Public Views of Science-Based Policy and Funding

The Political Context of Science in the United States: Public Acceptance of Evidence-Based Policy and Science Funding

Gordon Gauchat, *University of Wisconsin–Milwaukee*

In recent years, professional science organizations in the United States, including the National Research Council, National Institutes of Health, and National Science Foundation, have expressed concern about waning policy influence, declining government funding, and the growing politicization of science. Given this background, a number of theoretical questions motivate this study. First, what is the political context of scientific authority in the contemporary United States? More specifically, how can we best understand the association between political ideology and public perceptions of science in the current polarized environment? Using data from the National Science Foundation's *Survey of Public Attitudes Toward and Understanding of Science and Technology* (2006–2012), this study finds that the American public is culturally and politically divided in its support for the intersection of science and the state. Various models of political and cultural polarization are tested. Overall, ideological challenges to the cultural authority of science cannot be reduced to left-right political polarization or to conservative religious beliefs. Instead, skepticism on the political right is multifold, involving distinct modes of thought and concerns about the institutional ties between science and the state.

In 2012, the National Research Council (NRC) released a report titled *Using Science as Evidence in Public Policy*. The report appealed to social scientists to examine the complex and understudied relationship between scientific knowledge and policy formation. The report also cautioned that the scientific community confronts increased public scrutiny and budgetary pressures. The National Institutes of Health (NIH) and National Science Foundation (NSF) echoed these concerns, highlighting declining policy influence and federal financial support (Morello 2013; Reardon 2013; Wadman 2012; Zhang 2013). Yet, public perceptions of science, especially in relation to the modern state, remain poorly

The author would like to thank Tom Gieryn, Paul DiMaggio, and Robert Bell for their work on developing the questionnaire used in this paper. In addition, he thanks Michael Wallace, Kenneth Andrews, David Weakliem, Oriol Mirosa, and Andrew Perrin for their helpful comments and insights related to this paper. Research reported in this publication was supported by the National Science Foundation Research Grant under Grant No. (1359585). Please send all correspondence regarding this study to Gordon Gauchat, University of Wisconsin–Milwaukee. E-mail: gauchat@uwm.edu.

Social Forces 00(00) 1–24, Month 2015
doi: 10.1093/sf/sov040

understood in social science. One crucial and unsettled issue is whether public perceptions of science in the United States are politically and culturally polarized. Specifically, are perceptions of science associated with left-right political orientations? And, do polarized perceptions of science correspond with deep-rooted cultural belief systems that divide the general public?

Following Merton (1968[1938], 1968[1942]), social scientists have shown intense interest in the political and cultural context of scientific authority (Frickel and Moore 2006; Gauchat 2012; Gieyrn 1983, 2010; Jasanoff 1990; Shapin and Schaffer 1985; Shapin 2008, 2010). Yet, surprisingly little sociological research has examined the acceptance of science's cultural authority in the general public and, specifically, perceptions of the institutional ties between science and the modern state. This oversight is noteworthy, because the cultural image of science as the epistemic authority of the modern state is crucial to its broader cultural authority.[1] As the NRC report illustrates, professional science organizations and science journalists regularly deploy the discursive image that science is indispensable to the state apparatus. This study examines two of these cultural images—*science policy* and *science funding*.[2] The science-policy image refers to the claim that scientific evidence can improve government policy through the objective evaluation of various policy positions and the identification of social problems. The science-funding image refers to the claim that large-scale government investments are necessary and will yield societal benefits if scientific work remains autonomous from economic and political interests. The illusory or real nature of these cultural representations remains highly contentious (see Mulkay 1976; Panofsky 2010; Zuckerman 1988); however, the question for sociological research is whether the public accepts these cultural images, or conversely, what segments of the public express doubts (Gieryn 1983, 781–82).

Public support for evidence-based policy and government funding of science also provides a unique opportunity to study the "politicization of science" in the contemporary United States. "Politicization" is a loaded concept and is used with caution, because science has always been political, involving the interests of professional organizations, funding agencies, and policymakers (see Moore 2008; Shapin and Schaffer 1985). At issue in this study is the degree to which conflicts around science's cultural authority correlate with political identities and belief systems in an increasingly polarized environment. Toward this end, the current study examines the cultural processes that underlie left-right polarization in perceptions of science, focusing on public support/disapproval of science-based government policy and the federal funding of science.

Using data from the National Science Foundation's *Survey of Public Attitudes Toward and Understanding of Science and Technology* (2006–2012), this study tests a number of polarization models. The first model attempts to explain public acceptance of science in terms of left-right polarization along a single latent dimension (i.e., liberal-conservative views). A second model hypothesizes that differences in public acceptance of science are a function of conflict between traditional and secular worldviews, rather than a left-right political divide. Finally, a third model hypothesizes that polarization is multidimensional and dynamic. From this perspective, political orientations signify both a collective identity and a discursive field of loosely coupled belief systems with different goals and potential objections

to science's cultural authority. Although unlikely exhaustive, the three polarization models tested here have wider implications for future science funding and policy influence in the United States, given an increasingly divided political culture.

Science in Society

Initial research on perceptions of science emphasized uneven science literacy in the general public and used gaps in knowledge to explain unfavorable opinions (see Bauer, Allum, and Miller 2007; Gauchat 2011; Wynne 1995 for reviews). Here, science literacy refers to the cultural knowledge a person would need to "comprehend and follow arguments about science and technology policy matters in the media" (Miller 1998, 206). This line of research has shown that a substantial portion of the public does not know about basic scientific facts or the essential principles of experimental methods (Miller 2004; National Science Foundation 2014). Consistent with what researchers call the "deficit model," numerous studies have also found an association between science literacy and greater public acceptance of science (Allum et al. 2008; Durant, Evans, and Thomas 1992; Gauchat 2011; Sturgis and Allum 2004). Although often unclear, the main explanation for this finding is that individuals tend to be ambivalent, or even hostile, toward entities they do not adequately comprehend (i.e., due to a "deficit" of knowledge).

Recent advances in the areas of culture and cognition suggest an alternative approach to public understanding of science that remains understudied. Building on the work of Kahneman (2003), this perspective emphasizes the tendency for people to simplify cognition by using heuristics and cultural schema to interpret information toward some goal or end that reinforces what they already believed (Dunning 1999; Kahneman 2003; Kunda 1990; Vaisey 2009; Martin and Desmond 2010). Research has shown that social and cultural factors, such as group membership, media framing, and affect, shape how individuals interpret and process information. These findings shift focus away from the relationship between scientific knowledge and public acceptance of science, toward what Goffman (1986, 21) called primary frameworks or "schemata of interpretation," which "allows the user to locate, perceive, identify, and label a seemingly infinite number of concrete occurrences." Of particular interest in this study is the role of ideology in explaining public perceptions of science. Although poorly understood by social scientists (see Martin and Desmond 2010; Perrin, Roos, and Gauchat 2014), political ideology is both a belief system (or set of belief systems) as well as a group identity, and if properly conceptualized, likely profoundly influences individual cognition.

An approach building on cognitive sociology suggests substantively different explanations of public perceptions of science than those found in previous research in this area (see Cerulo 2014; Ignatow 2014; Lizardo 2014; Martin 2011; Vaisey 2009 for a discussion of cognitive sociology). For example, the "deficit model" assumes that knowledge (or literacy) is fundamental in shaping public opinions about science, because cultural divisions are critical *only* in the absence of the requisite knowledge and information (see Wynne 1995). Thus, the baseline claim of the "deficit model" would be that individuals' perceptions of

science are associated with ideological dispositions and group identity when science literacy was low or average (i.e., when respondents lack sophistication). Contradicting this claim, recent public opinion research has shown that science literacy does not reduce "the effect" of group identity or worldview, but intensifies these effects (Bolsen, Druckman, and Cook 2014; Lee, Scheufele, and Lewenstein 2005; see also Gauchat 2012; Kahan et al. 2012). The explanation for this finding is that more sophisticated group members tend to better understand how their beliefs and identities relate to a wide variety of technical issues, especially domains that are less commonly expressed and accessible in public discourse (e.g., "reducing government regulation" [accessible] versus "raising the minimum wage" [remote]). More fundamentally, cognitive sociology would emphasize the belief systems associated with public perceptions of science, with levels of scientific cultivation and sophistication being a secondary concern.

The current study overcomes substantial obstacles that have impeded social science research on this topic: mainly, the conceptualization and measurement of public perceptions of science and political ideology. Following insights from the cognitive sociology, public perceptions of science are formed in a field of relationships between the individual and social environment that include discursive claims about the cultural image of science (see Gieryn 2010). Given this insight, this study emphasizes the acceptance/disapproval of the culture frames that professional organizations, policymakers, and journalists use to construct science's "public image," rather than monolithic notions of "trust in science." Moreover, with broad public support, the epistemic authority of science—the credibility it has to make claims about how the world works—remains largely unchallenged; instead, contestation and polarization likely occur when science endeavors to regulate human behavior through government policy.[3] Thus, the science-policy and science-funding discursive frames examined here represent a substantial improvement over previous research on this topic that did not hypostatize the institutional ties between science and the state.[4]

A second major obstacle has been the conceptualization of political dispositions. In sum, political ideology remains poorly understood in survey research. The difficulty has been disentangling the cognitive elements (i.e., belief systems) from the symbolic identities (i.e., group solidarity) implicit in political dispositions. Either by habit or by necessity, survey researchers frequently measure political ideology with a unidimensional left-right orientation scale (i.e., respondents' self-placement arrayed from liberal to conservative) (see Jost, Federico, and Napier 2009 for a review). Building on recent theoretical advances, this study develops and empirically tests a multidimensional approach to political ideology that specifies both the belief systems and group solidarity aspects of political ideology.

Three Models of Polarization

Decades of scholarship have revealed that science faces continuous political headwinds, even though the boundaries of science and the political context it confronts are dynamic and socially negotiated (Geiryn 1999; Lewenstein 1992; Merton 1968[1942]; Moore 2008; Nisbet 2010; Shapin and Schaffer 1985;

Shapin 2008, 2010). Similarly, public perceptions of science are dynamic, reflecting changes in the larger social environment and the salience of different issues. Moore (2008) highlights that after World War II, scientists were increasingly engaged in political debates in the broader society in hopes of influencing regulatory policy and broader cultural beliefs. Jasanoff (1990) finds that by the 1970s, scientific expertise had become deeply entwined with regulatory policy in the United States, but public trust in this arrangement began to fray by the early 1980s, during the Reagan Administration. Political and cultural divisions in the United States also became more pronounced in this period, with the major parties becoming more "ideologically" pure and expanding their platforms into cultural issues (Ellis and Stimson 2012; McCarty, Poole, and Rosenthal 2006). With the "politicization" of professional science and growing polarization in the general public, social analysts from a variety of backgrounds have speculated that public perceptions of science have become politically charged (see Otto 2012; Mooney 2005; ScienceDebate.org 2015; Union of Concerned Scientists 2015).

Gauchat (2012) provides the most concrete empirical evidence that public perceptions of science have become more politically charged over time in the United States. Using public opinion data from 1974 to 2010, this study found a statistically significant decline in conservatives' confidence in the scientific community during the period. Other recent studies have confirmed that views on climate science and evolution are polarized according to left-right orientation (Kahan et al. 2012; McCright and Dunlap 2011; Newport 2007). Gauchat identified two distinct social changes that account for the decline in conservatives' evaluations of science. First, he argues that the growing ties between science and regulatory policy since the 1970s weakened support among conservatives, who increasingly oppose strong government control over private economic interests. Second, beginning in the 1990s, religious conservatives now exert considerable influence in the conservative movement, which intensified a tension between secular scientific authority on one side, and traditional moral authority on the other. Gauchat argued that these modes of discontent operate independently, and reflect the belief systems of different factions within the conservative movement. He also found that the decline was most pronounced among educated conservatives. This finding is consistent with the thesis in cognitive sociology that "sophisticated" individuals tend to understand the weight of competing positions on a large array of issues and defend their group identities (see Sherman and Cohen 2006: Martin and Desmond 2010).

Despite these findings, researchers have yet to examine the polarization question using more refined measures of public perceptions, such as the science-funding and science-policy items used in this study. Moreover, political ideology remains a conceptual "black box" in this research (see Ellis and Stimson 2012 for a similar argument). To address this shortcoming, the current study tests a number of polarization models that draw on work in political psychology and cultural sociology.

In their comprehensive review of the literature, Jost, Federico, and Napier (2009, 310) advance that political ideology is composed of an interlocking network of beliefs, evaluations, and ontologies. However, they contend that the cognitive structure of political ideology remains elusive, underscoring long-standing

debates among social and political psychologists about "the manner and extent to which political attitudes are cognitively organized according to one or more dimensions." The conventional single-dimension conceptualization of ideology assumes that a latent belief system motivates left-right orientations. Jost et al. glean two interrelated aspects of this belief system from the literature: (a) arguments about tradition versus social change; and (b) arguments for and against inequality. Gross, Medvetz, and Russell (2011) similarly show that numerous scholars have attempted to reduce American conservatism to a single dimension or underlying disposition. Even so, left-right political polarization is evident among political elites in the United States—those with observable ties to "liberal" and "conservative" organizations and identity projects (McCarty, Poole, and Rosenthal 2006). Moreover, research has shown evidence for a realignment in the general public: a process in which the political parties and ideological labels (e.g., liberal and conservative) have become more differentiated, and thus provide the public with better cues and clearer choices (Baldassarri and Gelman 2008; Brooks and Manza 2013).

In short, the simplest model of polarization suggests that public acceptance of science can be adequately explained in terms of liberal-conservative ideological conflict. More specifically, the left-right polarization model hypothesizes that elite cues and realignment in the general public have contributed to greater distance between "liberal" and "conservative" worldviews. Recent public opinion research has also pointed to growing skepticism toward science on the political right. However, this model requires the strong assumption that left-right identifications indicate a unidimensional belief system. It also fails to explain the theoretical link between left-right polarization and perceptions of science.

One prominent alternative model in sociological research is the secular-traditional conflict or culture war thesis. Hunter (1991) defined the "culture war" as a far-reaching social and political realignment in the United States that resulted in scientifically minded "progressives" aligning with the political left and "orthodox" religious traditionalists migrating to the political right. While controversial among social scientists (see Fiorina, Abrams, and Pope 2010), the "culture war" account remains central to mainstream media explanations of American political culture (see Frank 2005 for a related argument). In this study, the culture war thesis refers to the idea that political divisions in public perceptions of science can be reduced to conservative religious dispositions, especially the idea that the Bible contains literal truths that are relevant to the regulation and organization of human behavior (see Ellis and Stimpson 2012; Evans and Evans 2008). Consistent with this perspective, numerous studies have confirmed that conservative religious beliefs are associated with negative perceptions of science, and that this association is growing stronger over time (Ellison and Musick 1995; Evans 2013; Gauchat 2008, 2012). In contrast, Evans (2013) showed that interviewees with deep religious convictions express support for science across a variety of domains, suggesting a more complex relationship. The question in this study is whether religious beliefs are associated with less support for the intersection of science and the state, and whether this accounts for observed differences between "liberals" and "conservatives."

The shortcoming of the culture war argument is that it tends to overstate conflict between science and religion while overlooking secular modes of thought

that may also conflict with the cultural authority of science. Gross, Medvetz, and Russell (2011) and Jost, Federico, and Napier (2009) identify two alternative definitions of conservatism in the social science literature: *authoritarianism*—a fear of uncertainty and desire for social order—and *neoliberalism*—opposition to government intervention into the economy and progressive social welfare policies. The current study develops a third polarization model and hypothesizes that public reservations toward science are multidimensional, involving a number of distinct modes of thought loosely tied together by political identifications (Gauchat and Redding 2015; Gross, Medvetz, and Russell 2011; Perrin, Roos, and Gauchat 2014; Wuthnow 1989).

A large number of studies have used "authoritarian" beliefs to measure the psychological component of contemporary ideology in the United States (Altemeyer 1998; Duckitt et al. 2002; Duckitt 2006; Napier and Jost 2008; Hetherington and Weiler 2009; Stenner 2005). According to this research, authoritarianism is generally used to indicate a desire for social order and feelings of general threat (Jost, Federico, and Napier 2009). Numerous studies have also linked the authoritarian worldview with relatively rigid cognitive dispositions, indicating a general need for certainty, closure, and aversion to complexity (Feldman and Stenner 1997; Jost et al. 2003; Kahan 2013; Hetherington and Weiler 2009). The association between authoritarian beliefs and public perceptions of science is unclear, and previous research has yet to examine this question. On the one hand, authoritarians may be less supportive of science, because of their aversion to uncertainty and ineffectuality associated with science in contemporary life (see Giddens 1991; Beck 1992). From this perspective, scientific knowledge represents insufficient authority, because it fails to provide calculable and definitive responses to pressing social problems. At the same time, authoritarians might support science, because it contributes greatly to the expansion and application of techniques for maintaining social order at every single level of society (e.g., surveillance, military technology, medical protocol, scientific management). Thus, authoritarians could support or indicate reservations about the intersection between science and the state.

Centeno and Cohen (2012) describe neoliberalism as a disposition that "stresses the necessity and desirability of transferring economic power and control from governments to markets." A number of key studies have shown that neoliberal beliefs about inequality and the government's role in the economic sphere represent a primary framework in contemporary American politics (Gross, Medvetz, and Russell 2011; Jost, Federico, and Napier 2009). Brooks and Manza (2013, 742) found a strong association between conservative identification and neoliberal views on government responsibility, among both elites and the general public. The current study empirically tests whether neoliberal beliefs are in conflict with support for science-based policy and federal funding. No studies directly address this question, so the expected direction of this association is unclear. On one side, opposition may arise from the bonds between science and the regulatory state since the 1970s, which neoliberalism would oppose. Yet, laissez-faire beliefs may also indicate support for science, if the latter is thought to relate to innovation and economic vitality instead of state regulation.

To summarize, this study examines three theories of polarization that have support in previous research but have not been tested together in one study. The first indicates that political divisions in public perceptions are associated with left-right polarization and can be explained using the conventional unidimensional measure of ideology. The culture war thesis, alternatively, posits that the association between public acceptance of science and ideology is spurious, because religious conservatism is the "intervening cause." Finally, a third approach attempts to directly measure the various modes of thought that underlie political identities in the United States and hypothesizes that the polarization of public perceptions of science is multifold and involves distinct modes of thought that have coalesced on the political right. Three different beliefs systems are examined: (1) *biblical literalism*—the idea that the Bible is the literal word of God; (2) *authoritarianism*—a fear of uncertainty and the desire for social order; and (3) *neoliberal* views about the role of government in the economic sphere.

To account for the affective dimensions of political ideology, this study also considers two interaction effects. Martin and Desmond (2010, 9) argue that knowledgeable or sophisticated members of the public form stronger opinions, what they call *hyperconsistency,* "because they know what kinds of knowledge about the social world help and hurt their position, and they will then have a preference to believe what supports their ideological leanings." Thus, contrary to the baseline expectation that scientifically literate individuals will rely less on their ideological leanings, hyperconsistency hypothesizes that the effect of political identity will be strongest for scientifically sophisticated group members who best understand the intellectual positions embodied in their identity and will defend their group's positions (Cohen 2003; Kahan 2013; Sherman and Cohen 2006). Thus, the effect of political identification (liberal-conservative) will be associated with support for science when individuals report high levels of literacy.

A second interaction effect is used to test the *threat anxiety* hypothesis, which predicts that individuals will process information differently under conditions of uncertainty and fear. Researchers in political psychology have used authoritarianism to approximate cognitive rigidity and a need for certainty, closure, and aversion to complexity (Feldman and Stenner 1997; see Jost et al. 2003 for a review). Due to feelings of threat, the authoritarian mode of thought is hypothesized to moderate the positive association between public acceptance of science and science literacy.

Data and Measurement

The data used in this analysis come from the NSF's *Survey of Public Attitudes Toward and Understanding of Science and Technology.* Since 2006, this survey has been included in the biennial General Social Survey (GSS). The GSS is a nationally representative, face-to-face survey conducted by the National Opinion Research Center (NORC). The GSS Science and Technology module (S&T) is a large and comprehensive survey of public attitudes and knowledge of science.[5] Its inclusion in the GSS also provides access to detailed demographic data and a wide variety of questions about the cultural and political views of the adult

population in the United States. The data for this analysis come from the 2006, 2008, 2010, and 2012 surveys. The GSS uses a "split ballot" design, with ballots typically given to about a third of the sample.

Perceptions of Science and the State

To assess public acceptance of science's cultural authority, GSS respondents were given a set of statements about science in society and asked how much they agreed or disagreed with them: (1) "Science is too concerned with theory and speculation to be of much use in making concrete government policy decisions that will affect the way we live"; and (2) "Even if it brings no immediate benefits, scientific research that advances the frontiers of knowledge is necessary and should be supported by the federal government." Respondents were given four response categories, ranging from "strongly agree" to "strongly disagree." The science-funding item was then reverse coded, so that higher values represent more positive views toward science. Figure 1 shows the histograms for the final items used in the analysis.

Independent Variables

To measure public scientific knowledge, this study uses a *Z*-score standardized scale composed of factual quiz-type questions. This measure is often referred to as the "Oxford scale" and has been employed in numerous studies (see Gauchat 2011; National Science Foundation 2012). Respondents are asked about a range of scientific topics and whether they think a statement is "true" or "false," or if they "don't know." They are also asked about scientific methods and process, and these items are coded as "correct" and "incorrect" based on predetermined criteria. Following the standard of previous studies, "don't know" responses are coded as incorrect answers. Two items related to the "Big Bang theory" and "evolutionary theory" were excluded because of the potential religious bias in these questions. The final scale contains 12 items, $\alpha = .58$.

Table 1 lists the independent variables used in this analysis, aside from the science variables discussed above. Consistent with the discussion above, "political ideology" is measured using the conventional Democrat-Republican/liberal-conservative orientation scale and is coded so that higher values represent more conservative respondents (see Smith 2000). In addition, the study measures a number of belief systems or modes of thought that underlie these orientations. Biblical literalism is dummy coded from a question about how respondents understand the meaning of the Bible (see table 1 for details). Authoritarianism is measured using a set of questions about what characteristics respondents desire in children (Feldman and Stenner 1997; Hetherington and Weiler 2009; Jost, Federico, and Napier 2009; Stenner 2005; Perrin, Roos, and Gauchat 2014). Government responsibility is measured using a scale of items about the government's role in economic and social affairs (see Brooks and Manza 2013). Because public acceptance of science is viewed in relation to the state in this analysis, it is important to control for public "confidence in the government," which is a scale that combines three questions about respondents' confidence in the executive,

legislative, and judicial branches of government (Smith 2012). We also use a variety of control variables, which are described in table 1.

Analytic Strategy

The dependent variables measuring public views toward the intersection of science and the state are ordinal, with four ordered response categories. For consistency, the science-funding item is recoded so that higher values represent more positive views toward science. Ordinal logistic regression was developed to estimate ordered categorical outcomes and is commonly used in practice. There are two potential shortcomings of ordinal logistic regression. First, the parallel lines assumption requires that the slopes are identical across the response categories. Although this assumption is often violated, a Brant test indicates that this is not

Table 1. Key Independent Variables from the General Social Survey, 2006–2012

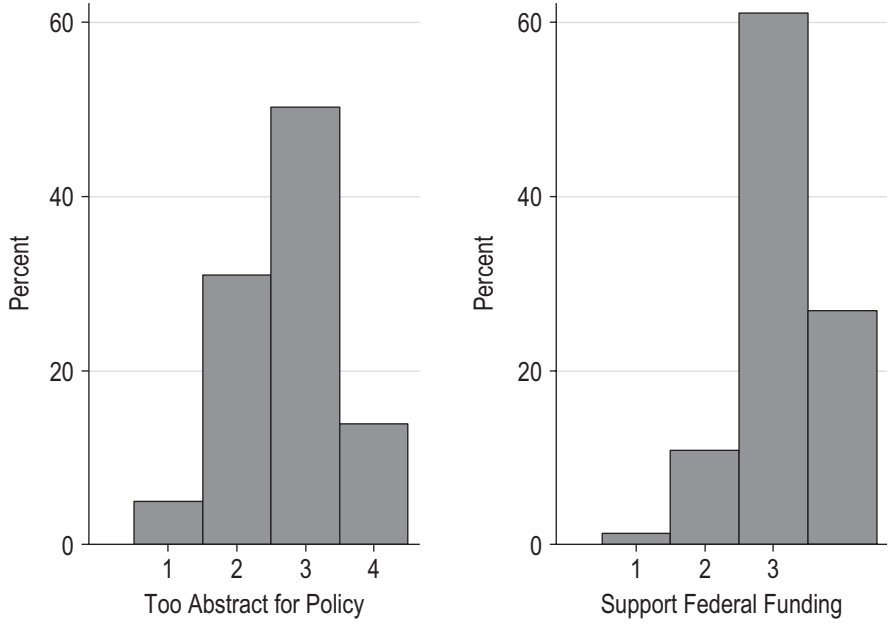
Variable	Item wording/coding
Confidence in government	*Z*-score standardized scale of respondents' confidence in the executive, legislative, and judicial branches of federal government, $\alpha = .67$
Political ideology	*Z*-score standardized scale of 7-point liberal-conservative ideology item and the 7-point party identification item, $\alpha = .65$
Bible is word of God	Which of these statements comes closest to describing your feelings about the Bible? 1 = The Bible is the actual word of God and is to be taken literally, word for word. 0 = The Bible is an ancient book of fables, legends, history, and moral precepts recoded by men.
Divinely inspired	Which of these statements comes closest to describing your feelings about the Bible? 1 = The Bible is the inspired word of God but not everything in it should be taken literally, word for word. 0 = (see above).
Authoritarian	*Z*-score standardized scale of two items. "If you had to choose, which thing on this list would you pick as the most important for a child to learn to prepare him or her for life?" (1 = most important—4 = least important (1) "To obey (reversed)"; (2) "To think for him or herself." Higher values represent stronger authoritarian orientations, $\alpha = .66$.
Government responsibility	*Z*-score standardized scale of four items related to government intervention into the economy. Scale scores are estimated with a factor-analytic model, $\alpha = .78$.
Female	0, 1
Nonwhite	0, 1
Education	Years
Family income	1986 $
Age	Years/10

an issue in this analysis. A second issue with ordinal logistic regression is the interpretation of interaction effects. In nonlinear models, conventional significance tests of the logged odds coefficients are controversial, because the estimated coefficients confound the magnitude of the effect of a predictor with the degree of unobserved heterogeneity in the model (Allison 1999; Long 2009). The straightforward solution to this problem is to use predicted probabilities and delta standard errors for significance tests, which is the approach adopted here.

The two interactions emphasized in this study are consistent with the theoretical questions discussed above, but other interaction effects were considered in supplementary analyses. Likelihood ratio tests, comparing a null model (model 2 below) to a full model that added each interaction effect separately, showed that these variables did not improve model fit. The final specifications were also estimated with generalized ordinal logistic regression, which estimates models with less rigorous assumptions but are difficult to present succinctly. The results of these supplementary analyses yield substantively the same findings as those reported below.

In order to compare effect sizes, the tables present standardized coefficients. The variance of a latent-variable y^* is estimated when computing standardized variables. This procedure is recommended, because the interpretation of coefficients is analogous to linear regression models (Long 1997, 129: McKelvey and Zavoina 1975, 114–16; Winship and Mare 1984, 512–25). For the science-policy outcome, y^* is a latent variable that represents the propensity to support scientific influence on government policy. Similarly, for the science-funding item, y^* is a latent variable

Figure 1. Histograms for science-policy and science-funding items, GSS 2006–2012



representing the propensity to support federal funding of scientific research. For dummy variables, the tables report y^*-standardized coefficients, so that for a unit increase in x_k (from 0 to 1), y^* is expected to increase by $\beta_k^{Sy^*}$ standard deviations, holding all other variables constant. For all other variables x_k, y^* standardized coefficients are presented, so that a standard deviation increase in x_k is expected to increase by β_k^S standard deviation units. For model fit, McKelvey and Zavoina's R^2 (1975, 111–12) is used, because simulation research has shown that this metric best approximates the R^2 from linear regression models (Long 1997).

Results

Figure 1 presents the histograms for each outcome variable. Notice that there is substantial support for the institutional coupling of science and government in the general public, but also variation in views. For the "Too abstract for policy" item, about 64 percent disagree with the statement that science is too theoretical to inform social policy; but support is not overwhelming, with only 13 percent strongly disagreeing. Likewise, over 88 percent of respondents agree that the federal government should fund scientific discovery, although only about a quarter of respondents strongly support it. On the surface, this would indicate that concerns over science's authority are exaggerated; on the other hand, if public perceptions are polarized, a well-resourced and ideologically motivated minority can pose substantial challenges.

Table 2 presents the results of three ordinal logistic regression models estimating the science-policy item. Recall that the response variables are coded so that higher values represent more support for science. The first model is a baseline, including controls, science literacy, and political ideology—measured using the conventional liberal-conservative/Democrat-Republican scale.[6] Model 2 adds the biblical literalism (dummy coded), authoritarian, and government responsibility variables. Model 3 includes interaction effects that test *hyperconsistency* and the *threat anxiety* hypotheses discussed above.[7] The findings in model 1 are consistent with previous research on public perceptions of science. On average, nonwhites, individuals with lower levels of education and science literacy, and conservative respondents report less support for the use of science to inform public policy. Notably, the significant effects of nonwhite and political ideology disappear in model 2 when the belief systems are added. This finding does not support the simple left-right polarization model, and instead indicates that multiple belief systems are required to explain polarized opinions of science.

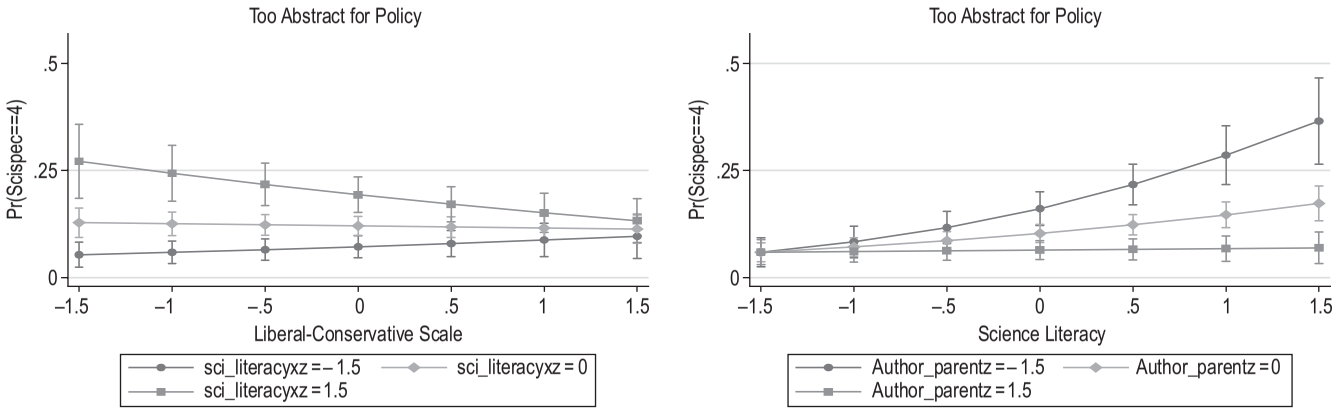
In model 2, the biblical literalism and authoritarian belief systems are both statistically significant. The belief that the Bible is the literal word of God is negatively associated with support for scientifically informed government policy ($p < .001$). Around a third of respondents believe that the Bible is the literal world of God, and another 46 percent believe it is divinely inspired, suggesting that biblical literalism is not an inconsequential belief in the United States. A Wald test indicates that the effect for "Bible word of God" is greater than "Bible divinely inspired" ($x^2 = 6.59$, $p < .05$). Authoritarian beliefs are also negatively associated with support for science-based government policy ($p < .001$). Notably, beliefs about government responsibility are not associated with the science-policy outcome.[8]

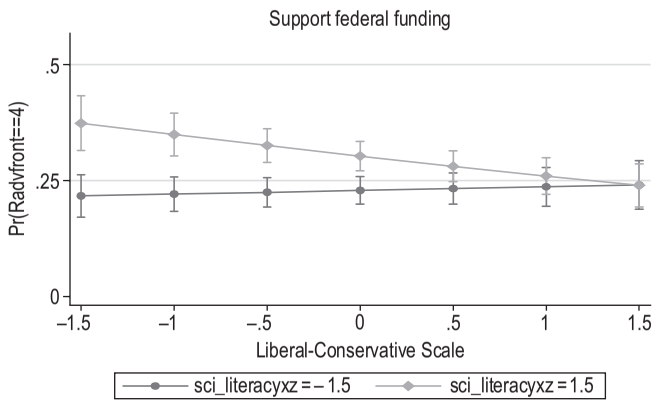
Table 2. Ordinal Logit Models Estimating the Science-Policy Item, GSS 2006 (*N* = 801)

	(1)	(2)	(3)
Female	–.031	–.010	–.011
	(.138)	(.142)	(.143)
Nonwhite	–.228*	–.065	–.025
	(.177)	(.188)	(.191)
Family income	–.011	–.039	–.049
	(.001)	(.001)	(.029)
Education	.189***	.154***	.156***
	(.029)	(.029)	(.029)
Age	.007	.018	.013
	(.004)	(.004)	(.004)
Political ideology (conservative)	–.107**	–.046	–.025
	(.069)	(.082)	(.084)
Science literacy	.226***	.183***	.240*
	(.177)	(.180)	(.429)
Confidence in government		.020	.017
		(.070)	(.070)
Bible word of God		–.448***	–.419***
		(.228)	(.236)
Bible divinely inspired		–.233*	–.201*
		(.195)	(.206)
Authoritarian		–.165***	–.174***
		(.081)	(.082)
Government responsibility		–.003	.013
		(.084)	(.085)
Political ideology × science literacy			–.154*
			(.158)
Authoritarian × science literacy			–.177*
			(.173)
Word of God × science literacy			–.242
			(.503)
Divinely inspired × science literacy			–.040
			(.476)
Likelihood-ratio chi-square	111.7	154.4	169.7
McKelvey and Zavoina's R^2	.152	.205	.219

Note: Standard errors are in parentheses. Coefficients for dummy variables are *Y*-standardized. All other coefficients are *XY*-standardized. "The Bible is a book of fables" is the reference category for biblical literalism.
***$p < .001$ **$p < .01$ *$p < .05$

Figure 2. Predicted probabilities with 95 percent confidence intervals showing theoretically relevant interaction effects





Model 3 adds the interaction effects to test the hyperconsistency and threat anxiety forms of motivated reasoning. A likelihood ratio test indicates that both the political ideology × science literacy and authoritarian × science literacy interaction effects improve mode fit. Consistent with the hyperconsistency hypothesis, model 3 shows that the effect of political ideology depends on the level of a respondent's science literacy. Figure 2 (panel 1) graphically represents this relationship. The three lines represent predicted probabilities for science literacy at the mean and 1.5 standard deviations above and below the mean, and the *x*-axis is political ideology. This graph indicates that when science literacy is held at the mean and 1.5 standard units below the mean, political ideology has no effect on the acceptance of science policy. Only for scientifically sophisticated respondents, those 1.5 standard units above the mean, is conservative political ideology associated with less favorable views toward science's authority. This supports hyperconsistency, because it suggests that after controlling for the underlying belief systems, political identity is a factor only when respondents are intellectually engaged.

The results in model 3 also support the threat anxiety hypothesis. Figure 2 (panel 2) shows that the effect of science literacy depends on respondents' level of authoritarianism. That is, the slope for science literacy is essentially flat for those with high levels of authoritarianism. For those 1.5 standard units below the mean, the positive slope is strongest. This is consistent with the threat anxiety hypothesis, because it shows that science literacy does not affect the perceptions of authoritarians, who are instead motivated by a desire for order and fear of uncertainty.

Overall, the results in table 3 support the more complex model of politicization over the left-right polarization or culture war models. Model 1, which represents the liberal-conservative polarization model, has the weakest model fit. Table 2 also supports the more complex politicization model over the culture war model. A likelihood ratio test shows that the full model (model 3) fits the data better than the simple model (model 1) adding just the biblical literalism dummy variables ($x^2 = 33.27$, $p < .05$).

Table 3 presents the models estimating public support for federal funding of science. The basic logic of the regressions is consistent with table 2. Overall, the results in table 3 further support the collective identity model of politicization. All three models also include dummy variables for survey years 2008, 2010, and 2012, but these variables are not reported here. In model 1, respondents with higher levels of education and science literacy are more supportive of federal funding, and more conservative respondents report less support for federal funding than liberal respondents. Again, model 2 shows that the liberal-conservative effect is diminished when we add the belief system variables, although it remains statistically significant.

Confidence in the federal government is positively associated with support for federal funding of science, which is different from the results for the science-policy outcome. Biblical literalism has a relatively strong negative effect on public support for federal funding of science. This finding, along with similar results for the science-policy outcome, suggests a substantial tension between science and religious beliefs in the United States, not *in abstracto*, but in the way science is

Table 3. Ordinal Logit Models Estimating the Science-Funding Item, GSS 2006–2012 (*N* = 2,699)

	(1)	(2)	(3)
Female	–.069	–.053	–.057
	(.079)	(.081)	(.081)
Nonwhite	–.064	–.054	–.041
	(.098)	(.103)	(.104)
Family income	.028	.033	.031
	(.015)	(.016)	(.016)
Education	.132***	.117***	.117***
	(.001)	(.001)	(.001)
Age	–.035	.001	–.001
	(.002)	(.002)	(.002)
Political ideology (conservative)	–.163***	–.054*	.051
	(.039)	(.046)	(.046)
Science literacy	.064**	.068**	.067
	(.097)	(.101)	(.219)
Confidence in government		.121***	.121***
		(.041)	(.041)
Bible word of God		–.349***	–.333***
		(.125)	(.129)
Bible divinely inspired		–.324***	–.312***
		(.107)	(.110)
Authoritarian		–.040	–.040
		(.045)	(.046)
Government responsibility		–.171***	–.162***
		(.047)	(.047)
Political ideology × science literacy			–.096*
			(.086)
Authoritarian × science literacy			–.021
			(.092)
Word of God × science literacy			–.019
			(.266)
Divinely inspired × science literacy			–.021
			(.251)
Likelihood-ratio chi-square	169.5	292.5	297.9
McKelvey and Zavoina's *R*	.075	.128	.130

Note: Standard errors are in parentheses. Coefficients for dummy variables are *Y*-standardized. All other coefficients are *XY*-standardized. 2006 is the reference category for years. "The Bible is a book of fables" is the reference category for biblical literalism.

used in society and financially sustained. Notably, a Wald test indicates that "Bible word of God" and "Bible divinely inspired" variables have largely the same effect, meaning that even moderate views about the divinity of the Bible are associated with less support for science funding.

Authoritarian beliefs are not associated with this outcome. The government responsibility variable has a negative and statistically significant effect, supporting an association between public perceptions of science funding and neoliberal views about government. Overall, these results show that perceptions of science are polarized, but this political discord reflects deeper cultural belief systems that cohere on the political right. Moreover, when comparing the results in tables 2 and 3, the belief systems associated with less favorable views toward science are somewhat distinct for the science-policy and science-funding frames.

Model 3 adds the interaction effects to test the hyperconsistency and threat anxiety hypotheses. The results in model 3 support the hyperconsistency hypothesis but not the threat anxiety hypothesis. A likelihood ratio test confirms that adding the political ideology × science literacy variable improves the model fit over the null model (model 2). Figure 2 (panel 3) shows the predicted probabilities at 1.5 standard units above and below the mean of science literacy, excluding the average science literacy line so that the confidence intervals can be seen clearly. The graph shows that the marginal effect of liberal-conservative orientation is relatively flat when science literary is low, and that the slope becomes steeper when science literacy is high. That is, left-right orientation is a factor in predicting support for the science-funding outcome among more scientifically sophisticated respondents.

Discussion

Are public perceptions of science polarized in the contemporary United States? To answer this question, three distinct models of politicization were tested in this study. The first model hypothesizes that variation in public acceptance of science can be explained in terms of left-right political polarization and a unidimensional conceptualization of ideology. A second model predicts that conservative religious beliefs, and not political ideology, best explain differences in public perceptions of science. A third model hypothesizes that politicization is best understood in terms of a conservative collective identity, which contains both cognitive (i.e., multiple belief systems) and emotional (i.e., group solidarity, fear) content.

In summary, the results of the multiple regression analysis best support the collective identity model. The findings also show that the "direct effect" of liberal-conservative orientation is spurious once the distinct belief systems that underlie those identifications are accounted for. Instead, the effect of liberal-conservative identification depends on the scientific sophistication and intellectual engagement of respondents—the effect of left-right orientation is statistically significant (and negative) only at high levels of science literacy. The results also support a constrained version of the culture war model: one that does not overstate the conflict between scientific authority and religious beliefs, and recognizes that secular strains of conservatism also play a role. Moreover, the belief systems associated with each outcome are not uniform. For the science-policy outcome, authoritarian

beliefs are associated with greater skepticism and neoliberalism has no effect; and for the science-funding outcome, neoliberalism is the key factor. In total, the results reported above indicate that the unidimensional model of left-right conflict oversimplifies the cultural sources of science's politicization in the United States.

This study offers two main contributions. First, rather than examining more abstract attitudes toward science in the general public, this analysis emphasizes a theoretically and socially relevant aspect of public perceptions of science—science's claims to cultural authority in relation to the modern state. The science-policy and science-funding outcomes examined here correspond to both symbolic and material resources that flow to science from the state. Shapin and Schaffer (1985, 332), in their seminal work, argued that the cultural authority of science is concomitant with the wider social and political order, because the emergence of "professional science" expanded state hegemony over alternative claims to knowledge in the civil sphere. Thus, it is a mistake to assume that science ever enjoyed totalizing cultural authority (see Shapin 2008, 2010). The question at issue in this study is whether the communities indicating apprehensions are politically organized and possess the resources to change the institutional arrangement between science and the state (see Wuthnow 1989).

Within this context, the findings in this study have deeper implications, because they imply that the culture divisions over science's authority have coalesced with political identities rather than cross-cutting them. This resonates with the observed reshuffling of science's base of power, with symbolic and financial resources coming increasingly from non-state and particularly powerful commercial interests (see Frickel and Moore 2006; Mirowski and Sent 2008; Moore et al. 2011). Yet, the findings reported here also show that the coalescence on the right is loosely structured, with different belief systems opposing some aspects of science's authority but not others. For example, authoritarians are concerned about the use of science to inform policy, but not about government funding of science. In contrast, individuals expressing neoliberal beliefs are unconcerned with evidence-based policy, but have reservations about government spending on "basic" research. Based on the results reported here, only biblical literalism is associated with skepticism of both the symbolic power of science to influence state policy and the use of state resources to fund science. Even so, public apprehensions toward science also come from secular locations in society, which are often overlooked in discussions of "politicization" and less easily dismissed as a cultural vestige. In addition, the hyperconsistency effect indicates that scientifically sophisticated conservatives express strong skepticism across both outcome variables and independent of their beliefs. If this approximates the views of activists and elites in the community, then conservatives appear politically mobilized to challenge the growing intersection between science and the state, rather than this skepticism representing a fringe view among the intellectually unsophisticated. Surveillance technology, climate change, global pandemics, and medical technology in aging societies all portend an expanding role for science in the governance of human behavior and culture, but this seems to discount the limitations of scientific authority to influence human affairs outside the context of a strong regulatory state, with the latter facing an uncertain political future.

The second contribution of this study is the innovative measurement of left-right political identity, involving distinct belief systems and affective content. Building on previous work (Gross, Medvetz, and Russell 2011; Perrin, Roos, and Gauchat 2014), this study examines three main dimensions of left-right identity: biblical literalism, authoritarianism, and neoliberal beliefs. The analysis also incorporates ideas from cognitive sociology to test the role of affective factors in the politicization of science, including group-identity defense and fear of uncertainty. Future studies should examine the collective identity model further and extend it to areas unrelated to science. For example, how have these belief systems changed over time in the general public, both independently and in their association with political identification (i.e., liberal-conservative orientation)?

This study also has a number of limitations. Importantly, perceptions of science are only one aspect of the cultural authority of science, but an important one in the United States, where large public investment in scientific research has been the norm since World War II. Shapin (2010) has proposed that the cultural authority of "science" is likely distinct from the authority of scientists in specific professional fields (e.g., forensics, climate science, medical research, social science). This study does not empirically examine this question, and future research should address this issue. However, the cultural and discursive framing of "science" by professional organizations and science journalists is still relevant and worthy of study in its own right (see Gieryn 1983, 1999). The potential relationship between public perceptions of "scientists" and "science" is an essential frontier for research on public understanding of science (see Gauchat 2011, for example). Another limitation of this analysis is that it cannot identify trends over time. This is a constraint of existing data sets, because only since 2006 have public attitudes toward science been collected alongside detailed culture and political variables. Analyses of repeated cross-sections will be available with the release of the 2016 *Survey of Public Attitudes Toward and Understanding of Science and Technology,* affording researchers a full decade of data. Even with these limitations, this study offers a number of key theoretical advances that will further future research on the cultural authority of science.

Notes

1. Public perceptions of science are one key aspect of the cultural authority of science, but the effects of science on material culture and organizations are equally important (see Driori et al. 2002; Gieryn 1999).
2. For a great example of these discursive images in science journalism, see the November 2012 article in *Scientific American* that discussed the politicization of science in the United States. Also of interest was the clamor for a "science debate" involving the 2012 US presidential candidates Mitt Romney and Barack Obama. Notably, the term "evidence-based policy" has become a professional buzzword in science organizations like the NIH and NAS, and is essentially synonymous with the term "science policy" used in this study. Evidence-based policy specifically refers to the need to accumulate scientific evidence to assess alternative "treatments" or policy initiatives and is most often used in the context of medical research.
3. As Gieryn (2010) and Shapin (2010) argue very effectively, science enjoys a great deal of cultural authority. So much so, that it is very difficult to locate an "anti-science"

disposition in the United States, where a segment of the population believes that the broad enterprise of science is wrong, harmful, and must be stopped. I know of no "pure anti-science" activist communities. Given this, political disposition and belief systems are not "anti-science," but may produce different cultural images of science, especially in relation to government regulation and public funding.

4. Survey researchers have consistently argued that survey items that target specific objects, such as opinions about science in relation to government, tend to yield more substantive conclusions about public opinion than abstract or general questions (Converse and Presser 1986).
5. The GSS S&T module was carefully developed by social scientists in partnership with the National Science Foundation and National Opinion Research Center (NORC). Currently, it is the only module in the GSS that is repeated in every biannual survey. Given this, the S&T module ostensibly represents its own entity.
6. A number of alternative specifications for political ideology were examined. First, I examined a model that included only a measure of liberal-conservative political views. A second included both liberal-conservative and party identification as separate variables. Another model used dummy coding for both liberal-conservative views and party identification. None of these alternative specifications substantively changed the conclusions presented below, including the results for the interaction effects.
7. Science literacy × biblical literalism and science literacy × government responsibility were also examined; however, these interaction effects were not statistically significant and did not change the results shown here. For further rigor, all potential interaction effects were examined separately and then together in one model. These analyses yield the same results as those reported.

About the Author

Gordon Gauchat is an Assistant Professor of Sociology at the University of Wisconsin–Milwaukee. His research interests include the cultural authority of science, political sociology, and cognitive sociology. He has published studies in *American Sociological Review*, *Sociological Forum*, *Gender and Society*, and *Public Understanding of Science* on these various topics. He is currently working on a number of projects that examine the consequences of public perceptions of science for democratic values, political participation, and science-related policy positions. He is also developing a new conceptualization of political ideology that accounts for advances in cognitive sociology and theories of intellectual movements.

References

Allison, Paul D. 1999. "Comparing Logit and Probit Coefficients across Groups." *Sociological Methods and Research* 28(2):186–208.

Allum, Nick, Patrick Sturgis, Dimitra Tabourazi, and Ian Brunton-Smith. 2008. "Science Knowledge and Attitudes across Cultures: A Meta-Analysis." *Public Understanding of Science* 17(1):35–54.

Altemeyer, Robert A. 1998. "The Other 'Authoritarian Personality.'" *Advances in Experimental Social Psychology* 30(1):47–91.

Baldassarri, Delia, and Andrew Gelman. 2008. "Partisans without Constraint: Political Polarization and Trends in American Public Opinion." *American Journal of Sociology* 114(2):408–46.

Bauer, Martin, Nick Allum, and Steve Miller. 2007. "What Can We Learn from 25 Years of PUS Survey Research? Liberating and Expanding the Agenda." *Public Understanding of Science* 16(1):79–95.

Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity*. Thousand Oaks, CA: Sage Publications.

Bolsen, Toby, James N. Druckman, and Fay Lomax Cook. 2014. "How Frames Can Undermine Support for Scientific Adaptations: Politicization and the Status-Quo Bias." *Public Opinion Quarterly* 78(1):1–26.

Brooks, Clem, and Jeff Manza. 2013. "A Broken Public? Americans' Responses to the Great Recession." *American Sociological Review* 78(5):727–48.

Centeno, Miguel, and Joseph N. Cohen. 2012. "The Arc of Neoliberalism." *Annual Review of Sociology* 38(1):15–24.

Cerulo, Karen A. 2014. "Continuing the Story: Maximizing the Intersections of Cognitive Science and Sociology." *Sociological Forum* 29(4):1012–19.

Cohen, Geoffrey. L. 2003. "Party Over Policy? The Dominating Impact of Group Influence on Political Beliefs." *Journal of Personality and Social Psychology* 85(5):808–22.

Converse, Phillip E., and Stanley Presser. 1986. *Survey Questions: Handcrafting the Standardized Questionnaire*. Thousand Oaks, CA: Sage Publications.

Driori, Gili S., John W. Meyer, Francisco O. Ramirez, and Evan Schofer. 2002. *Science in the Modern World Polity: Institutionalization and Globalization*. Stanford, CA: Stanford University Press.

Duckitt, John. 2006. "Differential Effects of Right-Wing Authoritarianism and Social Dominance Orientation on Outgroup Attitudes and Their Mediation by Threat from Competitiveness to Outgroups." *Personality and Social Psychology Bulletin* 26(5):299–320.

Duckitt, John, Claire Wagner, Ilouize du Plessis, and Ingrid Birum. 2002. "The Psychological Bases of Ideology and Prejudice: Testing a Dual-Process Model." *Journal of Personality and Social Psychology* 83(1):75–93.

Dunning, David. 1999. "A Newer Look: Motivated Social Cognition and the Schematic Representation of Social Concepts." *Psychological Inquiry* 10(1):1–11.

Durant, John, Geoffrey Evans, and Geoffrey Thomas. 1992. "Public Understanding of Science in Britain: The Role of Medicine in the Popular Representation of Science." *Public Understanding of Science* 1(2):161–82.

Ellis, Christopher, and James A. Stimson. 2012. *Ideology in America*. Cambridge, UK: Cambridge University Press.

Ellison, Christopher G., and Marc A. Musick. 1995. "Conservative Protestantism and Public Opinion toward Science." *Review of Religious Research* 36(3):245–62.

Evans, John H. 2013. "The Growing Social and Moral Conflict between Conservative Protestantism and Science." *Journal for the Scientific Study of Religion* 52(2):368–85.

Evans, John H., and Michael S. Evans. 2008. "Religion and Science: Beyond the Epistemological Conflict Narrative." *Annual Review of Sociology* 34:87–105.

Feldman, Stanley, and Karen Stenner. 1997. "Perceived Threat and Authoritarianism." *Political Psychology* 18(4):741–70.

Fiorina, Morris P., Samuel J. Abrams, and Jeremy C. Pope. 2010. *Culture War? The Myth of a Polarized America*. New York: Pearson Longman.

Frank, Thomas. 2005. *What's the Matter with Kansas: How Conservatives Won the Heart of America*. New York: Henry Holt.

Frickel, Scott, and Kelly Moore. 2006. *The New Political Sociology of Science: Institutions, Networks, and Power*. Madison: University of Wisconsin Press.

Gauchat, Gordon. 2008. "A Test of Three Theories of Anti-Science." *Sociological Focus* 41(4): 337–57.

_____. 2011. "The Cultural Authority of Science: Public Trust and Acceptance of Organized Science." *Public Understanding of Science* 20:751–70.

_____. 2012. "The Politicization of Science in the Public Sphere: A Study of Public Trust in Science in the US, 1974–2010." *American Sociological Review* 77:167–87.

Gauchat, Gordon, and Kent Redding. 2015. "Political Ideology in Public Opinion Research: A Cognitive Sociology Approach." (Forthcoming).

Giddens, Anthony. 1991. *Modernity and Self-Identity: Self and Society in the Late-Modern Age*. Cambridge, UK: Polity Press.

Gieryn, Thomas F. 1983. "Boundary-Work and the Demarcation of Science from Non-Science." *American Sociological Review* 48(6):781–95.

_____. 1999. *Cultural Boundaries of Science: Credibility on the Line*. Chicago: University of Chicago Press.

_____. 2010. "Paradigm for the Sociology of Science." In *Robert Merton: Sociology of Science and Sociology as Science*, edited by Calhoun, Craig, 21–39. New York: Columbia University Press.

Goffman, Erving. 1986. *Frame Analysis: An Essay on the Organization of Experience*. Boston: Northeast University Press.

Gross, Neil, Thomas Medvetz, and Rupert Russell. 2011. "The Contemporary American Conservative Movement." *Annual Review of Sociology* 37:325–54.

Hetherington, Marc J., and Jonathan D. Weiler. 2009. *Authoritarianism and Polarization in American Politics*. New York: Cambridge University Press.

Hunter, James D. 1991. *Culture Wars: The Struggle to Define America*. New York: Basic Books.

Ignatow, Gabriel. 2014. "Ontology and Method in Cognitive Sociology." *Sociological Forum* 29(4):990–94.

Jasanoff, Sheila. 1990. *The Fifth Branch: Science Advisors as Policy Makers*. Cambridge, MA: Harvard University Press.

Jost, John T., Christopher M. Federico, and Jaime L. Napier. 2009. "Political Ideology: Its Structure, Functions, and Elective Affinities." *Annual Review of Psychology* 60:307–37.

Jost, John T., Jack Glaser, Arie W. Kruglanski, and Frank J. Sulloway. 2003. "Political Conservatism as Motivated Reasoning." *Psychological Bulletin* 129(3):339–75.

Kahan, Dan M. 2013. "Ideology, Motivated Reasoning, and Cognitive Reflection." *Judgement and Decision Making* 8(4):407–24.

Kahan, Dan M., Ellen Peters, Maggie Wittlin, Paul Slovic, Lisa Larrimore Ouellette, Donald Braman, and Gregory Mandel. 2012. "The Polarizing Impact of Science Literacy and Numeracy on Perceived Climate Change Risks." *Nature Climate Change* 2(10):732–35.

Kahneman, Daniel. 2003. "Maps of Bounded Rationality: Psychology for Behavior Economics." *American Economic Reviews* 93(5):1449–75.

Kunda, Ziva. 1990. "The Case for Motivated Reasoning." *Psychological Bulletin* 108(3):480–98.

Lee, Chul-Joo, Dietram A. Scheufele, and Bruce V. Lewenstein. 2005. "Public Attitudes Toward Emerging Technologies." *Science Communication* 27(2):240–67.

Lewenstein, Bruce V. 1992. "The Meaning of 'Public Understanding of Science' in the United States after World War II." *Public Understanding of Science* 1(1):45–68.

Lizardo, Omar. 2014. "Beyond the Comtean Schema: The Sociology of Culture and Cognition Versus Cognitive Social Science." *Sociological Forum* 29(4):983–89.

Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. London: Sage Publications.

_____. 2009. "Group Comparisons in Logit and Probit Using Predicted Probabilities." Unpublished manuscript, Department of Sociology, University of Indiana.

Martin, John Levi. 2011. *The Explanation of Social Action*. New York: Oxford University Press.

Martin, John Levi, and Matthew Desmond. 2010. "Political Position and Social Knowledge." *Sociological Forum* 25(1):1–26.

McCarty, Nolan, Keith T. Poole, and Howard Rosenthal. 2006. *Polarized America: The Dance of Ideology and Unequal Riches*. Cambridge, MA: MIT Press.

McCright, Aaron M., and Riley E. Dunlap. 2011. "The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001–2010." *Sociological Quarterly* 52(2): 155–94.

McKelvey, Richard D., and William Zavoina. 1975. "A Statistical Model for the Analysis of Ordinal Level Dependent Variables." *Journal of Mathematical Sociology* 4(1):103–20.

Merton, Robert K. 1968[1938]. "Science and the Social Order." In *Social Theory and Social Structure*, 591–603. New York: Free Press.

_____. 1968[1942]. "Science and Democratic Social Structure." In *Social Theory and Social Structure*, 604–15. New York: Free Press.

Miller, Jon D. 1998. "The Measurement of Civic Scientific Literacy." *Public Understanding of Science* 7(2):203–24.

_____. 2004. "Public Understanding of, and Attitudes Toward, Scientific Research: What We Know and What We Need to Know." *Public Understanding of Science* 13(3):273–94.

Mirowski, Phillip, and Esther-Mirjam Sent. 2008. "The Commercialization of Science and the Response of STS." In *The Handbook of Science and Technology Studies, 3rd ed.*, edited by Hackett, E. J., O. Amsterdamska, M. Lynch, and J. Wajcman, 635–90. Cambridge, MA: MIT Press.

Mooney, Chris. 2005. *The Republican War on Science*. New York: Basic Books.

Moore, Kelly, Daniel L. Kleinman, David Hess, and Scott Frickel. 2011. "Science and Neoliberal Globalization: A Political Sociological Approach." *Theory and Society* 40(3):505–32.

Moore, Kelly. 2008. *Disrupting Science: Social Movements, American Scientists, and the Politics of the Military.* Princeton, NJ: Princeton University Press.

Morello, Laren. 2013. "More Cuts Loom for US Science." *Nature* 501:147–48.

Mulkay, Michael. 1976. "Norms and Ideology in Science." *Social Science Information* 15(4):637–56.

Napier, Jaime L., and John T. Jost. 2008. "The 'Antidemocratic Personality' Revisited: A Cross-National Investigation of Working-Class Authoritarianism." *Journal of Social Issues* 64(3):595–617.

National Science Foundation. 2012. *Using Science as Evidence in Public Policy*. Washington, DC.

_____. 2012. "Science and Engineering Indicators." Arlington, VA.

_____. 2014. "Science and Engineering Indicators." Arlington, VA.

Newport, Frank. 2007. "The Majority of Republicans Doubt Theory of Evolution." Gallup. (April 28, 2010) http://www.gallup.com/poll/27847/Majority-Republicans-Doubt-Theory-Evolution.aspx?utm_source=evolution&utm_medium=search&utm_campaign=tiles.

Nisbet, Matthew C. 2010. "Framing Science: A New Paradigm in Public Engagement." In *Communicating Science: New Agendas in Communication*, edited by Kahlor, LeeAnn, and Patricia A. Stout, 44–67. New York: Routledge.

Otto, S. L. 2012 ."Antiscience Beliefs Jeopardize U.S. Democracy" Scientific American.

Panofsky, Aaron L. 2010. "A Critical Reconsideration of the Ethos and Autonomy of Science." In *Robert Merton: Sociology of Science and Sociology as Science*, edited by Calhoun, Craig, 140–63. New York: Columbia University Press.

Perrin, Andrew, J. Micah Roos, and Gordon Gauchat. 2014. "From Coalition to Constraint: Modes of Thought in Contemporary American Conservatism." *Sociological Forum* 29(2):285–300.

Reardon, Sarah. 2013. "Large NIH Project Cuts." *Nature* 503:173–74.

Scheufele, Dietram A., and Bruce V. Lewenstein. 2005. "The Public and Nanotechnology: How Citizens Make Sense of Emerging Technologies." *Journal of Nanoparticle Research* 7:659–67.

ScienceDebate.org. last modified February 2, 2015, http://www.sciencedebate.org.

Shapin, Steven. 2008. "Science and the Modern World." In *The Handbook of Science and Technology Studies*, 3rd ed., edited by Hackett, E. J., O. Amsterdamska, M. Lynch, and J. Wajcman, 433–48. Cambridge, MA: MIT Press.

_____. 2010. *Never Pure: Historical Studies of Science as It Was Produced by People with Bodies, Situated in Time, Space, Culture, and Society, and Struggling for Credibility and Authority*. Baltimore, MD: Johns Hopkins Press.

Shapin, Steven, and Simon Schaffer. 1985. *Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life*. Princeton, NJ: Princeton University Press.

Sherman, David K., and Geoffrey L. Cohen. 2006. "The Psychology of Self-Defense: Self-Affirmation Theory." *Advances in Experimental Social Psychology* 38(1):183–232.

Smith, Eliot R. 2000. "Research Designs." In *Handbook of Research Methods in Social and Personality Psychology*, edited by Reise, Harry T., and Charles M. Judd, 27–48. Cambridge, UK: Cambridge University Press.

Smith, Tom W. 2012. "Trends in Confidence in Institutions, 1973–2006." In *Social Trends in American Life: Findings from the General Social Survey since 1972*, edited by Marsden, Peter V., 177–211 Princeton, NJ: Princeton University Press.

Stenner, Karen. 2005. *The Authoritarian Dynamic*. Cambridge, UK: Cambridge University Press.

Sturgis, Patrick, and Nick Allum. 2004. "Science in Society: Re-Evaluating the Deficit Model of Public Attitudes." *Public Understanding of Science* 13(1):55–74.

Union of Concerned Scientists. last modified February 15, 2015, http://www.ucsusa.org.

Vaisey, Stephen. 2009. "Motivation and Justification: A Dual-Process Model of Culture in Action." *American Journal of Sociology* 114(6):1675–15.

Wadman, Meredith. 2012. "The NIH Faces Up to Hard Times." *Nature*. http://www.nature.com/news/the-nih-faces-up-to-hard-times-1.11458.

Winship, Christopher, and Robert D. Mare. 1984. "Regression Models with Ordinal Variables." *American Sociological Review* 49(1):512–25.

Wuthnow, Robert. 1989. *Communities of Discourse: Ideology and Social Structure in the Reformation, the Enlightenment, and European Socialism*. Cambridge, MA: Harvard University Press.

Wynne, Brian. 1995. "Public Understanding of Science." In *The Handbook of Science and Technology Studies*, edited by Jasanoff, Sheila, Gerald E. Markle, James C. Petersen, and Trevor Pinch, 361–88. Thousand Oaks, CA: Sage Publications.

Zhang, Sarah. 2013. "Republicans Put 'National Interest' Requirement on US Science Agency." *Nature*. http://www.nature.com/news/republicans-put-national-interest-requirement-on-us-science-agency-1.14102.

Zuckerman, Harriet. 1988. "The Sociology of Science." In *Handbook of Sociology*, edited by Smelser, Neil. Newbury Park, CA: Sage Publications.