

## Presidential Policy Initiatives: How the Public Learns about State of the Union Proposals from the Mass Media

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*Media coverage of State of the Union proposals increases public knowledge on presidential policy initiatives, especially among individuals who follow news coverage. These estimates are based on within-survey/within-subjects comparisons of answers to factual questions for respondents who are simultaneously unexposed and exposed to media coverage on the same issue. In this powerful but underused design, individuals serve as counterfactuals for themselves, holding constant all relevant observed and unobserved characteristics. The findings are based on statistical analyses of data from four national surveys conducted since the late 1990s covering a range of topics from health care to Social Security reform. Watching or listening to the address directly does not appreciably affect knowledge once control variables are added for whether individuals follow news coverage of the speech, the amount of news coverage, and the interaction of these two factors.*

State of the Union (SOTU) addresses are highly visible moments in a presidency. They offer unparalleled opportunities for presidents to communicate their priorities and accomplishments. Aside from the pageantry, however, what do citizens learn from these important speeches? Scholars have shown that presidential rhetoric can help set the political agenda (e.g., Behr and Iyengar 1985; Cohen 1995; Lawrence 2004), but SOTU messages go beyond highlighting which issues are important. These speeches are policy manifestos for ambitious presidents taking their case directly to the public

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(Kernell 1997). Regrettably, little is known about whether the public learns about the policy positions conveyed in these high-profile addresses.

Citizens depend on the press and political actors for information about the world (Lippmann 1925). Perhaps that is one reason why knowledge in the United States is so low. Across a range of topics, Americans know little (Converse 1990; Delli Carpini and Keeter 1996; Ferejohn 1990) or are misinformed (Kuklinski et al. 2000). But knowledge, or the lack of it, matters in terms of policy preferences (Althaus 2003) and vote choices (Bartels 1996; cf. Lau and Redlawsk 1997; Lupia and McCubbins 1998). Formal models of democracy (Downs 1957) and empirical portraits of the American public (Page 1978; Page and Shapiro 1992) suggest that rational citizens compare the policies they want with those offered by political actors. But the relationship should go the other way, too, at least in theory, with politicians responding to well-developed public preferences (Geer 1996; cf. Jacobs and Shapiro 2000).

I study this interplay of the public and the president by looking at what is arguably a marquee moment in American politics: the SOTU address. Once each year, presidents highlight their past performance and announce their future plans. The quality of that exchange, as measured by what the public learns, goes to the heart of democratic representation. If presidents fail to communicate with the public, not only might they suffer in terms of prestige and power (Brody 1991; Neustadt 1990), but also accountability might be the ultimate casualty in the form of broken mass–elite linkages (Cohen 1997; Hill 1998). Fortunately, there is cause for optimism. This study demonstrates that the public learns about the policy positions conveyed in SOTU addresses, especially proposals that receive high levels of news media coverage.

## The SOTU Address and the Public

If any speech ought to have an effect on public knowledge, it should be the State of the Union (SOTU) address. It represents a best-case scenario. Like the Super Bowl or other regularly scheduled public spectacles (Dayan and Katz 1992), SOTU addresses are cherished political communication events that help bridge formal separations of power among American governmental institutions. The significance of this address lies in its constitutional origins. Article II of the U.S. Constitution delineates the powers of the president. Section 3 states, “He shall from time to time give to the Congress Information of the State of the Union, and recommend to their Consideration such Measures as he shall judge necessary and expedient.” Aside from a few other instances, such as inaugurations or state funerals, it is extremely uncommon to have the president, members of the cabinet, both chambers of Congress, and members of the Supreme Court gathered together on one night to listen to a nationally broadcast speech.

### The Informational Content of “The Speech”

Giving “Information of the State of the Union,” as the Constitution prescribes, can take several forms. Scholars typically interpret this in terms of agenda setting. One body

of work suggests that presidential speeches help shape what the public thinks is important (e.g., Behr and Iyengar 1985; Iyengar and Kinder 1987; Miller and Wanta 1996; Wanta 1997). Recent work by Lawrence (2004) points to the agenda-setting role of SOTU addresses. In 50 addresses from 1946 to 2004 covering more than a thousand issues, Lawrence finds that SOTU addresses not only helped presidents set the national agenda, but they also were used to take items *off* the agenda by credit claiming. Every 50 words that a president devoted to an issue resulted in a nearly 2 percentage point increase in the proportion of the public identifying that issue as America's most important problem; 50 words of credit claiming reduced issue salience by three times as much.

However, not all scholars view the president as an effective agenda setter. In a series of works using longitudinal data, Edwards, Wood, and Peake show that presidents may not influence public opinion or prime which issues people think are important, or, at the very least, those relationships may be much more complex and interrelated than previously thought (Edwards 2003; Edwards and Wood 1999; Wood and Peake 1998). Similarly, even scholars who document agenda-setting effects suggest that they might be short-lived. For instance, Cohen (1995) looked at SOTU addresses from 1953 to 1989 and concluded that presidential statements increased public concern about economic issues, civil rights, and foreign affairs, but only in the last category were effects observed past one year.

Given the conflicting findings, agenda setting is still an active area of research. But "information" transmission from SOTU addresses can have a much more literal interpretation. Facts, policy positions, and accomplishments are important bits of information. Does the public learn the substance of what presidents say? Presidential rhetoric has long been a focus of study (Ceaser et al. 1981; Hart 1987; Tulis 1987), and SOTU verbiage has evolved over the years to become shorter but more publicly oriented (Teten 2003). But aside from the agenda-setting literature, studies examining the effects of SOTU addresses tend to probe the effects of rhetoric on public attitudes or approval (e.g., Ragsdale 1984, 1987; Rosenblatt 1998; Sigelman 1980a; Wood, Owens, and Durham 2005). Simply put, we have little evidence on whether these constitutionally specified speeches achieve their information function by increasing what members of the public *know* about the proposals that presidents pitch.

One exception is Welch's (2003) study of policy learning from four Reagan-era speeches, two of which were SOTU addresses. Welch focuses on recall of open-ended responses to polls that Richard Wirthlin, the president's pollster, conducted during Ronald Reagan's first three years in office. Respondents who watched part or all of the speeches were more likely to remember at least one or two points (see also Edwards 2003, 206-08). But, as one might imagine, SOTU addresses cover a lot of territory. Working with the available archival data, Welch analyzes how many points respondents recalled, not which aspects of the speeches citizens learned. Citizens in the surveys might have learned a few pertinent facts or dozens of different ones. Selection bias might also be a problem, as is often the case in cross-sectional studies. Those who recalled points from the speech may have been disproportionately likely to do so (i.e., respondents who recalled particular points may have been more likely to watch the address). Welch acknowledges this point by stating, "[T]he fact that a person watched an entire address

suggests that person is interested and knowledgeable about politics to begin with and has the cognitive framework to capture what the president is saying” (2003, 359; see also Welch 2000). In other words, comparing respondents who heard or watched the speech with those who were not exposed may be problematic, especially when there is no common set of facts tested by recall.

Audience dynamics have also changed since Welch’s study of presidential speeches during the early 1980s. Presidents who once enjoyed a virtual monopoly on network airtime are now seeing audiences fragmented by cable and the Internet or tuning out altogether (e.g., Baum and Kernell 1999; Cohen 2004; Welch 2000), with young adults leading the exodus (Wattenberg 2004). SOTU addresses are still watched by millions, but the decline in firsthand viewing suggests indirect channels may be especially important now. While audiences are shrinking and competition has increased, hard news has also given way to softer varieties, and citizens trust the media less than they did during the golden age of presidential news in the 1960s and 1970s (Cohen 2004). All factors considered, learning might be harder now. Thus, if citizens are to learn about the policy positions that presidents try to convey in SOTU addresses, increasingly they must rely on mass media highlights from the speech (see also Edwards 2003, 172-73).

It is the mass media channel that is the focus here. I hypothesize that levels of public knowledge should be higher for aspects of presidential SOTU addresses that receive greater levels of coverage (Hypothesis 1). The supply of information, however, is only one part of the story. Whether citizens attend to the speeches is another critical factor. All else held constant, those who report following the speeches in the news should know more (Hypothesis 2), even after controlling for sociodemographic factors. In other words, individuals in privileged socioeconomic categories—older, white, educated, male, and wealthy respondents—will likely benefit disproportionately (see Delli Carpini and Keeter 1996; Edwards 2003, 209, for similar expectations). The combination—the interaction of media publicity and individual attention—should be especially likely to increase knowledge of presidential initiatives (Hypothesis 3).

We know from the literature on presidential debates that who wins in the eyes of the media often matters more to public perceptions than direct impressions (e.g., Holbrook 1999; Lanoue 1992). Accordingly, listening to or watching the speech should be insignificant once controls are added for media coverage and media attention (Hypothesis 4). That is, the effects of media coverage on learning should hold even when one considers viewers’ direct experiences with the speech. Many citizens might get too caught up in the pageantry of this long speech to remember the details of policies. It is the indirect route, through the mass media, that should facilitate learning, especially for individuals who pay attention to the coverage.

### **Positional Knowledge**

Information conveyed in SOTU messages should help citizens build a particularly useful form of knowledge. Traditionally, political knowledge has been categorized as either chronic or domain specific (Delli Carpini and Keeter 1996; Gilens 2001; Zaller 1992). Chronic, or general, knowledge consists of civics-style facts that one might learn

from a textbook, such as which branch of the federal government can declare laws unconstitutional. By contrast, policy- or domain-specific knowledge represents facts about programs, policies, or problems. The form of policy-specific knowledge considered here concerns where political leaders stand on various policy initiatives or proposals, which can be characterized as “positional knowledge.” Several scholars have argued that these domain- or policy-specific measures are preferable when trying to examine the impact of the information environment (Zaller 1992, 336-37). Following the preference for policy-specific information, I concentrate on knowledge of presidential policy initiatives in SOTU addresses, which are also known as news events (Price and Zaller 1993) or “surveillance” issues (Delli Carpini and Keeter 1991).

The focus here on positional knowledge fits with trends in the study of citizen competence (e.g., Jerit, Barabas, and Bolsen 2006; Kuklinski et al. 2000). In recent years, scholars have questioned the notion of whether citizens need a large store of general knowledge in order to function in a democratic society (Lupia and McCubbins 1998). According to this perspective, citizens should be knowledgeable about acute problems and pressing issues that appear in the headlines, but little else (Schudson 1998, 310-11). As more scholars reject the ideal of the fully informed citizen in favor of Schudson’s “monitorial citizen,” understanding how people acquire surveillance knowledge—especially where leaders stand on the major issues of the day—will be of great normative interest.

### Why Learning?

The literature on the relationship between presidential messages and public opinion is filled with null findings. For example, and as noted earlier, Edwards (2003) demonstrates that presidents do not usually change people’s minds about policy options or about what should be on the agenda. Here, the expectations seem to run counter to that line of research. So why should the public learn about policy initiatives?

Beyond methodological choices, which will be discussed in the next section, Edwards is “primarily concerned with the president’s ability to influence opinion on policies” (2003, 206), not political knowledge. As Edwards suggests, the failure of presidential rhetoric to move public opinion (i.e., attitudes, approval, or issue salience) could be the result of psychological factors. Individuals often resist messages that are counter to what they believe (Zaller 1992). In contrast, here the focus is on facts, and media coverage has been associated with factual learning (Jerit, Barabas, and Bolsen 2006). The desire to resist attitude change (Zaller 1992) or to protect prior positions through motivated reasoning (Taber and Lodge 2006) might not be strong because many citizens might not have priors here. That is, citizens might not have preexisting beliefs that could interfere with the acquisition of knowledge about policy proposals in SOTU addresses. This perspective corresponds to Bayesian updating, whereby individuals acquire new information in an unbiased manner (Barabas 2004; Gerber and Green 1999; cf. Bartels 2002). Thus, it is reasonable to expect learning about policy positions conveyed in SOTU addresses. Knowing facts from the speeches depends on what the

president says and on media coverage. Whether citizens monitor effectively, judged by their knowledge of the policy proposals, is the subject of this inquiry.

## Data, Design, and Methods

Attempts to study what the public learns from SOTU addresses face two constraints. First, few people know ahead of time precisely what a president will say. Ideally, one could select a random sample of citizens, randomly expose part of that sample to a SOTU address, and then observe knowledge levels before and after the speech; any change in knowledge could be attributed to the speech itself, especially if the control group did not change during the same time period. Regrettably, the issues that will be covered, and hence which questions to ask, are not known a priori, which hinders experimental studies of SOTU presidential policy rhetoric.<sup>1</sup>

A second barrier to investigating the effects of SOTU addresses is the lack of nationally representative postspeech survey data. Few survey organizations ask questions about SOTU addresses. In fact, a search of the iPoll archive at the Roper Center for Public Opinion Research turned up fewer than 400 questions since 1990 that mentioned “State of the Union” out of tens of thousands conducted during those years. Of those questions that were asked, many fall into behavioral (i.e., “Did you watch the speech?”) or evaluative categories (i.e., “Did the president seem like a strong leader?”). Surveys with objective knowledge questions corresponding to policy positions articulated in the speeches are rare.

Notable exceptions are the surveys on proposals in SOTU addresses conducted by researchers at Harvard University. In conjunction with the Kaiser Family Foundation, the Harvard team has studied public knowledge on a range of topics since the 1990s (Brodie et al. 2003). Several of the surveys asked detailed questions about policy proposals arising from SOTU addresses since the mid-1990s, although not in every year. These surveys, fielded by Princeton Survey Research Associates, asked respondents about specifics of the speech. Hence, they are more specific and topical than general political knowledge questions. It is precisely because the questions asked respondents about specific aspects of the addresses that I expect to observe a relationship between news coverage and performance on the knowledge questions.

### Studying Public Learning

Past attempts to estimate the effects of media coverage on knowledge suffer from an important limitation. What passes for media influence might simply reflect the impact of individual-level characteristics that happen to be correlated with exposure to the news. That is, only certain individuals (e.g., those with high incomes, Caucasians, males, etc.) might pay attention to politics in the first place. Thus, it is not clear whether watching the news increases knowledge or whether knowledgeable people watch the news.

1. Experiments have been conducted on leadership traits (Druckman and Holmes 2004) and attitudes (Kaid, Williams, and Trammell 2004) likely to be primed in SOTU addresses, but not facts.

The goal here is to estimate the causal effect of media coverage on surveillance knowledge. To do so, I invoke the idea of counterfactual reasoning captured by Rubin's causal model, in which causal effects are defined in terms of potential outcomes (Rubin 1974; see also Angrist, Imbens, and Rubin 1996). Using the terminology of the literature, let  $Y_{i1}$  denote the level of knowledge when individual  $i$  is exposed to media coverage (i.e., the "treatment" regime), and let  $Y_{i0}$  represent the level of knowledge when that same individual  $i$  is not exposed to media coverage (the "control" regime).

The casual effect of media coverage is the difference between these two potential outcomes (i.e.,  $Y_{i1} - Y_{i0}$ ). However, typically only  $Y_{i1}$  or  $Y_{i0}$  can be observed for any given unit because, as Dehejia and Wahba write, "one cannot observe the same unit under both treatment and control" (1999, 1057). Thus, in most instances, the observed outcome is  $Y_i = Y_{i1}T_i + Y_{i0}(1 - T_i)$ , with the analyst observing either  $Y_{i1}$  (when  $T = 1$ ) or  $Y_{i0}$  (when  $T = 0$ ) but not both. The difficulty of observing individuals who are simultaneously treated and not treated has been noted elsewhere (e.g., King and Zeng 2007; Little and Rubin 2000, 123).

One remedy, assuming that only nonexperimental observational data exist, is to compare groups of subjects who received treatment with those who did not (Rosenbaum 2002). This process is aided by statistical matching procedures to create comparison groups of subjects who are alike in all observable ways except treatment status (Rosenbaum and Rubin 1983). The key assumption, however, is that the groups are balanced on all observed characteristics. Even if groups are shown to be statistically equivalent based on all available covariates and their interactions, it is still possible that the matched groups will differ on unobserved factors.

### Knowledge Counterfactuals

I capitalize on the logic of causal inference in a way that does not require the key matching assumption of equivalence conditional on observables and in a manner that largely bypasses the simultaneous counterfactual problem. Using the iPoll database at the Roper Center for Public Opinion Research archives, I identified four surveys (conducted in 1997, 1999, 2000, and 2006) that asked respondents *multiple* questions about a *single* issue within a presidential SOTU address (e.g., several questions about health care, Social Security, or Medicare proposals). Thus, there are multiple observations for the same respondent within the same survey. Importantly, there also is variation in the amount of media coverage devoted to different aspects of the same news event. The treatment effect of media coverage is the difference between knowledge of a topic with coverage and knowledge of a topic without coverage. In this design, individuals serve as control cases for themselves. No assumptions about balancing respondents are needed because everything about the person, whether observed or not, is held constant.<sup>2</sup>

2. This design resembles Sigelman's elegant but "extremely simple" (1980b, 430) technique to estimate the president's power to persuade the public by asking survey respondents who did not already favor a policy whether they *would* if Carter considered the action necessary. Sigelman establishes baseline support before assessing the effects of attaching the president's name. The appendix explains the technique in greater detail and provides illustrative examples.

These surveys are useful from the standpoint of causal inference. But they also contain questions that strike directly at the heart of the monitorial behavior described earlier. Instead of asking the typical battery of general knowledge questions, the surveys query people about various aspects of proposals outlined in the SOTU addresses. Thus, knowing the correct answer to these items depends primarily on recent exposure to information in the speech rather than learning from years ago.

To make the idea of surveillance knowledge more concrete, consider the following example. In 1997, Princeton Survey Research Associates asked four questions about health care proposals in President Bill Clinton's SOTU address. The introduction began, "In his speech did Clinton propose expanding health care coverage to . . ." The first question asked whether the president recommended expanding coverage for "people who need long-term care." The second item asked whether Clinton recommended providing coverage for "all low-income people." For the third question, respondents were asked whether Clinton recommended providing coverage for "working people who are currently uninsured." The fourth question asked whether Clinton recommended providing coverage for "children." The correct answers are no for the first two questions and yes for the last two. Prior to the 1997 SOTU address, it would have been difficult to answer these questions correctly. Regardless of characteristics that may help explain differences in knowledge across the cross-sectional survey (e.g., socioeconomic factors), *for any given individual*, variations in knowledge about each of these recommendations should be attributable to varying levels of media coverage.<sup>3</sup>

### News Media Coverage

To sample media coverage devoted to the SOTU address, I rely on content analyses of national news stories on the same subjects queried in the surveys. More specifically, I examine the results of a content analysis of the full text transcripts of three national media outlets during the six weeks prior to the first day of each survey.<sup>4</sup> The three sources used here, the Associated Press (AP), *USA Today*, and the *CBS Evening News*, reflect major newswire, print, and broadcast media outlets. I do not claim that the citizens in the surveys were getting their news from these particular media outlets; instead, these sources provide a fairly representative view of the information that might have been appearing in the national news. A simple story count of the articles containing the correct answer captures the essence of what I seek to measure: namely, the amount of media coverage devoted to a particular surveillance issue. These counts will be used to test the first hypothesis, pertaining to increased coverage leading to increases in knowledge.

3. Although audiences may be declining (Wattenberg 2004), it is still possible that citizens watched the SOTU addresses directly, thus bypassing the indirect, mass media route. Later, I will consider whether those who report seeing or hearing the address learn disproportionately.

4. Media reports were obtained from Lexis-Nexis. The sponsors of the surveys asked knowledge questions in response to the SOTU addresses and developments in the news during the six weeks prior to the survey. Importantly, however, virtually all of the news stories appeared *after* the SOTU addresses. See Cohen (1997) for detailed analyses of issue content within as well as across SOTU addresses during the last half of the twentieth century.

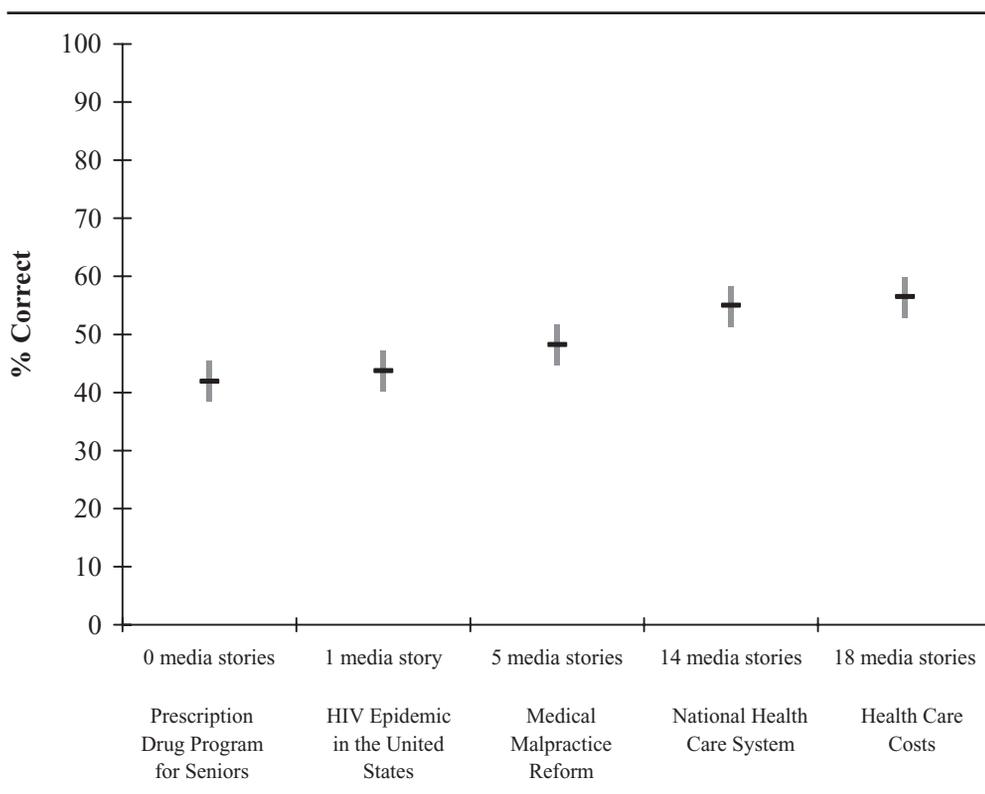
While most of the analysis takes place through aggregate-level comparisons of items with and without news coverage, to test the second and third hypotheses, I make use of questions in the surveys asking respondents about whether they followed the president's policy initiatives in the news. The media exposure items began with an introduction like the one that was used in 2000: "Now I'm going to read you a list of some stories covered by news organizations in the last month or so. As I read each one, tell me if you happened to follow this news story very closely, fairly closely, not too closely, or not at all closely." Thus, the media "follows" variable provides a test of attention to the news media.<sup>5</sup> In a survey from 2006, respondents were asked whether they watched or heard the SOTU address live, which is used to evaluate the fourth hypothesis.

The within-survey/within-subjects research design resembles others, such as a "one group posttest-only design using multiple substantive posttests" (Shadish, Cook, and Campbell 2002, 107), pattern matching (Campbell 1966), or coherence (Rosenbaum 2002). Although the design is a significant advance over past attempts to measure the influence of the mass media, this approach is not free of assumptions because it is not a true experiment. The most important assumption concerns media coverage itself, which is not randomly assigned. The follows variable might also be endogenous. Fortunately, auxiliary analyses find little cause for concern (i.e., patterns of predicted news coverage from a Poisson count model were unrelated to the size of the treatment effects observed, and reports of following did not change appreciably when there were more stories in the media for these issues, suggesting that the benefit of following only occurs when there are media stories in the environment). Thus, the analyses in the remainder of this essay assume the exogeneity of news coverage (a subject was *not* more likely to have been covered when large effects were observed) and the exogeneity of individual-level media attention (the direction of causality from following the issue to knowing and *not* the reverse), but these methodological issues are complex and should be investigated further (see, e.g., Jerit, Barabas, and Bolsen 2006).

## Findings

A helpful way to begin is to illustrate SOTU media treatment effects in several addresses in the late 1990s and 2000s. Figure 1 shows knowledge patterns for five policies from the SOTU address that George W. Bush delivered in 2006. The first policy—a prescription drug program—did not receive any coverage. Even though this signature policy had just been implemented, Bush did not discuss this policy in his

5. The knowledge question introductions referenced the news. For example, in the 1999 survey, the introductory text was, "In his recent State of the Union address, President Clinton made some proposals that would affect health care for seniors. Based on what you've seen or heard in the news recently, tell me whether or not the President proposed doing each of the following. . . ."



**FIGURE 1. Knowledge of Health Care Proposals in the 2006 State of the Union Address.**  
 Source: Princeton Survey Research Associates data, N = 1,203, Feb. 2-6, 2006. Survey sponsored by the Kaiser Family Foundation.

address, and only 42 percent of the 1,203 respondents in the sample gave the correct answer that he did not mention it (with a 95 percent confidence interval of 39 percent to 45 percent, shown in gray shading).<sup>6</sup>

A second question in the same survey asked whether George W. Bush talked about the HIV epidemic in the United States. This time, Bush did mention his proposal, but it received little coverage (one story). Few respondents (only 44 percent) knew that he talked about the HIV epidemic, which, considering the confidence interval (41 percent to 47 percent), is not statistically different from the prescription drug coverage question. These same respondents were also asked three other questions about Bush’s health care proposals that received coverage. For the third item, which received five stories, roughly 48 percent (45 percent to 51 percent) knew that Bush proposed medical malpractice

6. Knowledge is coded dichotomously as 1 if the respondent answered the question correctly and 0 for incorrect answers. To account for the disproportionate likelihood that some respondents will guess while others do not, all “don’t know” responses were randomly reassigned to substantive answer choices following procedures outlined by Mondak (2001). However, the substantive results hold with or without random reassignment of the don’t knows. I thank an anonymous reviewer for drawing attention to the issue of guessing and don’t know responses.

reform. In contrast, the second most heavily covered aspect of Bush's proposals concerned national health coverage (which Bush did not emphasize), which was in the news 14 times; nearly 55 percent (52 percent to 58 percent) of the respondents knew that Bush did not propose a national health care system like Canada's. Finally, the most heavily covered aspect of the five concerned the topic of rising health costs, which received 18 media stories. Roughly 57 percent (54 percent to 60 percent) of the respondents indicated that, yes, Bush did devote part of his speech to discussing health costs.

Because the same respondents were asked all five questions in the same survey, it is possible to subtract each person's response on one of the options that received coverage (the "treatment" condition) from that same person's response without any coverage, or at least less coverage (the "control" condition). For Figure 1, five treatment effects can be computed, comparing the counterfactuals of some coverage (1, 5, 14, or 18 stories) to the items that received no coverage. For example, comparing the first and fifth items, the treatment effect is about 15 percentage points ( $.57 - .42 = .15$ , *s.e.* = .02).

Table 1 shows  $2 \times 2$  contingency tables to help illustrate these calculations. For example, the 15 percentage point effect just described corresponds to Panel A. Nearly 48 percent of the respondents, or 585 of 1,203 (shown in the top-right cell with gray shading), went from providing an incorrect response on the prescription drug item to providing a correct response on the health care costs item. A smaller fraction, 34 percent ( $N = 398$ ), moved in the opposite direction. The overall effect is 15 percentage points, the difference between 48 percent and 34 percent in the two cells (after rounding), because the remaining respondents provided incorrect responses on both items (10 percent,  $N = 118$ ) or gave correct responses on both items (8 percent,  $N = 102$ ). The other effects are similar at 13 percentage points (drug program versus the health system in Panel B), 13 percentage points (HIV epidemic versus health costs in Panel C), and roughly 11 percentage points (HIV versus the national health system in Panel D). The Appendix shows these same comparisons by awareness levels.

Because treatment effects represent a respondent's score on the treated item subtracted from his or her score on the control item (i.e.,  $Y_{i1} - Y_{i0}$ ), the effect for the entire sample is the top-right cell of learners minus those who moved in the other direction in the bottom-left cell of the  $2 \times 2$  grids in Table 1. However, the other responses (i.e., those who gave incorrect or correct responses on both questions) are not irrelevant. The treatment effect calculations include these respondents, who serve as the balancing point, in the calculation of the standard errors and in the individual-level analyses reported later. Also, the items within any given question battery were read to respondents a random fashion, so response order effects are not a concern.<sup>7</sup>

Additional counterfactual comparisons are made in three separate nationally representative cross-sectional surveys. Figure 2 shows the effects of media coverage devoted to two sets of questions on health care and Social Security proposals from Clinton's 1999 SOTU address. Similarly, Figure 3 displays Medicare proposals that President Clinton

7. The 2006 survey also contained a four-item battery on specific HIV policies that could not be used for this study because media coverage did not vary (i.e., no information appeared in the mass media beyond the speech itself). Thus, it was not possible to array the items into treatment and control cases.

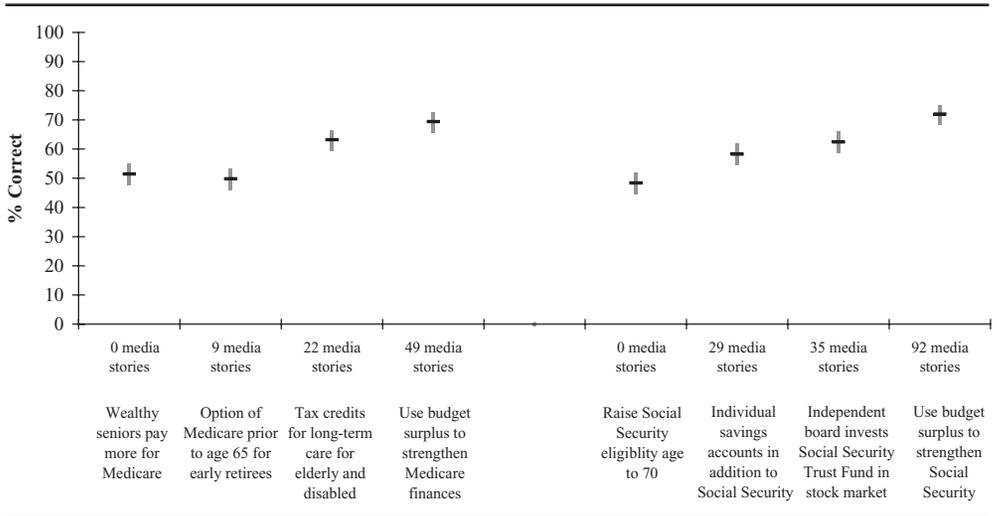
TABLE 1  
Treatment Effects on President Bush's Health Care Proposals in 2006

		Panel A Treatment Effect = +15			Panel B Treatment Effect = +13		
		Treatment on Health Care Costs (18 stories)			Treatment on National Health System (14 stories)		
		Incorrect	Correct	Total	Incorrect	Correct	Total
Control using Prescription Drug Program (0 stories)	Incorrect	10%	48%	58%	41%	17%	58%
		N = 118	N = 585	N = 703	N = 487	N = 216	N = 703
	Correct	34%	8%	42%	4%	38%	42%
Control using HIV Epidemic (1 story)	Incorrect	39%	17%	56%	11%	45%	56%
		N = 460	N = 220	N = 680	N = 131	N = 549	N = 680
	Correct	4%	4%	44%	34%	10%	12%
Total	Incorrect	43%	57%	100%	45%	55%	100%
		N = 516	N = 687	N = 1,203	N = 540	N = 663	N = 1,203
	Total						

		Panel C Treatment Effect = +13			Panel D Treatment Effect = +11		
		Treatment on Health Care Costs (18 stories)			Treatment on National Health System (14 stories)		
		Incorrect	Correct	Total	Incorrect	Correct	Total
Control using Prescription Drug Program (0 stories)	Incorrect	10%	48%	58%	41%	17%	58%
		N = 118	N = 585	N = 703	N = 487	N = 216	N = 703
	Correct	34%	8%	42%	4%	38%	42%
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		N = 460	N = 220	N = 680	N = 131	N = 549	N = 680
	Correct	4%	4%	44%	34%	10%	12%
Total	Incorrect	43%	57%	100%	45%	55%	100%
		N = 516	N = 687	N = 1,203	N = 540	N = 663	N = 1,203
	Total						

Note: The cell entries are the percentage in each cell and the number of respondents in the cell. The cells in gray shading represent instances of learning (i.e., moving from providing an incorrect answer in the control condition to providing the correct answer in the treatment condition). Percentages may not sum to 100% due to rounding. The distributions in all panels are statistically significant according to chi-square statistics ( $p < .01$ ).



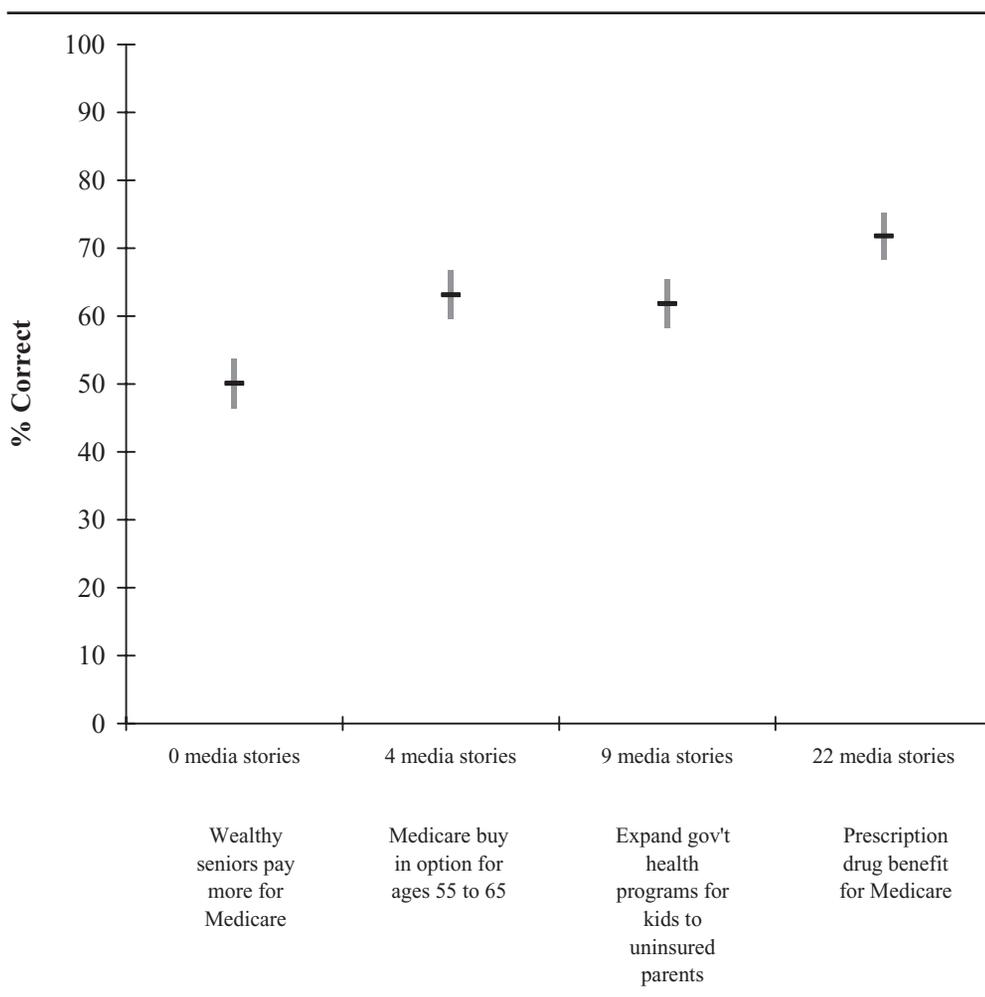
**FIGURE 2. Knowledge of Health Care and Social Security Proposals in the 1999 State of the Union Address.**

Source: Princeton Survey Research Associates data,  $N = 1,200$ , Feb. 19-25, 1999. Survey sponsored by the Kaiser Family Foundation and the Harvard School of Public Health.

made in 2000. As with Figure 1, knowledge varies positively with the number of news stories devoted to each aspect of the issues in the panels. Levels of knowledge in the baseline items are low. The treatment items are higher and correspond in rough fashion to the size of the increase in the number of stories. An exception to this is the proposal for Medicare prior to age 65 (shown in Figure 2), for which nine stories resulted in less knowledge than the baseline (a  $-2$  percentage point treatment effect,  $-7$  to  $3$  confidence interval). This aberration may be attributable to the way stories were aggregated over the three media sources (*AP*, *USA Today*, and *CBS Evening News*), and it proves inconsequential later when I examine the effects separated by source.

Two patterns from the three previous figures are worth noting. First, and consistent with the expectations (i.e., Hypothesis 1), there appears to be a positive relationship between media coverage devoted to aspects of SOTU addresses and what citizens know. This will be evaluated more rigorously through regression models in a moment, but the visual patterns are suggestive. The second notable pattern concerns the considerable variation in the baseline level of knowledge (i.e., knowledge in the absence of media coverage). In the figures, this baseline varies from 42 percent to 51 percent, differences that are likely attributable to variation in the difficulty of the issues. Fortunately, the within-survey/within-subjects technique moves the positional knowledge baseline upward or downward depending on the nature of the issue.<sup>8</sup>

8. In Figure 1, the correct answer varies from no for the first and fourth items to yes for the others. In Figures 2 and 3, the correct answer for the first response in each battery is no, while the correct response for the remaining items is yes. Especially for the data in the second and third figures, as well as the 1997 address (not pictured), it could be the case that response sets (e.g., answering all items yes) were driving the results. Fortunately, auxiliary analyses on the original data show that fewer than 10 percent of respondents said yes



**FIGURE 3. Knowledge of Medicare & Health Proposals in the 2000 State of the Union Address.**  
 Source: Princeton Survey Research Associates data,  $N = 1,600$ , Feb. 4-8, 2000. Survey sponsored by the Kaiser Family Foundation and the Harvard School of Public Health.

With the addition of data from another SOTU address in 1997 (not shown in the figures), it is possible to compute 37 treatment effects. Of those, 19 comparisons are of no coverage versus some coverage, while another 18 are ordinal comparisons (some coverage versus more coverage).<sup>9</sup> Thirty-three of the 37 are positive (89 percent), and most of those are statistically significant (i.e., the confidence intervals do not overlap zero

to all the items. Uniform no responses were even rarer (never more than 4 percent). Even including the more common “don’t know” still means that, on average, fewer than a third of the respondents (31 percent) gave the same answer to all the questions, suggesting that response set bias does *not* appreciably alter the results.

9. An example of an ordinal comparison in Figure 1 would be to use the medical malpractice question with 5 stories as the control case and to use the national health care system question with 14 stories as the treatment case. The effect is 7 percentage points (55 percent minus 48 percent).

in 31 of the 37). Positive treatment effects range from a gain of 2 percentage points (health care costs in 2006) to 56 percentage points (health care proposals on covering all children in 1997). Statistical analyses exploring whether media coverage predicts the treatment effects appear in the next subsection.

### Explaining Media Treatment Effects

Until this point, the emphasis has been on identifying and computing treatment effects using within-survey/within-subjects comparisons rather than explaining them. Explanation here takes on a different meaning than in typical studies of political knowledge because all relevant factors unique to individuals in the sample are held constant in making these counterfactual comparisons. By leveraging the design—and the complete control overall all individual-level characteristics that it brings—any differences in knowledge from the control to treatment conditions can be attributed to variations in media coverage.

As such, the statistical models shown in Table 2 contain very few explanatory variables. To explain the treatment effects, I constructed a series of ordinary least squares regression models with overall coverage as well as coverage by medium to explore potential source differentials. The models include all comparisons (ordinal and otherwise) out of concern for sample sizes. Fixed-effect dummy variables for each survey were included in the models (but omitted from the output) to account for idiosyncratic differences in the issues or survey administration.

Focusing on Model 1, the .30 (s.e. = .07) coefficient on the combined volume measure (a sum of AP, *USA Today*, and *CBS Evening News*) is positive and significant, as expected ( $p < .01$ ). Moving across the columns, positive and statistically significant ( $p < .01$ ) effects are observed for disaggregated measures of newswire coverage in Model 2, as well as for television and print news (Models 3 and 4).

Regardless of whether media coverage appears in print or television sources, volume is positively and significantly related to treatment effect size. Consistent with the first hypothesis, citizens have higher levels of surveillance knowledge in the aftermath of heightened media attention to the SOTU address. Each unit increase in combined coverage elevates knowledge by roughly a third of a percentage point. A two standard deviation shift in coverage (above the mean compared with no coverage) results in an estimated change of nearly 10 percentage points. The effects for newswire (AP) and print (*USA Today*) coverage are similar at 9 points and 11 points, respectively. While the coefficient in Model 4 is larger for television, the same two standard deviation change has a 6 percentage point effect on knowledge levels. The *R*-squared is estimated at .65 or higher, suggesting that model fit is relatively high despite the low number of observations. In auxiliary analyses not shown, logged versions of coverage are also significant ( $p < .01$  for all sources except *CBS*, which is  $p < .16$ ).

### Who Learns?

When everything about respondents is held constant, individuals tend to do better on aspects of SOTU addresses that receive high doses of media coverage. But concen-

**TABLE 2**  
**Regression Analysis of Treatment Effects**

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Volume (all sources)	.30*** (.07)			
Newswire coverage		.48*** (.12)		
Print coverage			.88*** (.20)	
Television coverage				2.01*** (.80)
Root MSE	8.82	8.97	8.61	9.32
R-squared	.69	.68	.70	.65
Number of cases	37	37	37	37

Note: The table shows ordinary least squares coefficients with robust standard errors in parentheses. The dependent variable is the treatment effect (treated-control). All models include fixed effects dummy variables to capture differences between the surveys but the coefficients have been suppressed for presentation purposes.

\*\*\*  $p < .01$  (two-tailed).

trating on the supply of information only tells half of the story. Some individuals may be particularly well suited to translating information from SOTU addresses into knowledge. As such, respondent characteristics can play an important role in determining who learns from SOTU addresses.

In the final set of analyses, I construct ordered probit models predicting who learns (e.g., the top-right cell portions of the  $2 \times 2$  crosstabs in Table 1, which are coded 1), who stays the same (the diagonals = 0), and who gets the question wrong despite the increased coverage (the bottom-left cells of Table 1 = -1). Hypothesis 1 received support in the previous set of aggregate-level analyses, but now attention turns to considering media coverage (Hypothesis 1) in conjunction with individual-level media attention (Hypothesis 2), the interaction of coverage and attention (Hypothesis 3), as well as the effects of watching or listening to the address (Hypothesis 4).

Table 3 reports five sets of estimates. The first two models utilize all available data from the four SOTU addresses, whereas the last three focus on the 2006 SOTU address. The first coefficient, *Media Treatment*, represents the difference between the number of news stories in the treatment case versus the number of stories in the control case (e.g., a treatment case with five stories compared to a control case with none would result in a media treatment value of 5). In Model 1, the *Media Treatment* term is positive and significant (coefficient = .004;  $p < .01$ ), which reaffirms the patterns in the aggregate-level analysis in the previous section and provides additional support for Hypothesis 1. This is the case when controlling for individual attention to the news, *Follows Address in News* (1 = following very closely, 0 = follows not closely at all), which is also positive and significant, as predicted in Hypothesis 2 (coefficient = .166;  $p < .01$ ). The remainder of the terms in Model 1 pertain to other socioeconomic and partisan characteristics. Many of these are in the expected direction. More educated, older males tend to learn more, as do Democrats when compared to the baseline case of independents.

**TABLE 3**  
**Individual-Level Analyses of Learning about State of the Union Policy Proposals**

	<i>All SOTU Addresses</i>		<i>2006 SOTU Only</i>		
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>
Media treatment	.004*** (.001)	.003*** (.001)	.011*** (.001)	.011*** (.001)	.006*** (.002)
Follows address in news	.166*** (.029)	.133*** (.041)	.115*** (.031)	.048 (.078)	-.160* (.096)
Watched or heard address	—	—	—	.082 (.081)	.175 (.120)
Media treatment × follows	—	.002* (.001)	—	—	.021** (.009)
Media treatment × watched	—	—	—	—	-.009 .011
Education	.075*** (.025)	.076*** (.025)	.063 (.048)	.063 (.048)	.063 (.048)
Income	-.011 (.034)	-.013 (.034)	-.027 (.047)	-.025 (.045)	-.025 (.045)
Age	.102* (.055)	.102* (.055)	-.109 (.074)	-.123 (.088)	-.123 (.088)
Female	-.033*** (.011)	-.034*** (.011)	-.017 (.021)	-.012 (.025)	-.012 (.025)
Black	-.018 (.029)	-.018 (.028)	.073* (.039)	.073* (.039)	.073* (.039)
Democrat	.030*** (.011)	.030*** (.011)	.032* (.019)	.031 (.019)	.031 (.019)
Republican	.033 (.022)	.033 (.023)	.093 (.070)	.090 (.067)	.090 (.067)
Cut point 1	-.694*** (.077)	-.707*** (.079)	-.549*** (.140)	-.545*** (.140)	-.595*** (.146)
Cut point 2	.733*** (.078)	.721*** (.077)	.646*** (.170)	.651*** (.169)	.602*** (.161)
Log-likelihood	-38,640	-38,638	-12,777	-12,772	-12,765
Number of cases	38,166	38,166	12,030	12,030	12,030

Note: The table shows ordered probit coefficients with robust clustered standard errors in parentheses. The coding of the dependent variable is 1 = learned correct answer (treatment vs. control), 0 = no change (same value on treatment and control case), or -1 = did not learn (correct response for control, not treatment). All missing demographic responses were imputed via the *Amelia II* software program (King et al. 2001). Don't know responses have been randomly reassigned to substantive answer categories (Mondak 2001).

\*\*\*  $p < .01$ ; \*\*  $p < .05$ ; \*  $p < .10$  (two-tailed).

Model 2 resembles Model 1, but it also adds the interaction between media coverage and individual attention. This term, which tests Hypothesis 3, is positive and significant, as expected, and it does not change any of the other results in an appreciable way. Overall, the effect of moving from no media coverage to the sample maximum (80 stories) is associated with an 8 percentage point increase in the likelihood of learning for the typical respondent (with a confidence interval from 5 to 11). The interactive effects for someone who follows the address are even larger. For that same typical respondent,

going from no media coverage and not following the address in the news to high media coverage and following the address in the news results in an estimated learning effect of roughly 20 percentage points (s.e. = .04; 95 percent confidence interval from 12 points to 28 points).

Models 3-5 in Table 3 report the results of analyses for the 2006 SOTU address only. This survey was unique in that it asked respondents, "Did you watch or listen to George W. Bush's recent State of the Union address?" in addition to items on knowledge and attention. Although a few control variables become marginally insignificant (education, gender, and Democrat), the most important aspect of Model 3 is that it successfully replicates the findings of interest from Model 1 with respect to the *Media Treatment* and *Follows Address in News* variables, which are both positive and statistically significant ( $p < .01$ ). Model 4 is virtually identical, but this time I add the indicator for watching or hearing the address. About 41 percent of the sample claimed to have seen or listened to the address, and while this term is positive, it is not close to being statistically significant. Importantly, the term for media coverage remains positive and significant, upholding the first hypothesis as well as providing some preliminary evidence on the expected null effect of watching the speech (Hypothesis 4).

The last column in Table 3 contains the estimates for Model 5, which repeats the last specification but this time with interaction terms for *Media Treatment*  $\times$  *Follows* and *Media Treatment*  $\times$  *Watched or Heard the Address*. The results show an impressive degree of support for the hypotheses. Media coverage remains positive and significant (Hypothesis 1). Following the address in the news without any coverage in the environment is negatively related to learning, but following is especially likely to be associated with learning when the level of media coverage increases as indicated by the significant interaction (Hypothesis 3). The term for watching or hearing about the address remains insignificant as a main effect, and it fails to attain statistical significance when interacted with media coverage as expected (Hypothesis 4). Therefore, individuals who pay attention are able to take advantage of heightened media coverage, and these gains hold across a variety of backgrounds and they go beyond watching or listening to the address itself.

Before discussing the empirical findings, it is worth noting that the answers to one additional survey question underscore the central argument advanced here regarding learning from the mass media. The same 2006 Princeton Survey Research Associates survey used in the analyses earlier asked respondents, "Where do you think you learned the most about what the President (George W. Bush) said about health care in the State of the Union address (January 31, 2006)?" The question then continued with, "Did you learn mostly from . . . what you heard from pundits or news reporters on TV (television) or read in a newspaper or what you heard from friends or family members or listening to the speech itself?" Most respondents claimed to have learned from television or print reports (52 percent), while fewer mentioned interpersonal discussion (17 percent) or listening to the speech (13 percent) or said they did not know (18 percent). Thus, even most members of the public believe that the mass media are their main sources of learning about SOTU policy initiatives, and their perceptions are reinforced by the evidence in the statistical analyses.

## Discussion

The Constitution describes the SOTU address in informational terms. According to these analyses, media coverage of SOTU addresses increases public knowledge. Also, some citizens in higher socioeconomic classes and those who pay attention to the news are better able to learn. These findings underscore the importance of the mass media's surveillance function (Graber 2004). Citizens need not know everything about the political world, but they can and do learn about important developments through news coverage of these major policy addresses.

Historically, media effects have been hard to find (Klapper 1960; Patterson and McClure 1976; but see Bartels 1993; Neuman, Just, and Crigler 1992; Zaller 1996). The same has been the case in studies of presidential rhetoric (Edwards 2003). Part of the challenge stems from the methods and data being used. Simple correlations between survey measures of media use and knowledge do not address causality. Even after controlling for a variety of exogenous factors such as age or race, a high degree of correspondence between self-reported media use and knowledge levels begs the question of which comes first. Do knowledgeable people watch the news, or does watching the news increase knowledge?

Experiments can isolate the causal effect of media coverage in laboratory settings (e.g., Iyengar 1991; Iyengar and Kinder 1987) or in surveys that provide information (Gilens 2001; Kuklinski et al. 2000). However, experiments are impractical in the case of SOTU addresses. It is nearly impossible to replicate the conditions under which someone encounters news from the mass media. News treatments in experiments run the risk of being too strong or unrealistic (Cook and Campbell 1979; see Gaines, Kuklinski, and Quirk 2007 for other potential problems).

Confronting these realities, social scientists often turn to natural or quasi-experimental designs in which some people are exposed to treatments and others are unexposed (e.g., Dalton, Beck, and Huckfeldt 1998; Neuman, Just, and Crigler 1992; Patterson and McClure 1976). But interpersonal (between subjects) designs are not foolproof. Observing high and low media exposure groups over time can lead questionable inferences because one cannot be certain, even with sophisticated statistical techniques, whether the two groups are comparable. In other words, those who are exposed to nonrandomly assigned news media treatments may differ in important ways from those who are not exposed. Media effects, or noneffects, might simply be attributable to differences in the underlying treatment and comparison groups.

What accounts for the powerful media effects uncovered here? Two factors seem particularly important. First, the use of within-survey/within-subject comparisons provides the type of analytical leverage that is lacking in most studies. The fact that there are multiple observations for the same respondent means that counterfactuals of knowledge with and without information can be observed directly. To use an example from this study, I can estimate a person's level of knowledge about proposals in a SOTU address when there are no news stories, *as well as* that same person's level of knowledge when there are many news stories. Causal inference is possible because media coverage is the

only changing factor. This approach also captures indirect effects. The influence of the media can be a two-step process mediated by personal connections (Katz and Lazarsfeld 1955) or social networks (Huckfeldt 2001). When the media cover an issue, a person might learn about the topic indirectly through conversation. Within-survey/within-subjects counterfactuals account for the strength or absence of social ties because all respondent characteristics and behaviors are held constant.

Second, I measure the treatment—media coverage—directly. Past studies have approximated media coverage by examining communities with many or few newspapers (Chaffee and Wilson 1977), sudden changes in media availability (Mondak 1995), variations in highly competitive media markets (Clarke and Fredin 1978), or geographic distance from the center of government (Delli Carpini and Keeter 1996, 212-13; Keeter and Wilson 1986). All of these studies acknowledge the importance of media coverage (also see Welch 2003, 359), yet none makes use of media content in the analyses. Not only does this study incorporate measures of media coverage, but it does so in a way that is completely realistic. These treatments are precisely what would have happened in the real world because these are real-world SOTU addresses since the late 1990s in the United States. Everything about the number and type of stories mirrors reality, as do the conditions under which citizens were exposed to the treatments.

These advances do not mean this study is without limitations. Aside from concerns about the exogeneity of media coverage, I assume (1) that the media sources are representative of the information environment, (2) that the content analyses are valid and reliable, (3) that the questions in any given survey are equivalent indicators, and (4) that the topics from the SOTU addresses selected by the survey organization are representative (i.e., not biased in a way that might impeach the results).

Finally, one must be careful in making generalizations from these findings. This is, after all, a study of only several issues in four recent SOTU addresses under two presidents, not dozens that other scholars have employed when looking at agenda setting (Cohen 1995; Lawrence 2004). At least two of the issues (Medicare and Social Security) are perennial concerns for senior citizens, which could explain the strong age effect. Also, this represents a very stark case in president–public relations. The minimal effects that others attribute to presidential rhetoric (e.g., Edwards 2003) might be the case here, too, if the focus was on less prominent speeches.

Nevertheless, the fact that learning occurred across partisan groups lends support to theories of rational learning among members of the public. This perspective, also known as Bayesian updating (e.g., Achen 2002; Barabas 2004, 2006; Gerber and Green 1999), stands in contrast to the emotionally entrenched beliefs predicted by rival perspectives such as motivated reasoning (e.g., Fischle 2000; Redlawsk 2002; Taber and Lodge 2006). It could be that findings in the presidency literature need to be reinterpreted along these lines as an explanation for why presidential statements sometimes have an effect, whereas other times they do not. The failure of presidential messages to move public opinion could be rooted in psychological factors, or as Edwards writes, “[m]ost people ignore or reject arguments contrary to their predispositions” (2003, 238). However, with facts such as whether the president proposed a policy, the desire to protect cherished prior views

might not be as strong. It could also be the case that citizens are more open-minded or that the messages are stronger, but more definitive research on belief updating is needed.

## Conclusion

Presidents use major policy addresses to communicate policy plans, yet we know little about their effects on the public. While others have debated whether presidential rhetoric sets the political agenda, the same scrutiny has not been devoted to the more basic question of whether citizens learn policy information. In a series of within-survey/within-subjects comparisons, I analyzed knowledge of presidential proposals on health care and Social Security from the 1990s and 2000s. I showed that media coverage of SOTU addresses lead to increases in public knowledge even when controlling for individual-level factors such as education, age, and partisanship.

Ample evidence suggests that the public does not know many basic facts about the political system. Yet there are moments in time, such as the SOTU address, when citizens pay attention and learn. The SOTU address has been called “an institutional, routine activity of the presidency,” and it is part of a larger policy campaign that presidents fight at the beginning of each session of Congress (Cohen 1995, 90; also see Light 1982). Scholars have devoted attention to the substantive content of the speeches as well as their effects on the public, but informal institutions such as the mass media (Cook 1998), and news coverage of the SOTU address in particular, shape political knowledge. While information on policy positions builds positional knowledge, it is important to remember that presidents initiate the communication. When political elites choose their own standards of evaluation, it may complicate efforts by citizens to make informed choices. Nonetheless, demonstrating that members of the public learn about policy positions represents an important step in holding presidents accountable.

Many are suspicious of popular leadership through rhetoric. In particular, the rise of the rhetorical presidency in the twentieth century has three potentially deleterious effects. First, words might replace deeds as the measure of presidential performance. Second, the office of the presidency becomes weakened through an overreliance on rhetoric. Third, the public might be misled on how the political system works (Ceaser et al. 1981). The main finding here that citizens learn from the presidential rhetoric in SOTU addresses, especially policy proposals highlighted in the mass media, represents an encouraging result from the standpoint of democratic theory and perspectives on citizen competence.

## Appendix

Because the within-survey/within-subjects technique is a somewhat atypical way of analyzing cross-sectional data, readers might find it useful to see all of the possible response patterns to two hypothetical knowledge questions, one of which is the control item with no coverage (Q1) and the other the treatment case with high levels of coverage

(Q2). In the hypothetical example here, there are 1,003 respondents, but only 9 of them are shown with ellipses, to denote that there are respondents not displayed. For the first two columns, entries of 0 correspond to incorrect answers, while 1s denote correct answers. The treatment effect in the final column is the difference between the second item with media coverage minus the first without it. Respondents who answered Q2 correctly and Q1 incorrectly are classified as having learned with a value of 1 (e.g., Respondents 1, 5, and 1,003 in the hypothetical example). Others either did not change (e.g., effect = 0) or moved in the opposite direction (effect = -1).

	<u>Q1 (No Coverage)</u>	<u>Q2 (High Coverage)</u>	<u>Treatment Effect (Q2 - Q1)</u>
Respondent 1	0	1	1
Respondent 2	0	0	0
Respondent 3	1	1	0
Respondent 4	1	0	-1
Respondent 5	0	1	1
.	.	.	.
.	.	.	.
.	.	.	.
Respondent 1,000	0	0	0
Respondent 1,001	1	1	0
Respondent 1,002	1	0	-1
Respondent 1,003	0	1	1

The within-survey/within-subjects counterfactual comparison technique provides a nearly perfect counterfactual for any given respondent. All treatment effects are computed relative to their own baseline. Some people were highly informed and answered both questions correctly. Others were chronically uninformed with incorrect responses on both questions. All of these individuals are included in the analysis, even when the responses are shown in aggregate form, but in the end the treatment effects may be tabulated by subtracting the percentage of respondents who learned from those who moved in the opposite direction. One could calculate effects differently, such as those going from a wrong to a right answer with increased coverage over all those who either went from right to wrong or were wrong both times. However, this would mean eliminating individuals who gave the correct response at two time points (e.g., dropping Respondent 3 and Respondent 1,001 in the hypothetical data set). To ensure that all cases were used in the reported analyses, the treatment effect calculations used all respondents.

### Treatment Effects by Levels of Attention to the SOTU Address

Given the emphasis in this study on the mass media, Tables A1 and A2 refine the analysis further by presenting treatment effect calculations at high and low levels of news media attention. Table A1 shows the comparisons for the 562 respondents who said they followed news about President Bush’s SOTU address “very closely” or “fairly closely.” In contrast to the overall treatment effect of 15 points shown in Panel A of Table 1, the treatment effect in Panel A of Table A1 for the highly attentive subgroup is 23 points (95

**TABLE A1**  
**Treatment Effects on Bush's 2006 Policy Proposals among High Attention Individuals**

	Panel A Treatment Effect = +23			Panel B Treatment Effect = +18		
	Treatment on Health Care Costs (18 stories)			Treatment on National Health System (14 stories)		
	Incorrect	Correct	Total	Incorrect	Correct	Total
Control using Prescription Drug Program (0 stories)	Incorrect N = 76	48% N = 272	62% N = 348	Incorrect N = 200	26% N = 148	62% N = 348
	Correct N = 140	13% N = 74	38% N = 214	Correct N = 39	31% N = 175	38% N = 241
	Total N = 216	61% N = 346	100% N = 562	Total N = 239	57% N = 323	100% N = 562
	Panel C Treatment Effect = +20			Panel D Treatment Effect = +16		
	Treatment on Health Care Costs (18 stories)			Treatment on National Health System (14 stories)		
	Incorrect	Correct	Total	Incorrect	Correct	Total
Control using HIV Epidemic (1 story)	Incorrect N = 180	26% N = 152	59% N = 332	Incorrect N = 83	44% N = 249	59% N = 332
	Correct N = 36	35% N = 194	41% N = 230	Correct N = 156	13% N = 74	41% N = 230
	Total N = 216	61% N = 346	100% N = 562	Total N = 239	57% N = 323	100% N = 562

Source: Princeton Survey Research Associates data, N = 1,203, Feb. 2-6, 2006. Survey sponsored by the Kaiser Family Foundation.  
 Note: The cell entries are the percentage in each cell and the number of respondents in the cell. The cells in gray shading represent instances of learning (i.e., moving from providing an incorrect answer in the control condition to providing the correct answer in the treatment condition). Percentages may not sum to 100% due to rounding. The distributions in all panels are statistically significant according to chi-square statistics ( $p < .01$ ). The table shows a subset of the entire sample who said they were following President Bush's State of the Union Address in the news "very closely" or "fairly closely."

**TABLE A2**  
Treatment Effects on Bush's 2006 Policy Proposals among Low Attention Individuals

	Panel A			Panel B		
	Treatment Effect = +8			Treatment Effect = +9		
	Treatment on Health Care Costs (18 stories)			Treatment on National Health System (14 stories)		
	Incorrect	Correct	Total	Incorrect	Correct	Total
Control using Prescription Drug Program (0 stories)	Incorrect N = 42	49% N = 313	55% N = 355	Incorrect N = 287	11% N = 68	55% N = 355
	Correct N = 258	4% N = 28	45% N = 286	Correct N = 14	43% N = 272	45% N = 286
	Total N = 300	53% N = 341	100% N = 641	Total N = 301	53% N = 340	100% N = 641
	Panel C			Panel D		
	Treatment Effect = +7			Treatment Effect = +8		
	Treatment on Health Care Costs (18 stories)			Treatment on National Health System (14 stories)		
	Incorrect	Correct	Total	Incorrect	Correct	Total
Control using HIV Epidemic (1 story)	Incorrect N = 280	10% N = 68	54% N = 348	Incorrect N = 48	47% N = 300	54% N = 348
	Correct N = 20	43% N = 273	46% N = 293	Correct N = 253	7% N = 40	46% N = 293
	Total N = 300	53% N = 341	100% N = 641	Total N = 301	53% N = 340	100% N = 641

Source: Princeton Survey Research Associates data, N = 1,203, Feb. 2-6, 2006. Survey sponsored by the Kaiser Family Foundation.

Note: The cell entries are the percentage in each cell and the number of respondents in the cell. The cells in gray shading represent instances of learning (i.e., moving from providing an incorrect answer in the control condition to providing the correct answer in the treatment condition). Percentages may not sum to 100% due to rounding. The distributions in all panels are statistically significant according to chi-square statistics ( $p < .01$ ). The table shows a subset of the entire sample who said they were following President Bush's State of the Union Address in the news "not too closely" or "not at all closely."

percent confidence interval ranging from 15 to 30). Similarly, Panels B, C, and D of Table A1 reveal larger treatment effects for the highly attentive respondents than those in Table 1 for the whole sample (effects of 18, 20, and 16 points, respectively). In contrast, Table A2 presents four comparisons for the 641 respondents who reported following the 2006 SOTU address “not too closely” or “not at all closely.” As expected, all four effects in Table A2 are smaller than they were for the highly attentive (Table A1), with an average size of 8 percentage points. These patterns hold for other cases and the analyses in Table 3 confirm the significant interaction between news coverage and attention.

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