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Causal Attribution and Economic Voting in American Congressional Elections

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This article examines the ways in which political sophistication conditions economic voting in U.S. congressional elections. At the congressional level, evidence of economic voting has been generally mixed and sometimes contradictory. In our view, much of the inconsistency in existing studies may result from a tendency to overlook significant heterogeneity in voter decisionmaking. Specifically, we argue that an individual’s ability to attribute responsibility for economic outcomes to congressional actors is a function of political sophistication. According to our theory, less sophisticated voters tend to focus their attributions of responsibility on the President (the most obvious national political figure), ignoring the influence of Congress on the national economy. More sophisticated individuals, by contrast, are capable of more diffuse attributions. Thus, to the extent that conventional economic voting occurs in congressional elections, it should be confined to the more sophisticated portion of the electorate.

Over the last several decades, scholars studying American elections have established conclusively that economic conditions powerfully shape citizen vote choice for a variety of offices at both the state and national levels (Kramer 1971; Tufte 1975; Hibbs, Rivers, and Vasilatos 1982; Chappell and Keech 1988). There is much less consensus, however, on the question of exactly how individual voters evaluate the economic information that they receive and relate it to the political world. Do people make political choices based on their own personal economic well-being (the “pocketbook” hypothesis—Kramer 1971, 1983), the economic health of the nation at large (the “sociotropic” hypothesis—Kinder and Kiewiet 1979, 1981), or a combination of both (Markus 1988)? This central question has dominated empirical research on individual-level economic voting. We would assert that there can be no single satisfactory answer for the entire electorate. Rather, the nature of an individual’s economic voting depends centrally on how he or she attributes causal responsibility for changes in both personal and national economic circumstances, a process that, we argue, is strongly conditioned by one’s level of political sophistication.

In this work, we explicitly incorporate political sophistication into existing models of economic voting. Here, we develop our theory of heterogeneous attribution, first proposed elsewhere (Gomez and Wilson 2001), in the domain of congressional elections. Our theory, explained in greater detail below, maintains that an individual’s ability to make causal linkages is strongly conditioned by his or her level of political sophistication—less sophisticated voters will tend to make simple, proximal attributions, while sophisticated voters are more willing and able to make distal ones. In a study of economic voting in presidential elections (Gomez and Wilson 2001), our theory leads to a set of counterintuitive hypotheses that challenge the conventional wisdom on sophistication and economic voting; namely, that politically sophisticated individuals are the ones most likely to vote their pocketbook, while less sophisticated voters tend to rely exclusively on sociotropic assessments. We find strong support for these hypotheses in two different presidential elections, suggesting that sophistication is indeed key to a proper understanding of heterogeneity in economic voting.

In many ways, however, congressional elections provide a richer, more interesting arena in which to explore the dynamics of economic attribution. In the congressional case, the task of assigning responsibility is rather complex. As Mayhew (1974: 53) asks, “Where can credit be found? If there were only one congressman rather than 535, the answer would in principle be simple enough—but there are 535.” In attributing responsibility for economic outcomes, voters might plausibly focus on the entire Congress (thus crediting or blaming all incumbents, regardless of party), or alternatively, they could adopt a more partisan approach, giving credit or blame to all candidates of the party that has controlled Congress, or to all candidates of the President’s party. Further complexity arises from the fact that congressional elections are national contests run within local contexts (Jacobson 1997). Thus, there is some uncertainty about how significantly we should expect economic concerns of any sort to affect congressional vote choice.

Note: The analyses presented here are based on data compiled by the Inter-university Consortium for Political and Social Research. The original collector of the data, ICPSR, and the relevant funding agency bear no responsibility for uses of this collection or for interpretations or inferences based upon such uses. The authors would like to thank Alan Abramowit and Marco Steenbergen for their helpful comments on previous drafts of this paper and Paul Gronke for providing data on campaign spending and challenger quality. Funding for this research was provided by grants from the University of South Carolina’s College of Liberal Arts and the John G. Tower Center for Political Studies at Southern Methodist University.

In this study, we address two key issues regarding economic voting in congressional elections. First, we seek to determine who voters hold responsible for economic outcomes, whether sociotropic or pocketbook: all incumbents, all candidates of the party that has controlled Congress, or all candidates of the President's party. This is a critical attribution question that has often been overlooked in previous work. More importantly for our purposes, we test our theory of heterogeneous attribution in the congressional context. Who considers economic factors in choosing among congressional candidates, and what types of assessments do they emphasize? How does political sophistication condition economic voting in these races? In answering these questions, we hope to contribute to a deeper, more nuanced understanding of the relationship between economic assessments and congressional vote choice.

We proceed with our study in four parts. First, we review the existing literature on economic voting in congressional elections. The evidence, as we will show, is mixed, particularly at the individual level. Next, we articulate our theory in full, and derive specific hypotheses regarding the cognitive requirements of economic voting in the congressional context. We then test these hypotheses using data from the 1998 American National Election Studies, in which we find strong support for our theory. Finally, we conclude by placing our research in the context of existing theories of economic voting, and by discussing the broader implications of our research.

**Economic Voting in Congressional Elections**

That economic conditions play a central role in the election and reelection of candidates has become a truism in American politics. Presidential candidates from William Jennings Bryan to Bill Clinton have long focused on the economic health of the country in their bids for office. The implicit strategy inherent in these attempts (and presumably in the attempts of congressional candidates as well) to capitalize on good or bad economic times assumes that the economy figures prominently in voters' political decision-making. While the importance of economic considerations in individual vote choice is generally acknowledged among political scientists, the precise nature of the relationship has been the subject of more than three decades of debate and refinement. This debate has been particularly relevant within—if not stimulated by—the literature on congressional elections. Indeed, while the bulk of recent attention in the economic voting literature has been focused on the presidency, much of the seminal theory and initial empirical testing in the field was developed in the congressional context (Kramer 1971; Tufte 1975; Kinder and Kiewiet 1979).

Kramer's (1971) classic work, which examined U.S. congressional elections from 1896 to 1964, was the first to demonstrate that economic factors are related to the partisan breakdown of the total congressional vote. The better the economy performs, Kramer showed, the better the candidates of the President's party do on election day. It is Tufte's (1975) work, however, that is most compelling on this issue. Tufte's aggregate analysis of congressional voting demonstrated that the vote could be explained parsimoniously by two variables: the President's approval rating and the yearly change in real disposable personal income. Abramowitz and Segal (1986) find these same factors to be significant predictors of the vote distribution in Senate races as well, though the model works less well for the Senate than it does for the House. These studies are reinforced by others (Bloom and Price 1975; Jacobson 1990) making a strong case for the importance of economic conditions in shaping aggregate congressional outcomes. There is, however, a dissenting view. Several scholars (Stigler 1973; Arcelus and Meltzer 1975; Erikson 1990) argue that economic factors play a modest role at best in midterm congressional elections.

Like the findings at the aggregate level, individual-level evidence for economic voting in congressional elections—unlike in presidential races—is mixed (Jacobson 1997). However, the questions generally addressed in individual-level studies like the present one differ significantly from those posed at the aggregate level. More than the extent to which economic concerns factor into congressional vote choice, students of individual political behavior have debated exactly how people use economic assessments to choose between competing candidates. Perspectives on economics and the individual vote have traditionally fallen into two main camps: those arguing that people vote according to changes in their own personal economic circumstances (Campbell et al. 1960; Kramer 1971, 1983), and those holding that individuals look primarily to the overall state of the national economy and vote "sociotropically" (Kinder and Kiewiet 1979, 1981). Typically, sociotropic variables have emerged as the strongest cross-sectional predictors of individual candidate choice. Fiorina (1981), however, counters this claim, providing one of the few evidentiary demonstrations of pocketbook voting in congressional elections. Nonetheless, the conventional wisdom is that judgments on the health of the national economy play a larger role in shaping people's voting decisions than do changes in their own financial circumstances, perhaps because of the distal attributions associated with pocketbook assessments (Lave 1962; Feldman 1982).

Most of the major studies examining economic voting, however, suffer from a significant flaw: they tend to treat the electorate, at least implicitly, as monolithic, ignoring the potential for systematic variation among voters in the economic heuristics used to choose between political candidates. That some people might vote based only on sociotropic factors, while others emphasize pocketbook considerations instead or as well, while still others don't.

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1 Fiorina's (1981) analysis demonstrates significant pocketbook voting effects for the 1956, 1960, 1986, and 1976 congressional elections. It is important to note, however, that most of Fiorina's evidence for pocketbook voting comes from indirect effects, with personal economic experiences affecting general economic assessments, presidential evaluations, and partisanship.
engage in economic voting at all, is a possibility not generally acknowledged in the seminal works of each major school of thought. Some studies, however, have sought to deal with this issue, suggesting significant heterogeneity in the nature of economic voting along a variety of dimensions.

The posited sources of heterogeneity are quite varied. Abramowitz, Lanoué, and Ramesh (1988: 856-57) argue that the ability to attribute causal responsibility for pocketbook conditions to societal forces may be a function of an individual’s education, since educated voters are “better able to perceive the influence of government policies and macroeconomic fluctuations on their own economic fortunes.” Feldman (1982) argues that heterogeneity may stem from individuals’ acceptance or rejection of the characteristically American ethos of economic individualism. Those who generally accept the individualist Protestant work ethic and who view America as a “land of opportunity” are much less likely to blame political leaders for economic reverses than are those who reject these cherished notions. Weatherford (1983) agrees that the likelihood and manner of economic voting vary among individuals, but argues for other determinative factors. In his view, the nature of a person’s media consumption and his or her tendency to emphasize issues versus images strongly affect the use of economically-based candidate choice heuristics. Finally, Dawson (1994) suggests that race may be a key factor, as African Americans form and use economic assessments differently than do white Americans. As these examples attest, one is presented with a wide range of potential explanations for why some individuals might “vote their pocketbook,” others might emphasize sociotropic concerns, and others might do neither.

While these studies are in many respects illuminating, they are hampered by two significant limitations. First, they focus almost exclusively on presidential elections, largely ignoring congressional races. Since the dynamics of attribution may differ substantially in the two contexts, we argue that a true understanding of heterogeneity in economic voting for congressional candidates requires the sort of independent examination that we undertake here. Even more importantly, consideration of the effects of political knowledge and sophistication is almost entirely absent from previous work on heterogeneity in economic voting.\footnote{A very recent exception in the comparative politics literature is Duch’s (2001) study of economic voting in the nascent democracies of Eastern Europe. Duch argues for political sophistication as a source of voter heterogeneity, asserting that “economic voting develops . . . as ambiguity regarding the link between government policy and economic outcomes declines.” Thus, in a very different political context, Duch advances a theory related to our own, emphasizing the role of the attribution process, conditioned by political sophistication, in shaping economic voting.}

In fact, assessing the different economic voting paradigms, Weatherford (1983: 158-59) flatly asserts that “there is no obvious difference between the two approaches in levels of sophistication.” We would strongly disagree. As we argue elsewhere (Gomez and Wilson 2001), an examination of varying levels of political sophistication in the electorate provides critical insight into individuals’ differential use of economic factors in their voting decisions. In the presidential context, we have demonstrated that sophistication strongly conditions an individual’s likelihood of employing a pocketbook decision calculus, in ways that run contrary to received wisdom. In the domain of congressional elections, however, the implications of our theory become somewhat more complex, though we argue that economic voting remains powerfully dependent on political sophistication, in some ways more so than in the presidential case. The remainder of the article is devoted to an exposition of our theory of heterogeneous attribution, its application in the context of congressional elections, and an empirical test of derived hypotheses.

**A Theory of Heterogeneous Attribution**

The most critical cognitive element involved in economic voting is the process of causal attribution (Peffley and Williams 1985). Attribution is indisputably fundamental to individual decisionmaking, and has been shown to influence powerfully attitudes toward the self and others, as well as emotional arousal (Fiske and Taylor 1984; Hewstone 1989; Petty and Cacioppo 1996). In the political realm, causal attribution is held to be central in citizens’ evaluations of leaders (Iyengar 1989) and in shaping individual vote choice (Lau and Sears 1981; Feldman 1982).

While the importance of attribution for political opinionation and choice is well established, several key questions about individuals’ ability to make attributions remain. Do all voters attribute credit or blame according to the same criteria? Are all citizens equally influenced by the amount of available information? Do they all make similar use of contextual cues? We argue strongly that, in all of these cases, the answer is “no.” In our view, the process of causal inference is influenced both by the nature of the particular attribution problem at hand and by characteristics of the person confronting it. Drawing on the work of Luskin (1987) and Sniderman (1993), our theory suggests that people at different levels of political sophistication will vary in their ability to associate outcomes with their causes. Thus, an individual’s ability to attribute changes in economic conditions to the actions of political leaders is fundamentally dependent on the knowledge base and depth of understanding with which he or she engages the political world.

It is this level of knowledge and understanding that we refer to as sophistication. Political sophistication is a dual concept, incorporating an individual’s levels of political awareness and cognitive integration (Luskin 1987). As Sniderman, Brody, and Tetlock (1991, 21) argue: “Political sophistication is a “bundle” concept. It packs together related, if distinguishable, properties including a tendency to pay close attention to politics, to have ready at hand banks of information about it, to understand multiple arguments for and against particular issue positions, and to recognize inter-relationships among those arguments.” Political sophistication should not be viewed simply as a summary
scale of political interest. Individuals at various levels of sophistication cognitively engage the political world in different ways, using heterogeneous decision rules in processing political information and making political choices.

Converse (1964), in his famous discussion of political belief systems, argues that all people seek consistency and congruence among their idea elements, and that this tendency is most pronounced among sophisticated individuals. Our theory of heterogeneous attribution rests on a somewhat more complex view, advanced by Sniderman, Brody, and Tetlock (1991), which holds that individuals at differing levels of sophistication seek congruence selectively. Less sophisticated voters tend to emphasize proximal consistency, seeking to bring closely related political information into congruence. As sophistication increases, however, individuals place greater emphasis on distal consistency, linking information across different levels of abstraction and making broader connections with more distant elements of their belief systems, such as their ideologies.

Differences in the process of causal attribution stemming from varying levels of political sophistication have clear implications for economic voting in congressional elections. When less sophisticated voters encounter data about economic conditions, whether personal or national, they have only limited ability to integrate this information into their understanding of the political world. Lacking a significant number of political referents, they are much less able to link economic assessments with other elements of their belief systems than are their sophisticated counterparts. Less sophisticated voters generally will have limited comprehension of the political-economic linkage, making it difficult for them to attribute changes in economic conditions to diverse political actors. For low sophisticates, we argue, attributions are largely restricted to proximate or local causes. They are substantially more likely than high sophisticates to identify the single most obvious actor in the relevant sphere as responsible for any given outcome. Thus, low sophisticates will tend to attribute responsibility for advances or reverses in their own economic fortunes to the actor most closely associated with their pocketbook: themselves. For these individuals, the link between their own finances and national economic policy is too remote, generally speaking, for politically consequential attributions to be made. Thus, we would expect no evidence of pocketbook voting by low-sophistication individuals, whether in the presidential or the congressional context.

This is not to suggest, however, that less politically sophisticated citizens never engage in economic voting. Indeed, we have demonstrated elsewhere (Gomez and Wilson 2001) that these individuals are in fact highly likely to use their assessments of the national economy in choosing among presidential candidates. While the link between the national government and one's personal economic well-being may be a distant and difficult one, the link between the national government and the national economy is relatively simple and direct. However, the same factors, rooted in our theory of heterogeneous attribution, that make low sophisticates more likely to engage in sociotropic voting in presidential races make them less likely to do so in congressional ones. As we have explained previously, less sophisticated voters will tend to focus attributions of responsibility on the single most obvious actor in the relevant sphere. When it comes to the national economy, this person is the President. Thus, low sophisticates will tend disproportionately to center their credit or blame for the national economy on the President, and to ignore other relevant actors (like Congress). Thus, while sociotropic voting is certainly possible for citizens with low levels of political sophistication, it is not likely in the congressional context.

For sophisticated voters, the dynamics of causal attribution are quite different. When they encounter economic data, sophisticates are much more likely to make distal associations between the new information and elements of their political worldview. Sophisticated voters possess plentiful political information, and have a variety of ways to integrate newly acquired information into their reserve of political knowledge. They are thus more likely to make global, as well as simply local, attributions. In addition, sophisticated individuals will tend to look beyond the most obvious causal factor in a given situation, and are more able than their less sophisticated counterparts to divide credit or blame among a variety of sources. While high sophisticates will clearly not ignore their own role in shaping their personal economic fortunes or the responsibility of the President for the national economy, they are likely to realize that other significant actors are also involved. Thus, unlike less sophisticated voters, high sophisticates will tend not to focus exclusively on the President as a target of their economic assessments, including those who have controlled Congress in their allotment of credit or blame. Thus, based on this theory of heterogeneous attribution, we make a strong claim: only sophisticated voters will hold the party controlling Congress responsible for economic outcomes, whether good or ill.

To the extent that economic voting in the conventional sense occurs in congressional elections, it should be confined to the more politically sophisticated segments of the electorate. It is this proposition that we test in the sections to follow.

DATA AND METHOD

Our examination of political sophistication and economic voting in congressional elections draws on data from

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3 Two recent studies (Hetherington 1996; Duch, Palmer, and Anderson 2000) raise the intriguing possibility that economic perceptions themselves (as opposed to their use in the voting decision, which is our concern here) may vary with individuals' levels of political sophistication. While beyond the scope of this study, these pieces suggest avenues for future analysis.

4 We do not mean to suggest here that Congress is in fact a more important actor than the President in shaping the nation's economic policy. Rather, both clearly play a significant role in economically relevant decisionmaking. It is more sophisticated voters, we argue, that are most likely to realize this dual responsibility, and thus to divide credit or blame between the legislature and the executive rather than focusing only on the President.
the 1998 American National Election Study. We test our theory using data from that year for several important reasons. First, 1998 is a midterm election year, allowing us to test the effects of economic voting in congressional elections in an environment less contaminated by presidential considerations than one would find in a presidential election year. During presidential elections, we would expect that an attribution bias might become more prominent, where voters attribute greater responsibility for economic well-being to the President due simply to campaign information effects. The less prominent role of presidential considerations at the midterm allows us to adjudicate more clearly between attributions of responsibility to different sets of congressional actors, e.g., congressional parties versus incumbents. Secondly, the 1998 context offers the benefit of unified party control of both houses of Congress. Analysis of economic voting could become rather murky if the House and Senate were controlled by different parties. If voters in 1998 held Congress at least partly responsible for economic conditions, their partisan targets for credit or blame were unambiguous—Republican candidates for House and Senate. Moreover, the Congress and the presidency were controlled by different parties at the time of the 1998 congressional election, allowing us to distinguish empirically between economic voting focused on the party of the President and economic voting focused on the majority party in Congress, an important distinction highlighted by Norporth (2001). Overall, the political circumstances of the 1998 electoral context present an excellent opportunity to distinguish clearly between several alternative accounts of economic voting in congressional elections.

In addition to these contextual advantages, the 1998 National Election Study contains several questions that are greatly advantageous for our empirical purposes. For instance, respondents for the first time were specifically asked to whom they attribute primary responsibility for recent national economic conditions and for the federal budget surplus, and allowed to choose between the President, Congress, and other actors. Analyses of these responses serve as an interesting and instructive complement to our vote choice models. The 1998 data allow us to test directly which individuals are most likely to attribute responsibility to Congress for economic and fiscal conditions, an issue fundamental to our heterogeneous model of congressional voting.

Operationally, we encounter several important choices regarding how best to measure our key concepts of interest: economic evaluations, individual political sophistication, and candidate choice. Our operationalization of economic evaluations follows the now standard NES question formulations. Pocketbook evaluations are tapped by asking respondents whether their own family's economic circumstances have gotten "much worse, worse, about the same, better, or much better" over the past year. Sociotropic evaluations are measured with the same set of response categories for an analogous question about the national economy. Fundamentally, our choice of measures is motivated by our theoretical desire to maintain parallel measurement of personal and national economic factors. Thus, we believe that it is important to employ measures for the two concepts that are as nearly identical as possible. These self-reports of economic conditions by respondents are, for our purposes, preferable to objective, aggregate economic indicators (e.g., Kramer 1971, 1983) as measures of pocketbook circumstances. As previous studies have shown (Rosenstone, Hansen, and Kinder 1986), self-reports using the five-category NES query are quite reliable, correlating strongly with specific events in respondents' lives—the loss of a job, falling behind on bills, etc.—and with economic data on real disposable personal income.

Individual political sophistication is a bit more difficult to operationalize. While political knowledge is not identical with political sophistication, it is at its core. Our notion of sophistication is very much like Neuman's (1981) idea of "knowledge in use," conceptually, we wish to capture some mix of knowledge and awareness in the domain of politics, to assess the level of cognitive complexity with which an individual engages social and political phenomena. We thus construct an additive scale based on six factual queries in the percent. African Americans = 8.9 percent, and Hispanics = 7.2 percent). The national inflation rate for the year preceding the election, according to the U.S. Statistical Abstract, was approximately 1.6 percent. Finally, the University of Michigan's "Survey of Consumers" reported that consumer sentiment also was relatively strong in the fourth quarter of 1998, although it had declined by roughly 7 percent from its (to that point) all-time high during the first quarter of the year.

5 This sampling restriction is further substantiated on practical grounds, since distinguishing between attributions potentially made to multiple actors in separate campaigns presents serious empirical challenges. Voters might express their economic assessments through the presidential vote, while voting in down-ballot races based on other factors. Alternatively, they might attribute their economic assessments to the presidents party and cast a straight-ticket ballot accordingly. A midterm election, in which the congressional vote is the only vehicle for expressing economic judgments, provides a much clearer environment for testing our specific hypotheses.

6 Indeed, over the last one hundred years, unified control of both Houses by the same party is the overwhelming norm. Only five instances of divided control during the period exist: the 72nd Congress (1931-32), the 97th-99th Congresses (1981-86), and the 107th Congress (2001-2002).

7 The objective economic context during the 1998 congressional election campaign was relatively good. According to the Bureau of Labor Statistics, the U.S. unemployment rate during 1998 was 4.5 percent, although the rate varied among different racial and ethnic groups (Whites = 3.9 percent, African Americans = 8.9 percent, and Hispanics = 7.2 percent).

8 This conception of political sophistication is very much in keeping with the Sniderman, Brody, and Tetlock (1991) description of a "bundle concept," combining elements of knowledge, awareness, and complexity of thought. Unfortunately, the survey format tends to limit measurement of political sophistication to the knowledge and awareness dimensions, making it difficult to capture complexity of thought. Thus, we have basically operationalized political sophistication as political knowledge, a closely related, but not identical, concept. In this regard, we follow Sniderman, Brody, and Tetlock (1991), Zaller (1992), and Delli Carpini and Keeter (1993), among others.
NES, as detailed in the appendix. While it does not mirror his scales exactly, this construction is in the spirit of Zaller's (1992) notion of political awareness. As Delia Carpi and Keeter (1993) have demonstrated, these NES items combine well to create a very robust and effective measure of political sophistication (or political knowledge—they use the terms essentially interchangeably). Detailed information on measurement and coding of political sophistication and economic evaluations is presented in the appendix.

Finally, we are faced with difficult decisions about how to operationalize our main dependent variable, candidate choice. Here, the key question is a theoretical one, as we have addressed above: Are the appropriate targets of economic voting all incumbents (regardless of party), all candidates of the party controlling Congress (regardless of incumbency status), or all candidates of the President's party (again, regardless of incumbency status)? Our assumption is that economic voting in Congressional elections should reflect a primarily partisan orientation, especially among more sophisticated voters. It would make little sense, for example, for voters in 2004 to credit Democratic incumbents for an economic rebound or to blame them for continued tough times, since they do not control the apparatus of Congressional decisionmaking. We would hypothesize, however, that sophistication plays a role here in a situation of divided government (such as 1998). Less sophisticated voters, with their President-centered economic assessments, are likely to reward or punish candidates of the President's party—Norpoth's (2001) "President Liable" condition—while more sophisticated voters, recognizing the substantial legislative responsibility for economic and fiscal policy, are likely to reward or punish candidates of the party that controls Congress (Norpoth's "Congress Liable" or "Split Verdict" condition). In any event, we present here models that test for all three potential credit/blame attributions: to the President's party, to the party in control of Congress, and to all incumbents. In our first set of models, we examine the likelihood of voting for Republican candidates, regardless of incumbency status (though of course we include incumbency as a control variable). In the second set, we look at the likelihood of voting for incumbents, regardless of party (including party as a control this time). In both cases, we model House and Senate races separately, using essentially the same variables. This approach allows for a thorough examination of economic voting in congressional elections, and offers the added benefit of allowing us to address the interesting question of whether economic voting in congressional elections is based on incumbency or party affiliation.

**Findings**

As outlined previously, our theory of economic voting in congressional elections rests on some key assumptions about attribution processes at different levels of political sophistication. We maintain that less sophisticated individuals will tend to focus disproportionately on the President's responsibility for national economic and fiscal outcomes, as he is the single most obvious actor on the national stage. Politically sophisticated people, by contrast, are more likely to recognize other, non-presidential causes of national economic prosperity or recession, including Congress, the Federal Reserve, the business community, and international actors, among others. Thus, all else equal, political sophistication should be negatively associated with an individual's likelihood of ascribing primary or exclusive responsibility for national economic and fiscal outcomes to the President. This proposition is quite important for our analyses. If it is true, we should expect little evidence that less sophisticated people reward or punish the party controlling Congress according to their economic assessments, because they are unlikely to make any link between congressional actions and the nation's prosperity. Conversely, economic evaluations should be important in shaping the congressional vote choice of more sophisticated individuals, who are able to target their assessments of credit or blame more broadly than simply the President.

Before presenting models based on this proposition, however, it is useful to examine the underlying assumption itself. As discussed previously, the 1998 NES contains two new items that address the issue directly. In one question, respondents are asked who "is most responsible for the economic conditions of the past few years"; in another, they are asked who "deserves more of the credit for the federal budget surplus." In both cases, they are presented with a variety of response choices, including the President and Congress. Clearly, these items provide an excellent opportunity to assess whether political sophistication indeed decreases the likelihood that an individual will attribute primary responsibility for national economic and fiscal outcomes to the President.

In Table 1, we present multinomial logit models based on these two queries. In addition to political sophistication, likelihood of attributing prime responsibility to each non-presidential actor is modeled as a function of sociotropic evalua-
Table 1
Attribution of Responsibility for National Economic Circumstances
(Multinomial Logits with President as Referent Category)

<table>
<thead>
<tr>
<th>Variable</th>
<th>General Economic Conditions</th>
<th>Budget Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C   WP BP ALL O</td>
<td>C   B N</td>
</tr>
<tr>
<td>Constant</td>
<td>.887** (.212)  .248 (.245)</td>
<td>.338 (.221)  .623** (.305)</td>
</tr>
<tr>
<td>Political Sophistication</td>
<td>.143 (.363)  .209 (.425)</td>
<td>1.544** (.369)  .488 (.529)</td>
</tr>
<tr>
<td>Sociotropic Evaluation</td>
<td>-.013 (.150)  -.221 (.172)</td>
<td>-.065 (.148)  -.067 (.201)</td>
</tr>
<tr>
<td>Party Identification</td>
<td>-.687** (.198)  -.645** (.237)</td>
<td>-.971** (.203)  -.835** (.291)</td>
</tr>
<tr>
<td>Party Identification × Sociotropic Evaluation</td>
<td>.505** (.192)  .417* (.222)</td>
<td>.387* (.193)  .262 (.273)</td>
</tr>
</tbody>
</table>

Number of Cases = 1225
LR $\chi^2 = 115.98$**
Proportional Reduction in Error = .213

Number of Cases = 1187
LR $\chi^2 = 456.93$**
Proportional Reduction in Error = .580

Note: The coefficients in the table are maximum likelihood estimates. Responsible actors are classified as: C = Congress, WP = Working People, BP = Business People, ALL = All (Volunteered), O = Others (Volunteered), B = Both (Volunteered), and N = Neither (Volunteered).

* p < .05, one-tailed test
** p < .01, one-tailed test

... possessions, party identification, and their interaction. The assumption here is that Republicans are more likely to identify actors other than President Clinton as being chiefly responsible for national economic conditions than are Democrats, particularly if they believe things have been going well (as most do). This expectation is clearly borne out in the results. Democrats are much more likely than Republicans to see President Clinton as primarily responsible for both the general state of the national economy and for the federal budget surplus—the partisanship coefficient is negative for each non-presidential actor in both models. Even after controlling for these strong partisan biases, however, political sophistication remains a significant factor, as our theory would suggest. In the model of responsibility for general economic conditions, political sophistication has a positive coefficient for every non-presidential response category except “working people,” with very strong effects on the likelihood of crediting “business people” or “others” for national economic prosperity. In the model of credit for the federal budget surplus, sophistication dramatically increases the likelihood that individuals will credit Congress, both, or neither (as opposed to the President) for the nation’s fiscal health.

One way to assess the substantive meaning of coefficients from the multinomial logit models is to examine the resulting “relative risk ratios” (Long 1997). These represent the change in likelihood of falling into a response category (relative to the control category—in our case the President) produced by shifting each independent variable from its minimum to its maximum while holding all else equal. Table 2 reports these figures for both multinomial logit models. For general economic conditions, the most sophisticated respondents are almost 17 times as likely to credit “others,” almost 5 times as likely to credit “business people,” 63 percent more likely to credit “all,” and 15 percent more likely to credit Congress, than are the least sophisticated respondents. For the federal budget surplus, the most sophisticated respondents are over 15 times as likely to credit Congress, and about 6 times as likely to credit “both” or “neither,” as the least sophisticated. Clearly, politically sophisticated respondents are substantially less likely to attribute exclusive responsibility for national economic and fiscal conditions to the President, and they are more likely to credit other actors. These results provide strong evidence for our contention that political sophistication is associated with more diffuse attributions of responsibility for national economic conditions, and thus for less President-centered sociotropic evaluations. They suggest that, as individuals become more politically sophisticated, they are more likely to hold Congress at least partially responsible for the nation’s economic and fiscal health, and hence to vote economically in congressional elections.

The previous analysis demonstrates the individuating properties of political sophistication as a predictor of sociotropic attributions. It does not, however, address directly the conditioning effect of sophistication on candidate choice suggested by our theory. Political sophistication
Table 2

Factor Change in the Odds of Responsibility for National Economic Circumstances
(Based on Multinomial Logits with President as Referent Category)

<table>
<thead>
<tr>
<th>Variable</th>
<th>General Economic Conditions</th>
<th>Budget Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>WP</td>
</tr>
<tr>
<td>Political Sophistication</td>
<td>1.153</td>
<td>.812</td>
</tr>
<tr>
<td>Sociotropic Evaluation</td>
<td>.987</td>
<td>.802</td>
</tr>
<tr>
<td>Party Identification</td>
<td>.503</td>
<td>.525</td>
</tr>
<tr>
<td>Party Identification ×</td>
<td>1.656</td>
<td>1.518</td>
</tr>
<tr>
<td>Sociotropic Evaluation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The coefficients in the table are relative risk ratios for a one unit change in the corresponding variable, exp(β̂), where p represents the relative probability of attributing responsibility to the President. Responsible actors are classified as: C = Congress, WP = Working People, BP = Business People, ALL = All (Volunteered), O = Others (Volunteered), B = Both (Volunteered), and N = Neither (Volunteered).

clearly affects judgments of who is responsible for economic outcomes, but do these differential attributions influence the mechanisms of electoral choice in meaningful ways? To answer this central question, we present in Table 3 probit models of congressional candidate vote choice in both House and Senate elections. As discussed above, we have modeled the elections for each chamber in two different ways. In one model, we test whether voters employ one of two possible partisan heuristics, treating either candidates of the President’s party or the congressional majority party as responsible for economic outcomes. Our second model tests the competing proposition that all incumbents, regardless of party, are held responsible.

In specifying each of the models, we incorporate several well-accepted indicators as exogenous predictors of congressional candidate preference. We include a battery of socioeconomic factors as statistical controls, including measures of race, gender, age, and income. In addition to the demographic control variables, we also employ measures of the respondent’s party identification (high values indicating Republican allegiance) and political ideology (high values indicating conservatism). We also include terms for partisan incumbency, as well as a feeling thermometer differential (GOP candidate-Democratic candidate) in the House and Senate races. We attempt to capture campaign effects by including contest-specific variables for the appropriate models. When examining the vote for House and Senate Republican candidates, we include campaign spending figures for both Republican and Democratic candidates in each race. In our analyses of voting for House and Senate incumbents, we include spending figures for incumbents and challengers as well as a measure of challenger quality. Finally, the models include the respondent’s level of political sophistication, as well as self-reported evaluations of both sociotropic and pocketbook economic conditions. Most importantly, we include interaction terms combining economic evaluations and sophistication. These allow us to test our key hypothesis. If positive economic assessments by themselves make voters more likely to support Republican candidates and/or congressional incumbents, it would suggest that widespread economic voting in the conventional sense is at work in congressional elections. If, by contrast, the interaction term is significant, it would indicate that economic voting is contingent on an individual’s level of political sophistication.

The findings reported in Table 3 support convincingly the predictions of our heterogeneous attribution theory. As expected, partisanship is a strong and consistent predictor of vote choice in both House and Senate elections. Ideology, by contrast, appears consequential only for predicting the vote for incumbents, and then is of modest significance. In the incumbency models, there is a detectable anti-Republican bias. In each of those models, GOP incumbents fared appreciably less well than their Democratic counterparts. This overall pattern across models likely reflects a moderate anti-Republican trend in the 1998 elections, conventionally attributed to residual voter anger over the Clinton impeachment process (Abramson, Rohde, and Aldrich 1999). In each of the models, voter affect toward candidates, as measured by the feeling thermometers, strongly predicts vote choice (as we would expect). The campaign-specific variables (candidate spending and challenger quality) are a mixed bag and are generally of negligible or modest import.

Most important, however, are our analyses of sophistication and economic assessments. Here, we receive very strong support for our hypotheses. To begin with, political sophistication alone is not significant in any model, itself not a surprising finding. Likewise, evidence of pocketbook

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11 In the incumbent vote choice models, variables like partisanship, ideology and issue positions have been recoded conditionally, reversing the response categories depending on the party of the incumbent. Thus, for example, party identification in those models refers to a match in partisanship between the voter and the incumbent.

12 The data on campaign spending and challenger quality were provided by Paul Gronke. The original spending data are from Congressional Quarterly's Politics in America. The challenger quality measure is from Canon (1990). The variable is a four-level measure, where "experience-seeking amateurs" are coded 1, "ambitious amateurs" 2, challengers with "some political experience" 3, and those who "held previous office" 4. Further details can be found in the appendix to Canon’s book.
### Table 3
Conjointational Vote Choice by Party and Incumbency (Probit Models)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Vote for GOP House Candidates</th>
<th>Vote for GOP Senate Candidates&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Vote for House Incumbents</th>
<th>Vote for Senate Incumbents&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.414 (.102)</td>
<td>.012 (.697)</td>
<td>-1.579 (.727)&lt;sup&gt;*&lt;/sup&gt;</td>
<td>-1.766 (.607)&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
<tr>
<td>Black</td>
<td>.760 (.951)</td>
<td>.086 (.483)</td>
<td>.738 (.803)</td>
<td>.715 (.567)</td>
</tr>
<tr>
<td>Female</td>
<td>.012 (.010)</td>
<td>.105 (.463)</td>
<td>.082 (.255)</td>
<td>-.061 (.295)</td>
</tr>
<tr>
<td>Age</td>
<td>.012 (.010)</td>
<td>.010 (.008)</td>
<td>.008 (.008)</td>
<td>-.005 (.006)</td>
</tr>
<tr>
<td>Income</td>
<td>.043 (.027)</td>
<td>.010 (.014)</td>
<td>.020 (.023)</td>
<td>.005 (.013)</td>
</tr>
<tr>
<td>Party ID</td>
<td>.363 (.084)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.364 (.092)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>1.028 (.303)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>1.296 (.247)&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ideology</td>
<td>.178 (.164)</td>
<td>-.034 (.134)</td>
<td>.380 (.138)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.258 (.111)&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
<tr>
<td>GOP Incumbent</td>
<td>.290 (.445)</td>
<td>.016 (.409)</td>
<td>-1.415 (.830)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-.980 (.520)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Dem Incumbent</td>
<td>-.746 (.538)</td>
<td>-.421 (.366)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT Differential</td>
<td>.051 (.008)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.054 (.007)&lt;sup&gt;**&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT Incumbent</td>
<td></td>
<td></td>
<td>.049 (.008)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.042 (.005)&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
<tr>
<td>GOP Spending</td>
<td>-.044 (.040)</td>
<td>.006 (.003)&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dem Spending</td>
<td>-.001 (.028)</td>
<td>-.004 (.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incumb Spending</td>
<td></td>
<td></td>
<td>-.080 (.035)&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.005 (.002)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chall Spending</td>
<td></td>
<td></td>
<td>.005 (.014)</td>
<td>-.006 (.003)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chall Quality</td>
<td></td>
<td></td>
<td>-.046 (.106)</td>
<td>-.102 (.125)</td>
</tr>
<tr>
<td>Political Soph</td>
<td>-.547 (.932)</td>
<td>-.769 (1.004)</td>
<td>.324 (.675)</td>
<td>-.527 (.597)</td>
</tr>
<tr>
<td>Pocketbook Eval</td>
<td>.149 (.544)</td>
<td>.518 (.348)</td>
<td>.023 (.485)</td>
<td>.135 (.377)</td>
</tr>
<tr>
<td>Sociolegal Eval</td>
<td>-1.070 (.608)&lt;sup&gt;*&lt;/sup&gt;</td>
<td>-.863 (.488)&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.296 (.436)</td>
<td>-.086 (.308)</td>
</tr>
<tr>
<td>Ptk Eval × Soph</td>
<td>-.409 (.797)</td>
<td>-.891 (.577)</td>
<td>-.198 (.638)</td>
<td>-.397 (.471)</td>
</tr>
<tr>
<td>Soc Eval × Soph</td>
<td>1.354 (.825)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>1.313 (.722)&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-.452 (.585)</td>
<td>.385 (.380)</td>
</tr>
<tr>
<td>Number of Cases</td>
<td>221</td>
<td>254</td>
<td>299</td>
<td>296</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>.66</td>
<td>.69</td>
<td>.60</td>
<td>.59</td>
</tr>
<tr>
<td>% Pred. Corr.</td>
<td>90%</td>
<td>79%</td>
<td>87%</td>
<td>90%</td>
</tr>
<tr>
<td>Prop. Red. Error</td>
<td>.793</td>
<td>.526</td>
<td>.604</td>
<td>.756</td>
</tr>
<tr>
<td>LR χ²</td>
<td>200.20&lt;sup&gt;**&lt;/sup&gt;</td>
<td>1670.26&lt;sup&gt;**&lt;/sup&gt;</td>
<td>214.13&lt;sup&gt;**&lt;/sup&gt;</td>
<td>2573.96&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Senate models were clustered by state to accommodate for spatial correlation among respondents from the same state.

<sup>*</sup>p < .05, one-tailed test

<sup>**</sup>p < .01, one-tailed test

Voting is quite weak, a result consistent with many previous analyses of both presidential and congressional elections. The key findings are in the area of sociolegal voting. To begin with, the interaction term is powerfully predictive in both the House GOP and Senate GOP models. This indicates that, as individuals become more sophisticated, positive economic evaluations are strongly associated with an increased likelihood of supporting Republican congressional candidates. This is true, it is important to note, even after controlling for partisanship, ideology, and income. It is equally interesting to note that, with the interaction term in the model, the coefficient on sociolegal evaluations by themselves is actually significantly negative, suggesting that people become less likely to support the party controlling Congress as their economic assessments improve. This seemingly odd finding is actually quite consistent with our theory. If, as we argue, less sophisticated voters tend to give all credit or blame for the economy to the President, those who thought the economy was good in 1998 should be positively disposed towards Bill Clinton, and hence less likely to vote Republican in congressional races. This would tend to support the conventional wisdom, at least since Kramer (1971), that candidates of the President’s party do well when economic times are good. Only among more sophisticated voters, captured by our interaction term, would candidates of the party controlling Congress receive substantial credit for economic good times.

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<sup>13</sup> Likelihood ratio tests indicate that the addition of the sociolegal × sophistication interaction term significantly adds to the performance of the models (House: χ²(1) = 2.93, sig at .08; Senate: χ²(1) = 2.61, sig at .10).
Figure 1 presents a graphical demonstration of the interactive effects of political sophistication and economic assessments on congressional vote choice. Here, we plot the probability of voting for Republican candidates in House (panel 1) and Senate (panel 2) races by national economic assessments, for voters at the bottom, middle, and top of our sophistication scale, holding all other variables in the model equal at their means. In both cases, the results are striking. For less sophisticated voters, the chances of supporting Republican candidates plunge as economic assessments improve. The same general trend is discernible among mean sophisticates, though with a much flatter slope. Among more sophisticated voters, however, exactly the opposite pattern is apparent—their probability of supporting Republican candidates climbs sharply as economic assessments improve. The “x-pattern” reflected in these graphs indicates that political sophistication is a powerful mediator of economic voting in congressional elections. Voters at different levels of sophistication clearly use their economic perceptions in profoundly different ways when determining their congressional candidate preferences.

A final thing to note about these models is their strong support for the idea that voters use partisan, rather than incumbency, referents in assigning economic responsibility to Congress. There is no evidence at all of economic voting in the two models where the dependent variable is likelihood of supporting incumbents. The overall pattern is clear: less sophisticated voters hold the President responsible for the
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economy and reward or punish his fellow partisans accordingly, while more sophisticated voters assign a fair measure of responsibility to Congress itself and thus target candidates of the congressional majority party for credit or blame.

DISCUSSION

In this study, we have examined the impact of individuals’ political sophistication on their use of economic heuristics in congressional voting. Our theory of heterogeneous attribution posits that individuals attempting to credit or blame political actors for the state of the economy will vary in the decision rules that they employ. This variable reliance on economic considerations when voting is, we argue, a function of the level of political sophistication that the individual brings to the task. In testing our theory at the congressional level, we not only illuminate the cognitive constructs of the voting calculus but also provide a coherent picture of the relationship between the economy and congressional elections. The hypotheses derived from our theory find a good deal of support. To the extent that perceptions of national economic conditions directly shape congressional vote choice, the effect is essentially confined to more politically sophisticated voters. These individuals are more likely to make the associative linkage between Congress and national economic policy than their low-sophistication counterparts. With regard to economic voting in the congressional arena, our work further clarifies who those voters hold accountable: all candidates of the incumbent party rather than all congressional incumbents. This, we believe, is an important distinction largely ignored in previous work on economic voting in congressional elections.

The broader implications of our work are two-fold. First, we provide clear evidence of systematic heterogeneity in voter decision rules, based upon the cognitive complexity with which they engage the political world. The attribution process associated with economic voting is difficult. Voters are asked to parcel out responsibility for economic conditions among diverse actors and causes—the President, Congress, the Federal Reserve, etc. The ability to deal with these cognitive challenges is fundamental to linking the economic and political spheres, a reality that we document both here and elsewhere (Gomez and Wilson 2001). These patterns are inextricably tied to our second broader implication, which deals with congressional responsibility for the economy. Our findings suggest that to the extent that democratic accountability—voters holding government responsible—exists in the congressional context, it is manifest only in those who are cognitively engaged with politics. Among informed and engaged voters, but only among them, congressional majorities are held responsible for their performance in the economic sphere.

APPENDIX

MEASUREMENT AND CODING OF KEY CONCEPTS

We measure political sophistication by tapping the individual’s political knowledge and attention to politics, a practice in keeping with previous work (Zaller 1992; Delli Carpini and Keeter 1993). For our analyses here, we construct a sophistication scale based on six NES queries:

(Q1) The first name is Al Gore. What job or political office does he now hold?
(Q2-Q4) Boris Yeltsin? Newt Gingrich? William Rehnquist?
(Q5) Do you happen to know which party had the most members in the House of Representatives in Washington before the election (this/last) month?
(Q6) Do you happen to know which party had the most members in the U.S. Senate before the election (this/last) month?

These items combine to create a 7-point knowledge scale ranging from 0 to 6, tallying the total number of questions that a respondent answered correctly. The frequencies of respondents at each position on the full scale are as follows: 0 (93), 1 (106), 2 (159), 3 (231), 4 (297), 5 (293), 6 (86). We have divided the final tally by 6 to produce a scale ranging from 0 to 1, with a mean of 0.56.44

To measure economic evaluations, we use responses to the following standard NES items:

“We are interested in how people are getting along financially these days. Would you say that you (and your family) are better or worse off financially than you were a year ago?”

“Now thinking about the economy in the country as a whole, would you say that over the past year, the nation’s economy has gotten better, stayed about the same, or gotten worse?”

Each question has five possible responses ranging from “much worse” to “much better,” which we have coded –2 to 2. The frequencies of responses to the personal economic question are as follows: –2 (91), –1 (189), 0 (343), 1 (474), 2 (180). For the national economic question, they are: –2 (33), –1 (155), 0 (476), 1 (418), 2 (179). We multiply these values by political sophistication to create our interaction terms, referred to in the tables as “Pkt Eval × Soph” and “Soc Eval × Soph.”

REFERENCES


44 We also tested the unity of the variables in our scale using principal-components factor analysis. We find one common factor for the items (eigenvalue = 2.798), with each item loading significantly. Additionally, scores on the scale seem invariant to respondent partisanship: Democrats average .57 and Republicans .81, while party ID and sophistication correlate only at .07.


Gomez, Brad T., and J. Matthew Wilson. 2001. “Political Sophisti-


Markus, Gregory B. 1988. “The Impact of Personal and National Eco-
nomic Conditions on the Presidential Vote: A Pooled Cross-


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