy. The Times had about twice as many above the fold stories on the Miers and Alito nominations. The Times also gave greater attention than the Post to the Paris riots and to racially-focused remarks made by Democrats about the candidacy of Michael Steele, an African American Republican running for U.S. Senate in Maryland.

The pattern of subjects covered shows the Times was more favorable to the administration than the Post. A comparison of same day headlines presents a similar picture. On Tuesday October 18th 2005, both papers had front page Iraq stories; the Times story had the headline "No tears for Saddam in Iraq" while the Post used "Iraqis Say Airstrikes Kill Many Civilians." On November 4th and 7th, 2005 (Times and Post, respectively), the Times ran "Recruits Join Armed Forces Seeking War - A Sort of Vendetta Spurs Youth to Enlist After 9/11" whereas the Post ran "Youths in Rural U.S.

Are Drawn to Military - Worries About Jobs Outweigh War Fears.” On October 26th, 2005 readers of the Times saw the headline “Iraq Voters Approve New Constitution.” In contrast, the Post front page displayed the headline: “Military has lost 2,000 in Iraq.” When the papers ran headlines on the Miers nomination, the Times read “Miers Achieved, But Stayed Under the Radar” (October 26th, 2005) while the Post wrote “Miers Autonomy will be at Issue-Panel to Probe her Judicial Reasoning.” (October 27th, 2005).

Although the Post coverage was less favorable to the administration than that of the Times, the period of the study was not a rosy one for Republicans overall. The Iraq war was not popular during the 4 weeks prior to the post treatment survey, and both the Times and the Post ran many front page stories on the war. While the Supreme Court nomination of Harriet Miers, a story given a lot of attention by the Times, was a more favorable story for the White House than the activities of the special prosecutor investigating leading administration figures, a story more salient in the Post, the Miers nomination and subsequent withdrawal was not a good story for President Bush or Republicans. During the period subjects received the papers, Bush’s approval rating fell from approximately 41 to 37 percent nationwide.⁶ This raises the possibility that, if getting the newspaper increases the flow of information to a subject, and the fall in Bush’s approval was a consequence of the kinds of events that were considered news during the month, even when that news was presented with a pro-administration slant it might still have the effect of reducing support for Republicans.

National events may have affected the gubernatorial race in Virginia as well. News reports commonly cited the national issues as persuasive to many (particularly marginal) voters in the Virginia election.⁷ Hence even though the dependent variable is voter choice at the state level, there is reason to believe that reporting of national events could have influenced the voter’s decision. Appendix Table 2 details the Post and Times coverage of the Virginia gubernatorial contest during the weeks leading up to the election. Both newspapers gave the race extensive coverage; the Post had 15 stories on the front page or first page of the Metro section while the Times had 10 articles. The Post

⁶ These numbers are based on an average of the polls compiled by the website realeclearpolitics.com. The average percentage of respondents approving of Bush’s job performance using all polls in the field during 10/12-10/18 (N=5 polls) was 40.8, during 10/19-10/25 was 41.2, and during 11/9-11/15 was 37.0.

⁷ “Moments foreshadowing a political collapse” *The Virginian-Pilot*, November 13th, 2005; “‘Twas a Famous Victory, & Republicans Have Some Issues” *Richmond Times Dispatch*, November 13th, 2006; “New GOP Agenda, Many Things Combined to Cripple Kilgore’s Gubernatorial Hopes” *Richmond Times Dispatch*, November 13th 2005.

gave more coverage to the campaign of the Democratic candidate Kaine, but the Times news coverage did not seem unbalanced and included stories that could not be expected to help the Republican candidate, such as reports that Kaine was leading and that Kilgore's campaign effort might be weakened by problems in the Republican party.

During the week after the November election, we re-interviewed 1081 of the 3,347 individuals in our sample. Response rates of 30 or 40 percent are typical in the public opinion literature (Asher 2004).⁸ The remainder was not reached because the individual refused to participate in the follow-up survey (29.7%), the individual asked for was not available at the time of the call (10.3%), the operator reached an answering machine (9.8%), or the individual only partially completed the survey (6.0%). The operators were unable to reach the remainder for a number of different reasons, including reaching a busy signal, being disconnected, or getting no answer on the phone.⁹ The follow-up survey asked questions about the 2005 Virginia Gubernatorial election (e.g. did the subject vote, which candidate was voted for or preferred), national politics (e.g. favorability ratings for Bush, the Republicans, the Democrats, support for Supreme Court nominee Samuel Alito), and knowledge of news events (e.g. does subject know number of Iraq war dead, has subject heard of I. Lewis Libby). The complete questionnaire is included in the paper as Appendix B. Table 2A shows sample statistics from the baseline interview for both the entire sample and the sub-sample that participated in the post-election survey.¹⁰ The observed differences in covariate means is what is expected by chance. None of the differences across groups was statistically significant in either the original or the follow-up survey; the lowest p-value for a test of independence across groups was slightly over 0.2. Using the treatment assignment as the dependent variable in a multinomial logit model produced a p-value for the joint significance of the covariates of $p= 0.95$ for the full sample and $p= 0.48$ for the follow-up sample. Table 2B presents summary statistics for outcome measures in the post-election interview.

⁸ Public opinion literature suggests that increasing the response rate from 30-40 percent to 60 percent produces similar results for a variety of questions, including attention to media, engagement in politics, and social and political attitudes (Keeter, Miller, Kohut, Groves and Presser 2000).

⁹ The complete set of dispositions for the follow-up survey was: Survey 31.8%, Refused to Answer/Not Interested 29.7%, Person not Available 10.3%, Answering Machine 9.8%, Partial Survey/Refused 6.0%, Disconnect 4.1%, Don Not Call/Irate 3.1%, Ring No Answer 1.7%, Wrong Number 1.5%, Language Barrier 1.1%, Busy Signal .8%, Rescheduled Call .1%, Deceased .03%.

¹⁰ The sample was drawn from 15,000 voter records (36% female) and 15,000 consumer records (28% female, 5% gender unknown).

Appendix Table 3 predicts sample attrition based on treatment group assignment, covariates and covariates interacted with treatment group assignment. We do not find that either treatment led individuals to be more likely to respond to the follow-up survey. As one may expect, individuals who voted in 2002 and subscribed to a news magazine (hence are more engaged in politics), as well as those who preferred the Democratic candidate for Governor in the baseline, were more likely to complete the follow-up phone survey. However, this sample selection bias is not correlated with assignment to treatment, as indicated by Column 2 in which the interaction of assignment to treatment and the covariates does not predict participation in the follow-up phone survey. Regardless, all results we present later in the paper include a model with baseline covariates in order to address potentially any bias in the sample response (as well as a model without covariates). If there is attrition based on unobserved variables that are correlated with the outcome measures but not predicted by the observables, our results may be biased.

One limitation of this study is that while we know which households received newspapers, we can not be sure that the newspapers were read. The treatment effects, if any, are based on a comparison of those assigned to get free papers and those assigned to the control group. The experimental treatment should therefore be interpreted as the average effect of substantially reducing the cost to the household of obtaining the news from the Post or the Times, rather than the marginal effect of reading the particular news stories listed in Table 3 and Appendix Tables 1 and 2. There is evidence that the newspapers were not disregarded. The Post informed us that, as of March 2006 (three months after the free subscription ended), approximately 17% of the treatment group had decided to subscribe to the Post.¹¹

Section 3. Results.

The post-treatment survey asked subjects about the 2005 Virginia Gubernatorial election, national politics, and knowledge of news events. Table 4 shows the effect of the newspapers on subject responses to questions about the Virginia Governor election. The dependent variables in the 4 sets of regressions are dummy variables created from the

¹¹ The Times did not provide us the comparable re-subscription figure.

survey responses: *Voted* is set equal to 1 if the subject reported voting in the November election, *Voted for Democrat* equals 1 if the subject voted and selected the Democratic candidate, *Did not vote, but preferred Dem* equals 1 if the subject reported not voting but preferred the Democratic candidate, and *Voted for or Preferred Dem* equals 1 if the subject either voted for or preferred the Democrat. For each set of regressions we present 3 specifications.¹² Column A includes only the treatment group indicators, Column B adds a set of covariates from the baseline survey (the 9 variables in Tables 2A and 2B plus a variable for age obtained from the post-treatment survey) and dummy variables for randomization strata, and Column C includes the baseline survey covariates, the strata dummy variables, and dummy variables for date of survey and survey interviewer. All of the results tables in this section (Tables 4-6) present treatment effects for these three model specifications.

It has been suggested that the decline in newspaper readership has contributed to a decline in voter turnout. The table 4 suggests that the newspapers did not affect the probability a subject voted. None of the point estimates measuring the effect of getting a newspaper on the probability the subject voted are large, and two of the six estimates were less than zero (Table 4, columns 1a-c). If the Post and Times treatment groups are combined into a single treatment (subjects who got a paper), the estimated effect on voting of getting a paper was very close to zero in two of the three models, and never greater than the standard error of the estimate.

The newspapers did have an important effect on which candidate the subject supports. The Washington Post endorsed the Democrat and the Washington Times endorsed the Republican. Among those subjects who reported voting, getting the Post is estimated to increase the probability of selecting the Democrat by between 7.9 percentage points (column 2a) and 11.4 percentage points (column 2c). This effect was significant at the 10% level (two-tailed) when no covariates are included and at the 5% level when covariates are added. Contrary to initial expectations, the Times was also associated with an increase in the probability of a Democratic vote in the Virginia Governor's race. The effect was about 60% as large as that estimated for the Post treatment and was not statistically significant. The positive coefficient estimate for the Times may reflect

¹² All tables report results using the classical least squares standard errors. If we use robust standard errors to account for heteroscedasticity, all the results maintain the same statistical significance, with the exception of Table 5, column 5a for which the p-value goes from .104 to .119.

sampling error and also, perhaps, the fact that the Democratic candidate for Governor was a conservative leaning Democrat who received relatively balanced treatment in the Times.

An increase in Democratic vote share could be due either to influencing individuals to vote for one candidate versus the other (i.e., the information changed the minds of voters, or influenced the undecided voters to shift Democrat), or to changing the composition of who voted (i.e., influencing more Democrats than Republicans to vote, but not actually influencing the voting choice). To examine this question, we tested whether voter turnout was affected positively (negatively) for those who reported to prefer the Democrat (Republican) candidate in the baseline survey. We conduct the same regression as in Table 4 Columns 1a for these two sub-samples, and we do not find any evidence of a change in composition of voters (t-statistics are all under 1, results now shown in tables). (specifications not shown in table, available upon request).

The third set of columns in Table 4 shows that the positive treatment effect was concentrated among those subjects who reported voting. In contrast to the boost in support among those who reported voting, those who received the Post and said they did not vote were *not* more likely to support the Democrat. The sample sizes are small for this set of results and nothing is near statistical significance, but it is interesting to note that those who received the Times and did not vote were much less likely to support the Democratic candidate.

Combining all those who voted for or prefer a candidate into a single dependent variable (Table 4, columns 4a-c) shows an approximately 5-7% increase in Democratic support for the Post treatment group, with borderline statistical significance. The results in the fourth set of columns in Table 4 suggest movement toward the Democratic candidate among those in the Post treatment group, but unfortunately, and as in other possible comparisons of the Post and Times treatment effects, the difference between the Post and the Times treatment groups could not be estimated with great precision. If it were real, the 4.4% difference in Democratic vote share between the Post and Times reported in Table 4, column 4a (or the 3.2% difference reported in column 4c) would represent a politically important effect of exposure to alternative media outlets. Given the 4% standard errors for each treatment group, however, the group differences are well short of conventional levels of statistical significance. Prior beliefs about media and bias should be updated in light of the evidence we present, but it would be useful for future

work to obtain more precise measurement of the differential treatment effects though use of larger samples.

Table 5 shows the estimated effect of the Post and Times on subject attitudes toward national politics. All variables are defined such that a higher value corresponds to a more conservative opinion, such as approval of Bush, of the Republican Party, etc. Panel A shows the effect of the treatments on subject views on specific issues (such as the Iraq war), while Panel B reports the effects on broader political matters (such as attitude toward the President or the Republican party). As in Table 4, the dependent variable for each group of regressions was created from the post treatment survey responses.

Turning first to Table 5, Panel A, variables were coded to reflect differences in newspaper coverage. Higher numbers reflect the conservative, more pro-Bush administration perspective associated with a Times. If the political slant of the Post and Times were moving subjects in the direction of their coverage, we would expect the coefficients on the Post treatment to be negative and the Times treatment to be positive. Table 5, Panel A shows 5 sets of regressions: *Most important problem*, coded as 0 if the respondent said that political scandals were the most important problem facing the country (closed-ended survey question 4A), 1 otherwise, *Most Important Issues in Iraq*, coded as 1 if respondent selects approval of the constitution or the trial of Saddam Hussein, 0 otherwise (Question 4B), *Leak case*, coded as 1 if respondent thought there was something illegal, 2 if unethical but not illegal, and 3 if officials did nothing wrong (Question 9), *Alito Confirmation*, coded as 3 if should confirm, 2 if not enough known, 1 if should not confirm (Question 10), *Specific Issue Index*, an equal weighted average of the first 4 variables in Panel A, with variables standardized by their standard error.

The results in Table 5A provide some weak evidence in support of the view that the papers moved subjects in the direction of their coverage. The only statistically significant finding is for subject support of Alito's confirmation to the Supreme Court, where for one of the models the Post treatment produces a lower level of support for confirmation (column 4a). Perhaps the most convincing evidence of a possible effect of media bias are the result for *Specific Issue Index*. The coefficient estimates suggest that the Times has zero effect on subject responses, but the Post does shift opinion in the direction of its coverage. While the results are consistent across specifications (5a-5c), the standard errors are too large for these results to be viewed as definitive.

Table 5, Panel B presents the effects of the treatments on subject views on broad national issues along with estimates of the effect of the Post and Times treatments on some indexes constructed from the variables analyzed separately in table 5. The dependent variables in the first 4 sets of regressions are: *Bush Approval Rating*, a categorical variable, equal to 4 if the respondent strongly approves, 3 if the respondent not-so-strongly approves, 2 if the respondent not-so-strongly disapproves, and 1 if the respondent strongly disapproves (Question 5), *Republican Favorable*, which equals 4 if the respondent is very favorable towards the Republican Party, 3 if the respondent is somewhat favorable, 2 if the respondent is somewhat unfavorable, and 1 if the respondent is very unfavorable (Question 6), Conservatism, a 7 point scale ranging from 7 when the respondent says they are an extremely conservative to 1 when extremely liberal (Question 17), *Broad Policy Index*, an equal weighted average of the first 3 columns, with variables standardized by their standard error.

The results in Table 5B suggest that greater news exposure during the 4 weeks prior to the post-treatment survey led subjects away from the Bush administration and Republicans. As we argued earlier, the news during the weeks leading up to the November election was not favorable to the President and his party. It might be that while there is a difference in the way a right leaning paper and a left leaning paper cover the news, what the coverage had in common was more important than any differences across newspapers. Both the Times and the Post resulted in decreased Presidential approval (Columns 6a-c) and decreased favorability for the Republican Party (7a-7b). The Post, but not the Times, is associated with a movement of opinion in a more liberal direction (8a-c). If the treatments are combined into a single indicator for whether the subject received a newspaper (not shown in tables), the effect of being treated on Bush Approval rating ranges as high as 0.16 (s.e. 0.09), which is significant at the 10% level. Columns 9a-9c show the results when the dependent variables from the first 3 sets of columns are combined into an index (by adding up the standardized values of each of the responses in Columns 6, 7 and 8). The Post has a borderline statistically significant effect on subjects' broad political attitudes, moving those sent the paper in a more liberal and Democratic direction. Exposure to the Times over this period moved subjects in a similar direction, though the results are weaker and fall short of conventional significance levels.

The final column of Table 5 combines the Specific Issue index and the Broad Policy index into a single index. The simplest specification, a comparison of each of the

treatment groups and the control group (column 10a), shows that the Post moved subjects in a liberal direction while the Times had no effect.

Table 6 shows the effect of the treatments on subject knowledge of topics in the news. The dependent variables in the first 3 sets of regressions are dummy variables, coded 1 if the respondent answered the question correctly, and 0 otherwise (Question 11 on Iraq war dead, Question 12a on Libby resignation, and Question 13 on Supreme Court nominee Miers). The dependent variable in the last set of regressions, *Fact Index*, is a weighted average of the first three dependent variables. There is no consistent pattern across the estimates and no evidence that getting the papers made subjects more informed about these issues. While greater political information among subjects in the treatment groups would have helped to explain the apparent movement in opinion toward the Democratic party during this time period, changes in opinion often occur without a subject being able to recall the facts that caused opinions to shift. Results of this type are commonplace in political science. Drawing on work from psychology (Anderson and Hubert 1963; Watts and McGuire 1964), political scientists have constructed models of on-line processing of political information, where citizens update their judgments in response to the flow of information but do not retain memory of the particular facts that caused them to revise their views (Lodge, McGraw and Stroh 1989; Lodge and Stroh 1993). These models receive substantial empirical support (Lodge, Steenbergen and Brau 1995).

Section 4. Conclusion.

Our investigation of the effect of newspapers on political attitudes, behavior, and subject knowledge of news events found that even a short exposure to a daily newspaper influences voting behavior as well as some public opinions.

First, there was some evidence that the political bias of the news source had a causal effect on voter behavior in the Virginia Governor's election. While neither newspaper increased the probability that a subject turned out to vote, exposure to the Post produced a statistically significant increase in the probability a voting subject selected the Democratic candidate. From exposure to the Washington Times, on the other hand, there was no statistically significant change in voting behavior (although the point estimate is positive as well).

Second, exposure to either newspaper was weakly linked to a movement away from the Bush administration and Republicans. Bush approval was measured using a 4 category scale, where 1 equals strongly disapprove, 2 means not so strongly disapprove, 3 means not so strongly approve, and 4 is strongly approve. Receiving either newspaper during the 4 week study period was associated with a 0.16 decrease in the approval scale. If there is a latent continuous distribution ranging from 0.5 to 4.5, measures greater than 2.5 are considered disapproval, and the treatment effect is constant across the distribution, then the treatment effect decreases approval by approximately $0.16/4 = 4\%$. That is a very large effect of media exposure, since it can be interpreted as the causal effect of being assigned to the newspaper treatment rather than some mixture of possible media effects and known selection bias. Ratings of the Republican party were estimated to change a similar magnitude. While these effects are large, due to sizable standard errors the evidence supporting these results was just short of standard levels of statistical significance. There was also some weak evidence that those getting the Post were more likely to oppose confirming Samuel Alito and were less likely to characterize themselves as conservative. For those measures the Times group was quite similar to the control group.

We put forth two potential mechanisms to explain our findings. First, media bias may alter behavior and opinions. The Post, for the most part, moved individuals left whereas the Times did not move individuals to the right (and in fact, in many cases, the statistically insignificant point estimate indicates a slight shift to the left). Hence, the mechanism is not as simple as newspapers moving individuals in the direction of their reporting bias. If individuals behave as Bayesians, then one must know their perception of the bias, not just the actual bias. Hence, in this setting, if individuals perceived the Times to be conservative, then biased news reporting may not influence public opinion at all. On the other hand, if individuals perceive the Post as more neutral, they may be more likely to be influenced by the reporting.

Second, the shift leftward may simply be a result of a reduction in the administration's standing due to unfavorable news coverage during the four weeks in which we sent households the newspapers. The experiment coincided with a difficult political period for the Bush administration, and the exposure to newspapers made the treatment groups (both the Post and the Times) more aware of current events. From October 15 to November 8 national presidential approval rates fell by 4 percent.

Examination of the national news coverage in the Times and Post showed that while the Times selected more favorable stories than the Post, and the Times headlines were more sympathetic to the administration, both papers carried many stories about the Iraq war, political scandals, and the failed attempt to place Harriet Miers on the Supreme Court. The evidence suggests that those exposed to this stream of news, even when the news was given a relatively pro-administration slant, held the President and his party in lower regard than those who were less likely to read the news.

Our field experiment directly addresses the problem of selection bias in standard observation studies. As in all empirical work, experimental or not, there is still the important question of generalizing from our particular findings. Any broad inferences from this study about the effects of media bias on political decisions should recognize that the results may depend on several specific features of our experiment, such as the political context, choice of subjects, intensity of treatment, length of the study, timing of the study, and choice of media outlets and type. To address these issues successfully, we suggest that this field experiment approach can be done in different political contexts, with different subjects, using different media, for longer (or shorter) periods of time in order to build a better body of knowledge on the mechanisms through which the media influences political behavior and opinions.

Table 1: Treatment Group and Control Group Assignment			
	Wave 1	Wave 2	Total
Post	605	360	965
	28.8	29.0	28.9
Times	595	355	950
	28.3	28.6	28.4
Control	904	528	1,432
	43.0	42.5	42.8
Totals	2,104	1,243	3,347
	<i>100</i>	<i>100</i>	<i>100</i>

Note: Cell entries indicate number of individuals assigned to each treatment group. Numbers in italics are column percentages.

Table 2A: Summary Statistics from Baseline Survey
Mean and standard errors

Panel A: Baseline Survey Responses					
	Sample Average	Control	Post	Times	p-value
	(1)	(2)	(3)	(4)	(5)
% female	34.8 (0.8)	34.4 (1.3)	33.0 (1.5)	37.0 (1.6)	0.18
% voted in 2004	88.6 (0.8)	88.5 (1.2)	88.8 (1.4)	88.6 (1.4)	0.98
% voted in 2002	48.0 (1.2)	49.0 (1.9)	45.8 (2.3)	49.1 (2.3)	0.48
% voted in 2001	7.3 (0.6)	7.1 (1.0)	7.7 (1.2)	7.3 (1.2)	0.93
% from consumer list	50.9 (0.9)	52.6 (1.3)	50.0 (1.6)	49.3 (1.6)	0.24
% get news or political magazine	9.2 (0.5)	9.4 (0.8)	8.8 (0.9)	9.4 (0.9)	0.88
% prefers Democratic candidate for Governor in VA	14.4 (0.6)	14.5 (0.9)	14.6 (1.1)	14.1 (1.1)	0.94
% no preference in VA Gov. race	14.8 (0.6)	14.2 (0.9)	15.5 (1.2)	15.1 (1.2)	0.63
% in wave 2 of random assignment	37.1 (0.8)	36.9 (1.3)	37.3 (1.6)	37.4 (1.6)	0.96
% participating in follow-up	32.3 (0.8)	31.7 (1.2)	32.0 (1.5)	33.5 (1.5)	0.65
N	3347	1432	965	950	
Panel B: Baseline Survey Responses on the Sample of Those Who Completed the Follow-up Survey					
	Sample Average	Control	Post	Times	p-value
	(1)	(2)	(3)	(4)	(5)
% female	32.9 (1.5)	31.5 (2.2)	36.8 (2.8)	30.9 (2.6)	0.21
% voted in 2004	90.7 (1.2)	92.6 (1.7)	89.2 (2.5)	89.5 (2.3)	0.44
% voted in 2002	56.0 (2.1)	57.6 (3.3)	50.6 (4.0)	58.7 (3.8)	0.27
% voted in 2001	8.4 (1.2)	9.2 (1.8)	8.2 (2.2)	7.6 (2.0)	0.84
% from consumer list	48.3 (1.5)	49.6 (2.4)	48.9 (2.9)	45.9 (2.8)	0.59
% get news or political magazine	11.3 (1.0)	10.4 (1.4)	11.0 (1.8)	12.9 (1.9)	0.54
% prefers Democratic candidate for Governor in VA	19.4 (1.2)	19.6 (1.9)	21.0 (2.3)	17.6 (2.2)	0.55
% no preference in VA Gov. race	12.9 (1.0)	13.2 (1.6)	10.0 (1.7)	15.1 (2.0)	0.16
% in wave 2 of random assignment	35.1 (1.5)	35.0 (2.3)	38.5 (2.8)	31.8 (2.6)	0.21
N	1,065	446	306	313	

Note: Standard errors reported in parentheses. Column 5 reports the p-values for chi squared tests of independence between treatments for each baseline variable.

**Table 2B: Summary Statistics for Outcome Measures
Mean and Standard Errors**

	Sample Avg.	Control	Post	Times
	(1)	(2)	(3)	(4)
Voted	.728 (.014)	.726 (.021)	.725 (.025)	.735 (.025)
Voted for Democrat	.446 (.019)	.411 (.029)	.490 (.035)	.451 (.034)
Did not Vote, But Preferred Democrat	.399 (.030)	.419 (.046)	.416 (.056)	.351 (.055)
Voted for or Preferred Democrat	.433 (.016)	.413 (.024)	.470 (.030)	.425 (.029)
Most important Problem (1=issue other than scandals, 0=scandals)	.078 (.008)	.08 (.013)	.068 (.014)	.086 (.016)
Most important issues in Iraq (1=constitution or Hussein trial)	.444 (.015)	.442 (.024)	.472 (.029)	.417 (.028)
Leak case (3=no one did anything wrong; 1=something illegal)	1.75 (.005)	1.74 (.038)	1.72 (.047)	1.79 (.045)
Alito confirmation (3=should confirm, 1=should not confirm)	2.34 (.021)	2.37 (.033)	2.27 (.040)	2.38 (.037)
Specific issue index (higher scores conservative)	.021 (.020)	.033 (.032)	-.028 (.039)	.051 (.035)
Bush Approval (4=strong approval, 1=strong disapproval)	2.43 (.043)	2.48 (.066)	2.37 (.079)	2.42 (.081)
Republican favorable (4=very favorable, 1=very unfavorable)	1.47 (.032)	1.50 (.050)	1.41 (.058)	1.48 (.059)
Conservatism (7=extreme conservative, 1=extreme liberal)	4.51 (.045)	4.56 (.069)	4.38 (.087)	4.58 (.083)
Broad policy index	.001 (.025)	.038 (.039)	-.066 (.046)	.014 (.047)
Broad and specific issue index	.010 (.021)	.033 (.032)	-.046 (.038)	.031 (.038)
Knew number dead in Iraq	.784 (.013)	.781 (.019)	.779 (.024)	.791 (.023)
Identified Libby as involved in leak	.739 (.013)	.754 (.020)	.705 (.026)	.748 (.025)
Identified Miers as Supreme Court nominee	.777 (.013)	.785 (.019)	.729 (.026)	.813 (.022)
Fact index	-.009 (.022)	.007 (.034)	-.079 (.043)	.035 (.040)
N	1065	446	306	313

Table 3: Front Page Headlines (Above the Fold)

		Post	Times
Iraq	Iraq war	6	7
	Iraqi constitution	1	3
	Detainees	3	1
	Hussein trial	1	3
Scandals	CIA leak case (Plame)	8	3
	Other scandals	2	0
State/Local	Virginia governor election	0	1
	Steele*	0	4
	DC, state, local	4	5
International stories (other than Iraq war)	Immigration	0	2
	Paris riots	1	3
	Anti-US protests/trade talks	1	1
	CIA	1	0
	Other international	4	7
Nominations	Miers	6	10
	Next court appointee*	1	2
	Alito	1	4
	Fed chief	1	1
Other	Hurricane (e.g., Katrina)	8	6
	Other	9	2

* Cell entries are number of stories above the fold on each newspaper's front page from October 17, 2005 to the day of the gubernatorial election, November 8, 2005. A complete list of headlines is in Appendix Table 1. "Next court pick" refers to the period after Miers withdrew and before Alito's nomination. "Steele" refers to stories about Democratic racially charged remarks about a black Republican Senate candidate.

**Table 4: Effect of Post or Times on Voting Behavior in Virginia Governors Race
OLS**

	Voted			Voted for Democrat			Did not vote, but Preferred Democrat			Voted for or Preferred Democrat		
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)	(4a)	(4b)	(4c)
Post	-.001 (.033)	.018 (.032)	-.008 (.034)	.079* (.045)	.086** (.043)	.114** (.046)	-.003 (.072)	-.011 (.081)	-.024 (.123)	.056 (.038)	.047 (.037)	.071* (.040)
Times	.009 (.033)	.026 (.031)	.012 (.034)	.040 (.044)	.053 (.042)	.074 (.046)	-.068 (.072)	-.026 (.085)	-.132 (.120)	.011 (.038)	.016 (.036)	.039 (.039)
N	1079	1040	1040	718	700	700	271	255	255	989	955	955
Refused	2	2	2	69	69	69	25	25	25	92	92	92
Does not know	0	0	0	0	0	0	0	0	0	0	0	0
Missing Cov.	0	39	39	0	18	18	0	16	16	0	34	34
Not asked	0	0	0	294	294	294	785	785	785	0	0	0
Total Surveyed	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081
R-squared	0.00	0.34	0.40	0.00	0.45	0.53	.00	.47	.72	0.00	0.37	0.44
Covariates	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Strata indicators	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Surveyor/Date indicators	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Note: Standard errors in parentheses. ** 95% significance, * 90% significance. Dependent variables in the four sets of columns are as follows: self-reported voter turnout, voted for the Democratic candidate (among those who claimed to vote), preferred the Democrat (among those who did not vote), and either preferred the Democratic candidate (if they said they did not vote) or voted for the Democratic candidate (if they said they voted), respectively. In the row labeled “covariates”, we refer to data from the baseline survey: gender, reported age, three separate indicators for voting in the 2001, 2002 and 2004 general elections, an indicator for whether the respondent was drawn from a consumer list, self report of receiving any news or political magazines, and baseline survey self reports of preferring the Republican candidate in the gubernatorial election and having no preference in the gubernatorial election, and an indicator for wave of the study. In the row “strata indicators”, we include indicator variables for each strata formed prior to the randomization, which included unique combinations of the following: intention to vote, receive a paper (non-Post/non-Times), mentions ever reading a paper, gets a magazine, and asked whether they wish they read the paper more. “Surveyor/Date indicators” refers to a set of indicator variables for each unique combination of surveyor and date for the follow-up survey. All results remain qualitatively similar, and statistical significance remains as-is, using probit or ordered probit specifications instead of OLS.

Table 5: The Effect of Treatment on Attitudes Towards National Politics
OLS

<i>Panel A: Specific Issues</i>															
	Most important problem (1=issue other than scandals,0=scandals)			Most important issues in Iraq (1=constitution or Hussein trial)			Leak case (3=no one did anything wrong; 1=something illegal)			Alito confirmation (3=should confirm, 1=should not confirm)			Specific Issue Index (higher scores conservative)		
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)	(4a)	(4b)	(4c)	(5a)	(5b)	(5c)
Post	-.012 (.021)	-.021 (.023)	-.028 (.025)	.038 (.039)	.020 (.039)	.051 (.042)	-.015 (.061)	-.042 (.062)	.023 (.067)	-.099** (.051)	-.025 (.052)	-.054 (.055)	-.061 (.049)	-.013 (.049)	-.029 (.052)
Times	.005 (.020)	.013 (.023)	.013 (.024)	-.020 (.038)	-.004 (.038)	.013 (.041)	.050 (.059)	.027 (.059)	.020 (.064)	.019 (.050)	.059 (.051)	.036 (.054)	.018 (.049)	.013 (.048)	-.001 (.051)
N	1033	996	996	982	949	949	899	870	870	971	940	940	1081	1041	1041
Refused	7	7	7	19	19	19	37	37	37	10	10	10	0	0	0
DK	41	41	41	80	80	80	145	145	145	100	100	100	0	0	0
Missing Cov.	0	37	37	0	67	67	0	29	29	0	31	31	0	40	40
Total Surveyed	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081
R-squared	.00	.14	.24	.00	.30	.37	.00	.32	.41	.01	.30	.40	.00	.33	.40
Covariates?	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Strata indicators?	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Operator / date indicators?	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
<i>Panel B: Broad National Issues</i>															
	Bush Approval Rating (4=strong approval, 1=strong disapproval)			Republican Favorable (4=very favorable, 1=very unfavorable)			Conservatism (7=extreme conservative, 1=extreme liberal)			Broad policy Index			Broad and Specific Issue Index		
	(6a)	(6b)	(6c)	(7a)	(7b)	(7c)	(8a)	(8b)	(8c)	(9a)	(9b)	(9c)	(10a)	(10b)	(10c)
Post	-.114 (.103)	-.046 (.097)	-.164 (.103)	-.096 (.077)	-.015 (.078)	-.086 (.082)	-.174 (.109)	-.101 (.110)	-.161 (.117)	-.104* (.061)	-.052 (.058)	-.112* (.061)	-.079 (.050)	-.029 (.047)	-.067 (.049)
Times	-.058 (.103)	-.056 (.097)	-.165 (.102)	-.026 (.076)	-.010 (.077)	-.111 (.081)	.021 (.109)	.025 (.108)	-.016 (.116)	-.023 (.061)	-.025 (.057)	-.095 (.061)	-.002 (.050)	-.006 (.046)	-.048 (.048)
N	955	918	918	1021	985	985	1033	1000	1000	1074	1034	1034	1081	1041	1041
Refuse/missing	17	17	17	17	17	17	16	16	16	7	7	7	0	0	0
Does not know	109	109	109	43	43	43	32	32	32	0	0	0	0	0	0
Missing Cov.	0	37	37	0	36	36	0	33	33	0	40	40	0	40	40
Total Surveyed	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081
R-squared	.00	.40	.49	.00	.30	.39	.00	.30	.37	.00	.38	.46	.00	.40	.48
Covariates?	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Strata indicators?	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Operator/date indicators?	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Note: Standard errors in parentheses. ** 95% significance, * 90% significance. Dependent variables in Panel A include response to closed-ended question about the most important problem facing the country, a closed ended question about the most important problems in the Iraq war, attitudes about the leak case, the Alito confirmation, and a specific issue index constructed from the most important problem, the most important issue in Iraq and attitudes about the leak case. Dependent variables in panel B include attitudes about general national issues, including Bush approval, favorability towards Republicans, Conservatism, and a policy index constructed from these previous three items. The “broad policy index” and the “specific issue index” are both constructed by summing the standard deviations from the mean for each of the three specific questions for that index. The “Broad and Specific Issue index” is constructed then by adding together the two indices. In the row labeled “covariates”, we refer to data from the baseline survey: gender, reported age, three separate indicators for voting in the 2001, 2002 and 2004 general elections, an indicator for whether the respondent was drawn from a consumer list, self report of receiving any news or political magazines, and baseline survey self reports of preferring the Republican candidate in the gubernatorial election and having no preference in the gubernatorial election, and an indicator for wave of the study. In the row “strata indicators”, we include indicator variables for each of the strata formed prior to the randomization, which included unique combinations of the following: intention to vote, receive a paper (non-Post/non-Times), mentions ever reading a paper, gets a magazine, and asked whether they wish they read the paper more. “Surveyor/Date indicators” refers to a set of indicator variables for each unique combination of surveyor and date for the follow-up survey. All results remain qualitatively similar, and statistical significance remains as-is, using probit or ordered probit specifications instead of OLS.

Table 6: Effect of Treatment on Political Knowledge
OLS

	Knew number dead in Iraq			Identified Libby as involved in leak			Identified Miers as Supreme Court nominee			Fact Index		
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)	(4a)	(4b)	(4c)
Post	-.002 (.030)	.018 (.033)	.021 (.034)	-.050 (.033)	-.024 (.034)	-.022 (.036)	-.057* (.031)	-.042 (.032)	-.034 (.034)	-.086 (.054)	-.036 (.056)	-.023 (.058)
Times	.010 (.030)	-.009 (.032)	.009 (.034)	-.006 (.032)	-.011 (.034)	.008 (.036)	.028 (.030)	.011 (.031)	.018 (.033)	.028 (.054)	-.004 (.055)	.032 (.057)
N	1077	1038	1038	1067	1029	1029	1074	1036	1036	1080	1041	1041
Refuse/missing	4	4	4	14	14	14	7	7	7	1	1	1
Does not know	0	0	0	0	0	0	0	0	0	0	0	0
Missing Cov.	0	39	39	0	38	38	0	38	38	0	39	39
Total Surveyed	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081	1081
R-squared	.00	.20	.29	.00	.21	.32	.01	.23	.32	.00	.25	.36
Covariates	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Strata indicators	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Surveyor/Date indicators	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Note: Standard errors in parentheses. ** 95% significance, * 90% significance. Dependent variables are: ability to identify the number dead in Iraq in a closed-ended question, identified ‘Scooter’ Libby from a list of four individuals as Dick Cheney’s chief of staff who recently resigned, identified Harriett Miers from a list of four individuals as a recent supreme Court nominee, and an index created from these questions. In the row labeled “covariates”, we refer to data from the baseline survey: gender, reported age, three separate indicators for voting in the 2001, 2002 and 2004 general elections, an indicator for whether the respondent was drawn from a consumer list, self report of receiving any news or political magazines, and baseline survey self reports of preferring the Republican candidate in the gubernatorial election and having no preference in the gubernatorial election, and an indicator for wave of the study. In the row “strata indicators”, we include indicator variables for each strata formed prior to the randomization, which included unique combinations of the following: intention to vote, receive a paper (non-Post/non-Times), mentions ever reading a paper, gets a magazine, and asked whether they wish they read the paper more. “Surveyor/Date indicators” refers to a set of indicator variables for each unique combination of surveyor and date for the follow-up survey. All results remain qualitatively similar, and statistical significance remains as-is, using probit or ordered probit specifications instead of OLS.

Appendix Table 1: Complete List of Headlines Above the Fold on the front Page, October 17, 2005 to November 8, 2005

	Times	Post
IRAQ		
Iraq War	Iraqis seek aid without crosses (10/19)	Iraqis say airstrikes kill many civilians (10/18)
	Iraqi women take up arms(10/24)	Enemy bodycounts revived (10/24)
	Suicide bombers hit hotels of Westerners (10/25)	Military has lost 2000 in Iraq (10/26)
	Militia ID cards are keys to the city (10/31)	Bigger, Stronger homemade bombs now to blame for half of US deaths (10/26)
	Senate Democrats force closed session on Iraq data (11/2)	Senate Democrats force closed meeting (11/2)
	Democrats intensify Bush slams (11/3)	Youths in Rural U.S. Are Drawn to Military - Worries About Jobs Outweigh War Fears (11/4)
	Recruits Join Armed Forces Seeking War - A Sort of Vendetta Spurs Youth to Enlist After 9/11 (11/7)	
		Iraqi Constitution Appears headed for Voter Approval (10/17)
Iraq Constitution	Constitution headed for win in Iraq(10/17)	
	Iraq voters approve new constitution (10/26)	
	Sunnis join hands for elections (10/27)	
Detainees	Court to rule on war tribunals (11/8)	CIA holds terror suspects in secret prisons (11/2)
		Cheney fights for detainee policy (11/7)
		High court to hear case on war powers (11/8)
Hussein trial	No tears for Saddam in Iraq (10/18)	Hussein: 'I Don't acknowledge this court' (10/20)
	Saddam rejects 'so-called' court (10//20)	
	Lawyer for Saddam cohort abducted (10/21)	
	Lawyer in Saddam trial found dead at mosque(10/22)	
SCANDALS		
Leak case	Grand jury indicts Cheney aide (10/29)	Cheney's office is a focus in leak case (10/18)

	High-profile journalists pivotal for prosecution(10/29)	Rove told jury Libby may have been his source in leak case (10/20)
	Bush advised to resist apology on Libby (10/31)	Bush aides brace for charges (10/26)
		Case presented to leak grand jury (10/27)
		Top Cheney aide indicted (10/29)
		With Vice President, he shaped Iraq policy (10/29)
		Rove's future role is debated (11/3)
		Libby pleads not guilty in leak case (11/4)
Other scandals		Lawmaker's Abramoff ties investigated (10/18)
		Letters show Frist notified of stocks in 'blind' trusts (10/24)

STATE/LOCAL

VA governor Big guns out as races end in Virginia (11/8)

Steele Party trumps race for Steele foes (11/2)
 Top Democrats duck on Steele hits (11/3)
 Cardin rejects racial tactics (11/4)
 Steele decries black critics as racists (11/7)

DC/other
 state/local Another 911 call is a wrong number(10/17)

 Bowe files for Chapter 11 haven (10/18)
 Bomb threat shuts Baltimore tunnels (10/19)
 911 errors a 'huge problem' (10/20)
 Appeals court tosses tax suit (11/5)

D.C. council votes to ease No-tolerance DUI law (10/19)
 Some days, I feel like the grim reaper (DC detectives) (10/21)
 Md. And VA. To study beltway toll lanes (10/27)
 D.C.'s bid to impose commuter tax denied (11/5)

INTERNATIONAL

Immigration Bush vows to oust 'every single' illegal (10/19)
 GOP mulls ending birthright citizenship (11/4)

Paris riots Muslim youths battle Paris police (11/4)
 Paris police fear rioters' heavy arms (11/7)
 Riots spread across borders (11/8)

Anti-US Bush espouses free trade (11/5)

French Premier offers plan on riots (11/8)

Anti-U.S. Protests flare at summit (11/5)

protests

CIA

Other

International

Venezuela seeks nuclear technology(10/17)
Mugabe calls Bush, Blair 'terrorists' (10/18)
Rumsfeld wary of Beijing's buildup (10/20)
Bush urges U.N. action on Syria (10/22)
Iraq leader predicts Israel's demise (10/27)
Volcker panel cites French, Russian firms (10/28)
Four arrests linked to Chinese spy ring (11/5)

A year later, Goss's CIA is still in turmoil (10/19)

Syria Blamed in Death of Hariri (10/21)
Syria feels heat over U.N. report (10/22)
Hospitals in China find profit in AIDS (11/8)

NOMINATIONS

Miers

Bush shifts debate on Miers (10/18)
Miers asked to flesh out answers (10/20)
Miers to end her meetings with senators (10/21)
Insiders see hint of Miers pullout (10/22)

Senators face off on Miers nod (10/24)
Leaders on right call for new pick (10/25)
Miers achieved, but stayed under the radar (10/26)
Senators reject Miers critics (10/26)
Women's group calls for Miers withdrawal (10/27)
Miers rules herself out (10/28)
Conservatives agree to...unite behind next court pick

Miers once vowed to support ban on abortion (10/19)
Senators grouse about responses from Miers (10/20)
Miers backed race, sex set-asides (10/22)
Miers's autonomy will be at issue (10/27)
Miers Withdrawn as Nominee for Court; search begins anew (10/28)
Nomination was plagued by missteps from the start (10/28)

Next court pick

(10/28)
Bush expected to pick justice from the right (10/31)

President poised to pick court nominee (10/31)

Alito

Bush picks Alito for Supreme Court (11/1)
Bush aides alerted key supporters to Alito nod (11/1)
Both parties prepared for 'Armageddon' fight (11/1)
Alito nomination to test 'Gang of 14' (11/2)

Alito nomination sets stage for ideological battle (11/1)

Fed chief

Bernanke named new Fed chief (10/25)

Bush picks advisor as Greenspan's successor (10/25)

OTHER

Katrina/storms

Storms profit energy industry (10/22)
Wilma roars along Mexico's coast (10/22)
Wilma thrashes Florida (10/25)
Bush backs budget cuts for storm aid (10/27)
Oil firms reap huge profit after storms (10/28)
Tornado kills 22 in Indiana, slams Kentucky (11/7)

Other

Episcopal liberals prepare for split (10/24)
GOP warms to 'tax' on oil (11/3)

Risk estimate led to few flood policies (10/17)
Two streets, two futures (Katrina's impact) (10/19)
Aide says FEMA ignored warnings (10/21)
Investigators link levee failures to design flaws (10/24)
Wilma slams both coasts in Fla. (10/25)
Red Cross borrowing funds for storm aid (10/28)
FEMA speeds Katrina relief (11/5)
Everything people worked for is gone (IN Twister)(11/7)
House GOP Leaders set to cut spending (10/17)
Run on drug for avian flu has physicians worried (10/22)
Thousands honor woman of courage (Rosa Parks) 10/31
For Rosa Parks, an overflowing tribute (11/1)
President requests billions in flu plan (11/2)
Food stamp cuts are proposed (11/3)
Flu plan counts on public cooperation (11/3)
Bush's popularity reaches new low (11/4)
Long-predicted flu finally tops agenda (11/7)

Appendix Table 2: Stories About the Gubernatorial Race On the Front Page or the First Metro Page

	Post	Times
Kaine	4	1
Kilgore	1	1
Potts	1	0
Kaine Ahead in Polls	0	2
Bush Campaigns for Kilgore	1	0
Kilgore Does not Attend Va. Bush Speech	2	0
Kilgore Hurt by Republican party problems	0	1
Antitax Groups Do Not Support Kilgore	0	1
Other Stories	6	4

* Cell entries are number of stories dealing with the gubernatorial race on each newspaper's front page from October 17, 2005 to the day of the gubernatorial election, November 8, 2005. "Kaine" refers to stories with headlines specifically about the Democratic Candidate, and "Kilgore" to stories about the Republican candidate. "Potts" refers to stories about the third party candidate.

Appendix Table 3: Analysis of Participation in the Follow-Up Survey
Probit

Dependent variable = 1 if Survey Successfully Completed in Follow-up Phone Call		
	(1)	(2)
Post treatment group	0.003 (0.020)	-0.048 (0.046)
Times treatment group	0.018 (0.020)	0.052 (0.050)
Female	-0.026 (0.017)	-0.040 (0.026)
Voted in 2002	0.095*** (0.024)	0.103*** (0.038)
From consumer database sample frame	0.044** (0.021)	0.046 (0.032)
Subscribes to news magazine	0.069** (0.029)	0.026 (0.043)
Reported preferring democratic candidate for governor	0.126*** (0.026)	0.126*** (0.040)
Wave 2 of Experiment	-0.037** (0.017)	-0.035 (0.026)
Post * Female		0.094** (0.045)
Post * Voted in 2002		-0.037 (0.054)
Post * From consumer database sample frame		0.011 (0.050)
Post * Subscribes to news magazine		0.053 (0.071)
Post * Reported preferring democratic candidate for governor		0.032 (0.059)
Post * Wave 2 of Experiment		0.043 (0.043)
Times * Female		-0.040 (0.040)
Times * Voted in 2002		0.014 (0.057)
Times * From consumer database sample frame		-0.018 (0.049)
Times * Subscribes to news magazine		0.092 (0.072)
Times * Reported preferring democratic candidate for governor		-0.031 (0.056)
Times * Wave 2 of Experiment		-0.048 (0.039)
Number of observations	3,347	3,347
Pseudo R-squared	0.018	0.023
Mean dependent variable	0.32	0.32
P(Times interaction variables ≈ 0)		0.56
P(Post interaction variables ≈ 0)		0.23

Note: Standard errors in parentheses. *** 99 % significance ** 95% significance *90% significance. Indicator variable included (but not reported) if gender information is missing (applicable for 134 observations). All variables (except assignment to treatment and gender) are from the baseline survey.

APPENDIX A: Baseline Survey

May I speak with _____ please.

Hello, I am calling on behalf of a research group at Yale University and we are conducting a study on media and politics in Virginia.

THE FIRST TWO QUESTIONS ARE ASKED ONLY TO INDIVIDUALS ON THE VOTER LISTS (This was changed partway through the study; the questions were asked of those on both lists for the second wave)

1. Do you plan to vote in the November election for Governor?

If: Yes – Continue

If: Und. – Continue

If: No – Go to Question #3

2. If the election for governor were being held TODAY, would you vote for ***[INSERT, ROTATE REPUBLICAN AND DEMOCRATIC WITH POTTS LAST]***?

1 Republican Jerry Kilgore

2 Democrat Tim Kaine

3 Independent Russ Potts

4 Other candidate (**VOL. DO NOT READ**)

9 Don't know (**VOL. DO NOT READ**)

3. Does someone in your household currently receive a subscription to a newspaper?

1 Yes - Continue

2 No – Go to Question #5

9 DK/Refused – Go to Question #5

4. May I have the name of the newspaper that you currently subscribe to?

1. Washington Post

2. Washington Times

3. Both Times and Post

4. Other (**Do Not Read**)

5. What papers, if any, have you read in the past week? (*If Respondent mentions more than one paper, code 1 if the list includes the Post, 2 if the list includes the Times and 3 if the list includes both*)

1 Mentions Washington Post (but not the Washington Times)

2. Mentions Washington Times (but not the Washington Post)

3. Mentions both Post and the Times

4. Other – (Do Not Read / Mentions only papers other than the Times or Post)

5. None

6. What is the last newspaper you bought at a newsstand?

1 Washington Post

2. Washington Times

3. Other – (Do Not Read / Paper other than the Times or Post)

5. None

9. DK/Refused

7. Do you currently subscribe to any news or political magazines?

1 Yes

2 No

9 DK/Refused

Requirements regarding Questions #8 & #9 –

1/4 of sample will get Question #8, 1/4 of sample will get Question #9, 1/4 of sample will get Question #8 & #9 and 1/4 of sample will not get either Question #8 or #9. All respondents will continue onto Question #10 – Demographics Question.

(Question 8 was dropped early in the study)

8. As a thank you for completing this survey, would you be interested in receiving a *one-month* free subscription to a national newspaper? The subscription is free and will end automatically after one month.

(Only if asked by respondent which national newspaper, respond with “One of your local newspapers. We do not know which one” Do not volunteer this information)

1 Yes

2 No

9 DK/Refused

9. Do you wish you read the newspaper more in order to stay informed about issues in your community and state?

Yes

No

Verification Question: *(Every respondent gets asked this question)*

I just need to verify that I was speaking to _____ (Verify Individuals First and Last Name)

And you reside at _____ (Verify Individuals Address)

Thank You for your time. Good Bye.

APPENDIX B: Follow-up Survey (conducted week following November Governor election)

Hello, may I please speak with _____?

We would like to ask you some questions about the election for governor in Virginia and about politics in the nation. The responses to this questionnaire will be confidential and you can stop the survey at any time.

1. Did you vote in the November election for Governor?

If: Yes – Go to 2a

If: No – Go to Question #2b

2a Of the following who did you vote for *[INSERT, ROTATE REPUBLICAN AND DEMOCRATIC WITH POTTS LAST]*?

- 1 Republican Jerry Kilgore
- 2 Democrat Tim Kaine
- 3 Independent Russ Potts
- 4 Other candidate (**VOL. DO NOT READ**)
- 9 Don't know (**VOL. DO NOT READ**)

2b If you had you voted, which of the below following candidates would you probably have voted for? *[INSERT, ROTATE REPUBLICAN AND DEMOCRATIC WITH POTTS LAST]*?

- 1 Republican Jerry Kilgore
- 2 Democrat Tim Kaine
- 3 Independent Russ Potts
- 4 Other candidate (**VOL. DO NOT READ**)
- 9 Don't know (**VOL. DO NOT READ**)

3. People get their news and information from many different sources. What do you consider to be your main source for the news: newspaper, television, radio, magazines, the Internet, or some other source?

1. Newspaper
2. Television
3. Radio

4. Magazines
5. Internet
6. Some other source

4A.. Which of the following do you think is the most important problem facing this country today: [ROTATE] The war in Iraq, the economy, terrorism, corruption and political scandals, health care and other social issues, or something else?

1. War in Iraq
2. the economy
3. terrorism
4. corruption/political scandals
5. health care and other social issues
6. something else

4B.. The war in Iraq has been the focus of a number of stories in the news recently. Which of these four stories about the Iraq war from recent weeks do you think is most important? [ROTATE] the trial of Saddam Hussein, the investigation into the pre-war intelligence regarding weapons of mass destruction in Iraq, White House officials leaking the identity of a woman working for the CIA prior to the war, or the approval of the Iraqi constitution?

1. trial of Saddam Hussein
2. investigation into the pre-war intelligence regarding weapons of mass destruction in Iraq.
3. White House officials leaking the identity of a woman working for the CIA prior to the war
4. approval of the Iraqi constitution

5. *Do you approve or disapprove of the way George W. Bush is handling his job as president?*
1. approve
 2. disapprove
 3. Refuse to answer/Do Not know

**IF APPROVES GEORGE W. BUSH HANDLING JOB AS PRESIDENT /
IF DISAPPROVES GEORGE W. BUSH HANDLING JOB AS PRESIDENT**

If Approve:

- 5a. Do you approve STRONGLY or NOT STRONGLY?

1. Approve strongly
2. Approve not strongly

If Disapprove:

5a. Do you disapprove STRONGLY or NOT STRONGLY?

1. Disapprove Strongly
2. Disapprove Not Strongly

If do not know/refuse to answer, skip 5a

ROTATE REPUBLICAN, DEMOCRATIC PARTY IN NEXT TWO

6. Is your overall opinion of the Republican Party very favorable, somewhat favorable, somewhat unfavorable, or very unfavorable?

1. Very favorable
2. Somewhat favorable
3. Somewhat unfavorable
4. Very unfavorable
5. NO RESPONSE; refused

7. Is your overall opinion of the Democratic Party very favorable, somewhat favorable, somewhat unfavorable, or very unfavorable?

1. Very favorable
2. Somewhat favorable
3. Somewhat unfavorable
4. Very unfavorable
5. No response; refused

8. *In general, how would you say things are going for the U.S. in Iraq— very well, moderately well, moderately badly, or very badly?*

1. Very well
2. Moderately well
3. Moderately badly
4. Very badly

9. As you may know, members of the Bush administration have told reporters the identity of a woman working for the CIA. From what you have heard or read about this matter, which of the

following statements best describes your view -- some Bush administration officials did something illegal; no Bush administration officials did anything illegal, but some officials did something unethical; or no Bush officials did anything seriously wrong?

1. did something illegal
2. did something unethical but not illegal
3. did not do anything wrong
4. Other (VOL)

10. As you may know, President Bush recently nominated Samuel Alito to the Supreme Court. Based on what you have heard or read, do you think the U.S. Senate should confirm Alito; not enough is known about Alito and the Senate should gather more information; or the Senate should not confirm Alito's.?

1. should confirm
2. not enough is known and the Senate should gather more information
3. should not confirm

Finally, I am now going to ask you a few short questions about public awareness of issues and how important they are to people like you.

11. About how many American soldiers have died in the Iraq war since it began in 2003? 1000 or fewer, More than 1000 but fewer than 2000, more than 2000 but fewer than 10,000, or more than 10,000?

1. 1000 or fewer
2. More than 1000 but fewer than 2000
3. More than 2000 but fewer than 10,000
4. More than 10,000

Randomize over next two: ½ gets 12a, ½ gets 12b:

12a. Of the following 4 people, which person recently resigned as Vice President Dick Cheney's chief of staff? Scooter Libby, Karl Rove, William Rehnquist or Dick Durbin?

- a). Scooter Libby
- b) Karl Rove
- c) William Rehnquist
- d) Dick Durbin
- e) Don't Know (VOL)

12b. Of the following 4 people, which person recently resigned as Vice President Dick Cheney's chief of staff? Scooter Libby, Mike Bloomberg, William Rehnquist or Dick Durbin?

- a). Scooter Libby

- b) Mike Bloomberg
- c) William Rehnquist
- d) Dick Durbin
- e) Don't Know (VOL)

13. Which of the following 4 women was one of President Bush's recent nominees to the Supreme Court?

- a) Sandra Day O'Connor
- b) Judith Miller
- c) Harriet Miers
- d) Maureen Dowd
- e) Don't Know (VOL)

14. Do you receive any newspapers currently?

- 1. Yes – Go to Q15
- 2. No – skip to Q16

15. Which newspapers?

- 1. Washington Times mentioned (VOL)
- 2. Washington Post mentioned (VOL)
- 3. Both Washington Times and Post mentioned (VOL)
- 4. Other

16. How often do you read the paper? Every day, several times a week, occasionally, or never?

- 1. Every day
- 2. Several times a week
- 3. Occasionally
- 4. Never

17. We hear a lot of talk these days about liberals and conservatives.

(SUGGESTION) Which of the following 7 definitions best identifies your position?

- 1. Extremely liberal
- 2. Liberal
- 3. Slightly liberal
- 4. Moderate, middle of the road
- 5. Slightly conservative
- 6. Conservative

7. Extremely conservative
8. No response; refused

**To end this survey, for statistical purposes
And what year were you born?**
Thank You for your time. Good Bye.

APPENDIX C: Postcard mailed to treatment group individuals

Congratulations!
You have won a free
Ten week subscription to *The Washington Times!*

We have held a drawing to award free ten-week subscriptions of *The Washington Times* to households in Prince William County. Delivery begins this week. **Delivery will automatically end after ten weeks, you do not need to call to cancel.** However, if you want to cancel before the end of the ten weeks, please call 1-800-635-9224 and we will remove you from this promotion. Thank you for trying out the newspaper.

Congratulations!
You have won a free
Ten week subscription to *The Washington Post!*

We have held a drawing to award free ten-week subscriptions of *The Washington Post* to households in Prince William County. Delivery begins this week. **Delivery will automatically end after ten weeks, you do not need to call to cancel.** However, if you want to cancel before the end of the ten weeks, please call 1-800-635-9224 and we will remove you from this promotion. Thank you for trying out the newspaper.

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