Public Choice
https://doi.org/10.1007/s11127-018-0572-y

Dynamic estimation of ideal points for the US Congress

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Received: 14 December 2017 / Accepted: 13 June 2018
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Abstract
Theories of candidate positioning suggest that candidates will respond dynamically to their electoral environment. Because of the difficulty of obtaining "bridge votes", most existing approaches for estimating the ideal points of members of Congress generate static ideal points or ideal points that move linearly over time. We propose an approach for dynamic ideal point estimation using Project Vote Smart's National Political Awareness Test to construct bridge votes. We use our dynamic estimates to measure aggregate change, to measure individual-level change, and to study the institutional and structural factors that explain the changing positions of House candidates and members of Congress. We demonstrate that while the Republican Party has been selecting increasingly extreme candidates, Democratic incumbents have become more extreme while in office. We also find that the congruence between elected members of Congress and their constituents is mostly explained by the selection as opposed to the responsiveness of the candidate. Nonetheless, we find evidence of dynamic responsiveness of incumbents in specific circumstances. We find that competitiveness, midterm elections, and sharing the president's party affiliation are associated with greater responsiveness. Conversely, retirement is not associated with a change in responsiveness. We find no evidence of responsiveness of challengers. Finally, we find that close elections draw challengers who are more in line with the district's ideology.

Keywords Ideal point estimation · Representation · U.S. Congress

1 Introduction

Theories of candidate positioning suggest that candidates will respond dynamically to their electoral environment as the preferences of voters and the electoral context change. That framework naturally opens up a number of questions relating to responsiveness. For example, are retiring members of Congress less responsive to constituents' preferences?

The ideal point estimates we construct in this paper can be obtained from https://sites.google.com/a/stonybrook.edu/mperess/research/Dynamic_Ideal_Points_Data.zip.

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Are Senators less responsive when they do not face imminent election? Are members of Congress more responsive when they face a hotly contested election? Are members of Congress less responsive in midterm elections? Are members of the president's party less responsive? Are members of Congress more responsive to their general or primary election constituencies? Each of these questions posits a factor that varies over time and may affect a candidate's position. Answering some of these questions is impossible without a dynamic measure. Answering the other questions without a "fully" dynamic measure is less than ideal.

Most existing approaches to estimating the ideal points of members of Congress generate static ideal points (Poole1998; Herron 2004) or ideal points that move linearly over time (Poole and Rosenthal 1991, 1997). The main challenge in estimating more dynamic ideal points is obtaining bridge observations across multiple congresses, which requires either bridge votes or bridge voters (Poole 2005). Bridge votes entail identical votes over two subsequent congresses. Although such roll call votes may exist (identical pieces of legislation that were voted on in subsequent congresses when the status quo did not change), they are very hard to identify, though some promising attempts to use such an approach have been made (Asmussen and Jo 2016). In the absence of bridge votes, existing ideal point estimates have instead relied on bridge voters. Employing bridge voters to connect subsequent congresses requires assuming that some legislators do not change their ideal points. For example, Treier (2009) has suggested that Senators may not change their ideal points in the first 4 years of their terms and that those Senators can be used as bridge voters. While that suggestion is promising and is worth further consideration, it limits our ability to recover dynamic estimates.

In this article, we propose a new approach for dynamic ideal point estimation applied to US House candidates. Specifically, we identify bridge votes from survey responses to Project Vote Smart's National Political Awareness Test (NPAT). Many members who served in the US House have responded to the NPAT, and the survey contains many questions that are identical across many years. It is those identical questions that serve as bridge votes in our estimation. Our approach for identifying bridge votes thus is similar to Shor and McCarty (2011) approach for bridging state legislatures.

We apply our dynamic ideal point estimates to measure aggregate change, to measure individual-level change, and to study the institutional and structural factors that explain the changing positions of House candidates and sitting members of Congress. We uncover a number of new findings. First, using existing estimates, it has been observed that the Republican Party has become extreme at a faster rate than the Democratic Party. We demonstrate that while the Republican Party has been selecting increasingly extreme candidates, Democratic incumbents have become more extreme while in office. Our results suggest a parity in polarization that has escaped notice because existing ideal point estimates can more easily capture change owing to the replacement of old members than to drifts in preferences.

We also find that the congruence between elected members of Congress and their constituents largely is explained by selection as opposed to candidates' responsiveness. Nonetheless, we find evidence of some dynamic responsiveness of incumbents to changes in their constituents' preferences. We find that retirement does not lead to a change in responsiveness. Instead, we find a very large effect of election closeness on responsiveness. Responsiveness is fairly high when an incumbent faces a close election but is absent when an incumbent faces no real electoral threat. Midterm elections and being a member of the president's party each diminish the responsiveness of incumbents to their voters. Challengers do not appear to respond to changes in constituent preferences and the correlation

between challenger and constituent preferences appears to be explained entirely by selection effects.

2 Dynamic responsiveness in the US House

A number of theoretical reasons can be found for believing that members of Congress change their positions over time in response to changes in the electoral environment, necessitating a dynamic measure. We focus on three specific reasons that present several opportunities for members of Congress to readjust their positions in the face of changing pressures—the ability to shirk during their final term, the competitiveness of the election, and whether the member is running for office during a midterm election.

According to theories of legislative "shirking", we would expect to see a change in voting behavior by a member of Congress during their last term in office. The logic of this argument is rather simple. Throughout their terms in office, legislators face the prospect of losing reelection and may be punished by their constituents for being out-of-step (Canes-Wrone et al. 2002). Legislators also face pressure from party leaders to vote with the party. Members of Congress may be punished by party leaders who can withhold funding for a member's district (Carroll and Kim 2010), refuse to grant them favorable committee assignments (Cox and McCubbins 1993), or deny the party's help in financing reelection efforts (Jenkins and Monroe 2012). Pressure from both constituents and party leaders may be reduced substantially for retiring members in their final terms, particularly if the individual does not intend to run for another office (Clark and Williams 2014). Such events could lead to changes in how members of Congress vote. In particular, retiring members of Congress may be more (or less) responsive to their constituents in their final term, or may simply move away from their constituents or from their party, depending on which of those pressures is stronger prior to their final term.

The existing literature primarily has focused on the missing electoral connection in the final term (Lott and Davis 1992; Poole and Romer 1993; Rothenberg and Sanders 2000; Poole 2005; Wright 2007; Lindstadt and Vander Wielen 2011). Absent the electoral connection, retiring members of Congress may be less responsive to their constituents. Moreover, if members of Congress personally are more extreme than their constituents, we may observe retiring Democrats moving to the left and retiring Republicans moving to the right. The literature mostly has not tested the theory in that way—only Wright (2007) models the changing responsiveness to constituent preferences directly and none tests whether retiring incumbents become more extreme, as the theory predicts. The remaining articles check whether retiring members of Congress change their position to greater extents. Clark and Williams (2014) address both diminishing constituent pressure and diminishing party pressure on retiring members. If party pressure dominates constituent pressure, we might observe no change in responsiveness and we may observe retiring Democrats moving to the right and retiring Republicans moving to the left because of lessened party pressure.

According to the marginality hypothesis, members of Congress who face competitive elections will be more responsive to their constituents (Griffin 2006). When positioning themselves, members of Congress face a tradeoff between taking moderate positions to placate their general election constituencies and taking extreme positions in line with their personal preferences or more in line with their party leaders (Groseclose 2001; Peress 2010; Serra 2010). According to the marginality hypothesis, the weight of those pressures on the final position of a candidate varies with the margin of electoral victory. When races

are not competitive—as is the case for most House races—little incentive exists to moderate or be responsive to constituents. Close races, however, encourage candidates to moderate their positions so as to maximize their vote potentials. As a result, then, we would expect that more competitive races should encourage candidates to be more responsive to the views of their constituents (Mayhew 1974). Several studies have reported evidence that when faced with strong challengers, candidates are likely to moderate (Ansolabehere et al. 2001; Griffin 2006; Jenkins and Monroe 2012). Furthermore, parties that won with comfortable margins are less likely to moderate their positions in future elections (Fowler 2005). An alternative hypothesis to consider, however, suggests that competitive races may in fact encourage greater ideological voting from candidates as a result of their attempting to mobilize support from the party's base supporters (Fiorina 1974; Gulati 2004).

In addition to how competitive an election may be, various theories also have argued that the context of congressional elections within the presidential election cycle also matters. It is well documented that the party of the president tends to lose seats in the following midterm election year. Two theories, in particular, have implications regarding candidate positioning. According to the *surge and decline theory*, during high turnout presidential elections, short-term partisan forces may determine each party's political fortunes. During low turnout midterm elections, peripheral voters are less likely to vote, thereby returning the election to more "normal" partisan voting, resulting in the party that benefited from the short-term partisan forces losing seats in Congress (Campbell 1960, 1987). The *balancing theory*, meanwhile, argues that the electorate increases its support for the out-party during midterms from a desire for balance in terms of ideology or policy (Alesina and Rosenthal 1995; Bafumi et al. 2010). The implication of both theories is that during midterm elections, the electorate likely consists of partisans who favor the out-party; candidates of the president's party therefore are prone to perform more poorly on Election Day. As a result, members of the out-party likely face little incentive to moderate their positions as conditions are favorable for them, while members of the president's party find themselves facing an electorate unfriendly to them, potentially requiring them to moderate their positions in order to survive. Conversely, it is possible that the stronger motivations of the out-party extend to the candidates as well, who thus may be more responsive during midterm elections.

A key thing to notice is that the foregoing theories posit dynamic responsiveness between House candidates and voters. Static estimates of preferences for members of Congress may be sufficient for many applications. In other cases, dynamic estimates that are not fully dynamic may be adequate—those cases include estimates that allow preferences to change in limited ways, such as DW-Nominate Scores.[1] The existing literature has dealt with the need for dynamic ideal point estimates in different ways. Take, for example, the literature on shirking. Some of that literature treats static estimates as if they were dynamic (Lott and Davis 1992; Rothenberg and Sanders 2000)—an approach that later was criticized (Carson et al. 2004; Herron 2004). Poole and Romer (1993) re-scaled static estimates using dynamic estimates allowing for linear change. Poole (2005) applied Nokken and Poole's (2004) method, which estimates ideal points in each Congress using fixed cutting lines obtained from Poole and Rosenthal's DW-Nominate estimates. Lindstadt and Vander Wielen (2011) used a handful of Senators as bridge voters, assuming that those Senators

[1] To clarify, DW-Nominate Common Space scores are static estimates for members of the House and Senate on the same scale. DW-Nominate scores allow for linear change in the estimates of members of the House and Senate, though the House and Senate estimates are not on the same scale.

did not change their positions over time. Clark and Williams (2014) assumed that continuing state legislators did not change their positions over a 4-year term. Wright (2007) avoided the issue by using the squared correlation between legislator and constituent preferences for different state legislative chambers as the dependent variable. In this paper, we introduce an approach for fully dynamic estimation that can be employed when static and linearly changing estimates cannot be used or are less than ideal. By employing dynamic estimates, we are able to test for a change in responsiveness without assuming that some legislators have fixed positions.

3 Data and methods

We construct ideal point estimates for US House candidates using the roll call votes of elected members and the responses recorded for candidates to Project Vote Smart's National Political Awareness Test (NPAT). Roll call votes for the 102nd through 114th congresses were obtained from https://voteview.com/. Since 1992, Project Vote Smart has been surveying candidates for various political offices including the US House. Candidates for office are requested to respond to a survey asking their positions on various political issues. The intention of Project Vote Smart is to use those responses to educate voters about the positions of candidates for office; the responses to the NPAT are posted on a public website. Yearly responses have been made available to researchers as spreadsheet files. In recent years, response rates to the NPAT have declined dramatically. Starting with the 2010 election, the NPAT has coded the responses of non-responding congressional and presidential candidates based on their public statements. The coded responses are available on Project Vote Smart's website, but are not available in the spreadsheet files provided to researchers. We developed a computer program that collects the responses from the public website.[2] The NPAT surveys in each year are not identical, but contain many identical items. Many of those items are suitable for bridging across years. An item asking if candidates would support rasing taxes on high-income households may not be suitable as a bridge item because raising taxes could mean different things in different years, if tax policy on high income households has changed. An item asking individuals if they are pro-choice or pro-life is suitable as a bridge item. An item asking individuals whether they support the death penalty also is suitable as a bridge item. We bridge NPAT responses across years, treating only the suitable items as bridge votes and treating the remaining items as different items in different years. Our approach for identifying bridge votes is similar to the approach used by Shor and McCarty (2011) and Battista et al. (2013, 2015) to bridge ideal points across the state legislatures.

The NPAT responses consisted of either binary or ordered items. The ordered items were converted to binary items. For example, consider a question asking candidates whether they would like to reduce, increase, and maintain current levels of defense spending. That item would be converted into two binary responses—the first would indicate whether the individual wanted to reduce defense spending; the second would indicate whether the individual wanted to raise or maintain the same level of defense spending. Our approach thus is similar to collapsing categories in an ordered probit model, except that we

[2] The coded responses are not archived and are over-written each time a candidate runs for election. The candidates' responses to the NPAT are archived.

consider all possible ways to collapse the ordered variable. Additional details on the data are given in the "Appendix" section.

The NPAT responses of candidates for office and the roll call votes of incumbents are assembled into a matrix of binary items, denote by y. We let n index "voters" and t index "votes"; we let $y_{nt} = 2$ denote a yea vote and $y_{nt} = 1$ denote a nay vote. A row in the matrix corresponds to a member serving in a particular Congress, or a candidate running in a particular election.[3] Our approach for estimating ideal points with bridge votes is similar to the "big-matrix" procedure described in Poole (2005) and implemented in Battista et al. (2013) and Tausanovitch and Warshaw (2013); it differs from the linear-mapping approach used by Shor and McCarty (2011). The roll call votes and NPAT responses of House members and House candidates are modeled using the quadratic-normal item response model (Jackman 2001; Martin and Quinn 2002). Ideal points are denote by $\alpha_n \in \mathbb{R}$ and cutting lines are denoted by the parameters $a_t \in \mathbb{R}$ and $b_t \in \mathbb{R}$. We assume that we observe $y_{nt} = 2$ with probability $\Phi(a_t + b_t\alpha_n)$ and $y_{nt} = 1$ with probability $1 - \Phi(a_t + b_t\alpha_n)$; we assume that those probabilities are independent across n and t.

To estimate the parameters of the model, we applied penalized maximum likelihood estimation (Peress and Spirling 2010; Battista et al. 2013). We can form the log-likelihood for the model as

$$l(\alpha, a, b) = \sum_{n=1}^{N}\sum_{t=1}^{T}\left\{1\{y_{nt} = 2\}\log\Phi(a_t + b_t\alpha_n) + 1\{y_{nt} = 1\}\log[1 - \Phi(a_t + b_t\alpha_n)]\right\}. \tag{1}$$

We form the penalized log-likelihood as

$$Q(\alpha, a, b) = l(\alpha, a, b) + \lambda_\alpha \sum_{n=1}^{N}\alpha_n'\alpha_n + \lambda_\delta \sum_{t=1}^{T}(a_t, b_t)'(a_t, b_t), \tag{2}$$

with penalty parameters $\lambda_\alpha > 0$ and $\lambda_\delta > 0$. The penalty parameters are used to deal with perfect separation problems, which typically affect a small number of voters and items in ideal point models (Poole and Rosenthal 1997; Jackman 2001; Poole 2005). Our main algorithm estimates α, a, and b by maximizing $Q(\alpha, a, b)$ over (α, a, b). This approach is equivalent to maximizing a Bayesian posterior with normal prior on the ideal points and item parameters. The objective function is maximized using the Limited Memory BFGS Quasi-Newton method (Gill et al. 1981).

We computed two sets of estimates—one set used only the NPAT responses and one set used the NPAT responses and roll call votes. The results we report are based on the second set of estimates, but we computed the first set because they may be useful to other scholars for particular applications. Figure 1 compares our ideal point estimates to the DW-Nominate Common Space estimates. Our estimates are very similar—in fact, the correlation between the two sets of estimates is 0.96. That is not altogether surprising—while we argue later that members of Congress do change their ideal points over time, such change is limited in magnitude (Poole 2007). Members of Congress may move around to a small extent, but we don't expect a member of Congress to move from let's say -1.5 to 1 on the scale. Using a static estimate of ideology therefore gives a good general sense of where a

[3] Each member of Congress would thus have a separate ideal point for each term they served and each candidate would have a separate ideal point for each congressional election in which they participated.

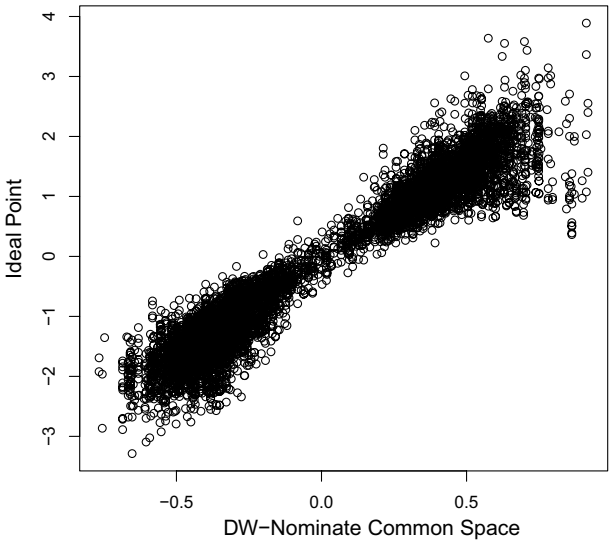

Fig. 1 Summary of ideal point estimates

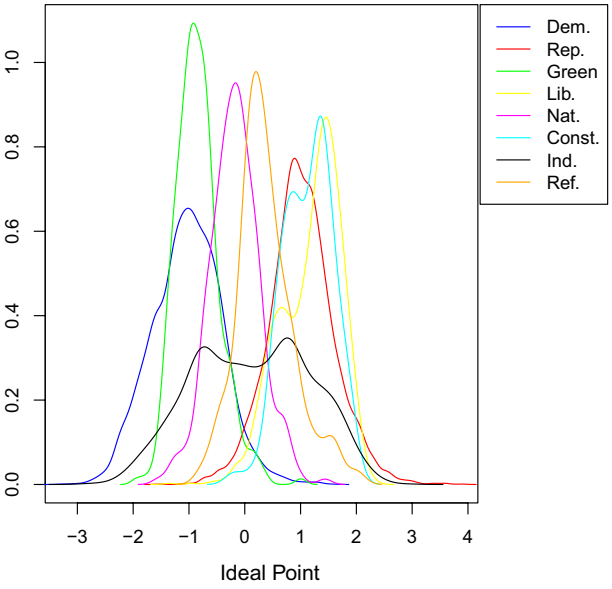

Fig. 2 Density of candidate ideal points by party

member of Congress stands over his or her entire career, but a static estimate prevents us from modeling changes in the positions of members of Congress.

In Fig. 2, we report the distributions of ideal points by party. The figure includes all candidates for which we have estimates, including incumbents, challengers, primary challengers and third party candidates. Each ideal point corresponds to an individual who voted in the US House, responded to the NPAT, or had his or her position coded by Project Vote Smart. Democratic candidates are mostly to the left of Republican candidates. Libertarian and Constitution party candidates are further to the right than the Republican party, on

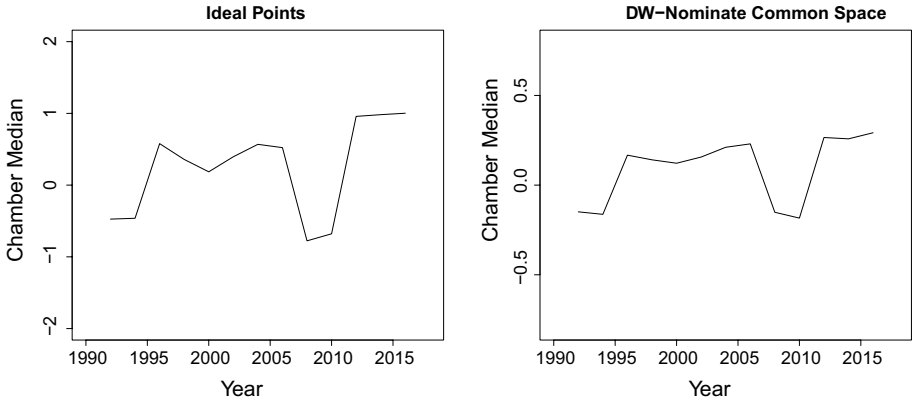

Fig. 3 House medians

average. Green Party candidates are about as liberal as Democratic candidates, but exhibit less variation.

4 Changing preferences of US House candidates

4.1 General patterns of change

In the left panel of Fig. 3, we report our estimates of the House median voter over time. The House median varies with the sizes of the parties in the House, with the House median moving to the right as a result of the 1994 elections, to the left as a result of the 2006 elections, and to the right as a result of the 2010 elections. The DW-Nominate Common Space estimates, presented in the right panel of the figure, display a nearly identical pattern. Note that the scales of our estimates and the DW-Nominate Common Space differ, so nothing should be made of the (absolute) sizes of the changes.

In Fig. 4, we report the Democratic and Republican party medians in the House as well as the distance between the parties relative to the difference in 1992. We report comparable estimates for the DW-Nominate Common Space measure. Relative to the DW-Nominate Common Space estimates, we uncover a larger increase is the distance between the parties over time. According to DW-Nominate Common Space, the distance between the parties has increased by less than 40% since 1992. We find that the distance between the parties has increased by around 60%. A second difference is that we find the Democratic and Republican parties to have polarized equally. That result contrast with the DW-Nominate Common Space scores, which suggest that the Republican Party has polarized about twice as much over the same time horizon. In the language of Treier (2009), the DW-Nominate Common Space does a better job of capturing growing extremity owing to *replacement* relative to *conversion*.[4] Absent votes, it is difficult to account for changing preferences associated with conversion, causing static approaches to underestimate polarization.

[4] Treier (2009) uses the term "conversion" to refer to the change in ideology in a legislature due to continuing members changing their positions.

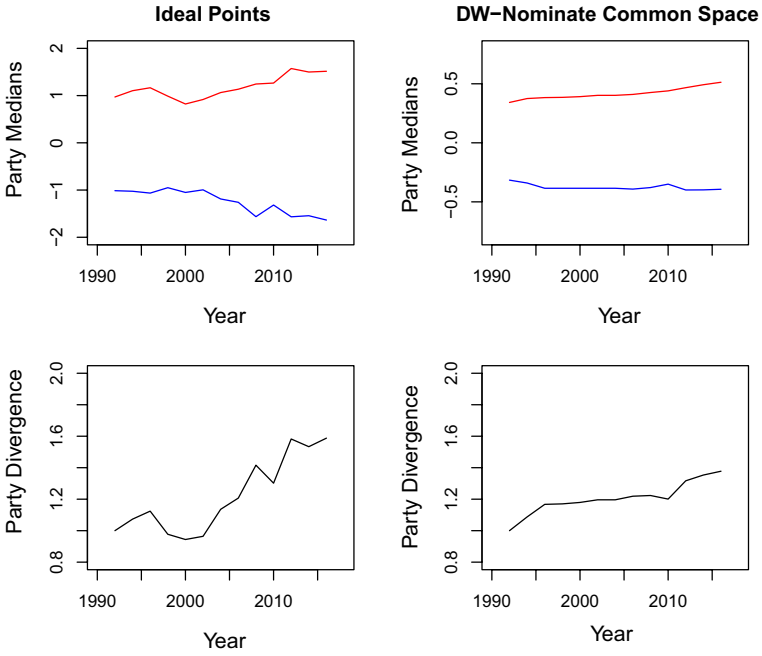

Fig. 4 Summary of ideal point estimates

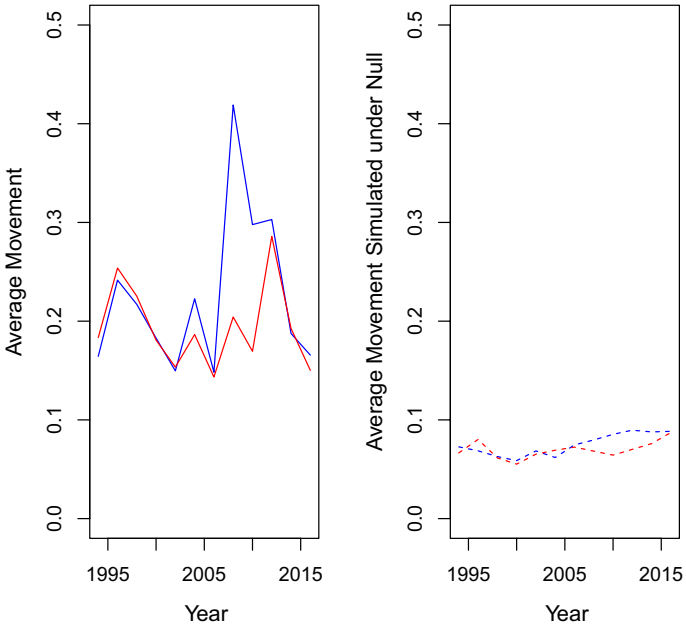

Fig. 5 Average absolute changes in position. In the left panel, the blue and red lines represent the average absolute movement for continuing members of the Democratic and Republican parties, respectively. In the right panel, the blue and red dashed lines represent the expected average absolute movement due to measurement error under the null of no actual movement for the Democratic and Republican parties, respectively. (Color figure online)

Fig. 6 Average change in position

We next consider the extent to which candidates change their positions over time. In the left panel of Fig. 5, we plot the average absolute value of the difference in the position of House candidates over a 2-year period. In most years, the average candidate moved 0.2 units, which is 10% of the distance between the average Democrat and average Republican candidate in our sample. During Obama's term, we saw more movement—particularly among Democrats. Democratic candidates moved an average of 0.4 units between the 2006 and 2008 elections. Note that those estimates reflect changes in the positions of individual candidates, not a change in the party averages. It is possible that we would observe movement even when none exists because of measurement error. To check that possibility, we simulated the amount of such movement we would observe due to measurement error for comparison.[5] The results are presented in the second panel of Fig. 5. The extent of change we observe is significantly larger than the change we would observe owing to measurement error under the null of no actual movement.

Figure 6 gives us a sense of the direction of the change for Democratic and Republican incumbents. Democratic incumbents generally have been moving to the left, but they have tended to move more to the left during presidential elections and less to the left during midterm elections. Prior to the 2008 election, Democratic candidates moved significantly to the left, but moved to the right prior to the 2010 midterm election.

In Fig. 7, we compare the positions of new versus old legislators. New legislators tend to be to the right of the legislators they replace, for both the Democratic and Republican parties. That result can be seen in Fig. 8 as well—the solid lines are old members and the dashed lines are new members representing the same congressional districts.

[5] The extent of measurement error is quantified by the standard errors of the estimates.

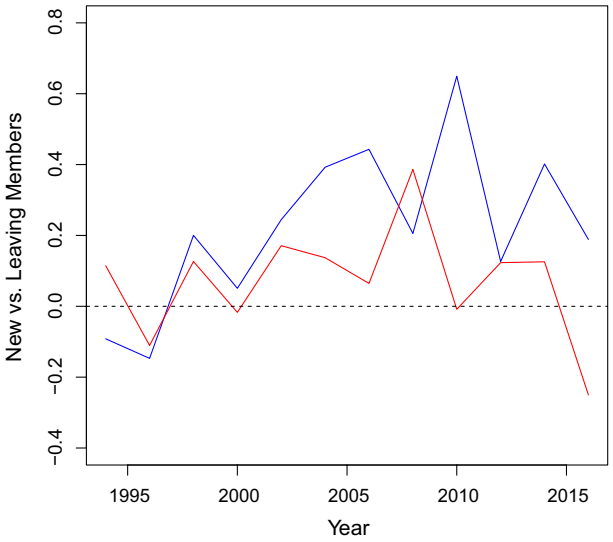

Fig. 7 Change between new and old House members from the same district

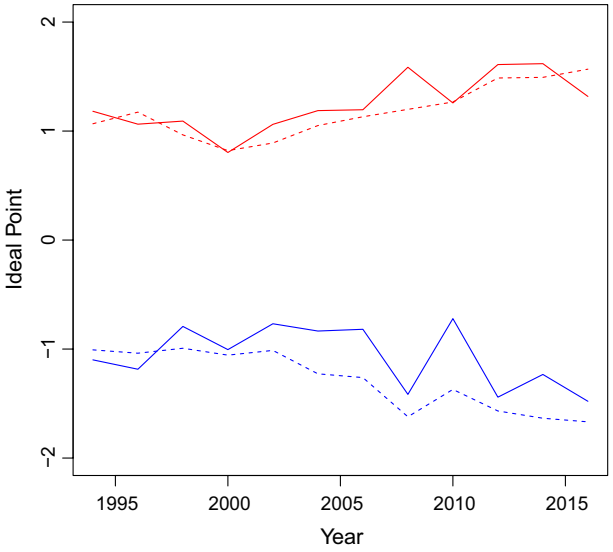

Fig. 8 Ideal point estimates of new and old House members from the same district. Solid lines are old members and dashed lines are new members

4.2 Explaining patterns of change for incumbents

Having established the general patterns of change, we next turn to explaining changes in incumbent and challenger ideologies. An important factor in explaining the positions of candidates for office is the ideology of the constituency. A common measure of the ideology of a congressional district is the two-party vote share of the Republican presidential candidate in the last presidential election. A limitation of that measure is that is in on a different scale in each election year. Alternatively, we can construct a measure of ideology using survey data wherein respondents report either their preferences on a number of

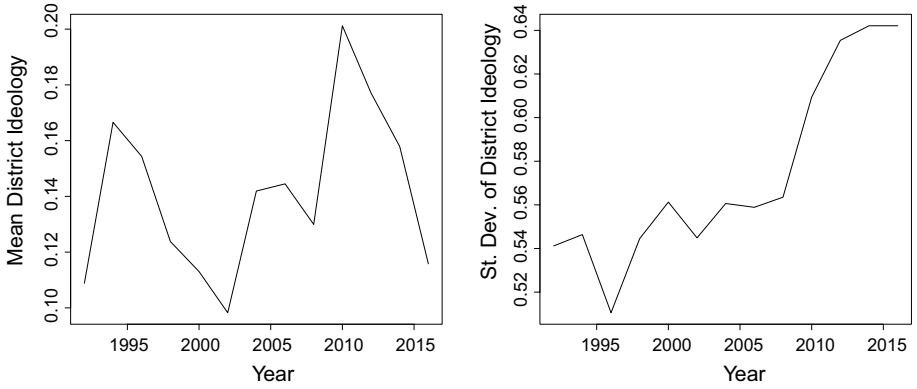

Fig. 9 Summary of district ideology

Table 1 Responsiveness of House incumbents

Sample	All	Democrats	Republicans	All
Independent variables				
Constant	−0.284*** (0.013)	−0.642*** (0.017)	0.225*** (0.018)	0.667*** (0.019)
District Ideology	1.635*** (0.022)	0.423*** (0.029)	0.666*** (0.030)	0.709*** (0.022)
Democrat				−1.656*** (0.025)
N	5026	4596	4583	5026
R^2	0.517	0.048	0.102	0.741

Standard errors are in parentheses

$^{+}p<0.10$, $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$

issue positions or place themselves on a liberal-conservative scale. A major drawback of such an approach is that it is difficult to come by a survey that provides sufficient sample sizes in 435 congressional districts for a period spanning elections from 1992 to 2016. The approach we apply is to adjust the scale of the Republican two-party presidential vote share by congressional district using a survey-based measure of ideology. We employ a measure constructed by Robert Erikson and Gerald Wright for 1992 through 2010 (Erikson et al. 1994). We collected similar data for 2012 through 2016 from Gallup polls. We then applied linear transformations to the raw measure of constituent ideology in each year in order to match the mean and standard deviations found in the survey data. The means and standard deviations of district ideology are reported in Fig. 9. The scale can be interpreted as the percentage of conservatives minus the percentage of liberals in the mean House district. For example, the mean House district had 12% points more conservatives than liberals in 2016. We note that our transformation makes district ideology comparable over time, but the scale of candidate ideology and district ideology are not comparable.

In Table 1, we report the results of linear regressions for which the position of the incumbent candidate is the dependent variable. In the first column, we enter only a constant

term and district ideology. The standard deviation of district ideology is a little greater than 0.5 and the standard deviation of incumbent ideology is a just above 1. The results thus suggest that a one-standard deviation increase in district ideology leads to a 0.7 standard deviation increase in incumbent ideology. Another way to put this is that if the net conservative identifiers in a district were to increase by 40% points (moving from 20% liberal and 40% conservative to 40% liberal and 20% conservative), the average position of the incumbent would move 30% of the distance between the parties. Such a change could be explained by a number of factors, including the idea that liberal districts tend to elect Democrats and conservative districts tend to elect Republicans. In columns 2 through 4, we stratify by or control for the party of the incumbent. Holding constant the party of the incumbent, changing the ideology of the district by one standard deviation leads to a 0.2–0.3 standard deviation change in the ideology of the incumbent. Even that movement, however, partially reflects selection of candidates to the district. Liberal Democrats and conservative Republicans may be less likely to win elections, and may be particularly less likely to win in districts where voters have the opposite ideology. Because we have a dynamic measure of incumbent preferences, a new strategy for measuring these selection effects opens up.

In Table 2, we report similar linear regressions that include fixed effects for each incumbent member of Congress. By entering fixed effects, we can study the influences of changes in district ideology on changes in incumbent positioning. The model in the first column includes district ideology only. The effect of district ideology is substantially weakened once we account for selection—we now observe that a one-standard deviation change in constituent ideology leads to a 0.05 unit change in the position of the incumbent. Another way to put this is that if the net conservative identifiers of a district increased by 40% points, the average incumbent would move 2.5% of the distance between the parties. We thus observe evidence that incumbents change their positions in response to their constituents, but that the effect is small and pales in comparison to the power of selection effects in ensuring that incumbents are aligned with their constituents.[6]

The remaining columns of Fig. 2 consider the ability of additional variables to explain changes in the positions of the candidates. The second column adds election year, interacted with the party of the incumbent.[7] The results suggest that (individual) Democrats in Congress have been moving to the left and (individual) Republicans in Congress have been moving to the right.

Column 3 considers whether retiring members are more or less responsive to their constituents. We coded a member as retiring if that member served his last term in Congress, did not run for another political office in the next election, and was not appointed to another political office immediately. Retiring members face different pressures than members running for reelection. Retiring members may be less sensitive to constituent preferences. They also may be less sensitive to pressure from party leaders. Depending on which of those effects is larger, it is possible that retiring members will be more responsive or less responsive to the preferences of their districts. In addition, it is possible that retiring members will move to the left or right in their final term. If members are personally more

[6] Bernhardt and Ingberman (1985) have argued that the ability of incumbents to change their positions may be limited because such changes may lead voters to become more uncertain about the positions of the candidates and voters may be risk averse.

[7] Note that base the party of the incumbent is omitted because fixed effects for individual members of Congress have been entered.

Table 2 Fixed effects models of the responsiveness of House incumbents to constituent preferences

Independent variables					
District ideology	0.129*** (0.029)	0.065* (0.028)	0.055^{+} (0.029)	0.461*** (0.085)	0.575*** (0.087)
Year * democrat		−0.014*** (0.001)	−0.016*** (0.001)	−0.016*** (0.002)	−0.016*** (0.002)
Year * republican		0.004** (0.002)	0.002 (0.002)	−0.001 (0.002)	−0.001 (0.002)
Retire * democrat			0.219** (0.082)		
Retire * republican			0.081 (0.070)		
District ideology * retire			0.170 (0.105)		
Margin				0.482*** (0.123)	0.524*** (0.126)
District ideology * margin				−0.445*** (0.115)	−0.465*** (0.114)
Midterm					0.004 (0.013)
District ideology * midterm					−0.085*** (0.024)
Pres. party					0.021 (0.014)
District ideology * pres. party					−0.100*** (0.025)
N	4975	4975	4975	3573	3573
R^2	0.937	0.939	0.940	0.946	0.947
Candidate fixed effects	Yes	Yes	Yes	Yes	Yes
Sample	Major party incumbents	Major party incumbents	Major party incumbents	Major party incumbents running for re-election	Major party incumbents running for re-election

Standard errors are in parentheses

$^{+}p<0.10$, $*p<0.05$, $**p<0.01$, $***p<0.001$

extreme than their constituents, if party is a proxy for the personal ideology of members of Congress, and if constituent pressure is relatively strong, we might expect retiring Democrats to move to the left and retiring Republicans to move to the right. Conversely, if members are pressured by their party to take extreme positions and party pressure is relatively strong, we might expect retiring Democrats to move to the right and retiring Republicans to move to the left. Our results indicate that retiring Democrats move somewhat to the right.[8] The results are consistent with retiring Democrats moving to the right because they face less party pressure. We also examined whether southern Democrats exhibit a different pattern. When we included separate interactions for southern Democrats and non-southern Democrats, we found that the coefficient on retiring southern Democrats was positive, larger, and statistically significant, while the coefficient on non-southern Democrats was small and not statistically significant. Those results could potentially reflect the fact that southern Democrats are personally more conservative than the rest of the Democratic Party, but feel party pressure to take more liberal positions.

We next turn to investigating whether facing electoral competition leads to more responsiveness. In column 4, we interact district ideology with the winning candidate's margin of victory in the race. The results imply that in a close race in a general election with an incumbent not from the president's party, a one-standard deviation change in the position of the district leads to a 0.24 standard deviation change in the incumbent's position. Put another way, a 40% point swing in the net conservatives in a district leads the incumbent to move 10 percent of the distance between the parties.

Column 5 of Table 2 considers two measures of electoral context—whether the election is a midterm election and whether the incumbent is from the president's party. Both interaction terms are statistically significant. The result for midterm elections may be because fewer swing voters participate in midterm elections, leading to weaker incentives for candidates to cater to moderate voters. The result for the president's party may be explained by the fact that out-party candidates are more motivated to win the election and therefore are more willing to sacrifice their policy goals to appeal to voters. Finally, we note that once we include additional controls, Republican incumbents do not seem to drift to the right, while Democratic incumbents still drift to the left.

4.3 Explaining patterns of change for challengers

In Table 3, we report results for challengers. In the first column, we control for the party of the challenger and the ideology of the district. District ideology is statistically significant, but exerts a fairly small effect on the positions of challengers. Even those effects may be explained by selection. To separate out selection effects from changes in the challenger's position, we again employ candidate-specific fixed effects. We are able to do that because we observe NPAT responses over multiple elections for 107 repeat challengers. Column 2 indicates a statistically insignificant effect of district ideology. In column 3, we consider interactions of district ideologies with electoral margins, whether the election is a midterm election, and whether the challenger is from the president's party. We find weak evidence that challengers are responsive to district ideology in midterm elections. Challengers appear to be much less responsive to the voters relative to incumbents, who themselves are responsive to the voters only under a limited set of circumstances.

[8] The mean district ideology in the sample is 0.141, implying that the point estimate of the marginal effect of retiring for Democratic candidates in the mean district is $0.219 + 0.170 * 0.141 = 0.243$.

Table 3 Fixed effects models of responsiveness of House incumbents

Independent variables			
Constant	−0.208*** (0.026)		
District ideology	0.152*** (0.039)	0.193 (0.320)	−0.007 (0.810)
Democrat	−0.391*** (0.044)		
Margin			−0.353 (1.353)
District ideology * margin			−0.064 (1.074)
Midterm			−0.003 (0.077)
District ideology * midterm			0.220+ (0.131)
Pres. party			−0.035 (0.119)
District ideology * pres. party			0.192 (0.194)
N	4048	995	976
R^2	0.020	0.989	0.990
Candidate fixed effects	No	Yes	Yes

Standard errors are in parentheses

$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

4.4 The selection of incumbents

Thus far, our results have demonstrated that incumbents follow their constituents more closely when they face close races, during presidential elections, and when their party does not occupy the White House. Challengers do not seem to alter their positions in the same way—challengers do not change their positions in response to changes in the electorates' preferences, challengers do not respond to the closeness of the election, and challengers from the president's party do not respond differently. We found weak evidence that challengers follow their constituents during midterm elections. We were able to study the influence of changes in constituent preferences on changes in positioning by adopting a fixed-effects strategy, which allows us to isolate responsiveness from selection effects. We now turn to studying those selection effects. Our approach employs the fixed-effects estimates from the regression reported in column 5 of Table 2 as the dependent variable, which is a measure of the long-run positions of incumbents (i.e., ones that are free of influences from the current election).

In Table 4, we regress the long-run position of the incumbent on variables from the incumbent's first election. The results in column 1 suggest that left-wing districts tend to draw candidates who are inherently more liberal; right-wing districts tend to draw candidates that are inherently more conservative. Based on column 2, we find that over time, the Republican Party has tended to draw increasingly right-wing candidates. In column 3, selection effects help align incumbents with their districts. Furthermore, we find that

Table 4 The selection of House incumbents

Independent variables			
Constant	0.717*** (0.034)	0.507*** (0.046)	0.533*** (0.159)
District ideology	0.705*** (0.046)	0.651*** (0.046)	0.256+ (0.141)
Democrat	− 1.724*** (0.043)	− 1.561*** (0.061)	− 1.599*** (0.067)
Year * democrat		0.004 (0.004)	0.004 (0.004)
Year * republican		0.024*** (0.003)	0.025*** (0.003)
Margin			0.076 (0.294)
District ideology * margin			0.695** (0.215)
Midterm			− 0.056 (0.043)
District ideology * midterm			0.000 (0.081)
Pres. party			0.027 (0.042)
District ideology * pres. party			0.020 (0.082)
N	658	658	601
R^2	0.797	0.808	0.811

Standard errors are in parentheses

$^{+}p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

parties tend to draw candidates that are more reflective of the district's ideology during competitive elections.

4.5 Discussion

The results reported above tell us that in one case, movements by candidates and the candidate selection are forces that work in the same direction. More competitive elections lead candidates to follow their districts more closely and lead to the selection of candidates who are more in line with the district. Incumbents appear to be less responsive to their constituents during midterm elections and incumbents from the president's party appear to be less responsive to their constituents. Analogous selection effects do not appear to operate for midterm elections and for candidates from the sitting president's party.

Movement over time has followed different patterns for the Democratic and Republican parties. Democratic incumbents have grown more liberal while serving in Congress while Republican candidates have not grown more conservative while serving in Congress. By contrast, over time the Republican Party has selected candidates who are more conservative while the Democratic party has not selected candidates who are more liberal. That evidence provides a partial explanation for why we observe the Republican Party moving to the right more than the Democratic Party moves to the left

in the DW-Nominate Common Space. The DW-Nominate Common Space does a better job of capturing rising extremeness owing to replacement relative to conversion. The growing ideological extremity of Republicans has been dominated by replacement, while the greater extremity of Democrats has been dominated by conversion.

The later finding potentially explains why retiring Democrats move to the right. Because the Democratic Party has not been recruiting candidates who are more liberal over time, the left-wing movement of that party could be explained by pressure from party leaders. During their last term, retiring Democratic member of Congress would not face such pressure and might choose to move to the right. This rightward movement was found to come primarily from retiring southern Democrats. Because the Republican Party has been able to recruit general election challengers who are more conservative over time, party leaders may not have needed to apply as much party pressure to achieve their legislative goals, leading us to observe no change among retiring members.

5 Conclusion

Members of Congress face ever changing electoral environments, and so our estimates of candidate ideology must be equally dynamic. In this paper, we provided a method of estimating dynamic ideal points using the National Political Awareness Test to bridge subsequent congresses. We used those estimates to investigate a variety of electoral and political contexts that candidates for the US House may find themselves in that may affect their ideological positioning—their last term in office, running in a close race, and running during a midterm election. Our results supply little evidence that retiring incumbents are engaging in ideological shirking—we found that retiring members were no less responsive to their constituents than continuing members. Instead, we found that retiring southern Democrats moved in the conservative direction, possibly owing to less party pressure. We found that House incumbents are less responsive to their constituents during midterm elections and that House incumbents from the president's party are less responsive to their constituents in general. Finally, we found evidence in favor of the marginality hypothesis, with incumbents being more responsive to the ideologies of their districts when facing a close election.

Beyond those results, we found that, contrary to existing empirical evidence, the Democratic and Republican parties have polarized to the same extents in the US House. That result has escaped notice because different mechanisms have been responsible for the polarization. The Republican Party has been recruiting candidates that are more conservative, while Democratic incumbents have been moving to the left while serving in office. Existing estimates are better at capturing changes owing to replacement and therefore have been better able to uncover polarization among House Republicans.

Finally, the observed responsiveness of incumbent voting behavior to district preferences largely is explained by selection. In fact, as Poole (2007) argues, House incumbents exhibit little change in their voting behavior over the courses of their careers. His famous quote needs only slight modification—*most* "members of Congress die in their ideological boots". They undergo limited, but predictable changes when they retire, during a midterm election, and when control of the presidency changes party. In a very small number of close elections, House incumbents may change how they vote significantly.

Appendix

In this section, we provide additional details about the National Political Awareness Test (NPAT). We focus on the bridge observations that allow us to estimate dynamic preferences for US House candidates. We employ two types of bridge. First, bridge votes allow us to connect the NPAT responses from different years. Table 5 reports the number of bridges between each year of the NPAT and for other years. At most times, many bridge items connect a particular year to other years (with 1992 being the exception). In 1992, seven bridge votes emerge between that year's NPAT and the other NPATs. With the exception of 1992, the number of bridges has ranged from around 20 to more than 100. Moreover, even when only about 20 bridge votes could be identified, the policy issues were quite varied. For example, in 2016, the bridge votes included items on abortion, taxes, campaign contributions, the death penalty, federal government involvement in education, global warming, the Keystone XL pipeline, healthcare, immigration, foreign involvement by the US military, social security, gay marriage, and terrorism.

The second type of bridging is between the NPAT and roll call voting in the US House. The bridge voters we use are for individual members who voted in a particular session of the US House and responded to the NPAT (or had their responses coded by Project Vote Smart) in the election following that session. The number of bridge voters is reported in Table 6. In 1992, 30 bridge voters were identified. Since then, the number of bridge voters always has exceeded 50 and, in most cases, has exceeded 100. Starting with the 2010 election, Project Vote Smart (PVS) began coding the positions of non-respondents. That information is, however, not archived. We have a large number of bridge voters in 2016 because we collected the data from the PVS website after the 2016 election and PVS coded responses for essentially all House candidates. Between 2010 and 2014, we have fewer responses because, although PVS coded the responses for essentially all candidates, for candidates who ran in later years, the NPAT coding would have be overwritten and lost (contrarily, candidate responses to the NPAT survey are available for prior years).

In the paper, we report results based on a one-dimensional model. In Table 7, we report the fit of one- to three-dimensional models applied to the entire data matrix and for the NPAT alone. We consider two measures of fit—the percentage of items correctly predicted and the geometric mean probability. Using a one-dimensional model, we can correctly

Table 5 Bridges between biannual NPATs

Year	Num. bridges
1992	7
1994	21
1996	114
1998	130
2000	121
2002	108
2004	119
2006	113
2008	50
2010	28
2012	19
2014	19
2016	18

Table 6 Bridges between the NPAT and the House of representatives

Year	Num. bridges
1992	30
1994	163
1996	184
1998	181
2000	152
2002	129
2004	133
2006	97
2008	81
2010	117
2012	88
2014	55
2016	376

Table 7 Dimensionality of candidate preferences

D	NPATs and roll calls		NPATs only	
	Per. corr.	GMP	Per. corr.	GMP
1	0.894	0.847	0.800	0.725
2	0.906	0.863	0.825	0.756
3	0.910	0.870	0.833	0.767

predict 89.4% of responses in the data matrix. Adding a second and third dimension helps only marginally—adding a second dimension allows us to correctly predict an additional 1.2% of items. The percentage correctly predicted is somewhat lower for NPAT items alone—we can predict 80.0% of the items correctly. For the NPAT alone, a larger share of the item responses are from challengers and third-party candidates; the responses of challengers and third-party candidates are somewhat less predictable. In addition, the improvement in fit from a two-dimensional model was somewhat larger for Libertarian candidates.

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