UNIVERSITY OF CALIFORNIA, MERCED

Information and Party Brands

A dissertation submitted in partial satisfaction of the requirements for the degree
Doctor of Philosophy

in

Political Science

by

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Dedication

To Ninja, thank you for all of your fuzzy cuddles and unwavering love. I could not have done this without you. I love you!

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Information and Party Brands
Stephanie A. Nail
Doctor of Philosophy in Political Science
University of California, Merced
Abstract

In the first part of my dissertation, I address the puzzle of how majority parties can create a legislative reputation that appeals to two very different constituencies – primary and general election voters. I argue that the majority party leadership strategically sets the agenda to send different informational signals about party members prior to each election. The findings show that there is variability in the types of bills that are scheduled at different times during the year. This suggests that the majority party can send different informational signals about its members in order to appeal to either the primary or general election constituency. Furthermore, it suggests that if voters are myopic, they are not getting the entire picture of the legislator's behavior and voting patterns by only looking at recent votes, which could ultimately affect democracy in the long run.

In my second paper, I argue that party labels can act as information shortcuts to help voters more reliably guess the issue positions of a representative, even when voters have no direct information about the representative's voting record. I isolate the effect of an individual being "treated" with knowledge of a representative's party label as a heuristic using an instrumental variable design. I characterize each state's Senate delegation to be either mixed or unified, with mixed meaning one Republican Senator and one Democrat Senator and unified meaning two Senators from the same party. I find that knowing a Senator's party makes voters 19.5% more likely to correctly guess their position on major votes. This finding suggests that party labels can independently improve citizen inference about their representatives, even when other forms of knowledge are held relatively constant.

In the last part of my dissertation, I investigate the effect of varying the level of information conveyed by party brands using an experiment. I argue that cheaper information has not increased voters' knowledge about individual candidates because voters possess an even cheaper and increasingly informative cue: party id. I propose an experimental design to test how varying levels of information affect individuals' willingness to pay for additional information when the goal is to make a correct decision. I theorize that as the parties become increasingly distinguishable, individuals will be less willing to pay the cost of seeking out information on their own individual legislators. I test this hypothesis using a between-subjects design. Subjects are randomly selected

to receive a party label or not. I systematically vary the informativeness of the distribution of votes that they receive according to real-world information level and measure their willingness to pay for extra information – in this case, a signal that will help them make their final decision. I use willingness to pay as the main dependent variable and calculate the average treatment effect for each informational level (JSD). Over time, willingness to pay for information has decreased by 30% as the party label has become more informative.

Strategic Agenda Setting and Election Timing in the U.S. House

Stephanie A. Nail
University of California, Merced

July 9, 2019

Abstract

The legislative cartel model argues that the majority party creates a favorable party brand through agenda-setting by constructing a set of votes to increase their members' chances of reelection. While much of the literature has focused on a single constituency, the structure of the U.S. electoral system explicitly builds in two constituencies based on the primary and general elections. In order to be successful, legislators have incentives to send different signals to these constituencies at different times in the election cycle. Here, I argue that the majority party leadership strategically sets the agenda to send different informational signals about the party's more moderate members prior to each election. Using roll-call votes from the 88th-113th Congresses, I find that there is a larger difference between the cutpoints of bills considered before and after the primary election in election years than in non-election years. These findings help resolve the puzzle of why it seems that legislators typically vote more with their party than would be expected, given the preferences of voters in the general election.

Keywords: Majority party agenda setting, legislative cartel theory, legislative voting, election timing

1 Introduction

The legislative cartel model of congressional parties put forth by Cox and McCubbins (2005) argues that parties strive to create a favorable party brand. One way that this can be done is through the use of majority party agenda-setting. With the power to manipulate the agenda, parties construct a set of votes that will make their members look good to their constituents (Cox and McCubbins 2005; Woon and Pope 2008). However, because incumbent legislators face two elections, namely the primary and general elections, party brands face two markets with very different sets of consumers. Primary voters are more interested in more ideologically extreme policy, while general election constituents are a mix of individuals from both parties, causing the aggregate preferences of the electorate to be more moderate. This creates a puzzle: How can parties construct an agenda that advantages their party incumbents in both of these elections?

To help resolve this puzzle, I draw on a literature that shows voters are myopic, such that they overweight recent events (Achen and Bartels 2002, 2004; Fiorina 1978; Gelman and King 1993; Wlezien 2015). By creating separate agendas immediately before and after the primary, legislators are able to present a different image to voters in the primary election and voters in the general election, thereby increasing their chances of reelection and consequently, the probability that the majority party maintains its majority status.

To examine this conjecture, I extend the legislative cartel model assumptions (Cox and McCubbins 2005) by asserting that the majority party leadership uses its gatekeeping and agenda-setting powers to strategically pick the order that scheduled bills are brought to the floor. I argue that before the primary election, the majority party leadership will bring up status quos and bill proposals that even the majority party's more moderate members will have no problems voting for. This increase in party line voting leading up to the primary election allows the moderate members to look like their preferences are more in line with the party median than the floor median. After the primary election, I argue that the majority party leadership will schedule bills that do not invoke a high level of party line voting and this allows the more moderate majority party members to defect to the minority side if needed. Depending on when they are brought up, specific bills can either be beneficial or costly in terms of how they can be used to construct a legislator's image. Therefore, I hypothesize that in election years, there is a larger change in the location of bill cutpoints before and after the primary election than in non-election years.

To test this hypothesis, I use a difference-in-difference research design that takes into consideration the difference between election and non-election

years. The treatment is whether a given year is an election year or not. The dependent variable is the location of cutpoints on final passage votes, measured at two different times in a given year (before and after the primary election). Using data from the 88th-113th Congresses, I find that there is in fact a larger difference between the mean cutpoint before and after the primary election in election years than in non-election years.

These results suggest that, with regard to the effects of elections on legislative behavior, we have been thinking too narrowly. We know that moderate votes can be costly for some legislators (Aldrich and Rohde 2001; Rohde 1991), but prior to the current study, a theory of the majority party strategically scheduling votes to help the party's more moderate members did not exist. By establishing that primary and general elections are fundamentally different in terms of the characteristics of the voters that participate in these elections, we are able to see variability in the type of bills that are scheduled by the majority party leadership in each period. Potentially, this result could help us to predict votes before elections more accurately. Furthermore, it implies that if voters really do take into consideration a legislator's recent vote history when they are trying to cast their vote in an election, they are not getting the entire picture of the legislator's behavior and voting patterns, which could ultimately affect voters and democracy in the long-run.

2 Majority Party Agenda-Setting and Election Timing

Through previous literature, we know that the majority party has the power to decide what gets scheduled on the agenda (Cox and McCubbins 2005; Den Hartog and Monroe 2011). Under the cartel model, the majority party takes advantage of their status and manages their party brand by overseeing the outcomes of bills that are voted upon on the floor (Cox and McCubbins 2005). In addition, the majority party has the ability to divert resources and establish a reputable record to assist party incumbents with reelection (Smith 2007; Cox and McCubbins 2005; Aldrich and Rohde 2001; Aldrich 1995). Specifically, the cartel model argues that the majority party uses the agenda to advance the electoral prospects of its members. Majority party agenda-setting has been found to affect the legislative process in both the House of Representatives and the Senate in the United States (Den Hartog and Monroe 2011; Cox and McCubbins 1993, 2005; Aldrich and Rohde 2000a, 2000b).

Overall, advancing the electoral prospects for its members can be tricky for the majority party because an agenda that benefits some members may

harm the electoral prospects of other members. We know that voters punish legislators for not following the preferences of their constituency and also for voting too partisan on decisive votes (Canes-Wrone, Brady, and Cogan 2002; Carson et al. 2010; Kassow and Finocchiaro 2011). On divisive votes, sticking to party line voting can be costly (Carson et al. 2010). Because legislators are unable to predict which roll-call votes will be prominent in the media and in the minds of their constituents, they must assume that each vote has a possibility of becoming salient in the future (Fenno 1978).

With agenda-setting powers, the majority party leadership has the ability to protect members of the party from votes that they might have to pay for later in terms of reelection probabilities. Forcing members to make moderate votes at the wrong times is costly (Aldrich and Rohde 2001; Rohde 1991), and in the opposite situation, making more moderate members vote with the party on partisan bills can also be costly. Although it has been shown that moderates can be compensated with side payments for policy loss that they incur through voting with their party as a result of majority party agenda-setting (Jenkins and Monroe 2012b; Carroll and Kim 2010), this process could potentially hurt the reelection probabilities of the moderate members. Furthermore, it is suggested that the majority party uses its agenda-setting power to prevent vote splits — meaning that the majority party divides on a given vote — from ever occurring (Cox and McCubbins 2005).

Legislators who make moderate votes when their constituency advocates for more partisan-leaning votes may lose votes in the next election. The constituency that votes in the primary election is more partisan than that of the general election, suggesting that a legislator with a string of moderate votes leading up to the primary may be punished by constituents and ultimately receive a lower percent of the vote than they would have received had their voting pattern been more partisan. Similarly, a legislator who makes extreme votes leading up to the general election may be punished by general election constituents who have aggregate preferences that are more similar to the floor median. There are many things that shape how parties and legislators are perceived, but an important component is a legislator's legislative record and reputation (Canes-Wrone, Brady, and Cogan 2002; Carson et al. 2010; Nyhan et al. 2012; Woon and Pope 2008; Kim and LeVeck 2013). Therefore, the current theory focuses on legislative voting behavior.

One aspect that is less discussed is that agendas do not only have heterogenous effects across members and their districts. There are also heterogenous effects within a member's district. The reason behind this is that every incumbent member faces two different electoral environments, a primary election and a general election. Therefore, in trying to construct an agenda to advance

the electoral prospects of its members, the majority party must also take into consideration agendas that will allow their candidates to succeed across these two elections. This is difficult because voters in each type of election have different preferences. Voters in the primary election tend to be more partisan than their general election counterparts, and therefore, prefer agendas that make the incumbent look ideologically closer to their party's median. In contrast, voters in the general election tend to have more moderate preferences, and therefore, prefer agendas that make incumbent members look more moderate. Little is known about how incumbents and their parties deal with these competing preferences.

Previous research suggests that voters care more about recent events than those farther in the past. Individuals are constrained by their ability to comprehend and store information about politics in their memory, and tend not to hold true attitudes (Converse 1964; Zaller 1992). Individuals are primed by events that are salient at the time they are asked for an evaluation (Iyengar et al. 1984; Krosnick and Kinder 1990), and are also susceptible to bias arising from the way information is framed by those who make it salient (Iyengar, Peters, and Kinder 1982; Nelson, Oxley, and Clawson 1997; Jacoby 2000; Chong and Druckman 2007). With regard to benefits created from policies, economic evaluations, presidential elections, and performance evaluations, voters have been shown to be myopic, meaning that they focus on more recent events (Achen and Bartels 2002, 2004; Fiorina 1978; Gelman and King 1993; Wlezien 2015; Weingast, Shepsle, and Johnsen 1981).

It is possible that voters are myopic for a variety of reasons[1]. In addition to memory constraints and lack of true attitudes (Converse 1964; Zaller 1992), it may be the case that voters only begin to pay attention to political information in the time immediately leading up to an election (Wlezien 2015). It could also be the case that since voters may choose to use a online-tally to keep track of information instead of a memory-based model, most of the information gained far before the election may have been condensed into a summary evaluation or forgotten (Lodge, McGraw, and Stroh 1989). Unless there is a constant long-term stream of similar information sent to individuals, it is likely that there will be no persuasive effect of information on behavior due to decay (Gerber et al. 2011) and lack of effortful processing (Hill et al. 2017). The observed myopic effects of persuasive campaign information tend to support a mix of both the memory-based and online processing models, with the majority of information losing its effect after six weeks and the accumulation of small effects over a long period of time lasting a bit longer (Hill et al. 2017).

[1]See Wlezien (2015) for a more detailed discussion of the possibilities.

It has also been proposed that voters ignore what happens early in the election cycle (Achen and Bartels 2004; Wlezien 2015). Similarly, other literature has contended that individuals do in fact wish to consider all four years in their evaluation. However, this information is not readily or easily available to them. Instead, individuals have prominent access to the last year, and thus, place more weight on it than previous years (Healy and Lenz 2014). The mechanism behind this idea is the "end heuristic," which suggests that individuals substitute the last year for the whole term (Healy and Lenz 2014).

Because voters overweight recent events, legislators have an incentive to change how they vote based on whether an election is nearer or farther away in time. Previous research has found evidence consistent with this argument, showing that a number of legislative behaviors do take the timing of an election into account (Lindstadt and Vander Wielen 2014; Shepsle et al. 2009). The benefits associated with credit-claiming influence legislators to save these types of bills until the end of the session, where they will be more recent in the minds of voters (Shepsle et al. 2009). In the time leading up to an election, legislators strategically monitor the amount of votes they make with their party to portray a more moderate image, thereby placing a higher emphasis on the demands of their constituency relative to their party (Lindstadt and Vander Wielen 2014). Specifically, this is demonstrated by a decrease in party unity scores in the second year of a Congressional session (Lindstadt and Vander Wielen 2014)[2]. There have been documented shifts in ideological stances relative to the proximity of elections, where legislators appear to be more moderate as the election (and their possible reelection) approaches (Elling 1982; Wright and Berkman 1986). As further evidence, these types of shifts are not seen when the records of retiring legislators are studied (Thomas 1985). One important idea to note from these studies, however, is that they look at roll-call behavior change in the years leading up to a Congressional election, not within a given year as the election gets closer.

Previous literature has not looked at whether the agenda is also responsive to the timing of different types of elections, such as primary and general elections. Do parties time votes such that voters in the primary election will favor the stances taken by incumbent legislators right before the primary election? Likewise, do parties then change the agenda so that more moderate general election voters will favor an incumbent's most recent votes? Currently, most scholarship assumes (either implicitly or explicitly) that even though the

[2]Instead of looking at party unity scores across years, in the following sections, this paper looks at cutpoint locations during a given year and their relationship to the idea of strategic timing.

majority party influences the agenda, it does not influence legislator voting behavior based on the timing of elections[3]. This means that the majority party is monitoring the agenda and scheduling bills that will be considered based on intended policy outcomes, not reelection probabilities. In the next section, I present an extension to the cartel model of agenda setting which shows how parties can construct specific agendas before and after the primary in order to make incumbents' recent votes more favorable to each constituency.

3 Theory

Primary elections and general elections are fundamentally different in the sense that there are different types of voters that participate. In a primary election, only voters registered to the party can vote, whereas in a general election, everyone that is registered to vote can participate. We know that primary election constituents place a high value on roll-call votes that are near their party median, whereas general constituents have interests that are typically closer to the chamber median (Bafumi and Herron 2010). Therefore, I argue that the majority party leadership will strategically set the agenda based on the timing of the elections. Following from previous literature, I assume that the policy space of the legislature is unidimensional and that each actor in the model has single-peaked preferences (Black 1948; Downs 1957; Poole and Rosenthal 1985, 1987). Additionally, I assume that legislators that are running in the primary and/or general election have the goal of being reelected (Mayhew 1974). A critical assumption for the theory is that voters get information in the months leading up to an election, meaning that they are, for the most part, myopic.

The current theory builds on the basic assumptions and implications of legislative cartel theory as proposed by Cox and McCubbins (2005). The cartel model asserts that members of the legislature are motivated by the prospect of reelection. The majority party brand uses the resources of having majority party status to help its members stay in office. Therefore, the majority party has the incentive to capture and disproportionately redistribute the resources that are available in the legislature to its members. Majority party members realize the benefits that can be gained from managing the party brand and therefore delegate power to leaders who act on behalf of the party to capture

[3]Analysis of roll-call behavior and the introduction of direct primary laws suggests that there is no relationship between primary elections and legislators making more partisan roll-call votes (Hirano et al. 2010). It is important to note, however, that Hirano et al. (2010) use pooled pre and post primary election roll-call behavior to test the relationship.

the resources available, thus forming a cartel. The party brand is managed by managing policy output and this is done by gatekeeping (Cox and McCubbins 2005).

I am not assuming that the majority party leadership values moderate members winning their reelection bids over more partisan members winning their reelection bids. What I am assuming, is that the majority party values keeping its majority status, and therefore works to get all of the majority party members reelected (Cox and McCubbins 2005; Aldrich and Rohde 2001), including both moderate and more partisan majority members. The majority party leadership wishes to protect its members from moderate challengers in the primary election and from extreme challengers in the general election, without diluting the party's legislative success and reputation. If the majority party leadership can strategically structure the timing of the agenda so that some votes serve the primary election and other votes serve the general election, this can send out informational signals about the voting behavior of the party's members and also promote legislative success for the party.

Because the majority party has the ability to set the legislative agenda, only status quos where new proposals can pass without any arm twisting will be addressed. A key assumption of the cartel model is that all bill proposals will pass at the floor median of the chamber. The majority party leadership uses its power to strategically block status quos that are preferred to the floor median from ever being considered (Cox and McCubbins 2005).

Given that the majority party leadership has the ability to set and control the legislative agenda through gatekeeping, the only additional assumption that the current theory adds to the assumptions of the cartel model is that the majority party leadership can set the order of the agenda. Therefore, I argue that the majority party leadership strategically sets the agenda according to the time period. This strategic agenda setting reveals information about the majority party's more moderate members at a given time. Their preferences either look similar to the more partisan majority party members (before the primary election) or they do not (after the primary election).

There are two actors in this model, the majority party leadership and the majority party members that are closer to the floor median than the majority party median (the majority party's more moderate members). The majority party leadership are members of the majority party that are delegated leadership power and have the ability to set the agenda. The majority party leadership wants to pass bills that are ideologically preferable to status quos (Cox and McCubbins 2005; Groseclose and McCarty 2001). They also want to use the advantages and resources of majority party status to keep majority party status and help get the party's members reelected (Cox and McCubbins

2005; Aldrich and Rohde 2001). The majority party's more moderate members are members that have preferences that are closer to the floor median than the majority party's median. These members want to get reelected (Mayhew 1974; Cox and McCubbins 2005), and listen to the preferences of the constituents in their districts.

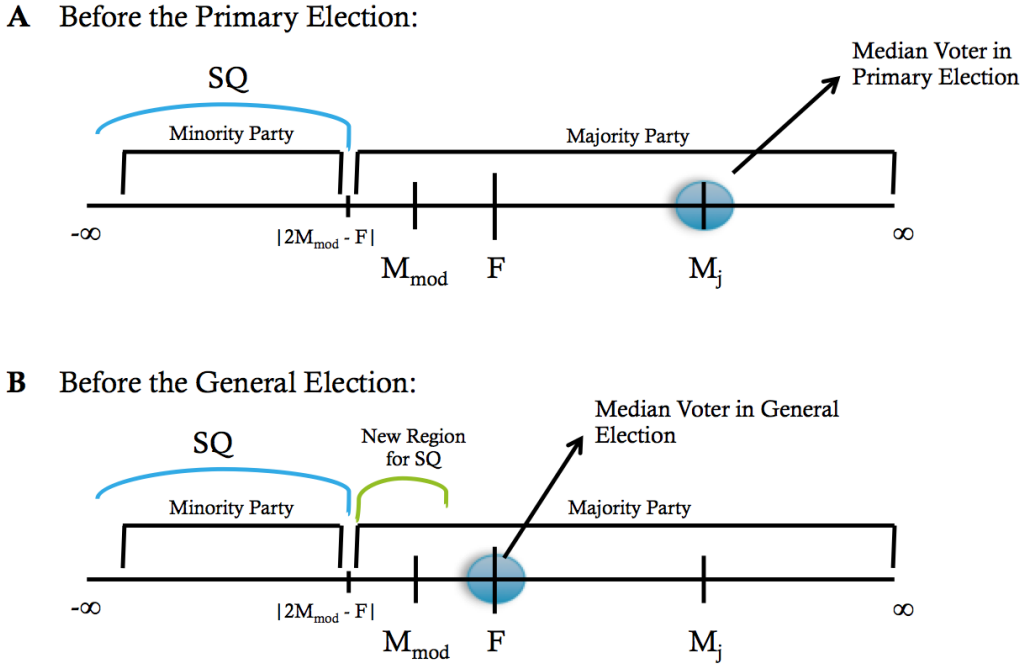

Figure 1: **Two Cases:** A: SQs that will be targeted before the primary election, B: New SQ region that is targeted following the primary election but before the general election.

The current theoretical argument is divided into two parts: before the primary election and after the primary election (Figure 1). Panel A of Figure 1 illustrates the theoretical argument before the primary election. Candidates in the primary election want to cater to the median voter of the primary election constituency, which is located around the party median (M_j). Leading up to the primary election, the majority party leadership creates opportunities for all members of the party, including the party's more moderate members, to look more partisan, thereby increasing their chances of winning in the primary election. To create these opportunities, I argue that status quos on the far left (minority side) of the space will be scheduled on the agenda. These status quos are items that will promote party line voting, meaning that the party's

more moderate members will have no problems voting with the majority party on these items.

To illustrate, let's imagine hypothetical legislator M_{mod} who is located halfway between $|2M_{mod} - F|$ and F (the floor median) in Panel A of Figure 1. Before the primary election, the majority party leadership wants to make the party's more moderate members look like they have preferences closer to the party median than they actually do. Therefore, they will introduce bills which will promote all party members voting together so that the preferences of the more moderate members and the preferences of the party's more partisan members will be indistinguishable. When the majority party brings up status quos that are in the region from $-\infty$ to $|2M_{mod} - F|$, the voting behavior of M_{mod} and M_j will be identical for any status quo, as they will all vote in favor of the proposal at the floor median to amend the status quo.

This type of strategic status quo timing allows the majority party leadership to protect the party's more moderate members. By choosing to bring up status quos for which the party's more moderate members will vote with the rest of the party, their voting behavior will be seen as more partisan. This increases the probability that the party's more moderate members will appeal to the median voter of their primary election constituency, thereby increasing their chances of reelection[4].

3.1 Example: Two Types of Votes

To see why the these differing agendas help protect the majority party's more moderate members, consider the following example. If we arrange all 435 members of the House of Representatives on a unidimensional space in terms of preference on minimum wage policy, let us assume that we are the 221st

[4]It is logical to think that the size of the majority party might have an effect on the majority party leadership's decision to strategically set the agenda based on election timing. When the majority is large, there should be less incentive to help the members that are closer to the floor median with reelection. Similarly, when the majority is small, it should be a high priority to make sure that all of the members (including those that are closer to the floor median) are reelected so that the party can keep its majority status. Therefore, the majority party leaders have fewer degrees of freedom to be able to release members who are closer to the floor median and allow them to vote against the party. In this case, smaller majorities should be less likely to take election timing into consideration. Given that this is the first attempt at investigating the influence of election timing on agenda setting, I do not make the theory more complicated by adding majority size. However, a preliminary test of the influence of majority size is included in a multivariate model in the Supplementary Information Appendix, where it is not significant and does not significantly change the point estimate on *election year* either.

most conservative member of the chamber and that there is a Republican majority. The specific policy brought to the floor by the majority party will make legislator 226 on the line indifferent between the status quo (SQ) and the proposed bill (P) (see Figure 2).

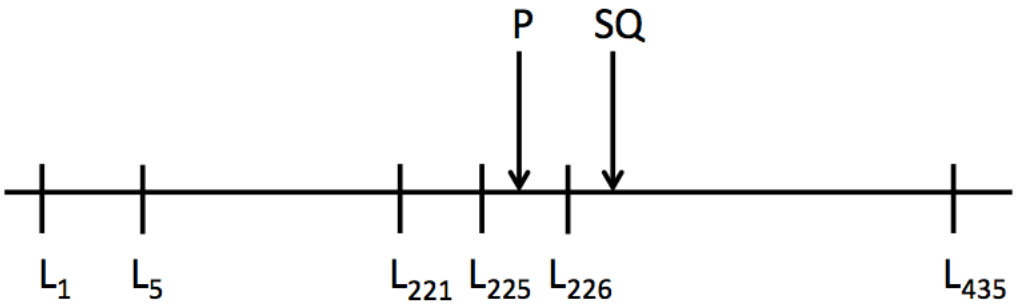

Figure 2: **Simplified Legislature:** A hypothetical legislature with 435 members with their preferred minimum wage policies portrayed on a unidimensional space.

Even though we know that we are the 221st member (L_{221}), let us assume that voters do not have such precise information about our position. Instead, they take clues from what we have done with the party recently to judge what kind of Republican we are. On the proposed minimum wage bill, suppose we vote with the majority leader. In this case, we look the same as the 5th most conservative member (L_5). There is no difference between the signal conveyed by us and the signal conveyed to voters by the 5th member. In this case, our behavior is revealed to be identical to a member that is very conservative. Alternatively, imagine that we vote in opposition of the majority leader. In this case, we look the same as the 435th legislator (L_{435}). There is no difference between the signal conveyed by our vote and the signal conveyed by the 435th member. Now, however, we are conveying a different signal from the 5th member, allowing us to look more moderate with respect to the majority party's more partisan members.

3.2 Predictions

Returning to Figure 1, Panel B illustrates what happens after the primary election but before the general election. Voters that participate in the general

election can be from either party in a two-party system, and therefore, the median voter in this constituency is usually centered closer to the chamber's floor median (F), on average. In the time following the primary election and leading up to the general election, the majority party leadership creates opportunities for the party's more moderate members to look more moderate. I argue that the majority party leadership will open a new region to draw status quos from, in addition to the region where status quos are drawn from before the primary election. In the unidimensional spatial model, this means that in addition to the status quos that the majority party leadership will bring up from the region $-\infty$ to $|2M_{mod} - F|$, before the general election, they will also bring up status quos from the region $|2M_{mod} - F|$ to halfway between M_{mod} and F, creating an agenda with a mix of status quos from these two regions. These are items that will promote less party line voting and allow more moderate majority party members to defect to the minority side if needed, without interfering with the majority party's legislative success.

To illustrate, let's return to our hypothetical legislator M_{mod} who is located between $|2M_{mod} - F|$ and F in Panel B of Figure 1. After the primary election but before the general election, the majority party leadership recognizes that for the party's more moderate members to be reelected, they may need to vote more moderately than the more partisan members of the majority party. For this reason, the majority party leadership will strategically schedule a mix of status quos from the original region $-\infty$ to $|2M_{mod} - F|$ and the new region $|2M_{mod} - F|$ to halfway between M_{mod} and F. In the region from $|2M_{mod} - F|$ to halfway between M_{mod} and F, the party's more moderate members will vote in favor of retaining the status quo. Therefore, before the general election, the voting behavior of M_{mod} and M_j will not be the same.

This allows the majority party leadership to send an informational signal about the voting behavior of the party's more moderate members in relation to the party's more partisan members. By using this mix of status quos from the two regions, the majority party leadership gives the party's more moderate members the opportunity to vote in favor of the status quo (with the minority party) and thus look more moderate. In turn, this protects the party's more moderate members in the general election, where their constituency's median voter is centered around the chamber's median, not the party's median.

In contrast to ideal points, which measure a legislator's preference location across a variety of issues on a single dimension, status quos are for a given policy. It is atypical that the same policy has a series of observations; rather, there is a single observation and our goal is to determine where on the unidimensional spectrum it lies. As a single observation, it is impossible to calculate its location in the same way we calculate ideal points for legislators,

as it is impossible to average across time or space to estimate the location of one observation. Therefore, because cutpoints are the closest estimate we have to the location of the status quo, the hypothesis below focuses on the change in cutpoints between pre/post election time periods[5].

Hypothesis: In election years, there will be a larger change in the location of bill cutpoints before and after the primary election than in non-election years.

4 Research Design

To test the hypothesis, I use a non-equivalent two group pre/post design (Table 1). Specifically, I make use of the difference between election years and non-election years. This separation is logical because we would not expect the majority party to strategically set the agenda based on election timing in non-election years because there are no elections, nor would we expect individual legislators to change their behavior based on election timing during non-election years.

This difference-in-difference design is especially useful because the only difference between an election year and the previous non-election year is consideration of the election. This design holds many covariates constant over each congressional session, including individual legislators, their ideal points, and their constituencies, thus eliminating the need for many control variables and minimizing selection problems. Between an election year and the previous non-election year, individual legislators, the ideological distribution of the House, and other remaining Congress-level factors are constant. It is not likely that a legislator's constituency changes or their ideal point changes substantially. Because an election year is "matched" with the previous non-election year, the only difference between the two years is the existence of the election in the election year. Therefore, if the difference-in-difference results show significant variability between election years and non-election years, this is very likely attributable to the timing of the election.

Within this design, the treatment is the primary election and this treatment is only seen in election years. Bill cutpoints are observed at two different times for each year, before the primary election cutoff (January-August) and after the primary election time in both election and non-election years, despite

[5]Cutpoints are the break between "yea" and "nay" votes on a given bill (McCarty, Poole, and Rosenthal 2001). Given that legislators can be organized on a unidimensional space based on their ideal points (estimated using NOMINATE), the cutpoint represents the point at which "yea" switches to "nay" (Poole 2000, Poole and Rosenthal 1997).

Table 1: Research Design

	Pre	Primary Election	Post
Election Year	$\mu_{cutpoints}$	X	$\mu_{cutpoints}$
Non-election Year	$\mu_{cutpoints}$		$\mu_{cutpoints}$

primary elections only occurring in the election year. I take the average location of the cutpoints over all of the bills in each of the two periods in each year (Table 1).

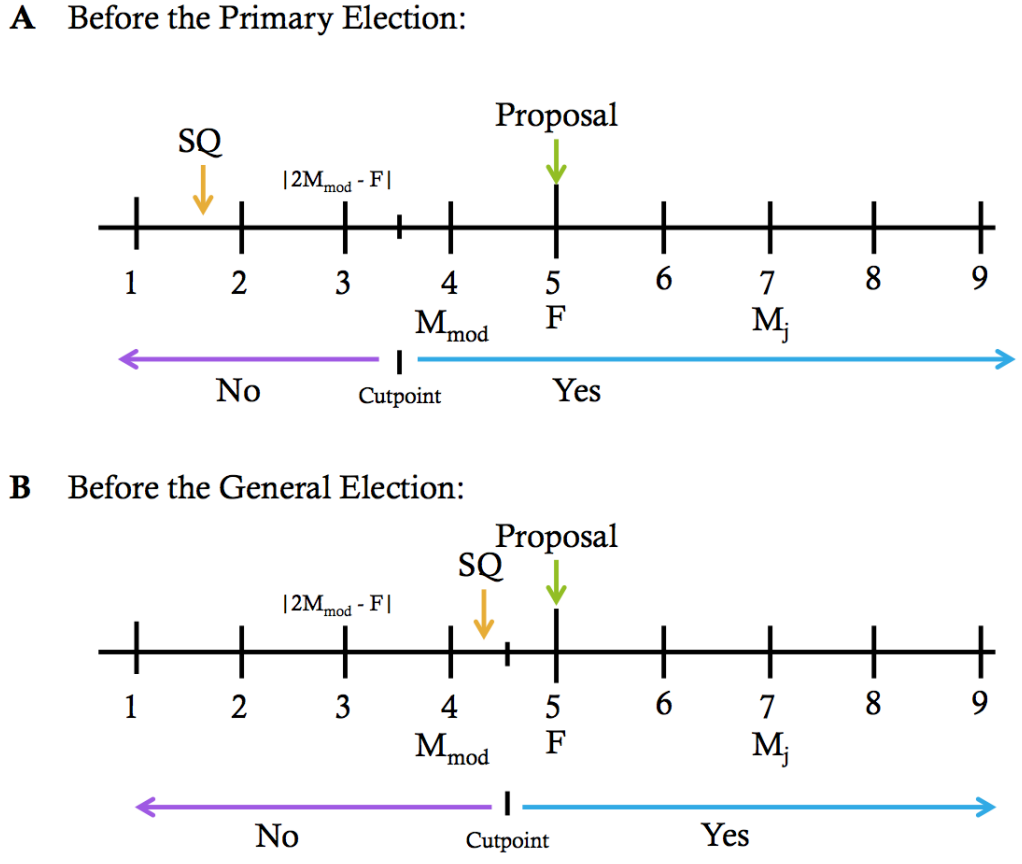

Figure 3: **Cutpoint Example**

I use cutpoints as the dependent variable in this analysis because the theory and hypothesis imply that there should be larger zone of status quos that are brought up after the primary election and before the general election than before the primary election. To illustrate this expectation, imagine a

hypothetical legislature with nine members (Figure 3). The majority party in this legislature consists of members 4-9, where member 4 is a more moderate member of the majority party. The minority party consists of members 1-3. Panel A demonstrates the expected cutpoint of a bill that is considered before the primary election. In this case, members 4-9 will vote in favor of the proposal, while members 1-3 will vote against the proposal in favor of the status quo. In this case, the majority party's more moderate member (member 4) votes with the more partisan majority party members and their behavior / preferences are indistinguishable. Essentially, we know that this pattern will hold for any status quo from $-\infty$ until $|2M_{mod} - F|$.

In contrast, Panel B shows the voting behavior of members after the primary election but before the general election. If a status quo is considered at the new point SQ, members 5-9 will vote in favor of the majority party's proposal, while members 1-4 will vote against the proposal in favor of the status quo. Notice that in this case, the majority party's more moderate member, member 4, was able to vote according to their more moderate preferences without hurting the success of the majority party. In this case, the majority party's more moderate member does not vote with the more partisan members of the majority party.

Therefore, according to the hypothesis, we should expect to see a shorter status quo zone before the primary election. This means that cutpoints will be farther away from the majority party median before the primary election. Alternatively, we should expect to see a larger status quo zone after the primary and before the general election, meaning that cutpoints will be closer to the majority party median. It is the change between these two time periods that I am interested in. In non-election years, we should expect to see no significant change in the size of the status quo zone relative to the time the primary election would have been if it was an election year.

I expect to see a difference in the absolute value of the location of cutpoints before the primary and after the primary election in election years ($\mu_{election,pre} \neq \mu_{election,post}$). I do not expect a difference between the location of cutpoints before the primary election time and after the primary election time in non-election years ($\mu_{non-election,pre} = \mu_{non-election,post}$), because we have no reason to believe that the majority party leadership would strategically set the agenda based on election timing when there are no elections in that year.

To carry out this test at the vote level, I use roll-call votes from the House of Representatives from the 88th-113th Congresses to examine the average location of cutpoints as the dependent variable. The treatment is whether it is an election year or not. When it is an election year, legislators want to appeal to two different election constituencies, the primary election constituency and

the general election constituency, and this affects the agenda. This is measured as a dichotomous variable that denotes the time period (before the primary (January 1st-August 30th)/ after the primary election). I compare the change in the locations of cutpoints before and after the primary election in election years to the change in the location of cutpoints before and after the primary time in non-election years.

The hypothesis suggests that there is a larger difference in the location of cutpoints before and after the primary election in election years than before and after the primary election time in non-election years.

5 Results

I use roll-call voting data from the House of Representatives from the 88th-113th Congresses (1963 - 2014) to examine the average location of cutpoints at different times in a congressional session. The dataset is a combined version of Poole and Rosenthal's DW-NOMINATE roll-call data and Rohde's PIPC data[6]. I use the PIPC dataset variables to narrow down the roll-call data to only include final passage votes[7]. Each row of the dataset gives information for a final passage roll-call vote, including the number of yeas, nays, month of vote, and first dimension cutpoint. I use the first dimension cutpoint, $Mid1st$, as the dependent variable. The month variable is used to make a dichotomous *primary* variable that is equal to 1 for the months January - August and 0 otherwise (September - December)[8]. There are a total of 3,163 observations at the individual final passage vote level used in this analysis.

[6]This dataset is available from Carroll et al. (2016) here: `http://voteview.com/dwnomin.htm`.

[7]I restrict the analysis to final passage votes because this type of vote is usually between the status quo policy and the proposal (Robinson, Monroe, and Magleby 2017). Additionally, relative to other vote types, final passage votes are more indicative of majority party agenda-setting power (Carson, Monroe, and Robinson 2011). This match-up provides an excellent test of the theory.

[8]Most of the Congressional primary elections are scheduled from January to August (95%) (2016), but there are still some in September. This variable was coded from: `http://www.fec.gov/pubrec/fe2016/2016pdates.pdf`. If August is too early, then it will be harder to find a treatment effect when comparing cutpoints before the primary to cutpoints of bills after the primary. From a research design standpoint, if we draw the line for the primary election time such that half the primaries are before and half are after, this would bias against finding an effect. Therefore, using only 95% is not a problem for the results. A robustness check with a primary date cut-off that includes every primary election date is included in the online Supplementary Information Appendix and does not significantly influence the results presented in the main text. Therefore, the original primary variable covering 95% of the primary dates is used.

I separately code each year as an *election year* or a $non-election\ year$. There are 52 years in the dataset, 26 election years and 26 non-election years. I calculate the mean cutpoint before the *primary* and after the *primary* for each year, regardless of election year status. These calculations yield two mean cutpoints for each year, one before the *primary* and one afterwards. Next, for a given year, I subtract the post-primary mean cutpoint from the pre-primary mean cutpoint, which yields the difference between the mean cutpoints before and after the primary election. The theory suggests that this difference will be bigger in election years than in non-election years.

Because there is frequent change in who controls the House of Representatives, I take the absolute value of the difference between the pre- and post-primary election cutpoints. This controls for the difference in cutpoint sign between Democratic and Republican-controlled years. Therefore, the difference represents only the average change in the location of cutpoints before and after the primary election and does not give us any information regarding the direction of the change[9].

The absolute difference between the average cutpoints before and after the primary election time for each year can be seen visually in Figure 4[10].

To test the hypothesis that in election years there will be a bigger change in the location of cutpoints before and after the primary election than in non-election years, I use a paired design. This means that I match one election year with the previous non-election year and compare the difference in average cutpoint locations in each period between the two years. To do this, I use a paired Wilcoxon signed rank test. This test is more appropriate than a paired t-test because of the small number of observation years in this analysis. Unlike a paired t-test, this test does not assume that the distribution of cutpoints in election years and non-election years follow a normal distribution. Using a paired design allows us to hold many covariates constant over each congressional session, including individual legislators, their ideal points, and their constituencies, eliminating the need for a string of control variables.

The null hypothesis is that there is no difference between the change in average cutpoints before and after the primary election in election years and

[9]The direction of change will be the subject of investigation in future research.

[10]While this graph may look similar to the "sawtooth pattern" in party unity scores as noted by CQ (`http://media.cq.com/votestudies/`), over the time period that I use, party unity does not correlate well with cutpoints ($\rho = -0.07$). There is little reason to think that the pattern of party unity scores exhibited over the past few decades follows the two-year election cycle investigated in this paper. Therefore, it is not a problem for the current theory or empirical test. The relationship between party unity scores and cutpoints is investigated in the online Supplementary Information Appendix.

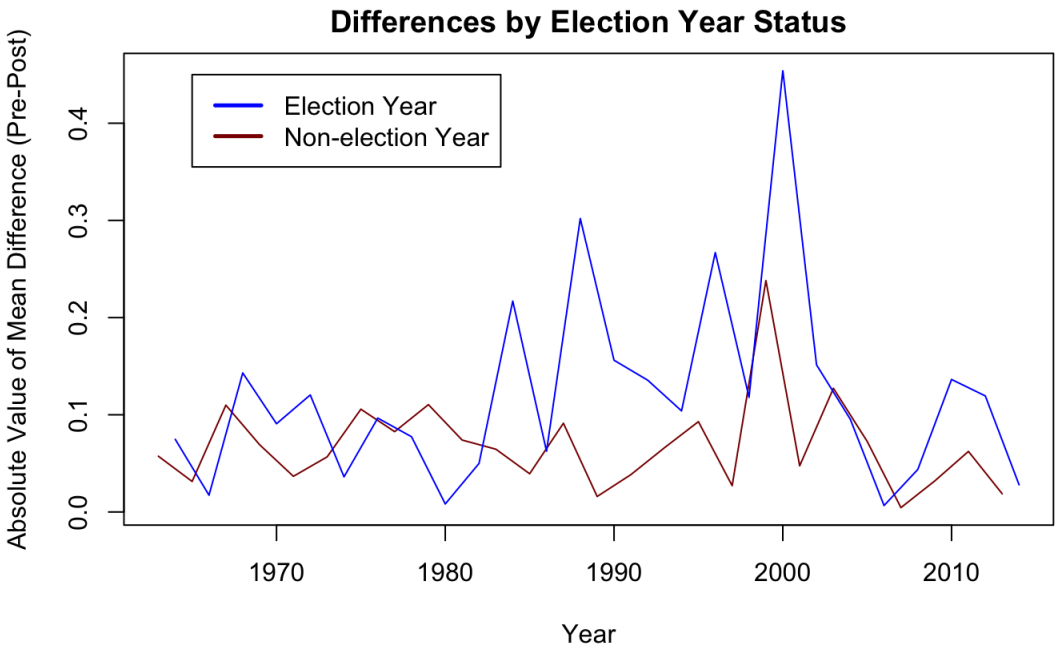

Figure 4: **Absolute Mean Cutpoint Difference by Year:** Overall, there are larger differences between pre/post mean cutpoints in election years than non-election years.

non-election years ($|\mu_{non-election,pre-post}|$ - $|\mu_{election,pre-post}| = 0$). Therefore, the alternative hypothesis is that the difference between the average difference in cutpoints in non-election years minus the difference in cutpoints in election years will be less than zero ($|\mu_{non-election,pre-post}|$ - $|\mu_{election,pre-post}| < 0$), meaning that there is a larger change in election years.

The results of the Wilcoxon signed rank test are presented in Table 2. Using a two-sided test, the results hold at the $p < 0.01$ level ($p-value = 0.004$)[11]. Therefore, we can reject the null hypothesis that there is no difference between the change in average cutpoints before and after the primary election in election years and non-election years ($|\mu_{non-election,pre-post}|$ - $|\mu_{election,pre-post}| \neq 0$). There is evidence to suggest that there is a larger difference between the change in average cutpoints before and after the primary election in election years than in non-election years ($|\mu_{election,pre-post}|$ - $|\mu_{non-election,pre-post}| > 0$).

[11]Technically, I wish to test if the paired difference between non-election years and election years is directional. Using a one-tailed test, the results still hold at the $p < 0.01$ level ($p - value = 0.002$)

Table 2: Wilcoxon Signed Rank Test Results

	p-value	V
Paired test of $\lvert\mu_{non-election,pre-post}\rvert$ & $\lvert\mu_{election,pre-post}\rvert$	0.004^{***}	66
N	Years: 26 E & 26 NE	Bills: 3,163

Two-tailed test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As noted earlier, the difference-in-difference research design accounts for many confounding factors because the only difference between an election year and the previous non-election year is consideration of the election. This design holds many covariates constant over each congressional session, including individual legislators, their ideal points, and their constituencies, thus eliminating the need for many control variables and minimizing selection problems. The above test presents a clean empirical finding based on a relatively strong research design. However, a multivariate regression approach is included in the online Supplementary Information Appendix for robustness[12].

6 Conclusion

Through the cutpoint location analysis presented in this paper, we can see that, as the hypothesis suggests, in election years, the majority party strategically schedules the agenda to include bills that will allow the party's more moderate members to exhibit voting behavior that looks identical to the party's more partisan members before the primary. In contrast, after the primary election in election years, the majority party schedules a mix of bills that allow the party's more moderate members to exhibit voting behavior that is more moderate than the party's more partisan members. As a result, by strategically allowing the majority party's more moderate members to have opportunities to make their preferences seem more in line with the party median before the primary election and more in line with the floor median after the primary election, the

[12]The dependent variable is the absolute difference between mean cutpoints before and after the primary election time for each year ($|\mu_{year,pre}$ - $\mu_{year,post}|$). I use a dummy variable that denotes whether or not it is an election year and a subsequent dummy variable that represents whether a Congress precedes a presidential election (whether or not it is an election year), as well as an interaction of the two variables. Finally, I include the change in the number of bills from the previous year to capture the idea that the number of bills considered in a year may affect the mean cutpoint location as well as the size of the majority party (number of members). Overall, none of the covariates are significant predictors of the difference in cutpoints. Arguably, this is a noisier test of the theory as there are many differences between election years and non-election years that are not controlled for using regression. If desired, these results can be moved to the main text.

majority party is able to send informational signals about the characteristics of the party's more moderate members at a given time. The goal of this strategic agenda setting is to help the party's more moderate members get reelected and thus allow the majority party to keep its majority status.

Previously, scholars have found that legislators vote with their party, even if their party receives only marginal support in their district (Ansolabehere, Snyder, and Stewart 2001). However, this conclusion may be due to the fact that most previous studies pool roll-call votes together over a given Congressional year without taking into consideration election timing. By considering election timing and comparing non-election years to election years, I argue that the majority party leadership uses their agenda-setting power strategically to give off the impression that legislators change their behavior to take constituents' preferences into consideration, when in reality, the majority party leadership is changing the location of bills that are brought up in the time before and after the primary election in an election year.

These results presented here suggest that, with regard to the effects of elections on legislative behavior, we have been thinking too narrowly. Prior to the current study, a theory of the majority party strategically scheduling votes to help the party's more moderate members did not exist. This idea does not come without substantive implications. In terms of members of the electorate deciding who to vote for, myopic behavior in combination with this kind of strategic information signaling by the majority party leadership could hinder the electorate's ability to get a clear picture of a legislator's voting patterns over the entire course of a year or session. In the long-run, this could affect democracy if members of the electorate are not voting for the correct candidates in terms of their own policy preferences or if legislators are responding to reelection probabilities by sending informative signals and not specifically responding to constituents' preferences.

Future work should take into consideration the direction of the change in cutpoints before the primary election time and after the primary election time. The current paper suggests that the change in average cutpoint locations before and after the primary election time is larger in election years than in non-election years. To account for changes in party control of the House of Representatives, the absolute value of the difference is used in this analysis. However, future work should consider the direction of change, given that a specific party controls the House of Representatives. Additionally, this analysis could be extended to the Senate. I would expect that strategic agenda setting based on the timing of elections would be weaker because majority party agenda control is weaker in the Senate (Den Hartog and Monroe 2011). Furthermore, there are fewer Senators up for reelection and therefore less of a

signal that needs to be sent.

Future work might also investigate the effect of the size of the ideological gap between the two party medians on strategic agenda setting based on election timing. It might be the case that with a larger gap between the party medians, the majority party leadership will feel the need to put increasing effort into securing the reelection of every member and therefore prioritize sending informational signals about the party's more moderate members to increase their chances of reelection. This would lead to a stronger effect of election timing as the ideological gap increases.

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Disjoint Delegations: Disentangling the Effect of Party Label on Inference

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Abstract

Party labels can act as an information shortcut that helps voters more reliably guess the issue positions of a representative, even when voters have no direct information about their representative's voting record. However, it can be difficult to assess exactly how much party labels, by themselves, improve voters' inferences about politicians' issue stances. This difficulty in isolating the effect of party labels arises because people who know a politician's party tend to also be more knowledgeable about politics in general. As a result, a number of studies have come to mixed conclusions about the effectiveness of heuristics (Lupia 1994; Dancey and Sheagley 2013). Here, I better isolate the effect of an individual being "treated" with knowledge of a representative's party label as a heuristic by using an instrumental variable design. Specifically, I use living in a state with a mixed delegation to the Senate (one Republican and one Democratic Senator) as an instrument for knowing the party label of each Senator. I then use this instrumented measure to examine how knowing a Senator's party affiliation affects a citizen's ability to guess their Senator's positions on key votes. Having a mixed delegation is largely orthogonal to other individual-level characteristics, but does affect an individual's ability to know their Senators' party affiliations because they must be able to specifically pair the right party label with each Senator (rather than simply guess it from other knowledge about their state). Individuals living in a state with a mixed delegation are therefore less likely to know the party label of their Senators. Using this instrumental variable design, I find that knowing a Senator's party makes voters 13.1% more likely to correctly guess their position on major votes. This finding suggests that party labels can independently improve citizen inference about their representatives, even when other forms of political knowledge are held relatively constant.

Keywords: Heuristics, party label, heuristic effectiveness, decision-making

1 Introduction

Individuals employ a variety of different heuristics to make decisions including party label (Dancey and Sheagley 2013), group endorsements (Lupia 1994), and source cues (Nicholson 2011). In particular, party label is generally easy for individuals to obtain. For individuals that understand party platforms, knowing the party label provides a large amount of information at a relatively low cost. The party label can help individuals make decisions regarding individual candidates and their policy positions, given that candidates and representatives follow their party platform (Dancey and Sheagley 2013).

In terms of using the party label as an effective heuristic, it is hard to isolate the effect of knowing the party label in the real world, as party affiliation goes together with many different things used in political decision making. For example, knowing a group endorsement is likely not the only information that an individual has about a given policy. Individuals might also know which party favors it, which politicians endorse it, or some idea of what kinds of effects the policy will bring. Disentangling the effect of party label from other heuristics is important because previous literature has come to mixed conclusions about the effectiveness of heuristics and their ability to lead to high quality decision making. Therefore, this paper seeks to uniquely identify the party label as separate from other heuristics and investigate the effect of knowing the party label on the probability of making a correct decision.

Scholars have asked if heuristics work and what the standards are by which we should evaluate them (Lupia 1994). Do individuals who use heuristics make the same decisions that they would have made if they had complete information? Can uninformed individuals come to the same conclusions as more informed individuals through the use of heuristics? Despite the initial discovery that heuristics could be used to overcome lack of information (Popkin 1991; Sniderman, Brody, and Tetlock 1991; Page and Shapiro 1992; Lau and Redlawsk 2006; Lupia 1994; Tversky and Kahneman 1974), further research argued that heuristics might not always be useful, efficient, or lead to the same results that full information would have led to (Kahneman 2003; Kahneman and Tversky 1979; Dancey and Sheagley 2013; Lau and Redlawsk 2001; Kuklinski and Quirk 2000).

These conflicting conclusions could be related to a number of confounds. For instance, it might not be the case that knowing the party label biases decision-making. Instead, it could be that those who know it are more attentive to politics, stronger partisans, and more likely to engage in partisan motivated reasoning (Green, Palmquist, and Schicker 2002; Cohen 2003; Rahn 1993; Taber and Lodge 2006). Therefore, this paper seeks to uniquely identify

the effect of knowledge of the party label of national politicians, holding all other things equal.

Our results show that knowing the party label is a useful cue that helps individuals make high-quality decisions. The identification strategy rests on a comparison between people that live in states with mixed delegations to the Senate and people that live in states with unified delegations to the Senate. A mixed delegation is one where there is one Republican Senator and one Democrat Senator. Mixed vs. unified delegation is orthogonal to other individual characteristic variables, but does affect knowledge of knowing the correct party label of a state's representatives. I argue that for individuals that know the party label, this increases the probability that they can correctly identify what actions their representative has taken. The primary way that having a mixed delegation affects knowledge of how the representative voted is that it is harder for individuals with mixed delegations to know the party label of a given representative in their state.

The research design employed in this paper uses the 2006 Cooperative Congressional Election Studies data for individual-level data and Senator roll-calls on bills asked about in the survey. Using an instrumental variables approach, I separate the effect of the party label by looking at mixed state delegations to the Senate. The idea behind this strategy is that individuals who live in states with mixed delegations are similar to those who live in states with unified delegations in terms of political interest, as well as other variables related to knowledge of party labels. Because individuals in the two types of states are similar in terms of variables related to political knowledge, comparing individuals with mixed delegations to those who have unified delegations allows for both the identification of party label alone and the construction of a two stage model. In the first stage, I estimate the probability that an individual knows the party label of their Senate representatives, using a dummy variable for mixed delegation as the main independent variable. In the second stage, I estimate the probability of an individual correctly identifying how their representative voted, using the (first stage) probability of knowing the correct party label of the representative as the main independent variable.

I show that individuals who live in states that have a mixed delegation to the Senate will be less likely to know the party label of their representatives. I then show that voters who do not know the party label are about 13% less likely to to correctly identify how their representative in Congress voted. This finding clarifies recent work, which shows that using the party label is sometimes associated with biased inferences. I do not deny that this is the case. However, I show that the average causal effect for those treated with knowing the party label is positive. When these voters know the party label

of their Senator, they make more accurate inferences about how their Senator actually voted.

2 Heuristic Effectiveness

Because the cost of acquiring information is relatively high and individuals are relatively uninformed regarding the political environment, heuristics can be used as cognitive shortcuts (Chaiken 1980). Although widely used, previous literature has debated the effectiveness of heuristics; specifically, their ability to lead individuals in the right direction in terms of political decision making.

On one side, scholars have argued that heuristics are indeed effective, as they help uninformed individuals arrive at the same conclusions as informed individuals, without the cost of obtaining complete information about the subject (Lupia 1994; Eagly and Chaiken 1993; Kuklinski and Quirk 2000). In terms of making correct decisions, the political environment is highly complex and individuals are disadvantaged by their lack of information. Therefore, individuals use heuristics to understand and form opinions about complex issues, policies, and candidates without having complete information (Popkin 1991; Sniderman, Brody, and Tetlock 1991; Page and Shapiro 1992; Brady and Sniderman 1985; Lupia 1994). For example, studies have shown that using the likeability heuristic, uninformed individuals can infer the policy positions of social groups (Brady and Sniderman 1985) and make judgements based on their fondness for the group (Nicholson 2011).

In contrast, other scholars have shown that heuristics are not an effective way to make sense of the political environment and may not lead to correct decisions. Previously, heuristic ineffectiveness has been attributed to political interest (Dancey and Sheagley 2013; Lau and Redlawsk 2001), neglected information (Rahn 1993), and the idea that individuals will use any information they have that comes to mind when making a decision, regardless of the accuracy of this information (Fiske and Taylor 2008). Furthermore, it is difficult for individuals to know which pieces of information they possess are accurate and which ones are not. Without knowing the quality of the information that they are using, individuals can be misled by heuristics (Dancey and Sheagley 2013; Lau and Redlawsk 2001; Kuklinski and Quirk 2000).

Along these same lines, Kahneman and his colleagues have shown that heuristic use has the possibility of leading to less than optimal decisions (Kahneman 2003; Tversky and Kahneman 1974; Kahneman and Frederick 2002). Decisions that are less than optimal are those that are not the same as what they would have been if the individual had complete information on which to

base their decision. In direct relation to the use of party label as a heuristic, scholars have shown that ineffectiveness can stem from politicians whose actions deviate from the ideals of their party platform (Dancey and Sheagley 2013; Ansolabehere and Jones 2010).

In observational data, it is generally hard to separate out the effect of a particular heuristic from other knowledge that an individual has. For this purpose, experimental studies seem more appropriate. However, it may be the case that in a laboratory setting with fake candidates, information processing and heuristics may work differently. Because there is no "right answer" about how fake candidates actually voted in Congress, we cannot begin to answer the question of whether knowing the party label leads to more accurate inferences using a laboratory setting. Additionally, the lack of a real record means that subjects could never have direct knowledge of how a candidate voted. This may exaggerate the role of heuristics, since subjects are forced to use them with fake candidates.

This paper seeks to separate out the individual effect of knowing the party label from other possible heuristics, in the context of real-world politicians and voting records. Unfortunately, individuals who know one thing about politics, such as the party label of a politician, tend to know other things about politics as well (Huckfeldt et al. 1999). This leads to a general inability to estimate the effect of the party label on its own, without interference from other heuristics that individuals use to make political decisions. By using a unique instrumental variable approach, I show that individuals in states with a mixed delegation are not significantly different in terms of political interest level from individuals who live in states with a unified delegation. However, living in a mixed delegation state affects the probability of an individual knowing the party label of their representatives. If the party label is known, I argue that it has a positive effect on an individual's ability to correctly identify the votes of their representatives.

3 Theory

On its own, when used as a heuristic, the party label is a beneficial tool that individuals can use to make up for incomplete information. I assume that individuals do in fact use the party label as information when making a political decision when they have it available to them. The effectiveness of the party label is conditional on the amount of information that can be gained from knowing it. This means that as the information level of the party label increases, using the party label as a heuristic will become more effective. In

contrast, if the party label is uninformative, even when it is known and used, it will not be an effective decision-making tool if accuracy is the goal. Therefore, I assume that the party label is an informative heuristic.

The main goal of this paper is to separate out the individual effect of knowing the party label. Because I am looking at the effect of knowledge on decision-making, I assume that there are no significant differences between the knowledge level of individuals in mixed vs. unified delegation states while controlling for other pre-treatment covariates that could be thought to affect this relationship. Assuming that there are no significant differences in political knowledge between the two types of delegations means that on average, individuals in California (D-D) look relatively similar to individuals in Indiana (R-D) in terms of level of political knowledge. This is the key to separating out the effect of the party label. I assume that mixed versus unified delegation status is orthogonal to individual characteristics, but it does affect individuals' ability to know the party label of their representatives.

Knowing the party label is a useful cue that helps individuals make accurate decisions. The institutional characteristic of mixed versus unified delegations helps to separate out the effect of the party label on its own. I argue that having a mixed delegation affects both the ability to know the party label of the state's representatives and therefore, the ability to know how the representatives vote.

The effectiveness of using the party label as a heuristic also depends on an individual's knowledge of the ideological placement of the major parties. If an individual does not have knowledge of which party is on the left, knowing the party label of their state's representatives will not be very helpful. In contrast, for individuals that do know which party is on the left, knowing the party label should be highly beneficial, given that representatives are behaving according to their party's platform. Therefore, the negative effect of living in a mixed delegation will be the highest for people who can place the parties on the ideological scale. Individuals who know party placement but live in a state with a mixed delegation will have a harder time knowing which representative is from which party and therefore, will be less likely to correctly identify their representatives' votes. Alternatively, individuals that know the placement of the parties and live in a state with a unified delegation will be more likely to know the party label of their representatives and be able to put it to good use. For individuals that do not know the placement of the parties, living in a mixed delegation should have no effect on the ability to correctly identify votes, due to the fact that these individuals do not derive information from the party label.

Individuals who live in states with a mixed delegation are less likely to

know the party label of their representatives than individuals that live in states with a unified delegation. Therefore, I hypothesize the following:

Hypothesis: Individuals who know the party label of their representatives will be more likely to correctly classify the votes of their representatives than people who do not know the party label of their representatives.

4 Research Design

To test this theory, I employ an instrumental variable design using data from the 2006 Cooperative Congressional Election Study[1]. Additionally, I merged hand-coded data on each state's Senate delegation onto the 2006 CCES dataset. The unit of analysis is individual bill-level voting data, where each state has two Senators who vote on proposed bills. Individuals are asked to identify the party label as well as the votes of their Senators on seven individual bills ranging from abortion to capital gains to the Iraq War. The data was converted to long form, meaning that each individual has 14 observations (7 bills for each Senator). The seven bills are analyzed separately, meaning that each individual has the opportunity to correctly guess 14 different votes between their two Senators[2].

To separate out the effects of knowing the party label, I use an instrumental variable approach. The instrument is a binary indicator of living in a state with a mixed (1) or unified (0) delegation to the Senate. The treatment is knowledge of the party label of the state's Senators and the outcome is correct identification of a Senator's vote on a bill. As shown in Figure 1[3], the binary indicator Z affects the outcome Y, correct identification of votes, through the treatment X, knowing the party label of the Senator.

Additionally, Z has additional associations with Y that are blocked by conditioning on the observed pre-treatment covariates, W. The observed pre-treatment covariates include the respondent's political interest level, age, gender, income, and ethnicity. In using this research design, I am not claiming that there are zero potential confounds between living in a mixed delegation and knowing the votes of a Senator. Instead, I am assuming that the number of plausible confounds becomes highly limited and can be controlled for.

[1]Data from the 2006 CCES was obtained from `http://projects.iq.harvard.edu/cces/home`.

[2]Unfortunately, this type of question where respondents are asked about the votes of their representatives is not available over multiple years. Therefore, this analysis only includes data from the 2006 CCES.

[3]Adapted from Morgan and Winship (2009).

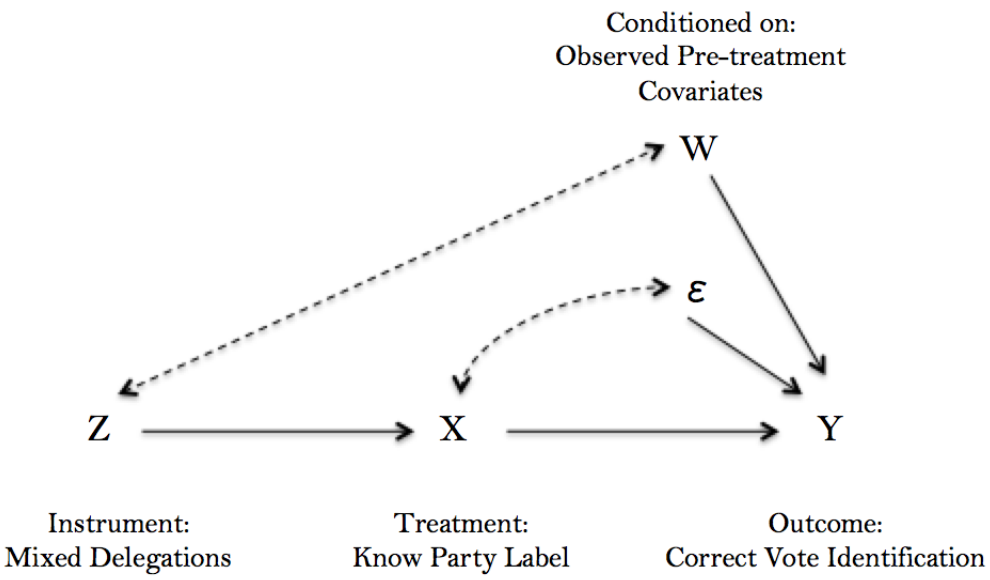

Figure 1: **Causal Diagram:** The instrumental variable, Z (a binary variable indicating mixed or unified delegation), affects the outcome Y, correct identification of votes, through the treatment X, knowing the party label of the Senator. Z has additional associations with Y that are blocked by conditioning on the observed pre-treatment covariates, W. In this case, Z is a valid conditional instrumental variable.

Figure 1 illustrates this argument in the following way: The instrument (Z) may have additional associations with our dependent variable (Y). These are represented by W in the figure above. However, we can block these additional associations by conditioning on them in both the first and second stage regressions. For example, there is a risk that Senators from mixed delegations vote with their party less consistently, and this independently makes it harder for voters to guess their position (whether or not a voter knows the party label). We can block this path by controlling for how often a Senator votes with their party (party unity score). If we control for these types of pre-treatment confounds, then Z is a valid conditional instrumental variable (Morgan and Winship 2009).

In the first stage, I investigate the effect an individual of living in a state with a mixed delegation on their ability to know the party label of their Senators, controlling for pre-treatment covariates. The first stage regression is

estimated using the following formula:

$$KnowPartyLabel = \alpha + \beta_1 mixed_i + \beta_2 polinterest_i + \beta_3 age_i + \beta_4 gender_i + \beta_5 income_i + \beta_6 whiteresp_i + \beta_7 SenParty_j + \beta_8 PartyUnityScore_j + u_i \quad (1)$$

The index i indicates respondent-level characteristics, while index j indicates Senator-level characteristics. $KnowPartyLabel$ is a binary indicator of knowing a given Senator's party label (1) or not (0). Although the theory assumes that individuals in states with mixed versus unified delegations are not significantly different in terms of political knowledge, due to lack of inclusion in the 2006 CCES, political interest is used as a proxy for political knowledge. There is no reason to believe that political knowledge and political interest would have significantly different effects on heuristic use. In fact, political knowledge questions may come too close to measuring knowledge of the party label, so political interest may actually be preferred in this case. *Polinterest* is a trichotomous measure with higher numbers representing more political interest. *Age* is the respondent's age at the time of the survey. *Gender* is a binary indicator that is equal to 1 if the respondent is female and 0 otherwise. Income is coded on a 14-point scale, with higher numbers representing a higher income level. Ethnicity is measured with *whiteresp*, which is coded 1 if the respondent is white and 0 otherwise. Because the party platform of one party might be easier to predict than the other, I control for the Senator's party ($SenParty$). Finally, to control for the effectiveness / ineffectiveness of the party label to convey accurate information, I use party unity scores as a measure of how often a given Senator votes with their party[4].

In the second stage, I use the estimated probability of knowing the Senator's party label (from the first stage) as the main independent variable. I investigate the effect of knowing the party label on the ability to correctly identify the Senator's vote on a given bill. The second stage regression is estimated using the following formula:

$$CorrectVote = \pi + \delta_1 KnowPartyLabel_i + \delta_2 polinterest_i + \delta_3 age_i + \delta_4 gender_i + \delta_5 income_i + \delta_6 whiteresp + \delta_7 SenParty_j + \delta_8 PartyUnityScore_j + v_i \quad (2)$$

$Correct\ Vote$ is a binary indicator that is equal to 1 if the respondent correctly identified their Senator's vote on a given bill and 0 otherwise. The idea behind this instrumental variable research design is that, as will be shown

[4]Party unity scores were obtained from `https://legacy.voteview.com/Party_Unity.htm`.

below, individuals in states with mixed versus unified delegations are not significantly different in terms of political interest. Therefore, the only relevant difference should be the fact that some individuals are living in a state with a mixed delegation to the Senate and others are not. Because individuals are otherwise similar, comparing individuals with mixed delegations to those who have unified delegations allows for both the identification of party label alone and construction of a two stage model. I argue that living in a state with a mixed delegation makes it more difficult for individuals to be able to correctly identify the partly label of their Senators. However, knowing the party label should make it easier to correctly identify the votes of their Senators.

5 Empirical Analysis

Before presenting results from the instrumental variable regression[5], I first test the assumption that there is not a significant difference in the political interest level (as a proxy for political knowledge) between individuals who live in states with mixed delegations versus unified delegations. To do this, I find the group mean for political interest for mixed and unified states. The mean political interest level of individuals in mixed states is 2.81, while the mean political interest level of individuals in unified states is 2.80. A t-test of the difference between these means yields a two-tailed p-value of 0.55, which suggests that there is indeed no significant difference between the political interest level of individuals in states with mixed versus unified delegations. Therefore, this allows for the assertion that the only relevant difference between individuals who live in states with mixed versus unified delegations is the delegation composition itself.

In the first stage of the instrumental variable regression, I investigate the effects of living in a state with a mixed delegation on the ability to correctly know the party label of a Senator. The theory assumes that individuals who live in states with mixed delegations will be less likely to correctly identify the party label of their Senators compared to individuals who live in states with unified delegations. This is exactly what I find in the first-stage estimates, shown in Table 1 below using Equation (1). Remember that each individual has the opportunity to correctly identify the party label of two Senators, individually, meaning that there are fourteen observations per respondent.

Because the effectiveness of the party label as a heuristic depends on an

[5]I use a normal instrumental variables 2SLS model here for ease of interpretation, but more appropriate bivariate probit results are presented in the Appendix. There are no substantive differences between the results of the two models.

Table 1: Instrumental Variable 2SLS Estimates (First Stage)

	(1) (All) KnowPartyLabel	(2) (All) KnowPartyLabel	(3) (Know Place) KnowPartyLabel	(4) (Know Place) KnowPartyLabel	(5) (DNK Place) KnowPartyLabel	(6) (DNK Place) KnowPartyLabel
Mixed Delegation	-0.01***	-0.02*	-0.01***	-0.02*	-0.02***	-0.01
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.02)
Political Interest		0.13***		0.10***		0.18***
		(0.01)		(0.01)		(0.02)
Age		0.00***		0.00***		0.00***
		(0.00)		(0.00)		(0.00)
Gender		-0.05***		-0.06***		-0.04**
		(0.01)		(0.01)		(0.01)
Income		0.01***		0.00***		0.01***
		(0.00)		(0.00)		(0.00)
White Resp.		0.02*		0.02**		-0.00
		(0.01)		(0.01)		(0.01)
Senator Party		-0.01		-0.01*		-0.00
		(0.01)		(0.01)		(0.01)
Party Unity Score		-0.00		-0.00		-0.00
		(0.00)		(0.00)		(0.00)
_cons	0.95***	0.51***	0.96***	0.62***	0.93***	0.33**
	(0.00)	(0.05)	(0.00)	(0.06)	(0.00)	(0.11)
N	102242	59864	71456	41972	30786	17892

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

individual being able to derive information from the party label, I compute three separate instrumental variable models. In the first column of Table 1, all respondents in the CCES are used, regardless of their ability to place the parties on the ideological scale. Overall, the estimates in the first column suggest that living in a state with a mixed delegation decreases the likelihood of knowing the party label of the Senator, and this effect is significant at the $p < 0.001$ level. Changing from a unified delegation to a mixed delegation decreases the probability that an individual knows the party label of their Senator by 0.01. With the addition of covariates in Column 2, we see that political interest, age, gender, income, and ethnicity are also significant predictors of knowing the party label of their Senator. Therefore, I include these variables as controls to investigate the robustness of the mixed delegation effect, however, there is no reason to believe that the covariates have a significant effect for one group (mixed vs. unified) over the other. With the inclusion of covariates in Column 2, the effect remains negative and significant ($p < 0.05$).

In the third and fourth columns, I narrow the analysis to only individuals who can correctly place the parties on the ideological left-right scale. As proposed in the theory above, the negative effect of living in a state with a mixed delegation should be most pronounced for those that are able to

correctly place the parties. The estimates in Column 3 suggest that individuals who know the placement of the parties are significantly less likely to be able to correctly identify the party label of their Senators when they live in states with mixed delegations ($p < 0.001$). With the inclusion of the covariates, the negative effect of living in a state with a mixed delegation remains significant ($p < 0.05$). Changing from a unified to a mixed delegation yields a decrease in the probability of an individual knowing their Senator's party label by 0.02.

The fifth and sixth columns present the effect of living in a state with a mixed delegation for individuals who are not able to correctly place the parties on the left right scale (roughly 30% of the sample). The estimate in Column 6 suggests that there is not a significant effect of living in a mixed delegation state on these individuals' ability to correctly identify the party label of their Senators. This is logical because individuals who are not able to place the parties on the left-right scale are probably also not likely to know the party label to begin with, regardless of which kind of state they live in.

Overall, Table 1 provides evidence to conclude that the effect of living in a state with a mixed delegation on individuals' ability to correctly identify the party label of their Senators is robustly negative and significant only for individuals that are able to correctly place the parties on the left-right scale.

In the second stage, I use the estimates of knowing the partly label from the first stage regression as the main independent variable. The second stage investigates the effect of knowing the party label on individuals' ability to correctly identify a Senator's vote on a given bill. Recall that the hypothesis suggests that individuals who know the party label of their representatives will be more likely to be able to correctly classify the votes of their representatives than people who do not know the party label of their representatives. Using Equation (2), I compute the second-stage estimates of the instrumental variables regression, which are presented below in Table 2.

Columns 1 and 2 analyze the effects of knowing the party label of the Senator on ability to correctly identify their votes for all individuals. Column 1 is the effect of knowing the party label without the inclusion of any of the covariates. The effect of knowing the party label on correct identification of votes is positive and significant ($p < 0.05$). This effect is not attenuated when the pre-treatment covariates are added back into the regression (Column 2). In this case, there is still a positive and significant effect of knowing the party label on ability to correctly identify votes ($p < 0.05$). For individuals treated with the partly label (going from not knowing to knowing), ability to correctly identify the vote of the Senator increases by 3.21. Using these results, knowing a Senator's party makes voters 13.1% more likely to correctly

Table 2: Instrumental Variable 2SLS Estimates (Second Stage)

	(1) (All) correct	(2) (All) correct	(3) (Know Place) correct	(4) (Know Place) correct	(5) (DNK Place) correct	(6) (DNK Place) correct
Know Party Label	4.79*	3.21*	5.28*	3.12*	3.19	2.98
	(2.17)	(1.43)	(2.69)	(1.35)	(2.54)	(3.72)
Political Interest		-0.33		-0.25		-0.45
		(0.18)		(0.14)		(0.66)
Age		-0.00*		-0.00		-0.00
		(0.00)		(0.00)		(0.01)
Gender		0.13		0.14		0.09
		(0.08)		(0.08)		(0.14)
Income		-0.01		-0.01		-0.02
		(0.01)		(0.01)		(0.03)
White Resp.		-0.04		-0.05		0.00
		(0.03)		(0.04)		(0.04)
Senator Party		0.03		0.02		0.06
		(0.02)		(0.02)		(0.03)
Party Unity Score		0.01***		0.01***		0.01*
		(0.00)		(0.00)		(0.00)
_cons	-3.73	-1.61*	-4.24	-1.86*	-2.18	-1.09
	(2.06)	(0.75)	(2.57)	(0.87)	(2.36)	(1.25)
N	98921	57945	69155	40586	29766	17359

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

guess their position on major votes[6].

The third and fourth columns show the effects of knowing the party label on ability to correctly identify Senators' votes for only individuals who can correctly place the parties on the left-right scale. The results are similar to those in Columns 1 and 2. Knowing the party label of the Senator has a positive and significant effect on ability to correctly classify their votes ($p < 0.05$). This effect is not attenuated by the inclusion of the pre-treatment covariates, as the effect of knowing the party label is still positive and significant at the $p < 0.05$ level. By treating individuals who are able to correctly place the parties on the left-right scale with the party label of their Senator, the probability

[6]This calculation is done using the bivariate probit model (included in the appendix) which has the same substantive results but is more accurate, given the binary treatment and outcome variables.

of correctly identifying their votes increases by 3.12. For individuals who know the placement of the parties, the effect of knowing a Senator's party on their ability to correctly guess the Senator's position on votes increases from 13.1% (everyone) to 17.1%.

Columns 5 and 6 display the effects of knowing the party label of their Senator on ability to correctly identify their votes for only individuals who are not able to correctly place the parties on the left-right scale. Column 5 shows that the effect of knowing the party label on its own for individuals who are unable to place the parties is not significant. When the pre-treatment covariates are added back into the regression in Column 6, knowing the party label is still not a significant predictor of correctly identifying Senators' votes, just as expected. It would not make sense for there to be a positive effect of knowing the party label on correct identification of votes for individuals who do not know the placement of the parties because they are unable to derive party platform information from knowing the party label. While the magnitude of the coefficients for knowing the party label are relatively similar between the "know" and "don't know" voters, the standard errors are much larger for "don't know" voters, beyond what we would expect from the sample size alone, suggesting that any possible effect for "don't know" voters would be more variable and inconsistent. For individuals that cannot place the parties, knowing a Senator's party does not have a significant effect on their ability to correctly guess positions on major votes.

Therefore, the hypothesis is supported for only individuals who are able to place the parties on the left-right scale. Individuals who know the placement of the parties can benefit from knowing the party label, as it allows them to use party label as an informational heuristic to help them correctly identify the votes of their Senators. Returning back to the assumption that the party label is an informative heuristic, we can see that this is indeed the case - the party label is an informative heuristic for people that can derive information from it (individuals that can correctly place the parties on the left-right scale).

5.1 States that Switch Often

It may be the case that states such as California, that almost never switch from a unified delegation to a mixed delegation (or the reverse), heavily influence the probability of an individual knowing the party label. To counter this argument, a robustness check was conducted with a subset of states that switched their delegation type 2-5 times over seven elections. The results from the first stage are substantively similar to the original analysis. The second stage results are presented below in Table 3. The results are substantively similar to the full

dataset including all of the states, meaning that for individuals that reside in states that switch their delegation type often, living in a mixed delegation decreases the probability of knowing the party label. However, when the party label is known, individuals are more likely to correctly guess the votes of their representatives in Congress ($p < 0.01$).

Table 3: Instrumental Variables 2SLS Estimates (Second Stage, States that Switch Often)

	(1) (All) correct	(2) (All) correct	(3) (Know Place) correct	(4) (Know Place) correct	(5) (DNK Place) correct	(6) (DNK Place) correct
Know Party Label	1.81*	0.95**	1.97*	0.86**	1.33	1.08
	(0.76)	(0.32)	(0.87)	(0.30)	(1.26)	(0.96)
Political Interest		-0.07		-0.06		-0.10
		(0.04)		(0.04)		(0.15)
Age		-0.00		-0.00		-0.00
		(0.00)		(0.00)		(0.00)
Gender		0.02		0.01		0.03
		(0.02)		(0.02)		(0.04)
Income Level		-0.00		-0.00		-0.00
		(0.00)		(0.00)		(0.01)
White Resp.		-0.02		-0.01		-0.04
		(0.02)		(0.02)		(0.04)
Senator Party		0.03**		0.01		0.06*
		(0.01)		(0.01)		(0.03)
Party Unity Score		0.01***		0.01***		0.01**
		(0.00)		(0.00)		(0.00)
_cons	-0.92	-0.57***	-1.07	-0.59***	-0.48	-0.48*
	(0.71)	(0.14)	(0.83)	(0.16)	(1.17)	(0.24)
N	35327	24342	24714	16841	10613	7501

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6 Discussion & Conclusion

Previous research highlighted the possible association between using the party label as a heuristic and biased inferences as a consequence. However, as I illustrate here using a unique identification strategy, the average causal effect of the party label is that it improves inference. Individuals who know the

party label of their Senator are more likely to make accurate inferences about how their Senator actually voted.

I argue that heuristics can be effective informational tools that individuals can use to make high-quality decisions. Using an instrumental variable approach, I find support for the hypothesis that knowing the party label improves inference, but this support is conditional on the ability to derive information from the party label itself. While the informational level of the party label is variable year to year and even bill to bill (Nail 2019), it is also the case that some individuals are better suited to make use of the party label than others. Individuals who are not able to correctly place the parties on the left-right scale are unable to make use of the party label as a heuristic even if they know it. This is due to the fact that they cannot derive information from the party label about which platform each label represents. Individuals who cannot place the parties on the left-right scale are not affected by living in states with a mixed delegation to the Senate - they are neither less likely to know the party label of their Senator nor more likely to correctly identify the votes of their senators.

In contrast, individuals who are able to place the parties on the left-right scale can gain a significant predictive advantage by using the party label as a heuristic. For individuals who know the correct placement of the parties, living in a state with a mixed delegation significantly decreases their likelihood of knowing the party label of their Senators. However, individuals who are able to place the parties on the left-right scale and also know the party label of their representatives are significantly more likely to be able to correctly identify the votes of their Senators. The party label is only an effective heuristic when individuals can gain information from it and when this information can be used to make correct decisions. By knowing the placement of the parties and the party label of a politician, individuals are significantly more likely to be able to correctly predict how their politicians are voting.

This paper has shown that there are instances where heuristics are more effective than others. In this case, party label is an effective heuristic when individuals can derive information from the party label itself. This enables individuals to make high quality decisions with little information. Additionally, there are times when the party label is more informative than others, such as when the two parties are divided over a certain issue (Nail 2019). If the accuracy of heuristics is variable, this has consequences for uninformed individuals who use heuristics to make up for incomplete information and close the information gap between themselves and informed individuals.

7 References

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8 Appendix

8.1 Bivariate Probit Models

In the main part of the paper, I include two stage least squares instrumental variables regressions for ease of interpretation. Included below are the bivariate probit models due to the binary instrument and binary outcome variable. The results from the tables below are substantively similar to the 2SLS models used in the paper.

Table 4: Instrumental Variables Bivariate Probit Estimates (First Stage)

	(1) (All) KnowPartyLabel	(2) (All) KnowPartyLabel	(3) (Know Place) KnowPartyLabel	(4) (Know Place) correct	(5) (DNK Place) KnowPartyLabel	(6) (DNK Place) KnowPartyLabel
Mixed Delegation	-0.15**	-0.19**	-0.17**	-0.26**	-0.13	-0.11
	(0.05)	(0.07)	(0.06)	(0.09)	(0.09)	(0.11)
Political Interest		0.68***		0.63***		0.75***
		(0.05)		(0.06)		(0.07)
Age		0.01***		0.01***		0.01***
		(0.00)		(0.00)		(0.00)
Gender		-0.40***		-0.50***		-0.21*
		(0.05)		(0.06)		(0.09)
Income Level		0.05***		0.04***		0.06***
		(0.01)		(0.01)		(0.01)
White Resp.		0.14*		0.21**		-0.01
		(0.06)		(0.07)		(0.09)
Senator Party		-0.09		-0.13*		-0.00
		(0.05)		(0.06)		(0.08)
Party Unity Score		-0.00		-0.00		0.00
		(0.00)		(0.00)		(0.01)
_cons	1.64***	-0.85*	1.72***	-0.31	1.49***	-1.57**
	(0.02)	(0.35)	(0.03)	(0.47)	(0.04)	(0.54)
athrho						
_cons	-0.71***	0.06	-0.78***	-0.01	-0.56***	0.24
	(0.10)	(0.07)	(0.16)	(0.07)	(0.13)	(0.13)
N	98921	67290	69155	46719	29766	20571

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

8.2 Results by Bill

In this section, I check the effects of mixed delegation by bill for each of the seven bills that are included on the 2006 CCES. The results are largely consistent, as knowing the party label of their senator makes an individual more likely to correctly guess their position on a bill for five of the seven bills.

Table 5: Instrumental Variables Bivariate Probit Estimates (Second Stage)

	(1) (All) correct	(2) (All) correct	(3) (Know Place) correct	(4) (Know Place) correct	(5) (DNK Place) correct	(6) (DNK Place) correct
Know Party Label	1.99***	0.48***	2.13***	0.65***	1.70***	0.10
	(0.14)	(0.13)	(0.20)	(0.16)	(0.20)	(0.24)
Political Interest		0.15***		0.13***		0.23***
		(0.02)		(0.03)		(0.05)
Age		0.00		0.00		0.00
		(0.00)		(0.00)		(0.00)
Gender		-0.08***		-0.08***		-0.05
		(0.02)		(0.02)		(0.03)
Income Level		0.01***		0.01***		0.02***
		(0.00)		(0.00)		(0.00)
White Resp.		0.06***		0.09***		0.00
		(0.02)		(0.02)		(0.03)
Senator Party		0.00		-0.08***		0.18***
		(0.01)		(0.02)		(0.03)
Party Unity Score		0.02***		0.02***		0.02***
		(0.00)		(0.00)		(0.00)
_cons	-1.07***	-2.40***	-1.20***	-2.39***	-0.81***	-2.52***
	(0.13)	(0.12)	(0.20)	(0.16)	(0.19)	(0.18)
athrho						
_cons	-0.71***	0.06	-0.78***	-0.01	-0.56***	0.24
	(0.10)	(0.07)	(0.16)	(0.07)	(0.13)	(0.13)
N	98921	67290	69155	46719	29766	20571

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

8.3 States that Switch

In this section, I provide the first stage results from the 2SLS instrumental variables regression using states that switch 2-5 times over 7 elections. The second stage results are presented in Table 3 in the main text. Additionally, I provide bivariate probit models. Both versions are substantively similar to the 2SLS results presented in Table 3.

Table 6: Results by Bill for Both Senators and All Respondents (Bivariate Probit Model First Stage)

	(1) KnowPartyLabel	(2) KnowPartyLabel	(3) KnowPartyLabel	(4) KnowPartyLabel	(5) KnowPartyLabel	(6) KnowPartyLabel	(7) KnowPartyLabel
Mixed Delegation	-0.15	-0.17*	-0.18*	-0.15*	-0.16*	-0.14	-0.18**
	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Political Interest	0.65***	0.70***	0.69***	0.70***	0.69***	0.70***	0.70***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Age	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gender	-0.44***	-0.43***	-0.43***	-0.42***	-0.43***	-0.41***	-0.44***
	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)
Income Level	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
White Resp.	0.11	0.14*	0.13*	0.13*	0.13*	0.14*	0.14*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Senator Party	-0.01	-0.10	-0.10	-0.10	-0.08	-0.08	-0.10
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.06)
Party Unity Score	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
_cons	-0.70	-0.79	-0.71	-0.79*	-0.84*	-1.10*	-0.85*
	(0.45)	(0.42)	(0.43)	(0.40)	(0.42)	(0.49)	(0.42)
athrho							
_cons	-0.07	0.08	-0.13	0.18	0.10	0.16	0.08
	(0.17)	(0.08)	(0.09)	(0.11)	(0.10)	(0.10)	(0.12)
N	7408	8503	8517	8418	8419	8304	8376

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Results by Bill for Both Senators and All Respondents (Bivariate Probit Model Second Stage)

	(1) correct	(2) correct	(3) correct	(4) correct	(5) correct	(6) correct	(7) correct
Know Party Label	0.81*	0.46*	1.14***	0.11	0.61**	0.69**	0.09
	(0.34)	(0.19)	(0.20)	(0.22)	(0.22)	(0.22)	(0.25)
Political Interest	0.11	0.23***	0.13**	0.22***	0.22***	0.28***	0.11*
	(0.06)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)
Age	-0.00	0.00	0.00**	0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gender	-0.06	-0.08*	-0.08	-0.06	-0.15**	-0.15**	-0.10**
	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)
Income Level	0.03***	0.02***	0.02**	0.03***	0.01	0.02**	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
White Resp.	0.15**	0.09*	0.05	0.03	-0.01	0.16**	0.00
	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)
Senator Party	0.58***	-0.95***	0.59***	-0.69***	-0.66***	0.88***	0.56***
	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.03)
Party Unity Score	0.03***	-0.01**	0.03***	0.00	0.04***	0.04***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
_cons	-4.10***	1.70***	-4.64***	0.69*	-2.40***	-5.33***	-2.67***
	(0.34)	(0.28)	(0.30)	(0.27)	(0.31)	(0.35)	(0.26)
athrho							
_cons	-0.07	0.08	-0.13	0.18	0.10	0.16	0.08
	(0.17)	(0.08)	(0.09)	(0.11)	(0.10)	(0.10)	(0.12)
N	7408	8503	8517	8418	8419	8304	8376

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Instrumental Variable 2SLS Estimates (First Stage, States that Switch Often)

	(1) (All) KnowPartyLabel	(2) (All) KnowPartyLabel	(3) (Know Place) KnowPartyLabel	(4) (Know Place) KnowPartyLabel	(5) (DNK Place) KnowPartyLabel	(6) (DNK Place) KnowPartyLabel
Mixed Delegation	-0.02***	-0.04**	-0.02***	-0.04**	-0.02***	-0.03
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)
Political Interest		0.14***		0.13***		0.16***
		(0.02)		(0.02)		(0.03)
Age		0.00***		0.00***		0.00**
		(0.00)		(0.00)		(0.00)
Gender		-0.05***		-0.06***		-0.04*
		(0.01)		(0.01)		(0.02)
Income Level		0.01***		0.01***		0.01**
		(0.00)		(0.00)		(0.00)
White Resp.		0.04***		0.05**		0.03
		(0.01)		(0.02)		(0.02)
Senator Party		-0.00		-0.01		0.02
		(0.01)		(0.01)		(0.02)
Party Unity Score		0.00		-0.00		0.00
		(0.00)		(0.00)		(0.00)
_cons	0.95***	0.39***	0.95***	0.48***	0.93***	0.20
	(0.00)	(0.08)	(0.00)	(0.10)	(0.00)	(0.15)
N	36778	25242	25676	17500	11102	7742

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: Instrumental Variable Bivariate Probit Estimates (First Stage, State that Switch Often)

	(1) (All) KnowPartyLabel	(2) (All) KnowPartyLabel	(3) (Know Place) KnowPartyLabel	(4) (Know Place) correct	(5) (DNK Place) KnowPartyLabel	(6) (DNK Place) KnowPartyLabel
Mixed Delegation	-0.18*	-0.31**	-0.22*	-0.40***	-0.14	-0.16
	(0.07)	(0.09)	(0.09)	(0.12)	(0.13)	(0.15)
Political Interest		0.70***		0.72***		0.70***
		(0.07)		(0.09)		(0.12)
Age		0.01***		0.01***		0.01**
		(0.00)		(0.00)		(0.00)
Gender		-0.41***		-0.49***		-0.28*
		(0.08)		(0.10)		(0.14)
Income Level		0.06***		0.06***		0.06**
		(0.01)		(0.02)		(0.02)
White Resp.		0.30***		0.35**		0.23
		(0.09)		(0.11)		(0.15)
Senator Party		-0.02		-0.07		0.14
		(0.08)		(0.09)		(0.13)
Party Unity Score		0.00		-0.00		0.01
		(0.01)		(0.01)		(0.01)
_cons	1.61***	-1.59**	1.67***	-1.02	1.50***	-2.57**
	(0.04)	(0.55)	(0.05)	(0.68)	(0.06)	(0.87)
athrho						
_cons	-0.40**	0.10	-0.57***	0.01	0.02	0.39
	(0.13)	(0.10)	(0.16)	(0.10)	(0.35)	(0.23)
N	35327	24342	24714	16841	10613	7501

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10: Instrumental Variable Bivariate Probit Estimates (Second Stage, States that Switch Often)

	(1) (All) correct	(2) (All) correct	(3) (Know Place) correct	(4) (Know Place) correct	(5) (DNK Place) correct	(6) (DNK Place) correct
Knowledge Party Label	1.48***	0.42*	1.75***	0.60**	0.69	-0.10
	(0.22)	(0.20)	(0.24)	(0.21)	(0.71)	(0.40)
Political Interest		0.12**		0.09		0.23**
		(0.04)		(0.05)		(0.08)
Age		0.00		0.00		0.00
		(0.00)		(0.00)		(0.00)
Gender		-0.07**		-0.09**		-0.03
		(0.03)		(0.03)		(0.05)
Income Level		0.02***		0.01**		0.02***
		(0.00)		(0.00)		(0.01)
White Resp.		0.06*		0.07		0.01
		(0.03)		(0.04)		(0.05)
Senator Party		0.09***		0.02		0.27***
		(0.02)		(0.03)		(0.04)
Party Unity Score		0.02***		0.03***		0.02***
		(0.00)		(0.00)		(0.00)
_cons	-0.65**	-2.51***	-0.89***	-2.60***	0.05	-2.51***
	(0.22)	(0.16)	(0.24)	(0.21)	(0.65)	(0.24)
athrho						
_cons	-0.40**	0.10	-0.57***	0.01	0.02	0.39
	(0.13)	(0.10)	(0.16)	(0.10)	(0.35)	(0.23)
N	35327	24342	24714	16841	10613	7501

Robust standard errors clustered by respondent in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

How Much Will Voters Pay for a "Bit" of Information?

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Abstract

Over the past four decades, technology has decreased the cost of acquiring information. Despite this pattern, there is not a clear indication that people have become more knowledgeable about their representatives in government on many dimensions. In fact, there is even some evidence that people are now less knowledgeable about some facts – such as the names of their Congress members (Jacobson 2015). I argue that cheaper information has not increased voters' knowledge about individual candidates because voters possess an even cheaper and increasingly informative cue: party id. As parties have become more ideologically distinct, voters have been increasingly able to guess how any given representative voted on a salient bill. Therefore, individuals should be less likely to seek out specific information about what individual legislators do in Congress. I test this hypothesis using a decision-theoretic experiment. In the experiment, participants try to guess how a candidate voted on a particular bill for a monetary reward, and may pay to acquire an informative signal before guessing. This is analogous to investing effort in learning facts about a candidate's record, which is costly. I find that participants that have the party label available to them are indeed less willing to pay for an informative signal when it becomes easier to guess a candidate's vote based on their party id. From 1970-2008, individuals' willingness to pay for more information when they have the party label has decreased by 30%.

Keywords: Information theory, decision-theoretic experiment, willingness to pay

1 Introduction

Over the past four decades, access to information has become much cheaper. Through internet search engines such as Google, individuals can ask questions and receive simultaneous answers. Despite this pattern, there is not a clear indication that people have more *direct* knowledge about how their representatives have voted in Congress[1]. In fact, there is evidence that people are now less likely to know specific facts about their Congress members than in the past (Jacobson 2015). For example, voters are less likely to know their representative's name than they were in the past (Jacobson 2015).

In this paper, I argue that cheaper information has not increased voters' knowledge about individual candidates because voters possess an even cheaper and increasingly informative cue: party id. Complex political environments have encouraged the use of heuristics such as the party label.

Building on this idea, I experimentally test the effect of varying the level of information conveyed by party brands. In particular, I test whether increasing levels of information conveyed by party brands has caused voters to invest less in learning about their representatives' individual records. I test this conjecture using a decision-theoretic experiment varying the amount of information that a candidate's party label conveys about how that candidate voted[2]. In the experiment, participants try to guess how a candidate voted on a particular bill for a monetary reward, and may pay to receive an informative signal before guessing. This payment is analogous to investing effort in learning facts about a candidate's record, which is costly. I hypothesize that participants with the party label available to them will be less willing to pay for an informative signal when it is easier to guess a candidate's vote based on their party id.

[1] Direct knowledge is knowledge about an individual representative, such as their issue positions, voting history, or even their name. In contrast, *indirect* knowledge is knowledge inferred about individual representatives using other information – such as guessing how a representative voted based on their party label.

[2] This paper builds on a previous paper (as well as a poster that was presented at PolMeth 2017), and investigates the effect of varying the level of information conveyed by party brands. In "The Informational Value of Party Labels and Legislator Voting Records," I show that the information conveyed by a party's record has increased over time. In the current paper, I test whether this has caused voters to invest less in learning about their representatives' individual records.

2 Party Label Informativeness and Willingness to Pay

Early work on voting behavior in the 1950s and 60s found that voters often knew very little about where candidates or their parties stood on a host of salient issues. Individuals were found to have neither a clear set of beliefs nor understand politics at an acceptable level (Converse 1964; Campbell et al. 1960). This may be fundamentally detrimental for democratic accountability. If individuals are not aware of where parties stand on issues or how their representatives vote in Congress, they are not able to determine if their interests are being represented and are unable to hold their representatives accountable for their actions.

However, voters' knowledge about politics has alsochanged substantially over the last 6 decades. For example, voters are now much more likely to know where the parties and their candidates stand on a host of issues (Hetherington 2001; Levendusky 2010). In fact, voters who pay very little attention to politics know as much about the differences between the party's positions as voters who paid a lot of attention to politics in the 1970s (Smidt 2017). Relatedly, work by Dancey and Sheagley (2013) finds that many voters can guess how their senator voted on a number of salient bills. Importantly, however, these changes in voter knowledge are largely being driven by what voters know about the parties, rather than an increase in voters' direct knowledge of candidates' own votes. For example, Dancey and Sheagley (2013) show that while citizens can often guess how their senator voted, they almost always get it wrong in the cases where their representative's vote diverges from the majority of the representative's party. Similarly, Warshaw and Tausonovitch (2018) show that voters are largely unable to distinguish how members of Congress from the same party differ ideologically.

Consistent with these findings, other scholars have found evidence that voters increasingly evaluate candidates based on their party affiliations, rather than their individual records (Rahn 1993; Lau and Redlawsk 2001; Popkin 1994; Snyder and Ting 2003; Bonica and Cox 2017; Kim and LeVeck 2013). Additionally, voters may actually know a smaller number of facts about their individual representatives than they did in the past. One example of this phenomenon is that voters are now less likely to know the names of their Congressional representatives (Jacobson 2015). This second finding is particularly interesting, given the fact that the rise of and popularity of the internet has made it much easier for individuals to find this type of factual information – and at a fairly low cost compared to past decades. Similarly, it should be

fairly easy to learn about how an individual's own representatives voted on a specific bill, but the vast majority of voters do not seem to posses this type of direct knowledge about their incumbents, even for salient bills (Dancey and Sheagley 2013; Ansolabehere and Jones 2010). By increasingly evaluating candidates based on their party instead of their individual records, this may signal a shift in the level of accountability in American politics from individual representatives to parties as a whole.

However, it is still an open question as to why this shift to "party-centric" voting has occurred. One prominent explanation is that the difference in what individuals know and how they vote is actually being driven by changes in how the parties behave in Congress. Votes made by legislators in Congress have become increasingly polarized (Poole, Rosenthal, and Koford 1991; McCarty, Poole, and Rosenthal 2006; Poole and Rosenthal 1991; Poole and Rosenthal 1997; Poole and Rosenthal 2011). In addition, legislators have also increasingly taken more extreme party positions (Bafumi and Herron 2010; Fiorina, Abrams, and Pope 2006; Clinton 2006). Over time, as the parties in Congress have polarized, meaning that they have become more ideologically distinct, the party label itself has become a more informative cue to voters (Dancey and Sheagley 2013; Kim and LeVeck 2013; Grynaviski 2006; Smidt 2017). With a polarized Congress, there are now greater differences between how the members of each party vote, in addition to greater homogeneity within each party. This makes it such that if you know how a candidate's party voted on an issue, you probably also have a very good idea about how that individual candidate voted as well. Therefore, because the party label of a candidate is relatively cheap to acquire and has become increasingly informative, voters may increasingly focus on a candidate's party label instead of other information.

This explanation is appealing, both because it is intuitive, and because increases in polarization strongly correlate with increases in what voters know about the parties (Smidt 2017). However, we cannot say for certain that this correlation means that the information contained in increasingly polarized party records is actually *causing* party-centric knowledge and voting among voters[3]. Also, even if the relationship is causal, we still lack evidence to show how strong the causal relationship is.

Evidence in support of this claim that more informative party labels

[3]For example, one potential confounder is illustrated by McCarty, Poole, and Rosenthal (2006), who argued that polarization in Congress has been driven by fundamental demographic changes in the electorate, such as economic inequality and increased levels of immigration. These types of demographic changes could certainly also affect changes in voters' knowledge and behavior in addition to Congressional polarization.

have caused more party-centric voting has historically been difficult to obtain, mainly because we lack a control group containing voters who lack access to the increasingly informative party brands at multiple points in U.S. history. Without this comparison, and especially with observational data, it is impossible to determine causality, leaving us with only the ability to determine the possible correlation between party-centric voting and the increasing informativeness of party records.

Here, I address this difficulty by using a measure that quantifies the amount of information that is contained in party records about how individual candidates vote. This measure is abstract and can be applied to many environments, including decision-theoretic experiments, where the amount of information available to subjects equals the amount of information that is conveyed by party brands at different points in history. Using an experiment in which I vary the amount of information conveyed by the party label to march the information environment at various points in time, I formally test the following hypothesis:

Hypothesis: As party labels become more informative about how individual candidates will vote, citizens will be less willing to invest costly effort in learning about how the candidate actually voted.

3 Measurement

To test this hypothesis, we first need a measure that quantifies how much information is conveyed by the party label while simultaneously describing how distinct the party brands are from each other at a given point in time. Information is defined here as a reduction in uncertainty. This means that the more information that is available, the more uncertainty is reduced. Here, we are interested in reducing uncertainty about how incumbents vote in Congress. Therefore, the more information that is contained in the party label, the more uncertainty about how incumbents will vote is reduced.

This concept can be applied to how people vote ideologically by using the Jensen-Shannon Divergence (Lin 1991). The Jensen-Shannon Divergence (JSD) uses entropy (H), which is a measure of uncertainty, to characterize how much uncertainty is reduced if we know which distribution is generating a given set of data[4]. In this case, the distributions are the parties in Congress (Republican, Democrat) and we can quantify the amount of uncertainty about

[4]See appendix for a more detailed characterization of the Jensen-Shannon Divergence (JSD), as well as its mathematical details.

ideological voting records that is reduced or eliminated when we go from not knowing an incumbent's party label to knowing their party label.

To do this, I first measure the uncertainty that we would have about whether an incumbent cast a conservative vote on any given bill if we did not know the incumbent's party. Then, I measure how much uncertainty we have about whether the incumbent cast a conservative bill if we did know what party they belong to. The difference between these two measurements represents how much uncertainty would be reduced on average by knowing the party that the incumbent belongs to. This difference is the JSD, and is illustrated in Equation 1 below.

$$JSD_{\frac{1}{2}(Dem,Rep)} = \overbrace{H\Big(\frac{1}{2}Dem + \frac{1}{2}Rep\Big)}^{\substack{\text{Uncertainty given that a vote is} \\ \text{cast by a member of either party}}} - \overbrace{\Big(\frac{1}{2}H(Dem) + \frac{1}{2}H(Rep)\Big)}^{\substack{\text{Average uncertainty given that a vote is} \\ \text{cast by a member of a specific party}}} \tag{1}$$

To briefly illustrate how the JSD might be used in the case of party records and how the information in party records has varied over time, I use roll call votes from the 45-113th Congresses from 1878-2014 to calculate the JSD for each year[5]. Let's assume that we are interested in guessing whether a legislator will vote yea or nay on a bill. Furthermore, assume that a legislator's vote (yea or nay) can be interpreted as taking the liberal or conservative side of the issue along a single left-right ideological dimension[6]. Given these assumptions, we could use Equation 1 below to measure the information gained by knowing a legislator's party label. In this equation, *Dem* and *Rep* are probability distributions over a binary random variable that scores liberal votes as 0 and conservative votes as 1. An observer might estimate each of these distributions by using each party's legislative record in Congress. Therefore, consistent with the literature on partisan lawmaking, Equation 1 implies that party labels are informative because they are linked to specific legislative records, which encode ideological brands (Cox and McCubbins 1993, 2007; Snyder and Ting 2003; Woon and Pope 2008). The party JSD measures the amount of information that is generally contained in parties' legislative records, rather than the information contained in any specific party's legislative record. The party JSD is calculated over the parties' entire legislative record because it is a measure of how much information is *produced* by the parties' legislative activities in

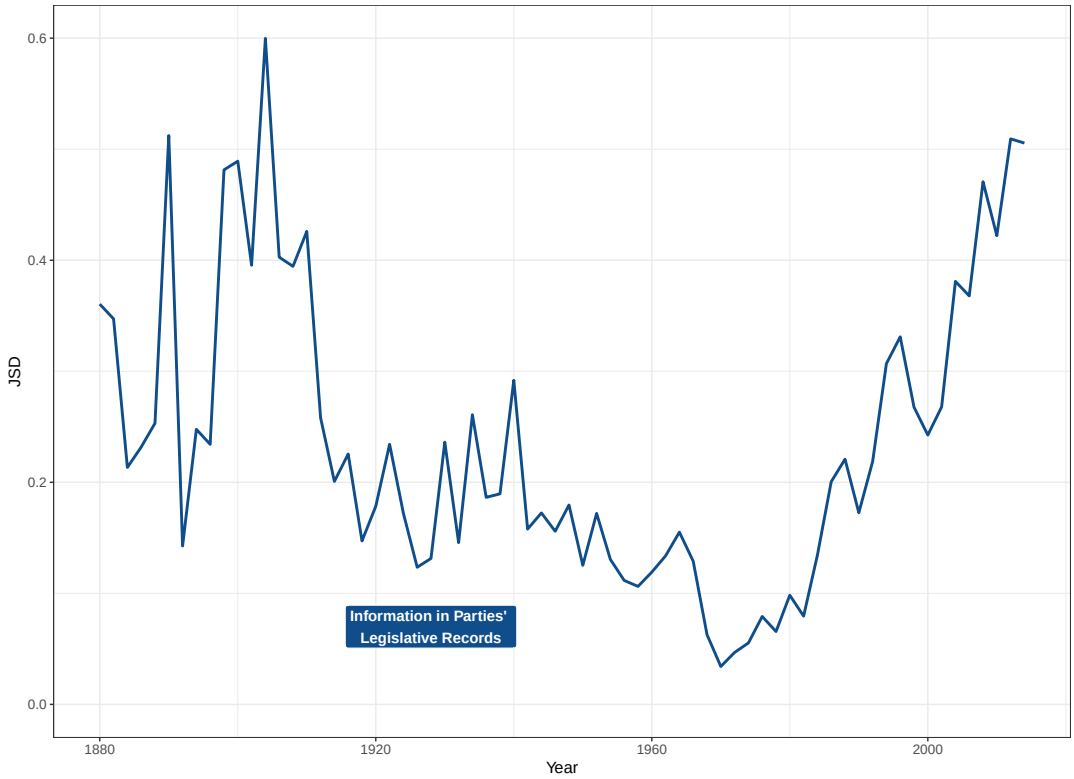
[5] All data is obtained from `http://voteview.com`. Following Poole and Rosenthal (2007), all consensus votes were removed.

[6] The JSD does not require that we restrict ourselves to a single dimension. This is just to simplify the example.

Congress. It is not a measure of how much information is consumed by any particular voter.

For each bill, I code whether a yea vote is conservative or liberal using the following procedure: First, I take the median first dimension DW-NOMINATE score of the legislators who voted yea. Then, I take the median first dimension DW-NOMINATE score for legislators who voted nay. If the median score of legislators who voted "yea" is greater than (i.e. more conservative than) the median ideology score of legislators who voted "nay," then a "yea" vote on the bill is classified as a conservative vote (1). Otherwise, it is coded liberal (0). For each party, I then calculate the proportion of conservative votes cast in a given year, $pr(con)$, and use this as the estimate of the probability that a candidate from the party takes a conservative vote on any particular bill. I use $1 - pr(con)$ or $pr(lib)$ to estimate the probability that party members take the liberal side of a vote. Using these estimated probability distributions, party JSD is calculated according to Equation 1 above. The JSD for each year from 1878-2014 as seen in Figure 1 below exhibits considerable variation over time.

Figure 1: **Party JSD:** Variation in Party JSD in the last 130 years



Theoretically, our measure of information, the JSD, can vary between 0 and 1. A JSD of 1 means that the parties are perfectly distinguishable from one another (most informative). In contrast, a JSD of 0 means that in terms of ideological voting records, the parties are not distinguishable at all.

Figure 2: **Party JSD Example:** 101st Congress (1990)

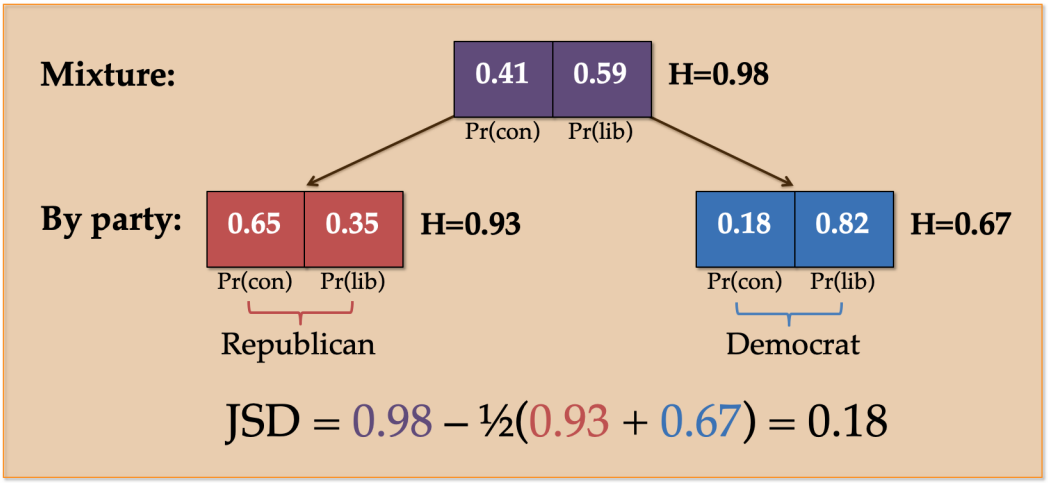


Figure 2 illustrates how the JSD can be applied to how people voted (yea / nay) ideologically for the 101st Congress in 1990. Figure 2 tells us that for all votes made by legislators in 1990, the probability that a given vote by a legislator was conservative was 0.41, while the probability of a liberal vote was 0.59. If we are trying to guess how a legislator voted (without knowing which party they are from), this distribution of votes leaves us highly uncertain about the correct answer[7]. If we break this mixture of all votes down by party, we see that for Republican legislators (red box), the probability of a given legislator making a conservative vote was 0.65 and the probability of making a liberal vote was 0.35. Similarly, for Democratic legislators (blue box), the probability of making a conservative vote was 0.18, while the probability of making a literal vote was 0.82. In addition, the uncertainty that we have regarding the voting behaviors of Democrats is much smaller (H = 0.67) than the uncertainty than we have regarding Republican legislators (H = 0.93). Overall, the JSD for 1990 was 0.18, meaning that at this time in history, the party label contained a relatively small amount of information in terms of ideological voting records.

The party label JSD varies over bills and years, and in recent years, has become increasingly more informative than in the past. As seen in Table 1

[7]The entropy (H) for this mixture of votes represented by the purple boxes is very high (0.98 out of 1.00) meaning that we are very uncertain.

Table 1: Party Label JSD (1970-2010)

Year	Party Label JSD
1970	0.03
1980	0.10
1990	0.17
2000	0.24
2010	0.42

and Figure 1, there is considerable variation in the party label JSD since 1970 and more generally, over the last 130 years. Because the party label JSD tells us exactly how much information the party label conveyed in a given year, we can use this measurement to recreate the information environment that an individual was exposed to during that time. To illustrate, recall that in the 101st Congress example, the mixed (purple) distribution of liberal / conservative votes included all votes taken during 1990. The JSD in 1990 thus gives us the amount of information that was conveyed by the party label for this year. To mimic the information environment of 1990, we can find a single bill where the distribution of yea / nay votes within each party matches the distribution of conservative / liberal votes in a given year.

For example, in 2004, the party label JSD was 0.43. I can mimic this level of information with a single bill that has the following characteristics:

Overall, on this bill,
213 legislators voted in favor of the bill and 214 legislators voted against the bill.

In terms of the distribution of yea / nay votes by party,
Democrats who voted in favor of the bill: 199/250
Republicans who voted in favor of the bill: 14/177

We can see here that knowing the yea / nay distribution on the bill overall is not helpful as it is 50 / 50. However, we know that the party label is highly informative (0.43) and this is demonstrated by the breakdown of yea / nay votes by party. When thinking about how a Democratic legislator voted on this bill, it is overwhelmingly likely that they voted in favor of the bill. Instead, if asked to guess about how a Republican legislator voted on this bill, it is highly likely that they voted against the bill. Here, knowing the party that a legislator is from greatly increases the probability that we would correctly

guess how they voted on this bill.

To test the theory and the hypothesis that as party labels become more informative about how individual candidates will vote, citizens will be less willing to invest costly effort in learning about how the candidate actually voted, I will construct a set of bills where the distribution of yea / nay votes within each party matches with the distribution of liberal / conservative votes in a year. Here, each bill will match a different party label JSD for a given year, allowing for a comparison of information-seeking behavior over time.

The goal is to use this set of bills that represents the informativeness of the partly label over time to see whether more informative yea / nay vote distributions (higher JSD and more informative party labels) cause individuals to be less willing to pay for information about whether a legislator voted yea or nay on the bill. This is analogous to how more informative distributions of conservative / liberal votes may have made people less willing to invest costly effort into finding out how their individual representative actually voted in Congress. In the following section, I detail an experiment using a set of bills matching different party label JSDs to test this idea.

4 Decision-Theoretic Experiment

This paper seeks to examine the effect of the increasing information level of party labels on willingness to obtain additional information using actual information levels over the past five decades. To test the hypothesis, I employ an experimental research design. The design is based on the idea that there is a certain level of information that is contained in the party label and individual legislator voting records.

When the party label becomes more informative (JSD goes to 1), it is expected that individuals will place more weight on the party label and less weight on individual legislators' voting records. This is because a JSD of 1 indicates that knowing the party label allows voters to perfectly predict how an individual representative votes. Thus, as the party label increases in informativeness, respondents given the party label of a legislator should be less willing to pay for information on individual legislators, even when the goal is correctly identifying an individual legislator's vote. In this way, the party label acts as an information subsidy – even though it is cheaper to get candidate information nowadays, the high information level of the party label makes acquiring individual legislator information uneconomical.

To explain how individuals can gauge the informativeness of the party label using the bills chosen to mimic the information environment in a given

Table 2: Close Vote Example

Bill	Democrat Yea	Democrat Nay	Republican Yea	Republican Nay	Total Yea	Total Nay	JSD
1	25	25	25	25	50	50	0
2	50	0	0	50	50	50	1

year, imagine that there are 50 Democrats and 50 Republicans for a total of 100 members of Congress. For the first bill in Table 2, exactly half each party votes for the bill. This means that 25 of the Democrat members and 25 of the Republican members vote yea. Similarly, 25 Democrat members and 25 Republican members vote against the bill for a total of 50 yeas and 50 nays. Because this distribution gives us no information, the JSD is 0 – the parties are not distinguishable. In contrast, for the second bill, imagine that all 50 of the Democratic members vote yea and all 50 of the Republican members vote nay. Although the total is still 50 yeas and 50 nays, because the parties are completely distinguishable, Bill 2 has a JSD of 1.

In the no party label condition of the experiment, Bill 1 and Bill 2 have the same amount of information (50 yeas and 50 nays). If the task is to guess if a given member of Congress voted yea or nay, you have a 50/50 chance of being right for both Bill 1 and Bill 2, since you do not know the party label of the member. Therefore, individuals should pay the same amount for additional information about how the individual legislator in question voted in both of these scenarios (Bill 1 and Bill 2).

In contrast, in the party label condition, despite the fact that each bill has 50 yeas and 50 nays, the JSD of the two bills are very different. Since Bill 1 has a JSD of 0, individuals should pay for additional information on how the member in question voted. This is because even though they have the party label to use, it does not provide them with any additional information to use. However, on Bill 2, since the party label of the member is known and the JSD is 1, individuals should never pay for additional information because knowing the party label is all the information that is needed to make a correct prediction. Following this logic, as the JSD increases from 0 to 1, individuals should be less willing to pay for additional information in the party label condition as the party label increases in informativeness.

The basic experimental set-up is shown in Figure 3. Participants are told that they will receive a bonus ($1) if they correctly guess how the legislator voted on the given bill. In the first part of the experiment, participants are presented with information on the distribution of legislator votes for a specific

bill that received a roll call vote (Stage 1). Bills used in the experiment were selected to match the overall JSD for the House of Representatives by year. The distribution of roll call votes on a bill within each party matched the distribution of conservative and liberal votes cast by each party in a given year. Therefore, the party label of a candidate conveys the same amount of information (about how the candidate voted on the bill) as the candidate's party label would have conveyed about their propensity to vote conservatively in a given year. This means that the bill-level JSD for a given bill is identical to a yearly JSD between the years of 1970-2010 (Table 1). Furthermore, despite varying the underlying bill-level JSD, only close votes (50% yea, 50% nay) are used in this experiment. This allows each bill to have the same baseline level of information, absent a party label (Table 2).

Participants are randomly assigned to receive one of two informational treatments: party label (Democrat or Republican) or no party label (Stage 2). Participants face a cost to acquire more information. If they choose to pay nothing, they will get a signal that is essentially a coin flip with a 50/50 chance of accuracy. On the other hand, if the participant chooses to pay \$0.02 or \$0.50, they will get a signal that is 52% or 100% accurate, respectively. Lastly, after receiving the signal according to their willingness to pay in Stage 3, the participant is asked to give their best guess of how the legislator in question voted on the bill (Stage 4). Participants are paid \$1.00 - signal cost for a correct guess and \$0 otherwise for one randomly selected trial.

This creates two distinct cases (Table 3). Participants complete a total of seven trials with varying bill-level JSDs under the same set of randomly assigned conditions, making this a between-subjects design.

Figure 4 is what participants in the experiment see. The top panel is a participant in the control condition which has "not available" as the party label. The bottom panel is a participant in the treatment condition who has "Republican" on the current trial, but randomly receives either "Democrat" or "Republican" for each trial. What is important to note here is that, for participants in the control condition (top), the only piece of information they can use is the 50/50 yea / nay distribution. They are not able to make use of the second piece of information – the distribution of yea / nay votes by party, because they do not have access to the party label of the legislator. We would therefore expect these participants[8] to pay some sum of money greater than zero for more information because they always have a 50/50 chance of answering correctly without more information. In contrast, for participants in the treatment condition (bottom), these individuals can use the distribution

[8]Given that they have a normal range of risk aversion.

Figure 3: **Trial Set-up:** Example trial using 1980 JSD

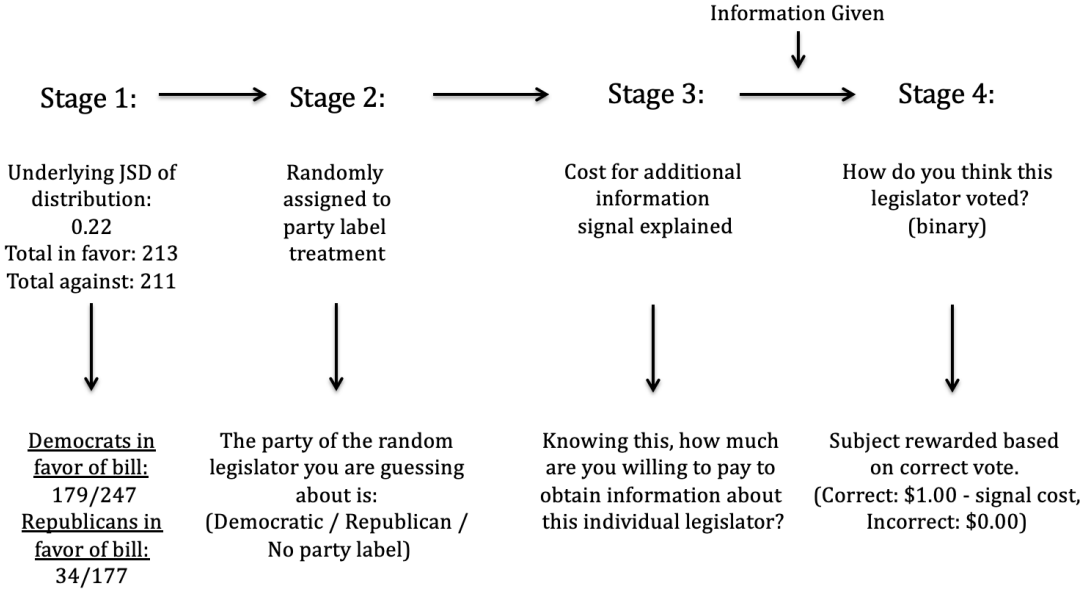


Table 3: **Experimental Design:** informational level and conditions

	Varying JSD by Year
Party Label	$Bill_{1_{JSD}}, Bill_{2_{JSD}}, \cdots, Bill_{7_{JSD}}$
No Party Label	$Bill_{1_{JSD}}, Bill_{2_{JSD}}, \cdots, Bill_{7_{JSD}}$

of yea / nay votes within each party. Therefore, we would expect treatment condition participants to be willing to pay less than individuals in the control condition because the distribution of votes within each party provides them with some information about how the candidate voted. In the particular case shown in Figure 4, subjects would know that the candidate (a Republican) was more likely than not to vote against the bill.

Despite the final stage being the participant's guess regarding the legislator's vote, the dependent variable of interest in this experiment is willingness to pay for information. The hypothesis posits that as the party label becomes more informative, individuals will be less likely to invest costly effort into learning about an individual candidate's voting record. Here, willingness to invest costly effort is modeled by monetary costs – to get more information about how the individual legislator that is being asked about voted, individuals must pay in cents. This is meant to capture the idea that in the real world, individuals must invest costly effort such as time to learn more about

Figure 4: **Top:** A participant in the control condition. **Bottom:** A participant in the treatment condition.

individual legislators' voting records. It is acceptable to use willingness to pay for a hint in the experiment as a proxy for costly effort even though willingness to pay is not elicited in the real world.

For each trial, participants are asked how much they would be willing to pay to get additional information to help them make their decision. This monetary value becomes the dependent variable. With multiple trials, the objective is to compare willingness to pay for an additional signal on bills with different party JSDs (over time).

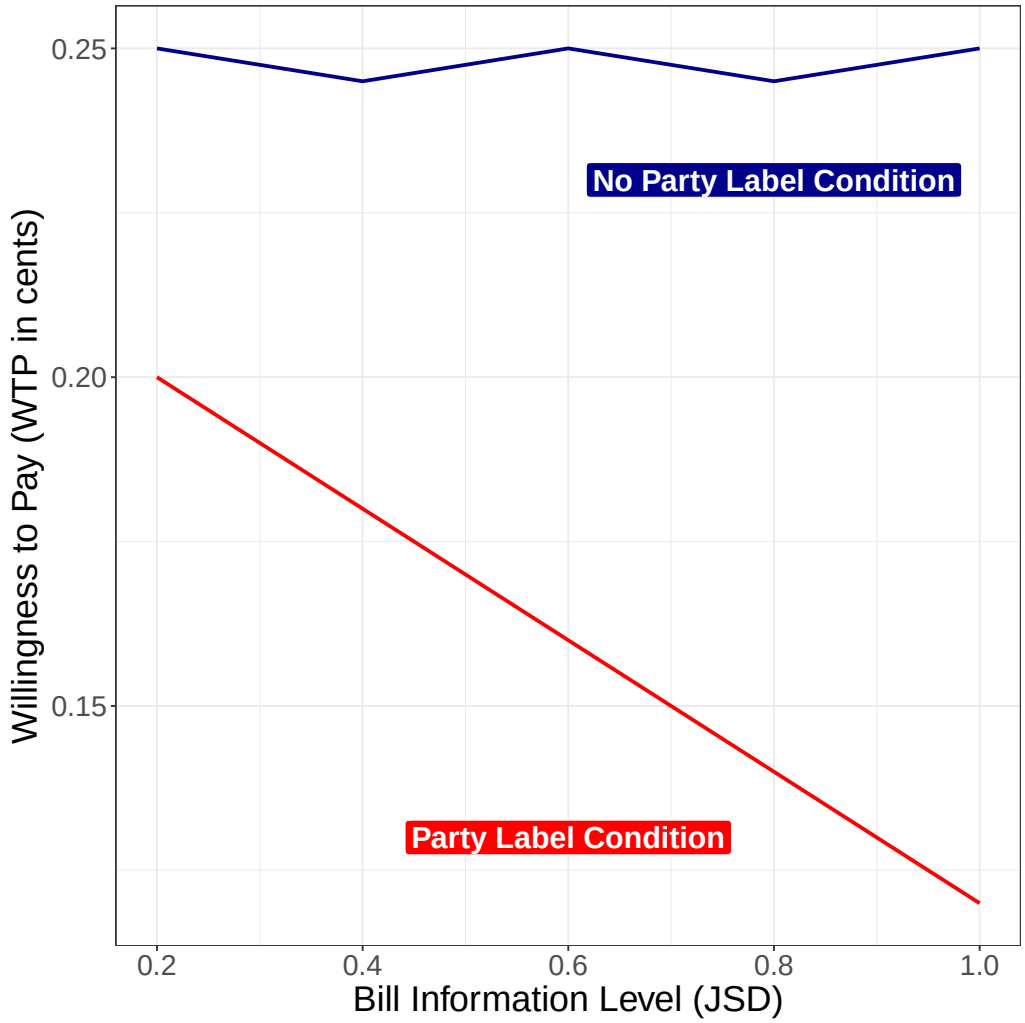
In the no party label condition, I expect there to be a similar willingness to pay across JSDs because the vote distribution for close votes (50% yea / 50% nay) is not informative and the participant is unsure of the party label of the legislator in each trial. Therefore, they should be willing to pay a relatively similar amount for additional information across all JSD levels since they are not given any party labels to make use of.

In contrast, in the party label condition, I expect that as the informativeness of the party label increases (JSD increases), individuals' willingness to pay for individual legislator information will decrease. As the distribution of votes between Democrats and Republicans becomes increasingly different, individuals who are given the party label will be able to make better predictions. Therefore, they will be less willing to pay for additional information in this case. As the distributions become more similar (JSD decreases), even individuals with the party label will have an increasingly hard time deriving information from it. Therefore, they will be more willing to pay for additional information.

With regard to willingness to pay for information, I compare the individuals who get the party label versus those that do not (Figure 5). Within each of the conditions, I vary the potential informativeness of the party label (JSD) while keeping the overall number of yeas and nays on each bill relatively equal. Individuals who receive the party label treatment, should be less willing to pay for additional information. The cost of obtaining additional information matters less for individuals with the party label given as we move from low informativeness of the party label to high informativeness (JSD). Therefore, the difference between willingness to pay in the party label condition (red) and willingness to pay in the no party label condition (blue) should become larger as the party JSD increases.

In the no party label condition, individuals' willingness to pay should be relatively the same across all of the different JSD levels. This is because they are given no party label and the yea / nay distribution of a close vote does not give them any additional information or the chance to increase their probability of making a correct guess without paying for additional information

Figure 5: **Pre-Registered Hypothesis Expected Results:** Relationship between WTP and JSD



on the legislator's individual voting record.

While this experiment is quite abstract, this level of abstractness helps us to investigate the mechanism by which individuals have come to invest less in learning about individual candidates' voting records. By holding all else constant but the informativeness of the party label (JSD), this allows us to determine if increasingly informative party labels have *caused* individuals to be less willing to invest effort into learning about individual candidate information.

5 Data and Methods

This experiment was pre-registered with the Open Science Foundation[9] and data was collected using Qualtrics and Amazon's Mechanical Turk[10]. Participants were screened to be at least 18 years of age and reside in the United States. The 1199 participants were randomly assigned to one of two experimental conditions: party label or no party label. Each participant completed multiple trials under the same condition (i.e. party label or no party label).

Figure 6 shows the results from the experiment. Because the seven trials are equally spaced in terms of JSD jumps from one trial to another, there is no year associated with the last trial. For ease of discussion, since this trial's JSD is closest to 2008, I will use 2008 as its year. The hypothesis is supported, as individuals in the party label condition are indeed less willing to pay for an additional piece of information, compared to individuals in the no party label condition, over time ($p - value = 0.0004$). Additionally, as the party JSD increases, the difference in willingness to pay between the party label and the no party label conditions generally increases. From 1970 to 2008, willingness to pay for information has dropped by about 30%.

We would also expect that there is not a significant difference between the WTP of individuals in the no party label condition between 1970 and 2008. This is indeed the case, as the average willingness to pay for respondents is not significantly different between the two years ($p - value = 0.4991$). Subsequently, we should expect a difference in WTP between 1970 and 2008 for participants in the party label condition. This is also the case. Participants in the party label condition are willing to pay significantly less for additional information in 2008 (when the JSD is over 4 times as high) than in 1970 ($p - value = 0.0004$). Finally, there is a significant difference between the amount that participants in the no party label versus participants in the party label condition are willing to pay in 2008 ($p - value > 0.0000$).

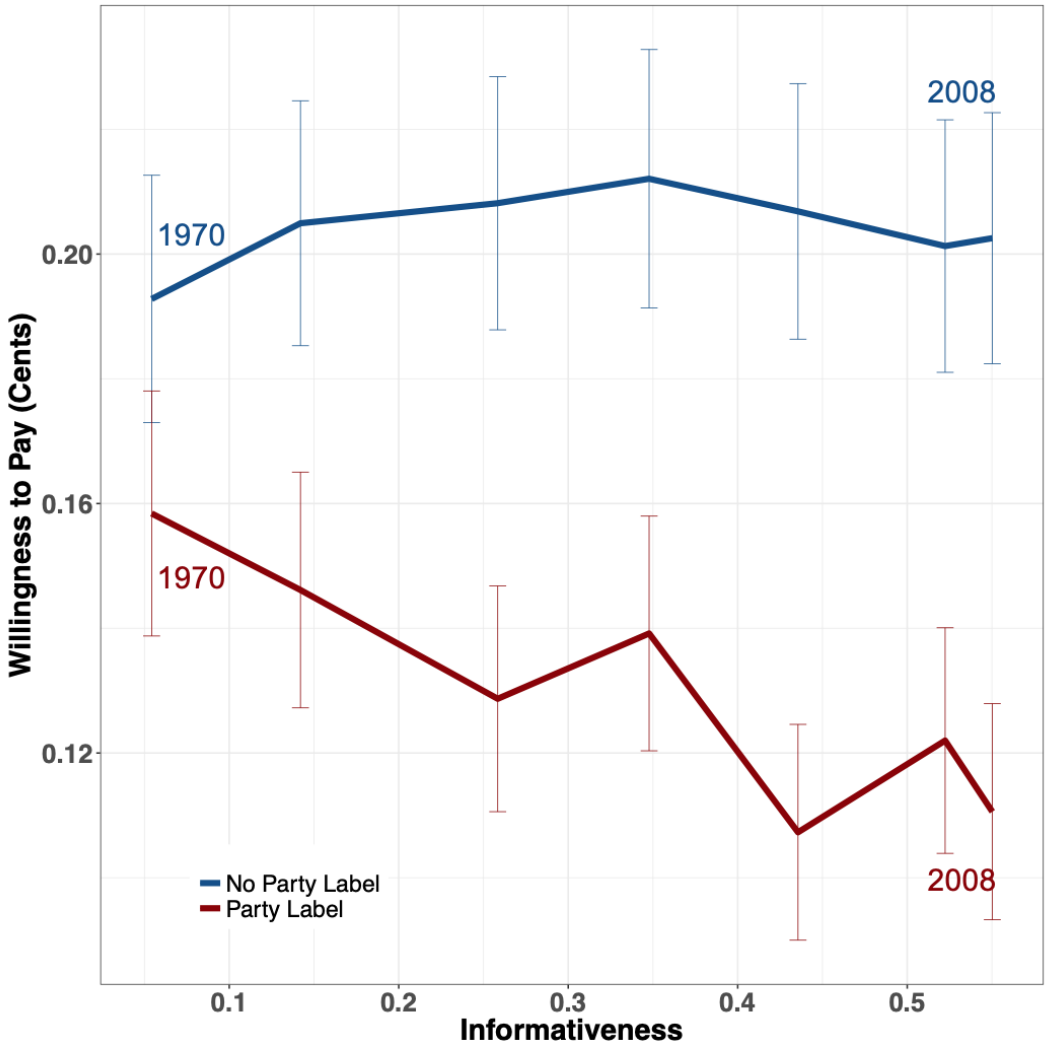
6 Discussion and Conclusion

While previous experiments have not controlled the benefit of voting correctly or the cost of acquiring more information, the design of the current experiment allows for control of both of these factors. In addition, this experiment varies the informational value of the party label to mimic real-world

[9] https://osf.io/dg43e/

[10] This experiment was reviewed and approved by the University of California, Merced IRB (UCM2017-151).

Figure 6: **Results:** Relationship between WTP and JSD



changes over the last five decades. This is done by first computing how much information is contained in the party label in a given year using roll-call votes. The resulting measure, the JSD, tells how distinct or distinguishable the votes of each party's members are along the left-right ideological spectrum (in terms of the propensity to make conservative or liberal votes). This measure is computed for every year and shows considerable variation throughout the years (Figure 1). The JSD can be computed for years or bills, and in this case, each yearly JSD is matched to an individual bill-level JSD. This matching means that the party label of a candidate conveys the same amount of information

(about how the candidate voted on the bill) as the candidate's party label would have conveyed about their propensity to vote conservatively in a given year. This means that the bill-level JSD for a given bill is identical to a yearly JSD between the years of 1970-2010 (Table 1) and tells us how distinct the party members' votes are on a given bill. By matching a bill-level JSD with a yearly JSD, this experiment is able to vary the informational value of the party label over time, using actual bills for individual trials, without participants realizing what bill or year they are being asked about. This study compares participants' willingness to pay for additional information over a variety of party label informational levels (yearly JSDs) by using multiple trials (one year per trial).

Since the 1970s, both the informational level of the party label and the informational level of individual members' legislative records have increased. However, the informational level of the party label has increased at a higher rate. This may be why there has been an increase in party line voting because knowing the party label is easier and just as effective as knowing a legislator's entire voting record. This experiment investigates the effect of varying the level of information that is contained in the party label. More specifically, it tests whether increasing levels of information conveyed by the party label has caused voters to invest less in learning about their representatives' individual voting records. The results suggest that this may indeed be the case, as willingness to pay for information when the party label is known has decreased by about 30% over time.

This result is important because it might signal a change in the level of representativeness in the United States. There is evidence that people have become more party-centric regarding what they know about and how they evaluate candidates. A large part of this change in what voters are willing to learn about their representatives is driven by the increase of information contained in the party label. If parties continue to vote in blocks and in more ideologically homogeneous ways, using the party label is increasingly effective. However, this means that voters are holding representatives accountable on the basis of the party, not on their individual voting record in Congress. If voters are not aware of the voting behavior of their representatives in Congress and how it differs from their party's voting record, this weakens the incentive of members of Congress to vote according to their district's preferences. Finally, this type of behavior could decrease the incumbency advantage. One of the many benefits to being an incumbent is having an individual voting record to run on. If voters are not paying attention to individual records, however, this could decrease this aspect of the incumbency advantage.

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8 Appendix

Method of Measurement

Here, I begin by briefly introducing two key concepts from information theory, which may be unfamiliar to many political scientists: *entropy* and *mutual information*. Readers who are already familiar with these concepts may wish to skip over these sections, and go directly to the section on the Jensen-Shannon Divergence.

Entropy

The JSD is based upon Shannon Entropy, which is defined by:

$$H(X) = -\sum_{i=1}^{n} P(x_i) \log_2 P(x_i) \tag{2}$$

$H(X)$ is a measure of uncertainty about a discrete random variable X. For example, X might be a binary random variable that represents whether a legislator casts a liberal or conservative vote on a particular bill. This measure of uncertainty is maximized when there is an equal probability of each value x_i. Therefore, continuing with the previous example, uncertainty about how the legislator will vote is highest when the legislator casts liberal and conservative votes with equal probability, in which case $H(X) = 1$. On the other hand, there will be no uncertainty if the legislator always casts liberal (or conservative) votes, in which case $H(X) = 0$.

The entropy of a random variable, $H(X)$, can also be interpreted as a measure of how much information is revealed by a data generating process. Under this interpretation, realizations of X convey more information if you are more uncertain prior to observing a given realization. For example, seeing a legislator cast a liberal vote will convey no new information if you already know that the legislator always takes the liberal side of an issue. However, it will convey quite a bit of information if you initially believe there is a 50/50 chance that the legislator will cast a liberal or conservative vote (i.e. this is the situation where entropy is maximized).

Mutual Information

Mutual information is defined by the equation

$$I(X, Y) = H(X) - H(X|Y) \tag{3}$$

where, $H(X|Y) = \sum_{j \in M} H(X|y_j)P(y_j)$. Because $H(X) \geq H(X|Y)$, mutual information is always positive, and is a measure how much the entropy of X is reduced if you know the realization of another variable, Y. For example, Y might represent the party of a particular legislator. If party affiliation is highly correlated with the ideology of a legislator's votes, then knowing Y (the party of a legislator) may substantially reduce one's uncertainty about X (whether the legislator takes the conservative or liberal side of a particular vote).

An alternative interpretation of $I(X, Y)$ is that it is a measure of the quantity of information Y provides about X. Under this interpretation, knowing Y will only provide you with new information about X if you are initially uncertain about X. To see this, note that if $H(X) = 0$ (i.e. there is zero uncertainty about X), then $I(X, Y) = 0$ as well. Furthermore, Y only provides information about X to the extent X and Y are correlated. To continue the example above, if you are uncertain about a legislator's position, knowing their party affiliation will provide information to the extent that liberal or conservative votes are correlated with being a legislator from a particular party.

8.1 The Jensen-Shannon Divergence

The Jensen-Shannon divergence (Lin 1991) generalizes the concepts of entropy and mutual information to encompass situations where an observer knows that data is generated by one of n distributions. It then characterizes how much uncertainty is reduced if each of the n distributions are labeled, such that the observer knows exactly which distribution is generating a given set of data. The JSD is the mutual information between the labels and the aggregate data (Lin 1991).

$$JSD_{\pi_1,\cdots,\pi_n(P_1,\cdots,P_n)} = \overbrace{H(\sum_{i=1}^{n} \pi_i P_i)}^{\substack{\text{Uncertainty over a mixture} \\ \text{of } n \text{ unlabeled distributions}}} - \overbrace{\sum_{i=1}^{n} \pi_i H(P_i)}^{\substack{\text{Average uncertainty} \\ \text{of } n \text{ labeled distributions}}} \quad (4)$$

In Equation 4 above, $\pi_1 \cdots \pi_n$ are the weights assigned to each distribution P_i. Usually these weights are simply $\pi_i = 1/n$ for all n distributions, but can be adjusted to reflect the prior probability that data comes from a particular distribution. When entropy is defined using logarithms with base 2 (as in Equation 2 in the Appendix), the JSD is bounded between 0 and 1.