

Who Knows Best? Education, Partisanship, and Contested Facts

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An alert, informed electorate is considered vital to a robust democracy, and the main path to that electorate includes formal education. The educated citizen is politically attentive, knowledgeable, and participatory, and the uneducated citizen is not. However, this fact conceals a less favorable effect of education. Educated citizens possess the cognitive skills to reject facts inconsistent with prior dispositions. And educated citizens are among the most invested partisans. Thus education is indispensable for an ideal democratic citizen, but that same education can create a resistant, insular democratic participant. We examine this duality across several prominent empirical cases where political facts are in dispute and employ goal-oriented information processing theory to generate hypotheses. In each case, we find that the most educated partisans are furthest apart in their factual understanding. Our primary concern resides with the inability of education to overcome powerful partisan motives; education intensifies those motives.

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Se considera que un electorado informado y alerta es esencial para una democracia robusta, y el principal camino para obtener tal electorado incluye a la educación formal. Un ciudadano educado es políticamente atento, bien informado y participativo, mientras que un ciudadano sin educación no lo es. Sin embargo, este hecho oculta un efecto menos favorable de la educación. Ciudadanos educados poseen las habilidades cognitivas para rechazar hechos incompatibles con sus creencias previas. Además, los ciudadanos educados son algunos de los miembros partidarios más comprometidos. Por lo tanto, la educación es indispensable para el ciudadano democrático ideal, pero esa misma educación puede crear un individuo democrático resistente e insular. Examinamos esta dualidad en un gran número de prominentes casos empíricos donde hechos políticos están en disputa y empleamos una teoría del procesamiento de la información orientada a objetivos para generar nuestra hipótesis. En cada caso, encontramos que los electores más educados son quienes tienen mayor capacidad en la comprensión de los hechos. Nuestra principal preocupación reside en la incapacidad de la educación para superar poderosos motivos partidistas; la educación intensifica los motivos.

Democracy cannot succeed unless those who express their choice are prepared to choose wisely. The real safeguard of democracy, therefore, is education.

—Franklin Delano Roosevelt

Our democracy's commitment to education is unquestioned. Educated citizens represent a chief obstacle to demagogues and the arbitrary use of government power. Successful democracies demand an educated public that can recognize its interests, exercise its rights, and distinguish between propaganda and fact (Locke [1690] 1989; Mill 1958; Rousseau 1979; Shapiro and Bloch-Elkon 2008).

This seemingly self-evident proposition that more education is preferable to less has led political scientists to pursue two distinct lines of inquiry (Campbell *et al.* 1960; Converse 1972; Key 1961). Most fundamentally, researchers have tried to ascertain whether an individual's level of educational attainment influences their political participation (Rosenstone and Hansen 1993), positions on campaign issues (Campbell *et al.* 1960), and their perceptions of parties and candidates (Berelson, Lazarsfeld, and McPhee 1954). The empirical evidence consistently supported the ideals of democratic theory, applauding the virtues of the educated citizens' increased participation and their capacity to perceive political phenomena accurately.

A logical step after the initial line of inquiry was concern about the effects of education on information processing. In Converse's (1964, 225) landmark research, for example, education was a strong predictor of ideological sophistication. The college educated displayed higher levels of ideological constraint and were therefore able to organize abstract political concepts in a predictable and consistent fashion. This finding suggested the inviting possibility that education could bridge the communication divide between the mass public and political elites. Subsequent research revealed that education is associated with increased political sophistication (Luskin 1987), political knowledge (Delli Carpini and Keeter 1996), and political awareness (Zaller 1992; but see Margolis 1977; Pomper 1972).

An educated citizen thus was not only more likely to participate in political affairs but possessed the requisite knowledge and cognitive skills to render wise and thoughtful judgments. Researchers also noted the value of education in affording citizens protection from self-interested partisans and sweeping propaganda efforts. McGuire (1969) observed that educated citizens call upon many different sources of information and possess a greater body of stored knowledge that can be utilized to question and counter dubious information. It appeared that the very success of propaganda turned on the lack of an educated public (Lasswell 1971).

The objective of our research is to examine the theoretical and empirical effects of education more closely. We deploy a psychological theory that centers on the cognitive skills of educated citizens and their likely effects on goal-oriented information processing and perception (Kunda 1990; Lodge and Taber 2000). The theory implies that while educated citizens possess the cognitive tools to curb the effects of political propaganda, these same abilities can be utilized to resist and challenge information considered inconsistent with dispositions (Taber and Lodge 2006). Resistance to political facts stems from an active goal-oriented motivation found in political predispositions and their interaction with education. Educated partisans appear to use information strategically, recognizing facts that fit with larger partisan purposes (Kunda 1992). While education offers protection from deceptive or fictitious political rhetoric, it may also shield citizens from political facts that may well be crucial to rational judgment.

It is the interaction of education and partisanship that draws into focus the antagonistic elements within education. The theory of goal-orientated information processing points precisely to this interaction and opens door for several testable hypotheses. Our analyses suggest that greater education alone does in fact foster an increased likelihood that citizens recognize important political facts. This finding supports the established literature on democratic competence and points confidently toward the importance of education in information processing and construing political facts properly. However, a more sophisticated model revealed the powerful biases created by the combination of education and party identification: education exacerbates existing partisan divisions concerning contested facts. Our results suggest that a well educated, but highly partisan public may operate without a common factual base to interpret political events, causes, or outcomes. To the extent that agreement among educated partisans is necessary to the vitality of democratic practices, the significant disparities in factual beliefs exhibited by respondents in our study should inspire a renewed attention to education. At a minimum, we can safely conclude that the greatest disagreement concerning important contemporary political facts occurs among the most educated strata of the polity.

The article proceeds as follows: first, we discuss education and its linkage to democracy, emphasizing the importance of education to citizens' political thinking, judgments, and participation. We then review the extant literature on goal-orientated information processing and derive hypotheses involving education, party identification, and the likelihood of accurately answering factual questions. The next section, we discuss data and design and present empirical findings from four separate national surveys that allow us to examine contested facts concerning the Iraq War, human evolution, and global warming. Although we discovered education to be a strong predictor of facts concerning Iraq, evolution, and global warming, the effect was not uniform across party identification. For every issue, the most educated partisan exhibited the greatest differences in the likelihood of responding accurately to issue facts. In concluding, our chief finding that the most educated partisans are no more likely to know the facts—and in one case less likely—than the least educated partisans causes us to consider a more subtle view of education in democratic theory.

Education

It appears axiomatic that democracy requires politically competent citizens. Classic political theorists stressed the importance of education in developing the moral and cognitive qualities necessary for citizenship in a democratic polity (Locke [1690] 1989; Mill 1958; Rousseau 1979). These writings influenced perhaps the preeminent scholar on democracy and education John Dewey

(1916), and later contemporaries such as Amy Gutmann (1987), who echoed the importance of formal education to democratic citizenship, especially its function to imbue traits vital to deliberative processes.

For democracy to work properly, citizens should be able to identify, understand, and protect their own political preferences. Engaged citizens survey the political environment and are attentive to and knowledgeable concerning political affairs. Knowledge and democracy are thus explicitly linked. Delli Carpini and Keeter (1996, 1) declared, “. . . democracy functions best when its citizens are politically informed.” In other words, citizens who possess the ability to access, understand, and retain concrete political facts can properly gauge and defend their political interests.

From early empirical studies of political behavior and attitudes, formal education was identified as the chief explanatory variable that produces the necessary cognitive attributes for democratic citizenship. Lazarsfeld, Berelson, and Guadet (1944, 42) observed, “Formal education, is of course, a direct creator of interest.” In the *American Voter*, Campbell and others (1960, 252) wrote of education, “. . . no other social characteristic employed in our research bears such a strong relationship to turnout in presidential elections.” And, Key (1961, 329) declared “[e]ducation . . . propels them (citizens) into political activity.” Converse (1972, 324) perhaps summarized the overwhelming significance of education best; “Whether one is dealing with cognitive matters such as level of factual information about politics . . . or motivation matters . . . or questions of actual behavior . . . education is everywhere the universal solvent, and the relationship is always in the same direction. The higher the education, the greater the ‘good’ values of the variable.”

But why is education the universal solvent? Theoretically, it is the purpose of education to develop intellectual capacities and expose students to alternative modes of thought (Dewey 1916). Indeed, education is central to developing the cognitive abilities relevant for weighing political alternatives and choosing among them (McClosky and Brill 1983). The mental exercises common throughout the educational ladder challenge students to develop their minds, refine their understanding of the prevailing political and social systems, and apply factual understanding to begin to solve existing problems. Importantly, an educated citizen is thought vital to maintaining the American economic and political system (Easton and Dennis 1969). Education transfers information and skills that bear directly on a greater understanding of the political system (Almond and Verba 1963; Campbell *et al.* 1960, 250-1; Greenstein 1965). Indeed students are taught concerning the political system to function within it (Hess and Torney 1967). Educated individuals are thus well positioned politically, and are in fact required systematically, to acquire factual information, resist misinformation, and reasonably fashion and defend their political interests.

The available empirical evidence is highly supportive of such a perspective—educated individuals are more likely to participate in political activities, frequently attend sources of political information such as party or

interest group events, and know more concerning political phenomenon (Campbell *et al.* 1960; Delli Carpini and Keeter 1996; Zaller 1992) than do those with less education. The verbal cognitive proficiency of the educated is also greater, representing an enhanced capacity to understand political events and analyze the implications (Nie, Junn, and Stehlik-Barry 1996). An educated person can access more stored information, which “provides pegs, cubbyholes, and other place markers in the mind to locate and attribute meaning to new information coming in” (Converse 2000, 335). These mental pegs lower the cost of consuming new information, provide significant organization and meaning amid a flood of information, and offer resistance to persuasive sources (see also Zaller 1992).

Central to Converse’s (1964) finding of ideological constraint among elites was the cognitive capacity to integrate and organize information in reliable patterns. Educated individuals possess an ideological sophistication absent among the general public. This organization makes genuine dialogue possible between elites and the educated public. If a segment of the population, for example, possesses the ability to conceptualize political affairs with the same clarity as political elites, the desired connection between public demands and policy outputs can be achieved. However, a lack of constraint among the public would only deepen skepticism concerning this very connection. As Lazarsfeld (1993, 83) observed, “The intellectual training received in the classroom enables the voter to make clearer discriminations in the political arena.” Without this training individuals are “. . . more susceptible to political propaganda and less receptive to relevant new information” (Delli Carpini and Keeter 1996, 265).

The theoretical and empirical evidence for education is clear; the more education, the stronger the democracy (Glaeser, Ponzetto, and Shleifer 2007). Formal schooling inculcates the mental training and cognitive development essential to the deliberative and participatory responsibilities of democratic citizens. Though the extant literature does expose a vast gulf between most citizens and the democratic ideal, it is nevertheless apparent that education works to bridge the gap.

An Alternative View of Education

Drawing from psychological theory, education’s potential influence on political information processing is less optimistic. Humans are goal-oriented information processors (Kunda 1990). People evaluate information with a directional bias that works to reinforce preexisting beliefs (Molden and Higgins 2005). This tendency makes sustaining a common factual understanding of political affairs difficult. If information runs counter to their beliefs, citizens may well choose to ignore it regardless of its factual importance. More relevant, education and this directional tendency can have a pronounced effect on one

another. Their interaction can generate an emergent information processing bias that is important to individual and systemic level analyses.

Goal-Oriented Information Processing

Researchers conceive people as motivated to arrive at a particular conclusion. Acting as “intuitive lawyers,” the goal is to “marshal the best available evidence for the preferred conclusion or against the unwanted conclusion” (Baumeister and Newman 1994, 5). When a particular conclusion is sought, it may not be desirable to attend to relevant evidence. Rather, individuals are likely to focus selectively on sources of information that reinforce a favored alternative. Kunda (1990) cited several studies that show when people are motivated to disregard scientific evidence they actively recruit opposing beliefs and suppress attention to information inconsistent with their own conclusions. For example, Sherman and Kunda (1989) examined subjects who evaluated scientific evidence related to a study showing an association between caffeine and a serious disease. Those subjects who reported high caffeine use were less persuaded and criticized the study’s application of methodological tools such as sample size, validity of respondents’ self-reports, and the prestige of the source of evidence. Similarly, Lord, Ross, and Leeper (1979) utilized subjects who were for and against capital punishment and exposed them to studies that either supported or opposed the notion that capital punishment deterred crime. Subjects were significantly less critical of the study’s research methods if conclusions supported their prior positions than if they opposed them. Kruglanski and Webster (1996) suggest these cognitive dynamics promote a sense of closure, whereby individuals prefer a firm and definitive conclusion; in these cases, a conclusion that is consistent with a preferred disposition.

Decades of important political science research confirm the powerful control of predispositions on political judgments (Abramowitz 2013; Bartels 2002; Gaines *et al.* 2007; Jacobson 2006). Berelson, Lazarsfeld, and McPhee (1954, 223) noted citizens’ perception of difference with parties turned on political predispositions; “The stronger the partisanship, the greater the (mis)perception of agreement with one’s own side and the less (mis)perception of agreement with the opposition.” Campbell and others (1960, 133) provided the enduring conception of party identification as a “perceptual screen through which the individual tends to see what is favorable to his partisan orientation.” And, more recently, Zaller (1992, 241) observed that “people tend to accept what is congenial to their partisan values and to reject what is not.”

When a partisan conclusion is sought, party identification anchors cognitive processes, biases memory searches, and information retrieval. Ultimately, party predispositions deliver evidence that justifies prior beliefs (Gaines *et al.* 2007). In recent analyses of party identification, Bartels (2002, 138) confirmed this view noting that “partisanship is not merely a running tally of political assessments, but pervasive dynamic forces shaping citizens’ perceptions of, and reaction to,

the political world.” Similarly, Taber and Lodge (2006) found that people are quick to challenge evidence that is inconsistent with their prior attitudes yet immediately accept supporting evidence. People are thus “often unable to escape the pull of their prior attitudes and beliefs, which guide the processing of information in predictable and sometimes insidious ways” (Taber and Lodge 2006, 767). Finally, Gaines and others (2007) found that Democrats and Republicans construed the same factual information—U.S. troop casualties—in a manner consistent with their support or opposition to the Iraq War. Democrats for example consistently interpreted given levels of troop casualties as higher than Republicans did when confronted with the same data. Frey (1986) noted that the tendency to seek out or construe information consistent with prior attitudes is likely to result in a memory stocked with supportive evidence. Having a strong predisposition thus creates conditions for a cognitive bias in favor of that preference.

The Interaction of Party Identification and Education

Education and partisanship influence reasoning by determining the types of information an individual will process. On the one hand, the cognitive development produced by education allows citizens to access an array of available information, process that information, and evaluate the alternatives. On the other, party identification narrows the information environment, attracting certain sources while ignoring others. Education provides a more thoughtful and effortful information search, whereas party identification engenders a biased use of information to arrive at a preferred conclusion. While these two variables appear to work in opposing directions, especially regarding beliefs concerning political information, the union of party and education can produce surprising results.¹

For example, relative to less educated partisans, highly educated partisans would be better equipped to challenge information inconsistent with predispositions. Educated partisans are schooled in political alternatives, possess greater ammunition with which to counter incongruent facts, and exercise biases that reinforce firmly held convictions (Jerit and Barabas 2012). Once joined, the product of education and party can be devastatingly effective for preserving partisan beliefs and disparaging opposing views (Lodge and Taber 2000). Indeed the most educated citizens are often among the most invested in a specific partisan issue. Once committed, their cognitive development produces biases against acquiring factual information that runs contrary to their parties’ efforts. The least educated partisans, however, are not as prepared to defend their partisan preference (Zaller 1992). Cognitive development is such that information inconsistent with predispositions may in

¹ It is conceivable that party identification and education serve as foundations for ideology, not as antagonists. See Barr and Tagg (1995), Atkinson (1997), and Patai and Koertge (1994).

fact be welcomed rather than perceived as threatening. It is not that less educated partisans possess a greater sense of evenhandedness, but rather because they lack the ability to engage in defense of their attitudes. The irony here is that the very characteristics that make education an obstacle to political propaganda can in combination with partisanship create resistance to genuine facts (Kuklinski 2007).

This observation is supported handsomely in Taber and Lodge's (2006) experimental studies. The authors showed that the most politically sophisticated subjects rarely utilized information objectively. Rather sophisticated subjects were most likely to exhibit disconfirmation biases—countering contrary arguments that were inconsistent with stated preferences while uncritically accepting supporting evidence. Additionally, a confirmation bias was evident, whereby sophisticated subjects sought out confirmatory evidence. These two biases worked together to engender greater attitudinal polarization among subjects with the highest levels of political sophistication. Sustaining beliefs, not objectivity, appeared to be the guiding motivation among partisan and highly informed subjects (see also Nalder 2010; Shani 2006; Taber, Cann, and Kucsova 2009; Wells *et al.* 2009).

Hypotheses

Several hypotheses can be derived from the literature. First, education is expected to be a significant predictor of factual knowledge. More educated respondents should be more likely than the less educated to identify properly the political facts. Second, we should observe significant partisan motivation concerning beliefs about the political facts. For example, we expect Democrats to believe that global warming is caused by human activity precisely because that is the prevailing view among Democrats. Republicans are likely to believe that global warming is a result of natural patterns.

The types of facts considered here are undoubtedly the subject of contemporary political debate but admittedly not as black and white as standard political knowledge questions. The facts arise from the political process and are not independent of it. They are attractively relevant, but force us to rely on a less stringent standard of evaluating a respondent's political knowledge. Similar to Nyhan and Reifler (2010), we define factual accuracy from the best available evidence and expert opinion. Finally, and most importantly, the most educated partisans should exhibit greater differences in the likelihood of responding accurately than uneducated partisans. Partisan polarization of factual beliefs should therefore be most severe among the most educated.

Data and Methods

Four surveys were consulted and four political issues were utilized to test hypotheses. We selected four controversial political issues (Iraq War, evolution,

global warming, and Iraq troop surge) for two central reasons. First, the issues garnered significant political attention and therefore survey questions sought to probe the public's understanding of the facts of the matter. We therefore have citizen judgments concerning disputed political facts from a variety of data sources. Second, these facts emerged from contemporary political debates, were widely reported during different time periods, and can be verified by expert opinion. In contrast to the typical political knowledge measures, we prefer to analyze facts that occupy policy makers and public. Such facts concerning the Iraq War, evolution, and global warming were politically contested precisely because they offered an important basis for citizens' attitudes and attributions.

Antecedents of the Iraq War

The first issue concerned the Iraq War and facts central to U.S. involvement. Data for this portion of the analysis were from surveys administered during the summer of 2003 by the Program on International Policy Attitudes (PIPA).² A nationwide panel was recruited through a standard random dialing technique. Those who agreed to participate were provided with free Internet access, and questionnaires were then administered over the Internet. To evaluate the relationship between party identification, education, and facts concerning the Iraq War, we examined the 1,362 respondents who received three factual questions concerning Iraq: "Has the U.S. found clear evidence that Iraq was working closely with al Qaeda?" "Has the U.S. found evidence of Weapons of Mass Destruction in Iraq?" "How do people in the world feel about the U.S. having gone to war in Iraq?" Preceding the war, and in the post-war period, a significant portion of the public held inaccurate beliefs and these beliefs were closely linked to support for Bush (Kull, Ramsay, and Lewis 2003). Notably, at the time of the survey, there was no evidence that weapons of mass destruction (WMD) were found, that al Qaeda and Iraq joined, nor was world opinion supportive of the United States.

Accurate responses were coded as one and zero otherwise. Adding across individuals, the following distribution emerged: approximately 40 percent answered all three correctly, 32.2 percent had one wrong, roughly 20 percent two wrong, and nearly 8 percent reported inaccurately on all three questions. So, roughly 60 percent of the sample maintained at least one false belief concerning Iraq. Our dependent variable thus runs from zero (all inaccurate beliefs) to three (all accurate beliefs).

Ordinary least squares (OLS) estimates presented in Table 1 were derived from models that included controls for age, race (1 = blacks), and gender (1 = women).³ Party variables of Democrats and Republicans are dichotomous

²For more information concerning the survey methodology, see http://worldpublicopinion.org/pipa/articles/international_security_bt/96.php?lb=brusc&pnt=96&nid=&id=

³OLS was the preferred model for interpretative ease and comparability across estimates. Ordered logit estimates provide identical results. For the full model, with facts concerning Iraq as

Table 1. Facts Concerning Iraq War by Education and Party Identification

Dependent Variable: Additive Measure of Facts Concerning WMD, World Opinion, al Qaeda Involvement.

Independent Variables	Split Sample		
	Democrat	Republican	Independents
Age	.61* (.11)		
Gender	-.02 (.05)		
Race	.05 (.09)		
Dem	.22* (.06)		
Rep	-.47* (.06)		
Education	.54* (.10)	.75* (.15)	.62* (.18)
R-square	.12		
N	1,231	430	428

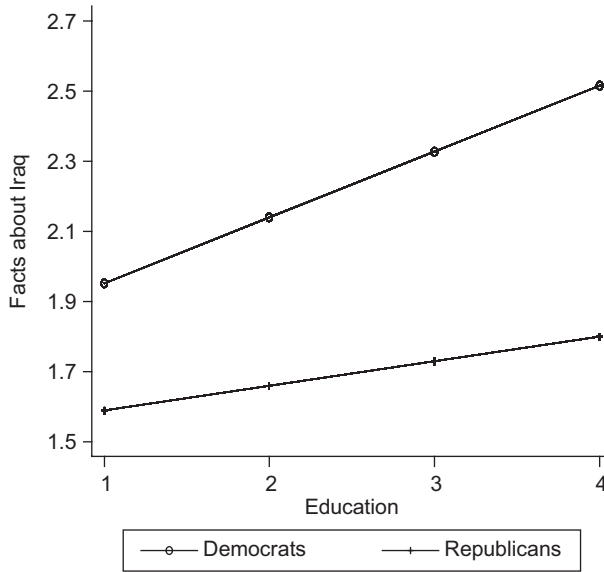
Notes: * $p < .01$, OLS estimates are derived from models that include age, race, and gender as independent variables and are scaled from 0 to 1. Data source: Program of International Policy Attitudes (PIPA) summer 2003. OLS, ordinary least squares; WMD, weapons of mass destruction.

with Independents as the baseline. Education takes values from 1 (less than high school) to 4 (four-year degree and beyond). To make estimates comparable, all variables were rescaled from zero to one. For example, we divided the education variable by 4, yielding a zero to one scale with college education plus category taking the value of 1. As expected, significant differences existed between Democrats and Republicans, and across education categories. Democrats' beliefs were often accurate ($b = .22, p < .01$), while Republicans were not ($b = -.47, p < .01$). In addition, the educated public possessed more accurate knowledge of Iraq than the less educated ($b = .49, p < .01$).

Splitting the sample by party identification revealed that educated Democrats possessed significantly greater factual knowledge concerning Iraq than uneducated Democrats ($b = .75, p < .01$). Education affected Independents similarly, drawing predictable distinctions between the least and most educated nonpartisans ($b = .62, p < .01$). But, education was *not* an important predictor among Republicans ($b = .28, n.s.$). The least and most educated Republicans were as likely to be inaccurate concerning Iraq. Furthermore, the differences in the education slope estimates for Democrats and Republicans were found to be statistically significant ($b = .12, p < .06$). Therefore, unaccompanied, education engendered factually accurate beliefs but when combined with Republican identification, this attractive effect disappeared. Among Republicans, education

dependent variable, ordered logit estimates are as follows: Age 1.33 (.23)*, gender -.06 (.10), race .10 (.19), Democrat .48 (.13)*, Republican -.90 (.13)*, education 1.2 (.22)*. * $p > .05$ or better.

Figure 1.
Conditional Effects of Education on Facts Concerning Iraq



failed to trump partisan motivation. Figure 1 illustrates the association for Republicans and Democrats. The figure clearly shows the largest disparity in factual knowledge concerning Iraq occurred among the most educated party identifiers.⁴

Evolution

The second issue examined involved the public's understanding of evolution. The culture wars helped elevate evolution to national prominence as contentious disputes arose between scientists, religious leaders, local school officials, and politicians (Berkman, Sandell, and Eric 2008). An especially potent fact utilized by supporters of evolution centered on the widespread agreement among scientists that humans evolved overtime. Scientists are nearly unanimous in this conclusion (American Association for the Advancement of Science 2009; Delgado 2006), but creationists often celebrate the small minority of scientists who do not agree (Keeter, Smith, and Masci 2007; Plutzer and Berkman 2008).

⁴In Figure 1 and subsequent figures, interactions represent the relationship between each of the interacting variables (party identification and education) and our dependent variable—factual beliefs, which in turn depend on the value of the other interacting variable. In all cases, party identification conditions the influence of education on factual beliefs. In some cases, party identification magnifies the impact of education on factual beliefs (Democrats in Figure 1) while in others reduces the effects (Republicans in Figure 1). See Neter *et al.* 1992.

Table 2. Agreement among Scientists Concerning Evolution by Party Identification and Education

Dependent Variable: Is There General Agreement among Scientists that Humans Have Evolved Over Time, or Not? 1-Yes.

Independent Variables	Marginal Effect	Split Sample		
		Democrat	Republican	Independents
Age	-.01* (.00)			
Gender	.06 (.15)			
Race	-.46** (.27)			
Democrat	.33** (.20)			
Republican	-.69* (.18)			
Education	.24* (.07)	.40* (.15)	.15 (.13)	.17** (.13)
N	830	257	277	296

Notes: * $p < .01$, ** $p < .10$. Logit estimates are derived from models that include age, race, and gender as independent variables. Data sources: Pew Research Center for the People & the Press and Pew Forum on Religion & Public Life July 2006 Religion and Public Life Survey.

The Pew Research Center conducted a survey in July of 2006 that focused on religion and public life. A fact concerning evolution was drawn from the following question: “Is there general agreement among scientists that humans have evolved over time, or not?” An affirmative response was coded one and a negative zero. Nearly 70 percent of respondents correctly identified that scientists are in agreement concerning evolution.

Table 2 provides estimates derived from logistic models. Once more, education increases the likelihood of answering correctly ($b = .24$, $p < .01$). Though much weaker, identification with the Democratic Party enhanced the probability of believing a scientific consensus for evolution ($b = .33$, $p < .06$). On the other hand, Republican identification led to a far different belief concerning scientific consensus ($b = -.69$, $p < .01$). The marginal effects of these variables reveal the relative power of partisan motivation. The effect of Republican identification on the likelihood of believing that there is a scientific consensus is roughly three times that of the effect of education. If we were to compare Democrats to Republicans, as opposed to a baseline of Independents, the effect relative to education would be substantially greater.

Finally the subsample estimates show the influence of education is very strong among Democrats ($b = .40$, $p < .01$), weaker among Independents

($b = .17$, $p < .10$), but as in the previous Iraq example disappears for Republicans ($b = .15$, $p < n.s.$).⁵ This finding is especially striking because scientific evidence concerning evolution would appear to be most accessible to educated partisans. If the result of education is greater familiarity and understanding of science, partisan differences should disappear among the most educated. But as the estimates in Table 2 indicate, education appears to work in the opposite fashion, drawing substantial disagreement among the most educated partisans.

Global Warming

A third test of our hypotheses centers on the issue of global warming. Although the political debate over global warming and climate change continues to simmer, some basic elements are clear. The vast majority of scientists believe the average temperature on earth is increasing (Zehr 2000), and a significant cause of this phenomenon is human activity (American Association for the Advancement of Science 2009; American Meteorological Society 2007; International Panel on Climate Change 2007; The Pew Research Center 2009; Union of Concerned Scientists 2010). In a May 2010 National Academy of Science report the scientific agreement is prominently stated: “Climate change is occurring, is caused largely by human activities, and poses significant risks for—and in many cases is already affecting—a broad range of human and natural systems. This conclusion is based on a substantial array of scientific evidence, including recent work, and is consistent with the conclusions of recent assessments by the U.S. Global Change Research Program, the Intergovernmental Panel on Climate Change’s Fourth Assessment Report, and other assessments of the state of knowledge on climate change” (National Academies Press 2010).

In April of 2008, the Pew Center conducted a survey that included key questions concerning global warming. Respondents were asked, “Do you believe that the earth is getting warmer because of human activity or natural patterns?” Those responding human activity were recorded as one and those believing natural pattern as the cause received a zero. Approximately 70 percent of respondents attributed global warming to human activity.⁶

⁵ The distribution of education across the partisan categories is reasonably uniform within the survey and across surveys used in this study. For example, for the Pew Research Center Data from July of 2006 concerning religion in public life, approximately 28 percent of GOP and Independent respondents possessed a high school education while 24 percent of Democrats did. At the top end of education (college plus), 14 percent report GOP, 15 independent, and 16 Democrat.

⁶ To respond to our chosen question concerning the causes of global warming, respondents first answered the following question: “From what you’ve read and heard, is there a solid evidence that the average temperature on earth has been getting warmer over the past few decades, or not?” Approximately 70 percent believed the earth was getting warmer. These respondents were then asked concerning the causes of global warming. The analyses presented in Table 3 are essentially the same if applied to this more general question concerning evidence of global warming.

Table 3. Cause of Global Warming by Party Identification and Education

Dependent Variable: Do You Believe that the Earth Is Getting Warmer Because of Human Activity or Natural Patterns? 1-Human Activity.

Independent Variables		Marginal Effect	Democrats	Split Sample Republicans	Independents
Age	-.008** (.004)	-.001			
Gender	.04 (.16)	.009			
Race	-.38 (.25)	-.08			
Democrat	.13 (.18)	.02			
Republican	-.71* (.22)	-.15			
Education	.25* (.07)	.05	.57* (.12)	-.38* (.16)	.29* (.14)
N	810		387	156	267

Notes: * $p < .01$, ** $p < .05$. Logistic estimates are derived from models that include age, race, and gender as independent variables. Data source: Pew Center for the People & the Press April 2008 Political Survey.

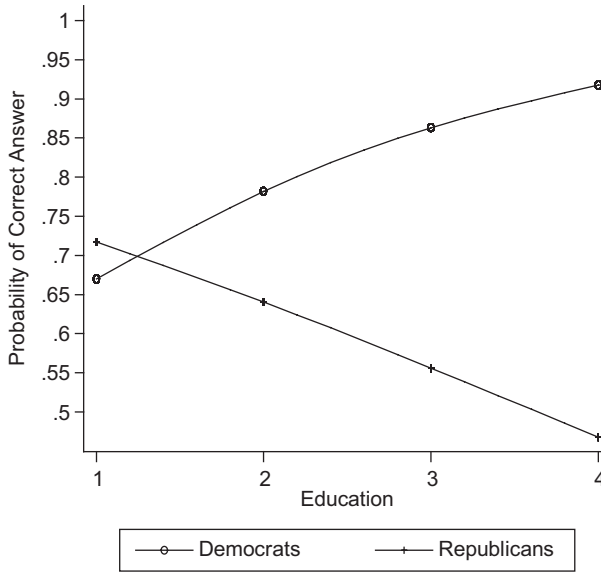
Table 3 offers estimates derived from logistic models. Predictably, education enhanced the likelihood of believing global warming is a result of human activity ($b = .25$, $p < .01$). There does not appear to be a substantial difference between Democrats and Independents ($b = .13$, n.s.) though Republicans are significantly less likely than Independents to believe human activity causes global warming ($b = -.71$, $p < .01$). The subsample estimates indicate the split among educated partisans is most extreme in this instance. Among Republicans, education drives the probabilities of a belief in human causes down considerably ($b = -.38$, $p < .01$) yet increases those same probabilities among Democrats ($b = .57$, $p < .01$) and Independents ($b = .29$, $p < .01$). As a result, the partisan gap among the most educated respondents is immense (see Figure 2). Perversely, uneducated partisans exhibit the greatest agreement regarding the cause of global warming.

Discussion

To this point, the pattern of results across issues is consistent and requires additional consideration. For example, the importance of education as a

However, we believe the attributed causes of global warming more directly reflect the heart of present policy debate. As such, we utilized this attribution for our analyses.

Figure 2.
Conditional Effects of Education on Facts Concerning Global Warming



significant predictor is without doubt. Though not the most potent predictor, the association between education and factual knowledge is robust. Moreover, the reliability of this association serves the dual purpose of validating our selection of factually correct beliefs. In other words, if education were not a significant predictor, or estimates pointed in the opposite direction, our certainty as to what was factually correct would diminish. This was not the case, as increased education led to agreement with expert opinion across issues. It is equally important to recognize that approximately 70 percent of respondents for the issues of global warming and evolution agreed with our definition of the facts. Though the facts are surely contested, the public was not equally divided but rather widespread agreement concerning the facts characterizes these issues.

Additionally, it is clear that Democrats and Republicans do not share factual beliefs concerning the same issues. Though this result is consistent with decades of research on partisan attitudes, it is nevertheless revealing when applied to contemporary facts concerning such pivotal issues as Iraq, evolution, and global warming. The results for Independents are constructive as well. Presumably, Independents exhibit fewer of the biasing tendencies of their partisan counterparts, and in this way offered a valuable control.⁷ Among

⁷Our conception of Independents does not of course address the possibility that Independents may not be truly Independent but rather lean toward a partisan tendency (Valentine and Van

Independents, we expected greater education, unencumbered by partisan motives, to produce identification with expert opinion. This expectation was confirmed. For the three issues, the more educated Independents, compared to less educated, identified with factual accurate information. This same pattern held true for Democrats. For Republicans, however, the story was quite different. Education either did not affect Republicans, or it worked to engender inaccurate beliefs (i.e., global warming). In this way, it appears that educated Republicans would bear the brunt of an attack from democratic idealists that prefer consensus concerning the facts of the day. If the public cannot perceive the facts similarly, especially the most educated partisans, the prospect of consensus and a responsible policy response to public problems appears dim.

We shall return to this larger question of democracy, but first should address the findings that Republicans are on the wrong side of the facts. It cannot be the case that Republican beliefs are wrong simply because they are Republicans. Rather, defending their identification puts Republicans at odds with the facts across three important issues. However, our theoretical view does not favor Democrats over Republicans but states that partisan motives and education often work together to yield beliefs inconsistent with the facts. We return to the Iraq War to determine whether factually inaccurate beliefs are specific to Republicans.

Iraq Troop Surge

In September 2007, the Pew Center collected data concerning the effectiveness of President Bush's troop surge in Iraq. By the time the poll was conducted, the surge had been in effect for more than eight months, and American military fatalities decreased appreciably from historic highs in May to historic lows by October. A marked decrease in military casualties accompanying the troop surge was a harbinger of declining sectarian violence and increased stability throughout the country, and ultimately helped political progress toward upcoming elections and talks of U.S. troop withdrawal (New York Times 2008; Time 2008). This changed context provides an opportunity to examine our theory when a widespread understanding of the facts favored Republicans—Republicans were more likely to favor the war, and it appeared that the troop surge made things better in Iraq (USA Today 2008).

Respondents were asked the following question: "As you may know, George W. Bush sent more U.S. troops to Iraq earlier this year. So far, do you think the troop increase is making things better in Iraq, is making things worse, or not having any effect?" Respondents answering better received a one (34 percent), and those preferring the latter options—worse (13 percent), or no

Wingen 1980). In the cases of Iraq, evolution, and global warming, it appears the effects of education among Independents mirror Democrats. However in an additional case addressed below, the surge of troops in Iraq, the influence of education appears strikingly similar to that of Republicans.

Table 4. Surge in Iraq by Party Identification and Education

Dependent Variable: As You May Know, George W. Bush Sent More U.S. Troops to Iraq Earlier this Year. So Far, Do You Think the Troop Increase Is Making Things Better in Iraq, Is Making Things Worse, or Not Having Any Effect? 1-Better, 0-Otherwise

Independent Variables		Democrats	Split Sample Republicans	Independents
Age	.21* (.04)			
Gender	-.46* (.14)			
Race	-.65** (.28)			
Democrat	-1.31* (.18)			
Republican	1.27* (.15)			
Education	.32* (.07)	-.04 (.15)	.44* (.13)	.38* (.11)
N	1,159	400	368	391

Notes: * $p < .01$, ** $p < .05$. Logistic estimates are derived from models that include age, race, and gender as independent variables. Data sources: Pew Center for the People & the Press September 2007 Political Survey.

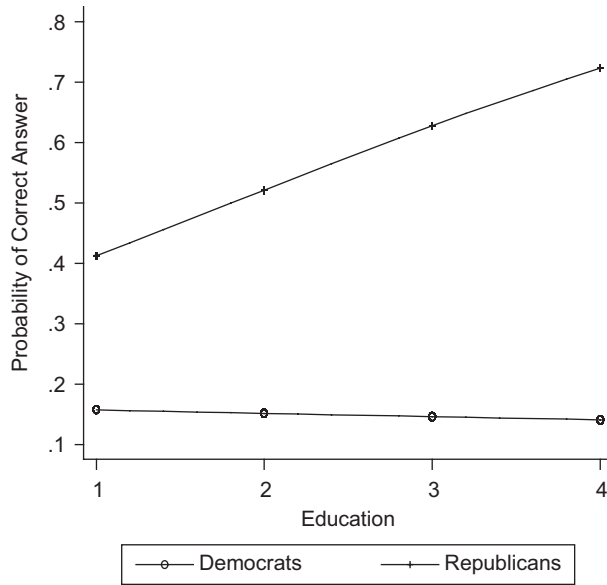
effect (43 percent)—were coded as zero. Table 4 provides logistic estimates. As before, education and party are key predictors. Greater education increased the probability of believing the surge was making things better in Iraq ($b = .32$, $p < .01$). But this time it was Democrats, not Republicans, who were less likely to respond in this fashion ($b = -1.31$, $p < .01$). More importantly, education is a potent predictor for Republicans ($b = .44$, $p < .01$) and Independents ($b = .38$, $p < .01$) but cannot overcome the null hypothesis among Democrats ($b = -.04$, n.s.). As in the previous examples, polarization is most evident among the most educated partisans (see Figure 3).

It is clear that partisan motives work similarly across both parties, and neither group appears accurate when the facts are inconsistent with partisan dispositions. Likewise, education does not seem effective against such motives. Rather, education reinforces partisan tendencies.

Theoretical Implications

Our research demonstrates the perils of viewing education as a one-dimensional measure. The conventional view suggests a democratic system greatly improved by an educated public that discerns fact from political fiction. Our empirical analyses reaffirmed this view, showing greater education produced beliefs concerning contested political facts that were accurate.

Figure 3.
Conditional Effects of Education on Fact Concerning Troop Surge



From an entirely different perspective, educated individuals also often also party members who may be motivated to protect their political leanings. Such educated partisans are fully equipped to counter dissonant information. Typically, educated partisans are heavily invested in political issues. A dispute concerning political facts is therefore entirely possible, and our analyses indicated that education exacerbated partisan differences. From this vantage point, it is difficult to discount the potentially detrimental effects of education. If educated party members do not view political facts similarly, and such educated partisans represent a nontrivial proportion of samples, the burden on deliberative democratic institutions increases considerably.

This general result that education amplifies partisan differences concerning the factual beliefs illustrates two important contributions of this research. First, the nature of the political facts is important. We selected facts that may be characterized as consensual but politicized. In three of the four cases—Iraq, global warming, evolution—70 percent or more of respondents got the facts straight. It was only among the most educated partisans that substantial disagreement emerged. However, if we had relied on dispassionate facts, such as those typically aggregated in political knowledge scales, the likelihood of polarization would decrease considerably. Questions concerning party control of Congress, proportions required to override presidential vetoes, or the content

of constitutional amendments are not tinged by partisan motives and reflect exposure to content provided in educational settings. With such questions education is likely to overwhelm partisan tendencies. But, such facts are tame by comparison and do not occupy the attention of policy makers or the public. Contested facts concerning Iraq, evolution, and global warming are relevant to policy debates and are immediately salient. Furthermore, lack of knowledge concerning these issues represents a fundamental misunderstanding of political affairs and, in most of these cases, science. These are precisely the types of facts that elicit partisan motives and move the educated public to defend their party commitments. These are also the facts that provide a basis for public deliberation and judgment.

Although our empirical work emphasized the determinants of contested facts, subsequent analyses may seek to probe determinants across a range of facts available on a specific issue and whether factual knowledge influences opinion. For example, researchers may inquire whether accurate beliefs on the causes of global warming influence opinion concerning environmental policy. It may also be useful to compare the effects of accurate beliefs concerning global warming with less politicized facts, such as agreement among scientists. This type of investigation would draw attention to the continuum of facts available, their potential effects, and the consistency of beliefs concerning a single issue and across several related issues.

Second, from a theoretical perspective, the theory of goal-oriented information processing compels researchers to consider subtle hypotheses concerning conditional relationships. Though partisan motivation is well understood, the synergy between party identification and education is much less so. Zaller's (1992) framework is perhaps the best known to examine the education/party interaction. Like others in this tradition, Zaller conceived education as an exposure variable, reflecting awareness of the information environment. Partisan polarization occurs among the most aware when there is elite discord and the information environment is relatively balanced in terms of partisan communications (100-1). The process is two step, top-down, and partisan resistance is a function of available information.

The polarization evident in our analyses, however, did not pivot on exposure to elite division but from the ability of educated respondents to exercise partisan bias. The process is political but determined by psychological biases inherent in motivated reasoning. Indeed, educated individuals think for themselves and evaluate political phenomena through a partisan lens. Consider this: elite division concerning the facts of Iraq was largely absent, and media coverage was overwhelmingly in favor of the Bush administration (Johansen and Joslyn 2008). Without elite division and media balance, Zaller's (1992) framework predicts a mainstream effect, whereby educated partisans agree upon the facts. Figure 1 shows they did not. And while elite division is evident on the causes of global warming and the scientific consensus over evolution, it cannot be characterized as decisive neither can the information environment be

labeled as balanced. But educated partisans are nevertheless polarized on these issues.

In this respect, we share Bernisky's (2007, 978) critique of Zaller's formulation. Bernisky shares Zaller's view of the power of the information context but does observe that polarization is not necessarily dependent on elite polarization. His elite cue theory suggests that opinion polarization can occur as long as a strong cue giver takes a clear view on the relevant policy. Republicans, for example, need only perceive that President Obama supports a policy proposal to know they should oppose it. As the Democrats follow Obama and Republicans move in the opposite fashion, polarization occurs even in the absence of a balanced flow of elite discourse. While our aim is not to test Zaller's perspective, nor Bernisky's, motivated reasoning nevertheless emphasizes psychological biases produced by education. The capacity to defend a developed political predisposition, which can also lead to polarization, is frequently overlooked because education is construed as awareness of the political information context, as opposed to awareness of one's own partisan proclivities and the cognitive facility to protect them. Moreover, goal-oriented information processing suggests strategic uses of information (Kunda 1992). For example, Democrats may have not believed the troop surge in Iraq was effective because they knew the strategic importance of that conclusion to the appraisal of Bush's foreign policy. Similarly, Republicans likely considered the importance of denying the existence of WMD to the larger issue of Iraq invasion and occupation.⁸

Finally, in a broader context, an eclectic array of recent studies offer a more subtle and unconventional understanding of education. Federico (2004) persuasively argued for a reconsideration of the role of education in the domain of racial attitudes. Though education is associated with racial tolerance, Federico noted it also fosters the ability to connect racial predispositions with policy attitudes. Thus, while the college educated are less likely to perceive black people negatively, their welfare attitudes are strongly informed by their racial perceptions—whether positive or negative. Similarly, Federico and Sidanius (2002a, 2002b) discovered that the association between perceptions of black racial inferiority and opposition to affirmative action was stronger among the most educated.

Price and Tewksbury (1996) found that because the educated tend to view themselves as impervious to mass persuasion, they in turn misperceive their own susceptibilities to media effects. Vallone, Ross, and Lepper (1985) discovered that education deepened the strong perceptual distortions known as hostile media effects. And Joslyn's (2005) analyses of the American National Election Studies (ANES) data revealed that it was the most educated—as opposed to the least educated—respondents that relied on stereotypical thinking concerning

⁸ We wish to thank an anonymous reviewer for providing this intriguing interpretation.

the parties. Finally, Silver, Anderson, and Abramson (1986) observed that vote misreporting was substantially higher among the most educated. Evidently, highly educated respondents felt the most pressure to report voting and thus exhibited the highest level of misreporting their Election Day participation. In short, these studies suggest the role of education is far more complex than typically conceived and the need to develop a broader understanding of education and its nexus with party identification is genuine.

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