

# Partisan Perceptual Bias and the Information Environment

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*Perceptual bias occurs when beliefs deviate from reality. Democrats and Republicans are thought to be especially susceptible to this type of biased-information processing. And yet we know little about the pervasiveness of perceptual bias outside the domain of “performance issues” (e.g., unemployment, inflation) or how individual-level partisan motivation interacts with the information environment. We investigate these issues in two studies that examine perceptual bias on a wide range of political topics spanning two decades. Using survey data as well as an experiment with diverse subjects, we demonstrate that people perceive the world in a manner consistent with their political views. The result is a selective pattern of learning in which partisans have higher levels of knowledge for facts that confirm their world view and lower levels of knowledge for facts that challenge them. This basic relationship is exaggerated on topics receiving high levels of media coverage.*

The ability to accurately perceive changes in the political world is a common benchmark for gauging the quality of citizen decision making. If unemployment increases or if the crime rate goes down, the expectation is that people of all political stripes—Democrats and Republicans—update their beliefs and use the new information to form their political preferences. However, this image of the public is challenged by research showing that different people interpret the same, ostensibly neutral, information differently (e.g., Gaines et al., 2007; Shapiro and Bloch-Elkon 2008). Importantly, this line of research is buttressed by experimental work indicating that once people have an opinion about an issue or candidate, they do not process new information about these objects in an even-handed fashion (Redlawsk 2002; Taber and Lodge 2006; also see Ditto and Lopez 1992; Edwards and Smith 1996; Lord, Ross, and Lepper 1979). Instead, they denigrate and counterargue claims that challenge their existing opinions.

Despite the accumulation of empirical research in this area, there has been little examination of how such biases play out in real-world settings. As a result, we know almost nothing about the prevalence of bias beyond a handful of the most commonly studied

issues. It also is unclear whether perceptual bias occurs *because* there is extensive media coverage of particular topics or *in spite of* that coverage. We investigate these questions in two empirical studies. The first combines survey data with original media-content analysis, while the second reports the results of a randomized laboratory experiment. Taken together, the analyses show that partisan perceptual bias is rooted in the supply of information as well as psychological processes that make learning some facts more difficult than learning others. Even though aggregate levels of knowledge increase as information in the mass media becomes more plentiful, both Democrats and Republicans learn at different rates depending on whether the information they encounter squares with their partisan predilections.<sup>1</sup>

## The Role of the Information Environment in Perceptual Bias

Existing research on political learning documents an important role for the information environment (e.g., Barabas and Jerit 2009; Nicholson 2003;

<sup>1</sup>An online appendix for this article is available at [www.journals.cambridge.org/jop](http://www.journals.cambridge.org/jop). Replication materials are provided at <http://polisci.fsu.edu/index.htm> and <http://dvn.iq.harvard.edu/dvn/>.

Price and Czilli 1996). In particular, the level of knowledge moves in tandem with the amount of politically relevant information in the mass media. Increases in the volume of news coverage may even eliminate “knowledge gaps” between people with high and low socioeconomic status (Curran et al. 2009; Jerit, Barabas, and Bolsen 2006).<sup>2</sup> The lesson from this research is clear: as information becomes more available (e.g., through the mass media), the level of political knowledge in society rises.

And yet, when it comes to certain topics, perceptual bias abounds. For example, Democrats and Republicans offer different answers to objective questions pertaining to the unemployment rate, inflation, crime, and the deficit (e.g., Bartels 2002; Conover, Feldman, and Knight 1986; 1987; Shani 2009). It seems implausible that such biases are the result of too little information (i.e., the mass media routinely cover topics like the economy and crime). According to the prevailing wisdom, the culprit is individual-level motivation—or the tendency for partisans to see the world in a manner that is consistent with their political views. Support for this phenomenon dates as far back as *The American Voter* (Campbell et al. 1960), but a flurry of new evidence has accumulated in recent years (Gaines et al. 2007; Nyhan and Reifler 2010).

The case for perceptual bias is strong, but several gaps remain in our understanding of this behavior. First, the existing literature tends to focus on “performance” issues, such as crime, inflation, unemployment, and the deficit. This emphasis makes sense from an analytical standpoint: trends in such indicators can be objectively established, and they often have clear implications for the party in power. However, we know little about the prevalence of bias beyond these topics. If partisans have an incentive to distort “actual-world information” in the direction of “preferred-world states” (Parker-Stephen 2010), then perceptual bias might exist on a much wider range of issues. Indeed, the implied mechanism—partisan motivated reasoning—suggests that we should observe perceptual bias *whenever* a fact has “partisan relevance” (i.e., whenever a fact has positive or negative implications for one’s party). This conclusion fits with recent evidence from Burden and Hillygus (2009), who find that “active learning”

causes partisans to differentially process information as they learn about the incumbent president (also see Ostrom and Simon 1988). More generally, the increase in partisan polarization among elites has “penetrated the public’s psyche” (Shapiro and Bloch-Elkon 2008, 122), resulting in an important role for partisanship in public opinion, even in the perception of routine political events. Our study contributes to the literature by going beyond the usual array of issues and searching for biases in partisan learning on a wide variety of topics from the 1990s and 2000s.

The second unanswered question pertains to the role of the information environment and whether increases in the amount of news coverage diminish perceptual bias or merely intensify bias. Most political concepts are “hot,” which is to say that the typical person knows how they feel about objects such as President Obama, tax cuts, or the death penalty (Taber and Lodge 2006). Indeed, a person’s likes and dislikes often come to mind *before* conscious awareness of the object’s other characteristics (e.g., that Obama is the president, a Democrat, and a former senator). These “hot cognitions” motivate people to defend their preexisting opinions, biasing subsequent information processing.<sup>3</sup> However, researchers have different notions about what this bias looks like. Recent work in political science finds evidence for a confirmation bias, in which people seek out attitude-confirming information, *and* a disconfirmation bias, in which people scrutinize and counterargue information that runs contrary to their political priors (Taber and Lodge 2006). By contrast, evidence from psychology suggests that there may be an asymmetry in the two processes. According to one classic study, bias occurs because of the “uncritical acceptance of preference-consistent information rather than the rigid denial of preference-inconsistent information” (Ditto et al. 1998, 66; also see McDonald and Hirt 1997). But existing work in *both* fields says little about how partisan-motivated reasoning is affected by the ebb and flow of information. The present study seeks to fill this gap.

## Expectations

All else equal, we expect that on topics with relevance for one’s party, Democrats and Republicans will exhibit selective learning. They will be more likely to learn politically congenial facts and less likely to

<sup>2</sup>Even Delli Carpini and Keeter (1996), who focus on the individual-level determinants of knowledge, acknowledge the importance of the information environment. They find, for example, that after controlling for a variety of factors such as education or occupation, people living closer to the state capitol know more about local politics, presumably because of the greater accessibility of information about state government.

<sup>3</sup>These biases arise from the motivation to maintain and protect identity, either regarding the self or a valued social group, such as a political party (e.g., Sherman and Cohen 2006).

learn facts that challenge their partisan leanings (H1).<sup>4</sup> We further expect that high levels of media coverage will amplify this general pattern of perceptual bias (H2). Not only are people more likely to seek out attitude-confirming rather than attitude-disconfirming information, but the former also is accepted effortlessly and with little attention to the quality of the information (Ditto et al. 1998). It is, in a word, *easy* to learn politically congenial facts, and this tendency only becomes greater as media coverage of a topic increases. By contrast, even if people cannot entirely avoid news sources that challenge their views—and even if they devote more cognitive resources to discordant information, as some scholars suspect (e.g., Ditto et al. 1998; Hastie 1980; Pyszczynski and Greenberg 1987)—individuals scrutinize, counterargue, and reject such information flows. This implies that any increase in media coverage will be nullified and result in little (or no) learning. We test these claims in two empirical studies, the first of which is detailed below.

## Study 1: Perceptual Bias in the 1990s and 2000s

Our first study combines observational data with original media-content analysis to explore perceptual bias on a wide range of political topics from the 1990s and 2000s. We extend the data collection efforts of Barabas and Jerit (2009), who assembled nearly two dozen national public opinion surveys containing over 100 knowledge questions along with data regarding media coverage of those topics. The original data were augmented in three ways. First, we nearly doubled the number of surveys, going from 23 to 43 opinion polls. In particular, we added new surveys from the 2000s, allowing us to examine events occurring under a Democratic and Republican administration (Bill Clinton and George W. Bush, respectively). Second, while the original study focused almost exclusively on policy-specific knowledge, the expanded dataset includes questions on a variety of topics, involving both domestic and foreign policy. Some of the questions have to do with specific programs, policies, and problems (i.e., they are “policy-specific” knowledge

items), while others are more general in nature (i.e., they ask about party control or “people and players”). Lastly, we coded all of the knowledge questions in our dataset (n=205) for their degree of partisan relevance (more on the coding process below).<sup>5</sup>

Nearly all of the questions in our dataset pertain to topics that were in the news in the weeks and months leading up to the survey, which makes them especially useful for studying perceptual bias. We also limit our attention to factual questions. This approach is a departure from previous studies that analyze items having various degrees of “facticity” (e.g., Shani 2009). For example, in addition to studying people’s perceptions of the national economy (e.g., unemployment, inflation) and the crime rate, Shani (2009) examines perceptions of the nation’s security, moral climate, and position in the world. Answers to the latter questions are bound to reflect partisan bias because responses are influenced by differences in the world views and values of the major parties (Gerber and Green 1999; also see Petrocik 1996).

Along with the usual array of individual-level factors that are included in studies of political knowledge (e.g., education, income, age, gender, and race), we also will include measures of a person’s partisanship. In most of our surveys this question reads, “In politics today, do you consider yourself a Republican, Democrat, or Independent?” For each of the 43 surveys, we created dummy variables for the partisan groups, coding Republicans or Democrats “1” if they self-identify in each manner.<sup>6</sup>

## Media Coverage

We combine the survey data with content analysis of these same topics in the national news. Using Lexis-Nexis, we analyze the full text transcripts of a variety of media outlets during the six weeks prior to the first day of each survey. The data-collection effort builds upon the content analysis from Barabas and Jerit (2009), so for approximately half of the topics analyzed, we examine three sources (the *Associated Press*, *USA Today*, and *CBS Evening News*). For the rest of the issues, the content analysis includes a more diverse collection of outlets (CBS, NBC, ABC, CNN, MSNBC, Fox, *New York Times*, *USA Today*, and the

<sup>4</sup>We focus on bias with respect to one’s own party for several reasons. Recent work finds that when given a choice, people seek out information about their own party, rather than the opposition (Lau and Redlawsk 2006). Psychological studies also show that people are differentially sensitive to stimuli that are “self-relevant” and that they privilege the processing of such stimuli (Markus and Wurf 1987; also see note 3).

<sup>5</sup>Because any given survey may include multiple questions, there are a total of 205 knowledge items across the 43 surveys in our dataset (for details, see the online appendix). In the models for Study 1, the standard errors are clustered on the individual to account for repeated observations for the same person.

<sup>6</sup>Unfortunately, these surveys rarely ask about the strength of a person’s party identification.

*St. Petersburg Times*). As it turns out, the results are nearly identical across the two halves of our data.<sup>7</sup>

Once we identified the relevant sample of news stories in each media outlet, we tallied the total number of articles mentioning the correct answer during the content-analysis period.<sup>8</sup> A simple story count captured the essence of what we sought to measure—namely, the amount of coverage devoted to a particular issue.

**Partisan-Relevant Facts.** Our primary concern is the degree of perceptual bias on factual questions about politics and whether the information environment exacerbates that bias. To explore these issues, we characterized each of the questions in our database according to whether it had “partisan relevance.” That is, would the typical Democrat or Republican identify the topic as a partisan issue, and if so, was there any sort of barrier or incentive to learn the information in question?

Working independently, two coders scored each knowledge question on two dimensions. First, they assessed whether the question made a reference, explicit or implicit, to either the Democratic party or the Republican party (Petrocik 1996).<sup>9</sup> Second, the coders determined whether the substance of the question had positive or negative implications for the party referenced in the question. Our expectation was that partisans would have higher levels of knowledge for facts that cast their party in a positive light; conversely, we expected that they would have lower levels of knowledge for facts that cast their party in a negative light.<sup>10</sup>

We provide a few examples to make these coding decisions more concrete. Consider a question that was asked in February 1999: “In his State of the Union address, President Clinton also made some

proposals regarding the Social Security program. Based on what you’ve seen or heard in the news recently, tell me whether or not the President proposed . . . Using a part of the federal budget surplus to help make the Social Security program financially sound?” The correct answer to this question is “yes.” The question was coded as making a reference to a Democratic actor because it mentioned President Bill Clinton. It also was scored as having positive implications for the party because the President made a proposal to shore up a program that has been long favored by Democrats (Petrocik 1996; also see Egan 2009). On the other side of the spectrum, the following question was asked in April, 2004: “You may also have heard news about the Bush Administration’s new cost estimates of the Medicare prescription drug law that was passed in December 2003. From what you’ve seen or heard in the news, were these new cost estimates higher or lower than previously released estimates?” The correct answer was “higher” so this question was coded as making a reference to a Republican actor and having negative implications for that party. In both examples, the item asks about an objective fact which can have either a positive or negative implication for the party in question.

Other cases in our dataset—such as questions having to do with a vaccine protecting women against cervical cancer, the lawsuit against the tobacco companies, or the conflict between Serbians and ethnic Albanians—were coded as having no implications, positive or negative, for either party. A little more than a third of the questions in our dataset ( $n=75$ ) fell into this category. The remaining questions were coded as having partisan relevance. For these cases, the coding process yielded a series of dummy variables that indicate whether a question invokes one of the parties and whether the topic has positive or negative implications for that partisan actor or group (i.e., Democratic-Positive, Democratic-Negative, Republican-Positive, Republican-Negative). In other words, each question was scored as pertaining to either the Democratic party or the Republican party, but not both.

**Aggregate Patterns.** We begin by showing aggregate levels of knowledge for Democrats and Republicans across all issues and then across topics that were coded as having positive or negative implications for each party. Table 1 displays the results. The analyses use unweighted data, but the patterns are similar when survey weights are employed. Focusing on the left side of the table, which shows aggregate levels of knowledge across all the questions in our

<sup>7</sup>We believe this pattern lends credence to our approach—that is, using a small number of prominent national news sources to proxy the overall information environment. In the results we present below, we combine our cases and use a dummy variable to control for differences across the two subsets of our data.

<sup>8</sup>A story was considered relevant if it discussed the issue underlying the knowledge question. Intercoder reliability analyses indicate high levels of agreement for identifying relevant articles ( $\kappa = .71$ ) and identifying articles containing the correct answer ( $\kappa = .84$ ). According to Cicchetti and Sparrow (1981), a value of  $\kappa$  above .6 is good; .75 or higher is excellent.

<sup>9</sup>A question made an *explicit* reference when it mentioned a partisan group or actor by name. It made an *implicit* partisan reference if it invoked a group, symbol, or issue associated with one of the two parties (Petrocik 1996).

<sup>10</sup>See the online appendix for the coding instrument and details on intercoder reliability.

TABLE 1 Levels of Knowledge across Partisan Groups

	All Question Topics			Topics Receiving High Media Coverage		
	All Topics	Positive Implications for Party	Negative Implications for Party	All Topics	Positive Implications for Party	Negative Implications for Party
<b>Democrats</b>	.41	.45	.35	.45	.51	.39
	[.40 .41]	[.44 .45]	[.34 .36]	[.45 .46]	[.50 .52]	[.38 .40]
Number of questions in category	205	51	29	105	26	16
Number of respondents	73,898	18,573	9,283	39,238	8,497	5,145
<b>Republicans</b>	.43	.52	.43	.50	.53	.49
	[.43 .44]	[.52 .53]	[.41 .44]	[.49 .50]	[.52 .54]	[.46 .52]
Number of questions in category	205	38	12	105	19	6
Number of respondents	66,764	13,206	3,800	35,837	7,265	1,447

Note: Cell entries indicate average levels of knowledge for each subgroup with 95% confidence interval appearing in brackets. High coverage corresponds to cases that are at or above the median in terms of the number of stories.

dataset, there is strong support for Hypothesis 1. For both Democrats and Republicans, levels of knowledge are higher for topics that cast a person's party in a positive light. We observe the opposite pattern when it comes to question topics that have negative implications for the party in question.

More specifically, the overall proportion correct for Democrats is .41 (with a 95% confidence interval ranging from .40 to .41 shown in brackets). For question topics that have positive implications for the Democratic party, that figure rises to .45 (95% C.I. = .44 to .45). Conversely, on questions that were coded as having negative implications for the party, knowledge among Democrats drops to .35 (95% C.I. = .34 to .36). To illustrate this general pattern, consider a series of questions about Clinton's 1999 State of the Union address. On this topic, 43% of Democrats knew that in his speech Clinton proposed tax credits to help people pay for long-term health care for the elderly and disabled. But far fewer (25%) knew that Clinton was *not* planning to ask seniors with higher incomes to pay more for Medicare (i.e., contrary to the preferences of many Democrats, he was *not* going to propose means testing for Medicare). In other words, it was "easier" for Democrats to learn the first fact (tax credits) because it was consistent with party policy (e.g., Petrocik 1996). The second fact (not making the wealthy pay more for Medicare) was less consistent with party policy and therefore much harder to learn.<sup>11</sup>

<sup>11</sup>The pattern for Republicans is more muted. Thirty-four percent answered the tax credit question correctly, while 26% gave a right answer on means testing. In contrast to the pattern for Democrats, Republicans are less sensitive to the partisan implications of the two Medicare facts.

The bottom half of the table shows the pattern for Republican respondents. Across all the questions in our dataset, the proportion correct is .43 (95% C.I. = .43 to .44). For politically congenial topics, knowledge among Republicans rises to .52 (95% C.I. = .52 to .53). For topics with negative implications for the party, the level of knowledge among Republicans remains at .43 (95% C.I. = .41 to .44). A pair of questions from a January 2003 survey illustrates this pattern. Seventy-four percent of Republicans knew that President Bush won the approval of Congress to use military force against Iraq. However, when these same respondents were asked if the Bush Administration publicly released evidence that Iraq was involved in the planning and funding of the 9/11 terrorist attacks, only 43% could correctly state that the administration did not do this. Both facts were covered in the mass media, but only the first fact portrayed the Bush administration in a positive light.<sup>12</sup> Thus, learning among partisans is uneven: they are willing to learn facts that are consistent with their world view but are more resistant to learning information that challenges their partisan predispositions.

According to Hypothesis 2, partisan perceptual bias will be exacerbated by high levels of media coverage. We examine support for this hypothesis in the right side of Table 1, which presents levels of knowledge for partisan groups under conditions of high media coverage (e.g., above the median in terms of the number of stories). Across the topics receiving high coverage, the overall proportion correct for

<sup>12</sup>Once again, differences in knowledge across the items were smaller for out-partisans. Among Democrats, 58% were correct on the first question, and 45% were correct on the second one.

Democrats is .45 (95% C.I. = .45 to .46). This figure represents a 4-point increase over the proportion correct for all the topics in our dataset (that value was .41). Any optimism regarding the ability of people to learn from extensive news coverage is tempered by the next two columns, which show strong evidence of perceptual bias. For topics that were coded as having positive implications for the party and which also had high levels of media coverage, knowledge among Democrats increases to .51 (95% C.I. = .50 to .52). However, when the media shines the spotlight on topics that portray the party in a negative light, the proportion correct drops to .39 (95% C.I. = .38 to .41). A similar pattern is observed for Republicans. Across all topics receiving high media coverage, the proportion correct is .50 (95% C.I. = .49 to .50). That value rises to .53 (95% C.I. = .52 to .54) for topics that have positive implications for the party and drops to .49 (95% C.I. = .46 to .52) for negative topics.

By way of putting the findings from Table 1 in context, consider topics that were coded as having no partisan relevance (results not shown). Differences in knowledge between Democrats and Republicans should be minimal because there is no motivation to treat information selectively. This is exactly what we find, with the average level of knowledge for Democrats at .38 (.38 to .39), slightly below Republicans at .42 (.42 to .43) and Independents at .39 (.39 to .39). On topics that receive low levels of coverage—that is, when neither motivation nor the information environment is operating to facilitate bias—the three groups become indistinguishable (Democrats = .32 [.31 to .33]; Republicans = .33 [.32 to .34]; Independents = .32 [.31 to .33]). All told, the aggregate patterns largely support Hypotheses 1 and 2.

**Probit Analysis.** The differences in the means are suggestive, but it is important to show that the patterns can survive the introduction of control variables. To do this, we conducted a multivariate analysis in which the outcome of interest is correctly answering the knowledge question (coded as “1”) versus any other response (“0”). The model includes the usual individual-level predictors of knowledge (education, income, gender, age, and race; see Delli Carpini and Keeter 1996). Differences in knowledge across surveys, due either to the clustering of respondents in particular media environments or variation in question topic, are captured by a series of fixed-effects terms. Our main interest in the model lies in the triple interaction between partisanship (operationalized with a dummy variable for Democratic or Republican identifiers), a partisan relevance indicator, and the number of news stories devoted to the topic. Hypoth-

esis 1 predicts that partisans should have higher (lower) levels of knowledge on topics that were judged to be consistent (inconsistent) with their world view. Hypothesis 2 states that perceptual bias will intensify as media coverage increases (H2).

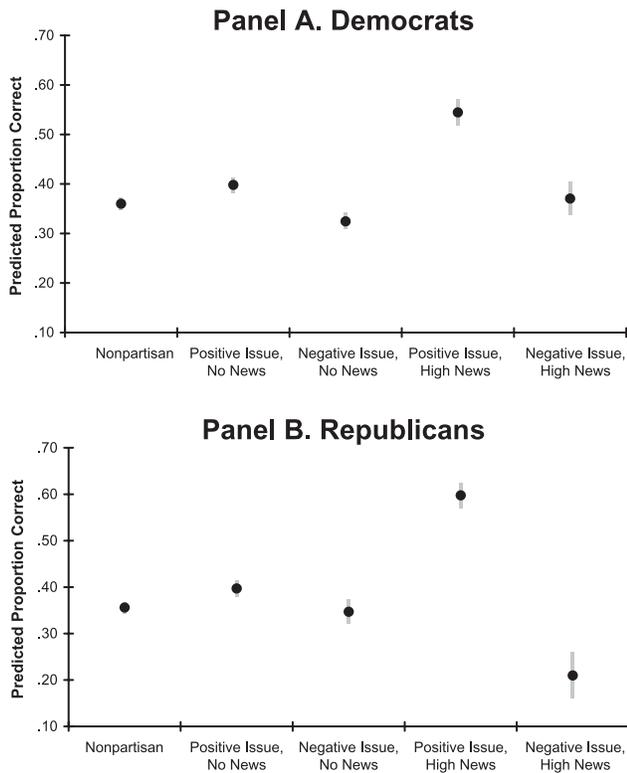
Constructing models to test our theoretical predictions requires two triple interactions for each party group—one for positive issues and one for negative issues—for a total of four triple (three-way) interaction terms. We also include all the underlying constituent terms (Brambor, Clark, and Golder 2006), which amounts to 17 other variables. Complicating matters further, the signs and statistical significance of interaction terms can be difficult to interpret, especially in nonlinear models (Kam and Franzese 2007). The recommendation from Brambor, Clark, and Golder (2006) and others is to illustrate effects and confidence intervals at various levels of key independent variables. Following that advice (and to comply with *JOP* page limits), we show our tables in the online appendix and focus here on the predicted probabilities generated from the statistical models.

We begin by describing knowledge on topics with the typical level of coverage. Consistent with H1, partisans displayed a pattern of selective learning. Holding media coverage at its average level, the predicted probability of a Democrat providing the correct answer on a “friendly” topic is .43 (.42 to .44). For topics that challenge the Democratic world view, the predicted probability is .33 (.32 to .35). A similar pattern was observed for Republicans. They have a .45 chance (.44 to .46) of providing the correct answer on topics that have positive implications for their party. On negative issues, that probability is lower at .30 (.28 to .32).

According to H2, partisan perceptual bias should become magnified as news coverage increases. Figure 1, Panel A, displays the model-based patterns of political learning for Democrats on topics that have partisan relevance across low and high levels of media coverage.<sup>13</sup> For topics that have no partisan implications (positive or negative) and no news coverage, the typical Democrat has a predicted correct response of .36 (95% C.I. from .35 to .37). This estimate is slightly below the raw mean reported for Democrats on all issues and levels of media coverage in Table 1. The low-proportion correct should not be surprising (e.g., Converse 1990), and it is only a few points above what would be expected by chance on an item with three

<sup>13</sup>Low and high corresponds to two standard deviations below and above the mean for an otherwise average respondent. In this case, “low” corresponds (or was censored) to no media coverage.

**FIGURE 1 Levels of Knowledge by Issue Motivation and News Coverage**



*Note:* The entries are predicted probabilities from a probit model with the dependent variable 1=correct and 0=otherwise. See the Online Appendix for the coefficient estimates.

answer choices.<sup>14</sup> The key test of H2 comes as we move across the figure from left to right.

The second entry in Figure 1, Panel A, shows the level of knowledge for Democrats on a “friendly” topic receiving low levels of news coverage. The predicted probability of offering the correct response is .40, with a confidence interval that ranges from .39 to .41. For “negative” issues with low levels of coverage, the predicted probability of offering the correct answer is lower at .32 (95% C.I. from .31 to .34). As predicted by H1, Democrats are sensitive to the partisan implications of information, with significantly higher levels of knowledge for facts that are consistent with their world view (first difference of effect = .04; s.e. = .01) and lower levels of knowledge for information that challenges their priors (first difference =  $-.04$ ; s.e. = .01).

Consistent with H<sub>2</sub>, the pattern is more dramatic for issues receiving high levels of news coverage. In

this situation, the predicted probability of offering the correct response is .54 for topics that cast the Democratic party in a positive light. This 18-point effect is statistically significant relative to the baseline (i.e., non-partisan) scenario (first difference of effect = .18, s.e. = .01). For highly covered topics that have negative implications for the Democratic party, the predicted probability of providing the correct answer is .37 (.34 to .40). On its face, this null effect may seem less dramatic than the positive case (f.d. = .01; s.e. = .02), but bear in mind what Panel A shows. For topics with negative implications for the party, levels of knowledge among Democrats hardly budge as media coverage increases to its highest levels.<sup>15</sup>

Republicans display an almost identical pattern (shown in Panel B). The baseline estimate of correct responses for Republicans is .36 (95% C.I. from .35 to .36). For partisan relevant facts that receive low levels of coverage, the degree of perceptual bias is modest. For positive topics the estimate is higher (.40), and for negative ones it is lower (.35), though only the positive estimate differs significantly from the baseline scenario (f.d. = .04; s.e. = .01). Like the pattern in Panel A, when media coverage is high, Republicans show a proclivity for learning facts that are consistent with their priors. In this situation, the probability of providing a correct answer is .60 (.57 to .62), which represents a 24-percentage-point increase over the baseline case after rounding (f.d. = .24; s.e. = .01). For negative topics, the predicted proportion correct is .21 (.17 to .26). Here the limited number of cases in this category (see Table 1) results in an unusually large confidence interval. Once again, though, the general pattern is consistent with our theoretical argument. Levels of knowledge among Republicans are seemingly immune to information flows when the news conveys facts that run contrary to their partisan world view—if anything, knowledge seems to move in the opposite direction.

So far, the statistical analyses support our expectations. For the typical “positive” and “negative” topic (i.e., one receiving average levels of news coverage), there is a modest but statistically significant level of perceptual bias. This pattern is consistent with H1, and it supports our claim that Democrats and Republicans are motivated to see the world in a particular way. As

<sup>14</sup>Across all the questions in our dataset, the modal number of answer choices is three.

<sup>15</sup>In other words, we do not observe “negative learning” (i.e., knowledge significantly *lower* than the baseline scenario) for uncongenial facts under conditions of high media coverage. Such a pattern should be uncommon because even motivated reasoners try to maintain an “illusion of objectivity” (see Pyszczynski and Greenberg 1987, 308; also see Redlawsk, Civettini, and Emerson 2010).

predicted by H2, perceptual bias becomes greater on topics receiving extensive media coverage. People readily accept preference-consistent information, and this tendency leads to a dramatic increase in knowledge for politically friendly facts receiving high levels of media coverage. The opposite pattern holds for preference-inconsistent information. Indeed, the levels of knowledge for politically uncongenial facts are all but impervious to the amount of news coverage.

The robustness of our results was probed in various auxiliary analyses (not shown here). Those models controlled for some of the differences across topics in our dataset as well as the probability of guessing the correct answer, which we use as a proxy for question difficulty. In these analyses, results were similar to the ones reported above. Additionally, no significant differences were found in levels of knowledge (for either Democrats or Republicans) with alternative partisan relevance terms that account only for the source cue (e.g., whether there was a reference to the party). Differences in knowledge emerge only after we take into account the party referent *and* the positive or negative implications of the information.

Notwithstanding the robustness of our results, several issues give us pause. For starters, the contemporary media environment makes it easy for partisans to seek out news that reinforces their political beliefs (Iyengar and Hahn 2009; Morris 2005; Stroud 2008). One may therefore question the wisdom of using a measure of the information environment that combines several news outlets. However, the average correlation between the story counts in individual outlets and the summary measure is .85, with the Pearson's  $r$  ranging from .63 to .98. Thus, the amount of coverage was highly similar across the various outlets in our study.

Second, given the way we operationalized partisan relevance, the comparisons in our figures are across different topics (e.g., Democratic-Positive, Democratic-Negative, Republican-Positive, Republican-Negative). We examined the data to see if there were systematic patterns in which topics receive media attention, with particular attention to whether the partisan relevance indicators predict the level of coverage. Although there is a tendency for policy-specific questions to receive less coverage ( $p = .06$ ), the partisan relevance indicators generally do not predict the amount of coverage (average  $p = .45$ ). Nevertheless, in our next study, we confront the issue of media endogeneity head on by conducting a laboratory experiment in which adult subjects were exposed to information treatments with partisan relevance. Like the topics we examined in the probit

analysis, the issues correspond to actual political events. However, instead of treating media coverage as a measured variable, we deliver information exogenously and search for evidence of perceptual bias among Democrats and Republicans.

## Study 2: Experimental Evidence on Perceptual Bias

In the spring of 2011, 417 adults came to a university campus to participate in a study “that examines people’s political attitudes and behaviors.”<sup>16</sup> The subject pool was diverse, with participants ranging from 18 to 87 years old (average age = 46). Sixty percent of the subjects were female, and approximately 25% were African American. Like other citizens of the surrounding county, 58% of our subjects were registered Democrats, and 25% were registered Republicans (additional details regarding the sample and randomization checks appear in the online appendix).

We conducted a between-subjects study with random assignment to one of five conditions. There were four treatment groups, each one corresponding to a type of partisan fact (Democratic-Positive, Democratic-Negative, Republican-Positive, or Republican-Negative). Subjects in the treatment conditions read a short paragraph that was designed to look like an excerpt from a news story. Each excerpt provided factual information that could be used to answer a corresponding knowledge question, which came after the treatment. The fifth condition was a placebo control group in which subjects read a paragraph about a blood-donation shortage at the American Red Cross.

In all five conditions, the treatments were based on actual news stories and edited to be roughly 100 words. They also had similar stylistic features, such as a heading in bolded text and some numerical information in the body of the text. To maintain continuity with earlier analyses, the stories were based on real-world events from the fall and winter of 2010 to 2011. For example, the placebo story referred to an actual blood-donation shortage at the Red Cross occurring around January 2011. The four issues in the treatment conditions (the Troubled Asset Relief Program, the trade deficit, Republican control of the U.S. House, and defense spending) also pertained to actual news events. We selected these topics from a November 2010

<sup>16</sup>The experiment was part of a larger study whose participants were drawn randomly from a list of registered voters in Leon County, Florida. See the online appendix for additional details.

Pew Research Center survey that examined knowledge about current affairs (the texts of the treatments appear in the online appendix). Although we believe the topics are plausible examples of each type of partisan fact, we validated our categorization with auxiliary analyses, described below.

The first issue, which we designated as a “Democratic-Positive” fact, had to do with the Troubled Asset Relief Program (TARP). Even though this policy was passed during the final months of the Bush Administration, TARP is an example of a federal government intervention that has come to be associated with President Obama.<sup>17</sup> In our study, the treatment story informed subjects that the bank bailout program was an “astonishing success” and likely to return a profit. By contrast, the story we identified as “Democratic-Negative” was about the current trade deficit and how it might hamper the nation’s economic recovery. The first story portrays a Democratic issue in a positive way, while the second one conveys bad economic news for the party in control of the White House (i.e., Democrats).

For the “Republican-Positive” topic, we used a story that described the historic change in power that took place in the U.S. House of Representatives in the fall of 2010. The excerpt highlighted the scope of Republican gains in the fall election and clearly conveyed a positive image of the party. The fourth and final treatment story was about defense spending and how this spending category represents a greater share of the budget than either Medicare or interest on the national debt (two budget items that are the frequent target of Republican criticisms). The news excerpt also noted the percentage of defense spending that goes to Iraq and Afghanistan.

### Validation of Partisan Coding

Because there is room for interpretation when it comes to categorizing these four topics, we validated our decisions in two ways. First, we looked at the distribution of knowledge among partisans groups for the four facts in the Pew survey, which was fielded

<sup>17</sup>For example, a Pew Research Center for the People and the Press Poll from July of 2010 ( $N=1,007$ ) asked a nationally representative sample, “Was the government bailout of banks and financial institutions, also known as TARP (Troubled Asset Relief Program), passed and signed into law under President George W. Bush or President Barack Obama?” Almost half the respondents, 47%, said TARP was passed and signed by Obama while 34% said Bush and 19% said they did not know.

before our study.<sup>18</sup> Our expectation was that Democrats and Republicans would be more likely to know positive facts related to their party and less likely to know negative facts. In all four cases, the expected pattern prevailed.<sup>19</sup> Starting with the positive facts, Democrats were more likely to know that at least half of the TARP funds have been repaid ( $p < .10$ , one-tailed) relative to Republicans and Independents. Likewise, Republicans were more likely to know that their party took control of the House ( $p < .05$ , one-tailed) relative to Democrats and Independents. When it came to the negative facts, Democratic respondents were less likely to provide the correct answer to the trade deficit question ( $p < .10$ , one-tailed). Similarly, Republicans were less likely to give the right answer on the defense spending item ( $p < .01$ , one-tailed). While knowledge levels and significance patterns vary across the four issues, the overall patterns confirm our expectations.

We also validated our topic coding in a second way. We pretested the four facts in a separate study involving a convenience sample of college students ( $N = 255$ ). Participants evaluated each of the facts on the two dimensions described earlier (party referent and positive/negative implications). In each case, the ratings of the naïve coders corresponded to our judgments. The majority of subjects identified the TARP and trade deficit facts as concerning the Democratic party on the one hand, and the house majority and defense spending items as Republican topics on the other hand.<sup>20</sup> When it came to evaluating the positive or negative implications of these topics, the naïve coders confirmed our coding decisions. That is,

<sup>18</sup>The Pew study, conducted from November 11 to 14, 2010, was a national survey consisting of landline and cell phone users ( $N = 1,001$ ). For the TARP issue, the question asked how much of the bank bailout money had been paid back to the government (answer: more than half). On the trade deficit, respondents were asked whether people in the United States bought more foreign goods than we have sold overseas, sold more than we have bought, or has it pretty much balanced out (answer: bought more). The party control item asked whether Republicans have a majority in the U.S. House of Representatives, the U.S. Senate, or both (answer: House). Finally, on the budget question, respondents were asked which activity, Medicare, interest on the national debt, or national defense the U.S. government currently spends the most money (answer: defense).

<sup>19</sup>We conducted a probit analysis in which giving the correct answer was the dependent measure (0=all other responses). We included the usual array of individual-level predictors (income, age, education, gender, and race) along with a dummy indicator for each partisan group and region.

<sup>20</sup>Moreover, in three out of four instances, the response distributions were significantly different from what one would expect by chance (at  $p < .06$  or better, one-tailed).

they were more likely to rate TARP and the house majority items as having positive implications for the party in question ( $p < .08$  and  $p < .01$ , respectively, one-tailed). Likewise, they were more likely to rate the deficit and defense spending facts as having negative implications for the party ( $p < .01$  and  $p < .08$  respectively, one-tailed). Taken together, both sets of validation analyses confirm our categorization of the four facts. Despite the inevitable subjectivity in how people evaluate political topics, two different subject pools “saw” these facts in largely the same way we did. The key question is whether we find the same pattern of biased learning that we reported in Study 1.

## Experimental Results

We begin by describing patterns of knowledge for all subjects.<sup>21</sup> The Democratic-Positive fact was by far the most difficult, with only 39% of lab participants giving the correct answer to the TARP question. By contrast, 90% of the subjects got the trade question (Democratic-Negative) right. The percent correct was nearly identical across the Republican-Positive and Republican-Negative items. A little more than half of participants, 57%, gave the correct answer to the party control and defense-spending questions. Respondents in the national Pew survey showed a similar ordinal pattern of knowledge across the four items.<sup>22</sup>

Among partisans in our experiment, we observed the same pattern as in Study 1: a readiness to learn politically congenial facts combined with a reluctance to learn facts that challenge one’s political predispositions. For example, Republicans who were treated with positive information about the party had higher levels of knowledge about the topic than their counterparts in the control group ( $|t| = 1.46$ ;  $p < .15$ , two-tailed). Republicans who were treated with negative information about the party were indistinguishable from Republicans in the control group; i.e., there was no evidence of learning ( $|t| = .63$ ). We observe similar results for Democrats, although here

the patterns are slightly weaker, perhaps due to differences in the apparent ease of the Democratic-Positive and Democratic-Negative questions. Democrats who were treated with positive information about the party had significantly higher levels of knowledge about the topic than their counterparts in the control group ( $|t| = 3.09$ ;  $p < .05$ , two-tailed). In this particular case, the treatment-minus-control difference was substantively very large (.23). Democrats who were presented with negative information about the party also had higher levels of knowledge than the controls ( $|t| = 1.89$ ;  $p < .15$ , two-tailed), but the knowledge gain was more modest (.13).<sup>23</sup>

We pushed the analysis a bit further with a series of probit models in which the dependent variable was knowledge of a partisan fact. In each of these models, levels of knowledge among partisans who were treated with information were compared to levels of knowledge among their counterparts in a control condition. Thus, for the Democratic-Positive fact, we compared levels of TARP knowledge for Democrats in the treatment condition with knowledge of the TARP fact among Democrats in the control group. Similar comparisons were made for the other facts. In all four models, the key independent variable is the treatment indicator for either Democratic or Republican subjects.<sup>24</sup> The sample was selected from a voter file, so pretreatment covariates were included to improve the precision of the estimates and to correct for imbalances across conditions.<sup>25</sup> Figure 2 plots the marginal effects for the treatment indicators (which corresponds to the treatment effect of being provided with party-relevant information across the four conditions).

Like our previous analyses, partisans were more likely to learn facts that had positive implications for the party. In the case of Democrats (the first estimate

<sup>21</sup>The text of the knowledge questions was similar to the items on the Pew survey (see note 18), and modified only to present the same number of response options across conditions (the question wording is shown in the online appendix)

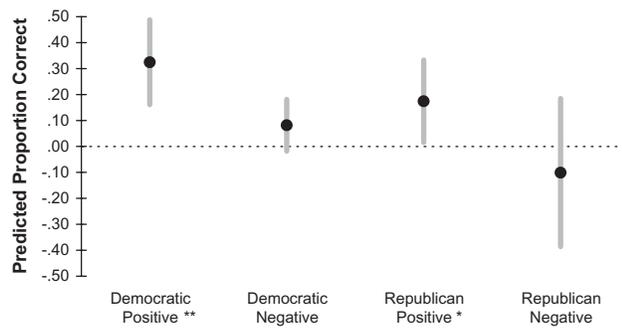
<sup>22</sup>In choosing to use actual news events in the treatment stories, we sacrifice some degree of experimental control. The topics may not be equivalent in some ways, such as question difficulty. However, the primary goal of Study 2 was to provide information exogenously. Differences across topics in the four treatment conditions do not threaten the internal validity of the comparison between any one of the treatment groups and the control condition. Moreover, the realism of the treatment stories makes the experiment more analogous to Study 1.

<sup>23</sup>A tabular version of these results appears in the online appendix.

<sup>24</sup>Participants in each experimental group read a story and then answered *four* knowledge questions (e.g., on TARP, the trade deficit, party control of the house, and defense spending). Because treated subjects read an informational story about only *one* of these topics, we can expand the size of our control group whenever treated subjects answered items on which they were not treated *and* when they were statistically indistinguishable from the controls on these items. We use an augmented control group for three of the four questions to improve statistical power. For the Republican-Negative fact, we used the original control group because treated subjects in the other three conditions differed significantly from the controls on this item.

<sup>25</sup>The probit analyses are justified because randomization tests revealed imbalances across the five conditions ( $p < .05$  on model chi-square). There were significant ( $p < .10$ ) deviations on race, gender, age, partisanship, and turnout in previous elections.

**FIGURE 2 Marginal Effects of Information Treatment across Issue Type**



*Note:* Estimates are marginal effects from probit model predicting knowledge (with 95% C.I.). For Democratic-Positive and Democratic-Negative facts, the marginal effect is on the treatment indicator for Democratic subjects. For Republican-Positive and Republican-Negative facts, the marginal effect is on the treatment indicator for Republican subjects. See text for model details. \*\*  $p < .05$ ; \*  $p < .10$  (two-tailed).

on the left), this results in a 32-percentage-point difference in knowledge for party positive facts (marginal effect = .32; s.e. = .08;  $p < .05$ , two-tailed). For Republicans treated with a positive fact (the third estimate), there is a 17-percentage-point difference in knowledge across treatment and control groups (m.e. = .17; s.e. = .08;  $p < .10$ , two-tailed).<sup>26</sup> By contrast, exposing partisans to negative information about their party had virtually no effect on levels of knowledge. Just moments after having been given information with negative implications for their party, both Democrats and Republicans showed little evidence of learning. For Democrats, the difference in knowledge across treatment and control is small and insignificant (m.e. = .08; s.e. = .05;  $p = .14$ ). For Republicans, the marginal effect is negative and insignificant (m.e. = -.10; s.e. = .15;  $p = .49$ ).<sup>27</sup>

Across the various analyses presented here, our results have been remarkably consistent. People are motivated to see the world in a manner that is consistent with their political views. This results in a selective pattern of learning in which partisans have higher levels of knowledge for facts that confirm their world view and lower levels of knowledge for facts that

<sup>26</sup>The corresponding marginal effects in models without any covariates are .23 (s.e. = .08) for Democratic-Positive facts and .16 (s.e. = .09) for Republican-Positive facts.

<sup>27</sup>Marginal effects in models without covariates are similar, at .13 (s.e. = .06) and -.09 (s.e. = .14).

challenge them. This basic pattern is exaggerated on topics receiving extensive news coverage.

## Conclusion

Our analyses show that the information environment interacts with individual-level motivation in a powerful way. When individual-level motivation is absent (i.e., on topics that do not have any partisan implications), greater amounts of news coverage generally translate into higher levels of political knowledge. However, when a topic has implications for one of the two parties, increasing the level of media coverage heightens partisan perceptual bias. In these instances, there is an even stronger proclivity for learning politically congenial facts and for resisting uncongenial ones. Indeed, our results suggest that extraordinary levels of media coverage may be required for partisans to incorporate information that runs contrary to their political views. In contrast to the abstract notion of political learning touted by those who value civic engagement, “scholars must also realize that most learning deviates systematically from a simple model of objective information gathering” (Burden and Hillygus 2009, 633).

Our analysis focused on knowledge with respect to one’s own party, largely because the influence of motivation should be the strongest in these situations (Sherman and Cohen 2006). Accordingly, when it came to knowledge of facts regarding the opposing party, we found a mix of patterns. Sometimes partisans seemed more knowledgeable about negative topics pertaining to the other side, but sometimes they did not. The end result, noted earlier, was that perceptual bias was more muted when it came to learning facts about the opposing party. This asymmetry would seem to have implications for aggregate opinion, making it a topic that is ripe for further study.

Overall, our study contributes to the literature in several ways. A burgeoning array of experimental work shows that partisans do not treat information in an even-handed manner (Lodge and Taber 2000; Redlawsk 2002; Taber and Lodge 2006). Yet, the evidentiary basis for this claim is much thinner once we leave the laboratory. Most existing work has focused on “performance issues” where one would expect partisans to differ. We know relatively little about the presence of bias on the plethora of topics that appear in the news on a daily basis—stories about a presidential speech, a bill weaving its way through Congress, an unexpected action taken by a foreign leader, or a government report on an important policy

problem—even though such routine political events form the raw ingredients of mass public opinion.

We also examine an important, but largely unexplored, potential source of perceptual bias: messages that emanate from the mass media. Given the public's reliance on partisan elites for information about politics (Key 1961; Page and Shapiro 1992; Zaller 1992), the mass media are likely to have an important influence on the degree of perceptual bias in public opinion. The contemporary media environment all but creates the conditions for perceptual bias, making it easy for partisans to seek out news that reinforces their political beliefs while avoiding sources that challenge them (Iyengar and Hahn 2009; Morris 2005; Stroud 2008). While past studies have shown that the volume of news coverage is positively related to the level of knowledge in society, our results raise the unsettling possibility that on certain topics extensive news coverage may elevate the degree of perceptual bias in public opinion.

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