Online Supplemental Information

A: Distribution of Position-Taking Across Bill Types

Table 1: Bills by Major Topic Code (percentages)

	All Bills	w/Roll calls	w/ IG pos	Used
Agriculture	1.95	1.91	3.26	3.96
Civil Rights	2.34	2.76	4.56	4.85
Defense	8.26	9.24	6.53	4.50
Domestic Commerce	8.39	14.44	12.94	16.98
Education	6.06	4.25	7.02	3.31
Energy	5.76	6.69	6.64	6.80
Environment	4.83	6.05	6.24	6.80
Foreign Trade	11.96	2.55	2.03	3.02
Government Operations	10.52	12.53	9.44	10.65
Housing	2.17	2.97	2.05	2.13
Immigration	0.72	0.85	1.09	1.66
International Affairs	3.22	3.18	3.06	2.19
Labor	5.05	4.03	6.20	6.86
Law and Crime	6.26	5.20	8.25	5.92
Macroeconomics	4.82	5.73	4.79	4.91
Public Lands	9.35	7.64	5.77	5.38
Social Welfare	2.43	1.38	2.46	1.36
Technology	2.08	4.14	3.81	4.56
Transportation	3.84	4.46	3.87	4.14

While there are some differences in the distribution of bills across topic area at the different levels of selection shown in Table 1, we do observe substantial coverage of all issue areas in the bills ultimately used for estimation. The items used in our scaling include opportunities for interest groups and legislators to take positions across issue dimensions.

B: Additional Industry Distributions

Figures 1, 2, and 3 depict joint posterior distributions for the CRP categories within "Other Organizations," health sector, and labor groups, respectively. We observe healthcare products and biotechnology devices tend to have mass on the right, while health education and mental health services tend to have mass left of center. The majority of medical professional and hospital categories have moderate modes. Union categories tend have their mass largely left of center, as we would expect. However, building trade, entertainment, transportation and police/firefighter unions show more moderate and conservative organizations.

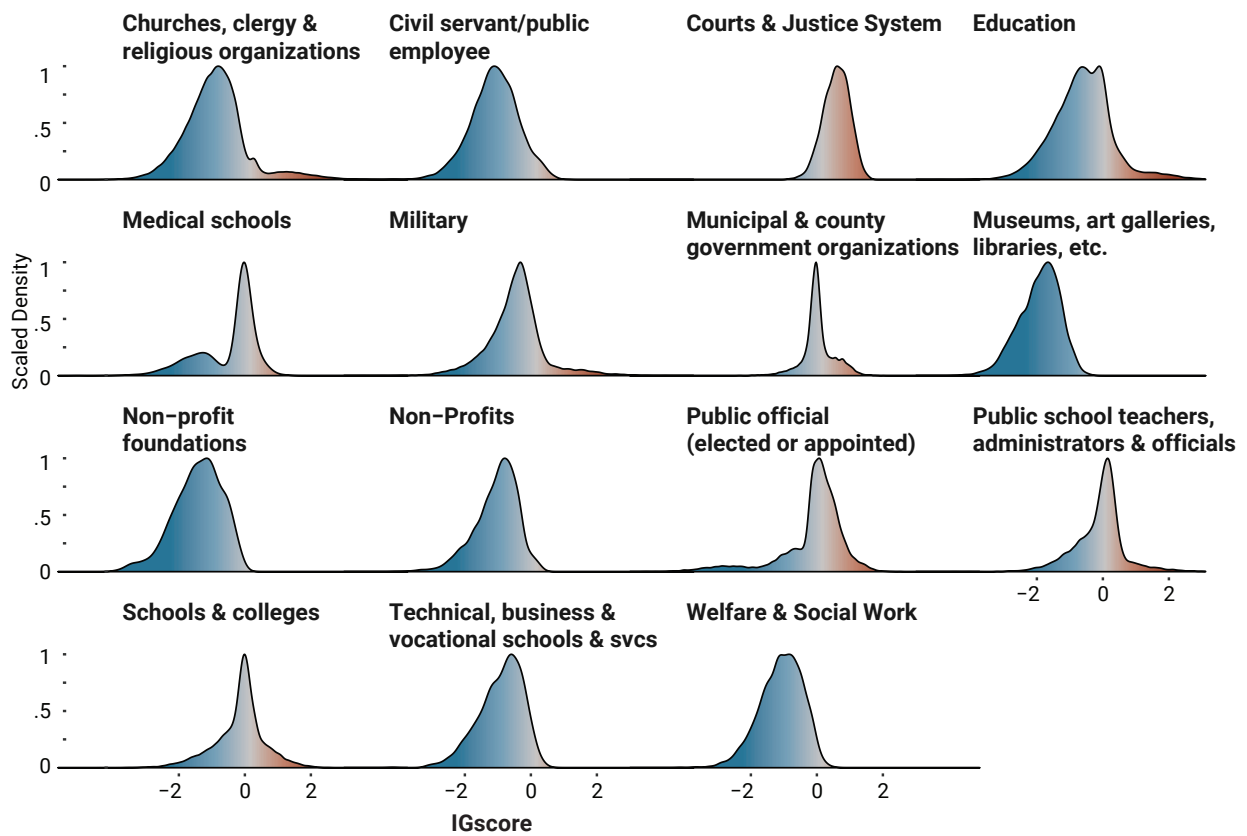Figure 1: Kernel Density plots of IGscores of Other Sector groups by CRP "catcode"

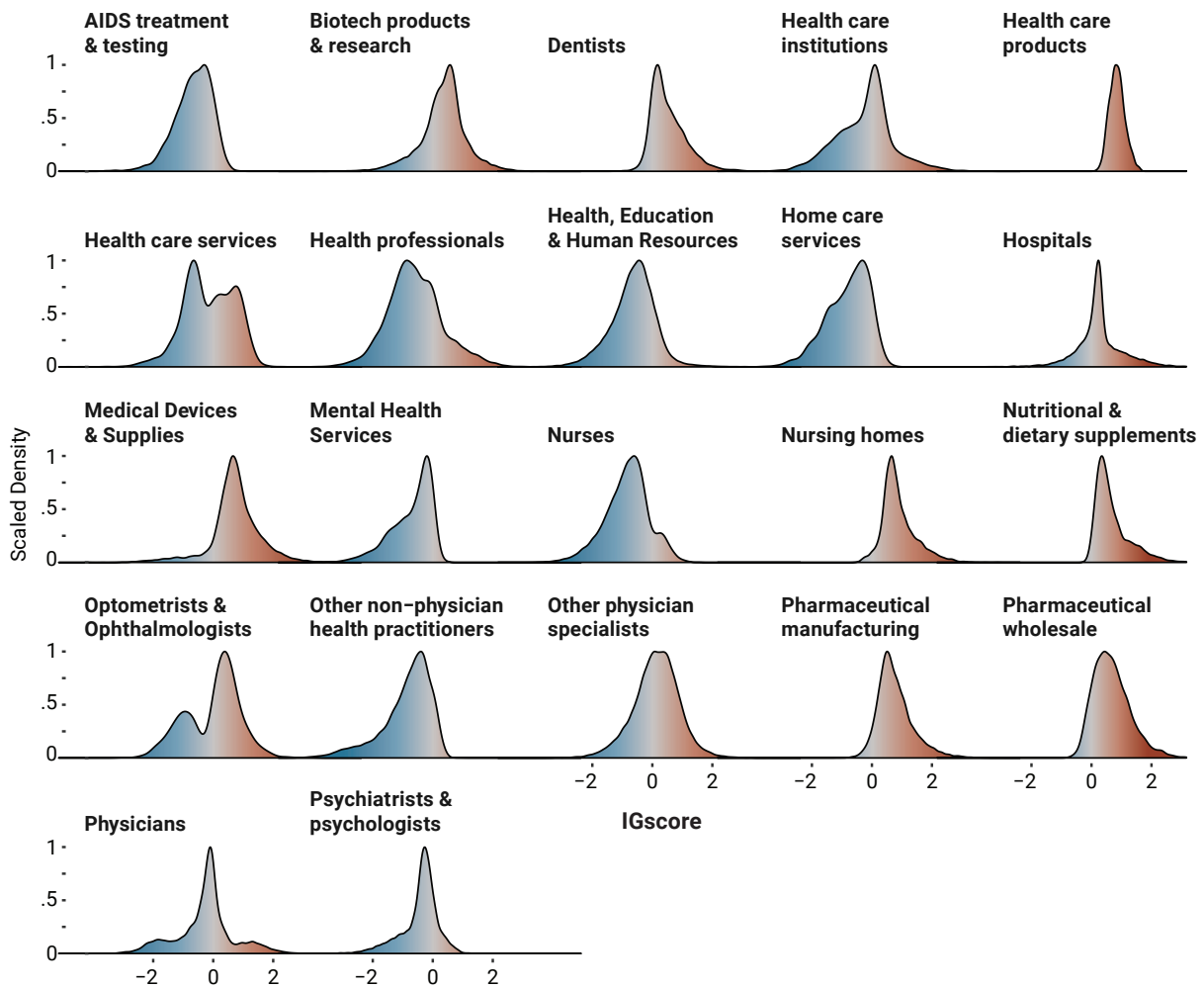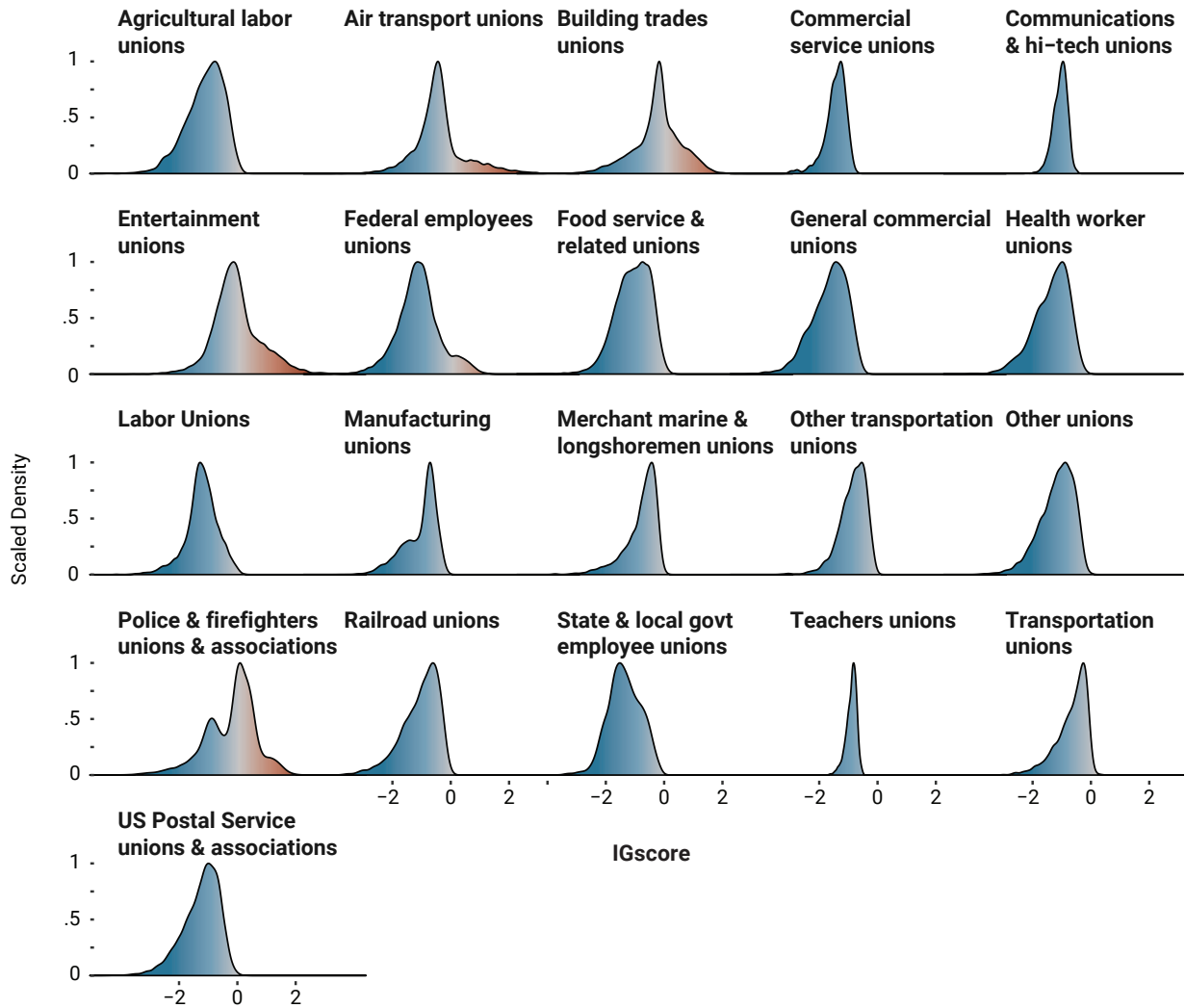Figure 2: Kernel Density plots of IGscores of Health Sector groups by CRP "catcode"

Figure 3: Kernel Density plots of IGscores of Labor Sector groups by CRP "catcode"

C: Assessing Sensitivity to Inclusion of Congressional Roll Calls

As an additional measurement validation exercise and robustness check, we re-estimated IGscores using the same procedure we describe above, but excluding all Members of Congress and their positions from the estimation matrix. We complete this exercise in order to ensure that our estimates do not rely too much upon the roll call data, in order to provide requisite overlap for reliable estimation. Below, we analyze the means of each organizations' estimated posterior distribution estimated with and without roll call data. Our findings indicate that the vast majority of IGscores for interest groups are stable, regardless of the inclusion of roll call data. Indeed, the Spearman rank correlation between scores produced using interest group positions alone and our IGscores is 0.870.

There are a relatively small number of organizations (172), for which these different procedures produces scores with mismatched signs. We present the organizations with the 20 largest changes in table 2 below. An examination of these organizations suggests that estimation which includes data from Members of Congress is more accurate. For example, Federation for American Immigration Reform has been labeled an anti-immigrant hate group by the Southern Poverty Law Center, and Progressives for Immigration Reform accused of being a green-washing front group for the Federation for Immigration Reform by the Anti-Defamation League.[1] In fact, 4 of the top twenty organizations are tied to John Tanton's nativist/immigration restrictionist network.[2] The scores using Member data also place law and order oriented organizations like police, law enforcement and district attorney organizations right of center, which we believe to be accurate.

In addition to the joint Congress-interest group IGscores appearing more accurate substantively, the problem of sign-switching is ameliorated in large part by simply accounting for the measurement error and noise associated with scoring groups that took relatively few positions. After re-estimating both the joint Congress-group IGscores and the group-only

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[1]https://www.adl.org/blog/progressives-for-immigration-reform-announces-conference-and-new-project
[2]https://www.splcenter.org/fighting-hate/extremist-files/individual/john-tanton

Table 2: Organizations with the largest differences between IGscores and IG only re-estimates

Orgname	IGscore	IG-only score	Difference
Progressives for Immigration Reform	1.75	-2.96	4.72
Federation for American Immigration Reform	1.10	-3.60	4.70
Center for Immigration Studies	1.92	-2.69	4.61
Americans for Legal Immigration	1.80	-2.58	4.39
American Israel Public Affairs Committee	1.45	-2.89	4.34
NumbersUSA	0.84	-2.93	3.77
National Association of Police Organizations	0.44	-3.18	3.63
National Narcotics Officers' Associations' Coalition	1.08	-2.54	3.62
Pet Industry Joint Advisory Council	0.52	-2.80	3.32
InterDigital	1.89	-1.13	3.02
National Association of Assistant United States Attorneys	0.32	-2.57	2.89
Cantor Fitzgerald	1.72	-0.97	2.68
Tessera	1.71	-0.97	2.68
Fallbrook Technologies	1.69	-0.97	2.66
Dolby Laboratories	1.74	-0.86	2.60
Federal Law Enforcement Officers Association	0.43	-2.17	2.60
Innovation Alliance	1.09	-1.32	2.41
Fraternal Order of Police	0.04	-2.24	2.27
National District Attorneys Association	0.59	-1.68	2.27
American Association of School Administrators	0.22	-1.95	2.16

Figure 4: Distribution IG-only (blue) v. Joint (yellow) Scores ($k = 5$)
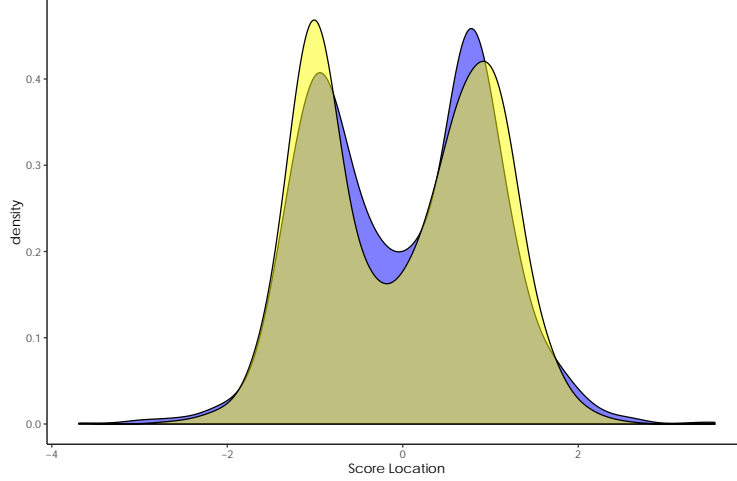
scores with a k-core of 10 (instead of our original $k = 5$), the total number of sign-switching organizations decreases substantially, from 172 out of 2,511 groups (6%) when $k = 5$ to just 24 out of 1,100 (2%) when $k = 10$, and the correlation between group-only scores and IGscores increases to $\rho = 0.913$. Thus, inasmuch as an interested analyst is concerned about congressional influence on the appearance of groups' preferences in his or her particular application, we believe the most conservative approach is to focus on groups most active in position-taking.

Of particular importance for our application, it merits mentioning that the interest-group-only scores, even at the $k = 5$ level, do not appear to differ substantially in their overall distributions from our joint IGscores, as depicted in Figure 4. Since the groups-only scores do not include member ideal points by definition, it is not possible to examine the extent to which our representational claims obtain within the groups-only set of scores. Nevertheless, these distributions provide some evidence that our joint scaling of members and groups does not substantially alter our summary of groups' revealed preferences.

D: Convergence Diagnostics

Below, we display some convergence diagnostics for our parameter estimates. We omit trace plots and tables of individual parameter statistics, due to the sheer number of estimates included in our analysis. Instead, we summarize model convergence by displaying a histogram of Gelman and Rubin's (1992) $\widehat{R}$ for our estimates. This summary statistic is a measure of the ratio of the average variance within each change to the overall variance in all chains. A ratio close to 1 indicates convergence with estimates, below 1.10 seen as generally indicative of convergence. As the the histogram demonstrates, our model appears to have converged, according to these statistics. Out of our thousands of parameters only 8 exhibit $\widehat{R}$ statistics greater than 1.1.

Figure 5: **Gelman-Rubin ($\widehat{R}$) Statistics for Parameter Estimates**
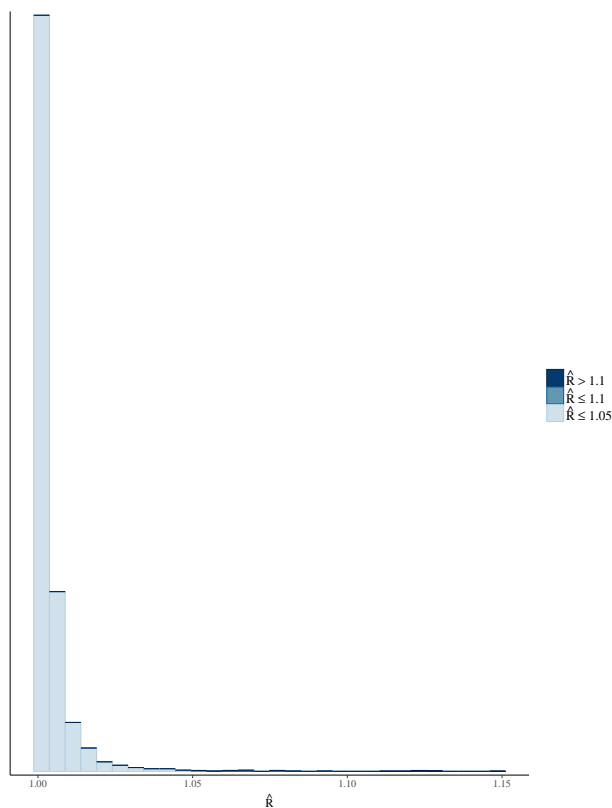
E: IGscores Comparison to NOMINATE

As discussed in the main text of the paper, IGscores exhibit a high level of correlation with the first dimension of DW-NOMINATE. This correlation is depicted in Figure 6 and demonstrates that the introduction of interest group position-taking into the estimation matrix does not unduly influence the estimation of legislator ideal points. Indeed, as Table 3 reports, we find consistently high rank-correlations between the mean of the IGscore posteriors for each organization and NOMINATE. We find this to be true across Congresses and both across and within parties.

Figure 6: IGscores of Members in the 114th plotted against 1st dimension NOMINATE
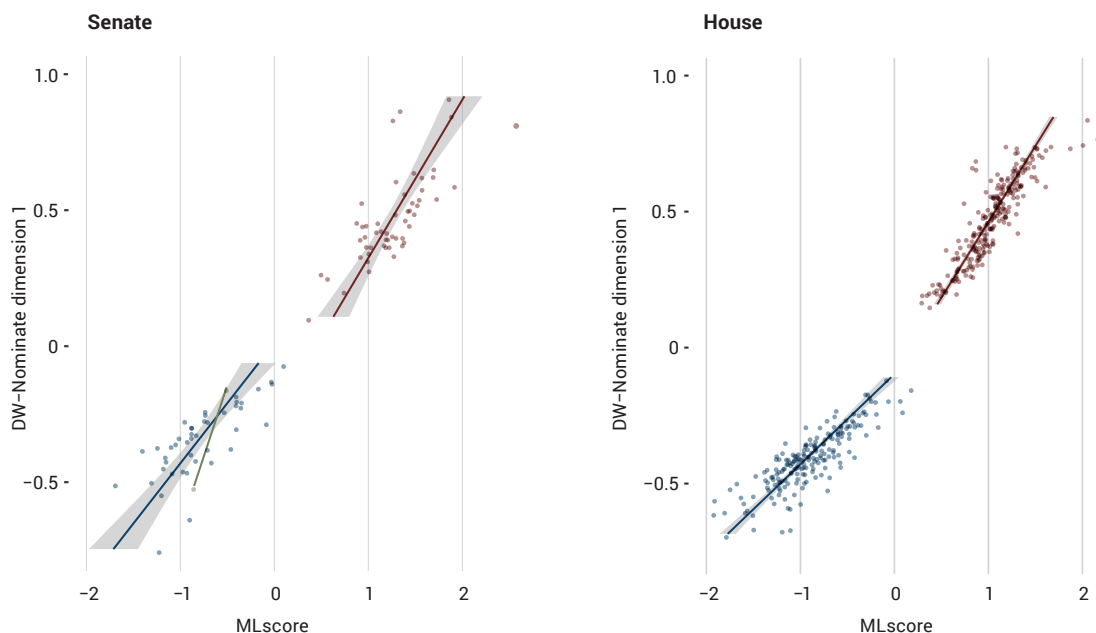
This strong correlation notwithstanding, our scores do exhibit small differences from DW-NOMINATE—a difference we believe to be a positive ramification of including interest group position-taking in our estimation matrix. That is, while our IGscores scores are highly rank-correlated with the 1st dimension of NOMINATE, IGscores also display notably more *moderation* than do DW-NOMINATE scores. Figure 8 shows a comparison between

Table 3: Spearman ρ rank correlations between IGscore and NOMINATE dimension 1

Congress	Full	Within Dems	Within Reps
114	0.95	0.82	0.82
113	0.95	0.84	0.81
112	0.96	0.82	0.83
111	0.96	0.86	0.86
110	0.96	0.84	0.87
109	0.95	0.81	0.81

IGscores and the first dimension of NOMINATE, which we have standardized so that they are comparable to IGscores. Whereas the first dimension of NOMINATE shows substantial spatial distance between the furthest right members of the Democratic caucus and the furthest left members of the Republican caucus, our scores do not show such a substantial difference in any of the Congresses analyzed. In the 109th - 111th Congresses, we recover estimates for the rightmost Democratic Member of Congress that are further to the right than the leftmost Republican Member of Congress. This finding is summarized in Table 4. In Table 4, we present the difference in scores between the rightmost Democrat and the leftmost Republican for each Congress in our dataset, with both IGscores and the first dimension of NOMINATE which we have standardized to have a have a mean of 0 and a standard deviation of 1. Negative values indicate spatial overlap between between the most moderate members of the party caucuses.

Table 4: Distributional comparisons between IGscores and the standardized first dimension of NOMINATE by congress.

Congress	IGscore diff	NOMINATE[a] diff	KS-test (D)	KS-test (p-value)
114	0.11	0.17	0.105	0.0049
113	0.12	0.17	0.110	0.0023
112	0.03	0.12	0.120	0.0007
111	-0.24	-0.02	0.146	0.0000
110	-0.12	0.08	0.121	0.0006
109	-0.59	0.03	0.123	0.0006

[a]Standardized ($\mu = 0$, $\sigma = 1$) dimension 1 of NOMINATE.

We also report results for two-sample Kolmogorov-Smirnov tests to whether both scores

appear to be drawn from the same continuous distribution. The K-S tests show statistically significant differences between IGscore and standardized NOMINATE distributions for all Congresses. The comparisons between of empirical CDFs of NOMINATE and IGscores clearly indicate that more moderation and less sharply defined peaks in the bimodal distributions of IGscores than NOMINATE scores.

Figure 7: Comparison of the Empirical CDFs of IGscores and NOMINATE for Members of Congress for the 109th-114th Congresses
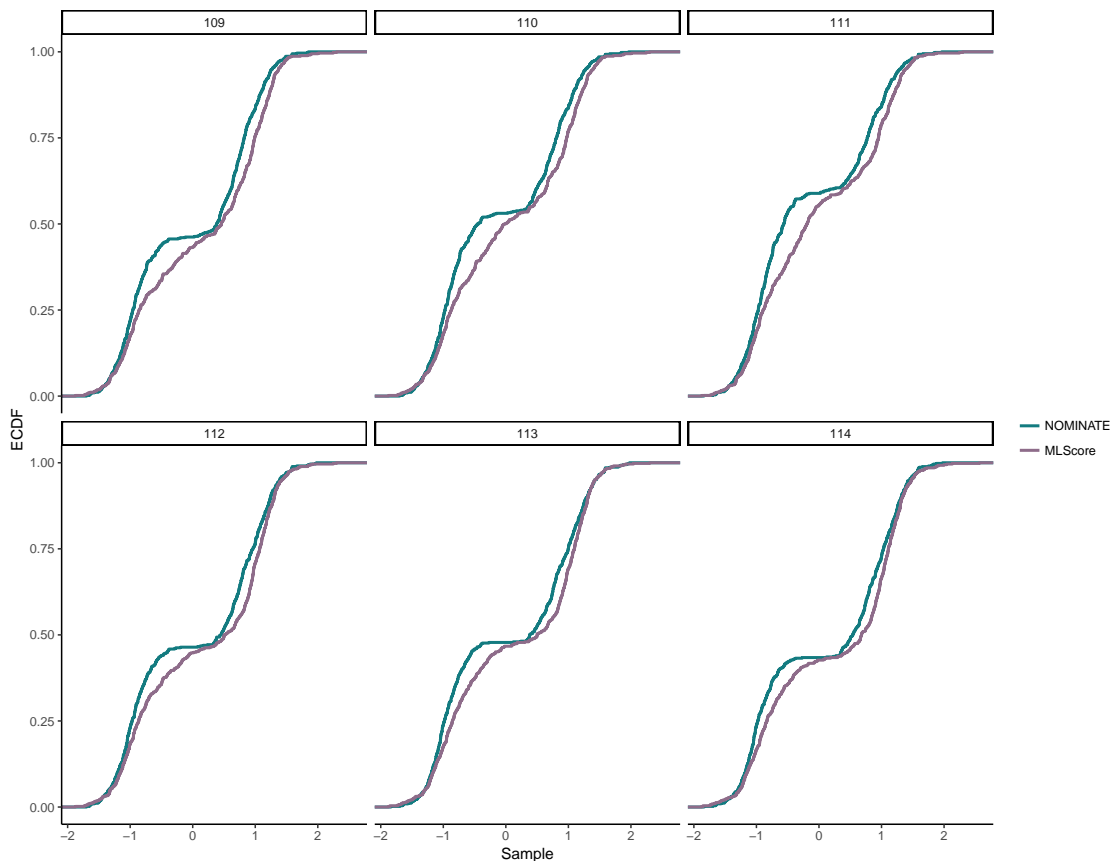
Scholars have extensively documented elite polarization among Members of Congress using roll-call based measures of ideology or inter-party conflict [e.g McCarty et al., 2016, Barber and McCarty, 2015, Fleisher and Bond, 2004, ,]. However, because the proliferation of messaging bills and symbolic roll call votes in recent years, these measures may overstate the extent to members disagree on substantive policy issues. Our IGscores address one aspect of these artifacts of partisan agenda control by excluding a large set of inconsequential bills in

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Figure 8: Distributions of IGscores and standardized NOMINATE dimension 1 of Members
of Congress for the 109th-114th Congresses
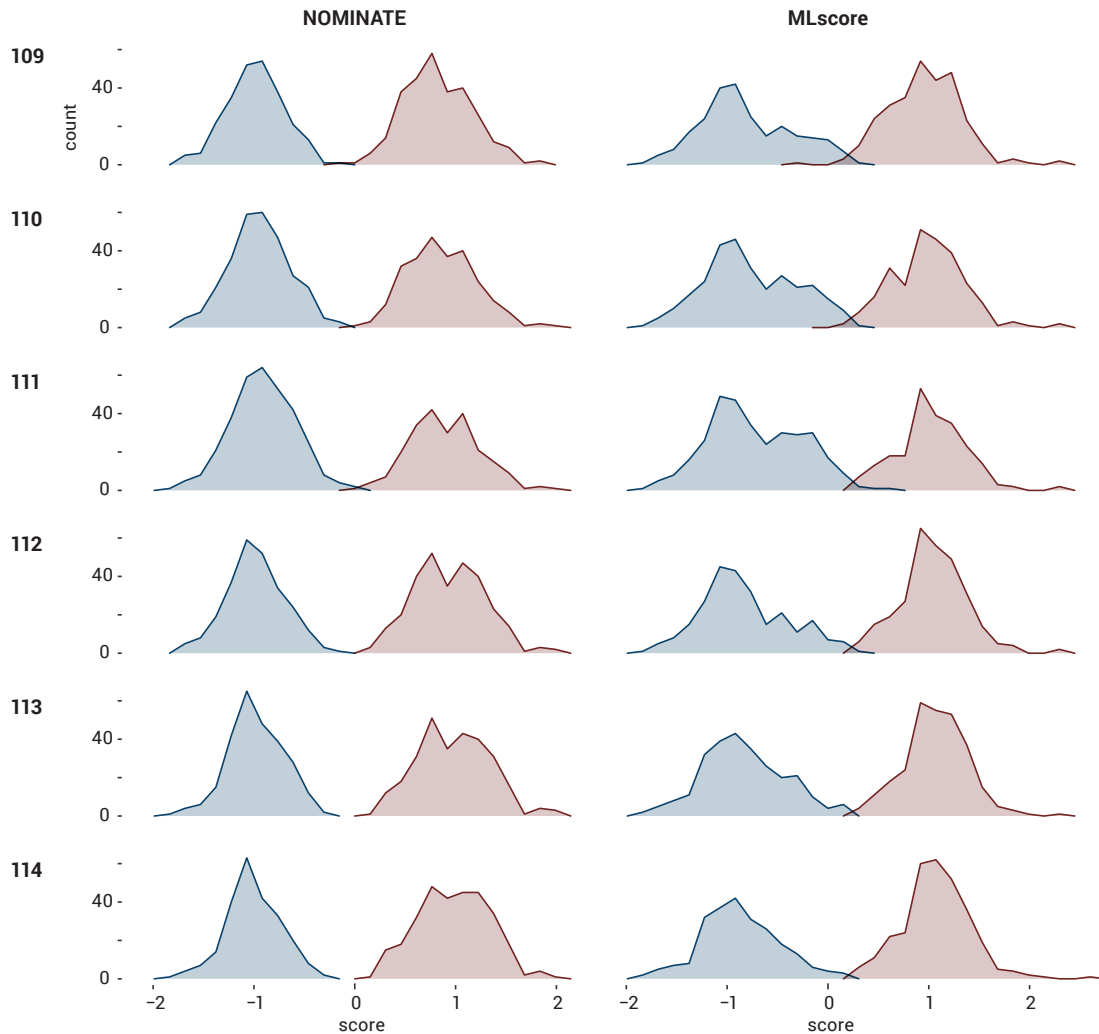
our estimation procedure while including many bills where some actors (i.e., interest groups) took positions but that were ultimately kept off the floor agenda.

Indeed, because of the filtration procedure we apply to the position matrix, only bills with substantial interest group activity are included in our estimation. Assuming interest groups tend to take positions on substantive rather than merely symbolic bills, interest groups serve as a sort of bottom-up expert coding of which bills have substantive policy implications. When the estimation of ideal points is limited to these bills, we find notably

greater moderation than previous scores that used all roll calls.

F: Additional comparisons to CFscores

In order to compare our estimates with the CFscores from [Bonica, 2013] we use the mean of each organization's posterior IGscore distribution as a single score. We then standardize both CFscores and these IGscore posterior means.

Unlike in the main text, we compare here the full distributions of CFscores and IGscores. We plot the distribution of CFscores of 3,416 PACs from the replication data from Bonica [2013] and the IGscores of the 2,646 organizations in our dataset.[3] Figure 9 shows the full distributions of the interest group community as measured by CFscores and IGscores. As represented by IGscores, the interest group community is both more ideologically heterogeneous and more ideologically extreme than it appears when represented by CFscores. Indeed the IGscore distribution is notably bimodal, with a left-of-center mode at ~ -1.094 and a right-of-center mode at ~0.978.[4] The CFscore distribution, on the other hand, has one large center-right mode at ~0.206, and a much much smaller one at ~ -1.548. IGscores provide a picture of a bimodal, polarized interest group community while CFscores seem to suggest a moderate center-right set of interest groups.[5] The relative moderation of CFscores perhaps reflects the tendency of PACs to contribute to incumbents regardless of ideological alignment [Tripathi et al., 2002].

As a final comparison, in addition to the BEST analysis found in Figure 10, Figure 11 shows the individual comparisons between IGscore and CFscore for matched groups. As we have noted, for organizations for which we have both measures, CFscores tend to be more moderate on average, while organizations' IGscores, on the other hand, are both more conservative and more heterogeneous. We argue this better reflects the partisan allegiances

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[3]In all previous density plots of IGscores in the paper we showed the expected density of IGscores by plotting the full posterior distributions of all scores. In this case, to facilitate comparison between the distribution of CFscores, which are point estimates, and our IGscores we have represented each organization's IGscore as the mean of the posterior distribution for θ_i.

[4]Note that this graph represents the distribution of IGscore estimates.

[5]In 1000 bootstrap resamplings the IGscore distribution had a higher *Bimodality Coeffiecient* [Pfister et al., 2013] than the CF distribution in all but 12.

Figure 9: Comparison of distribution of giving interest and position-taking interests
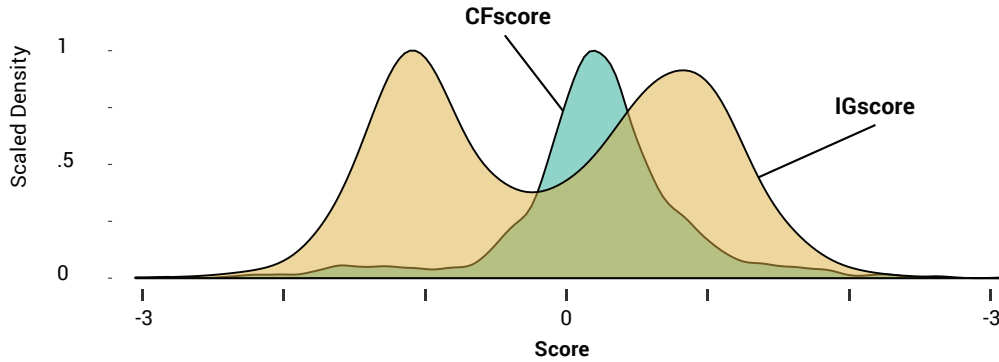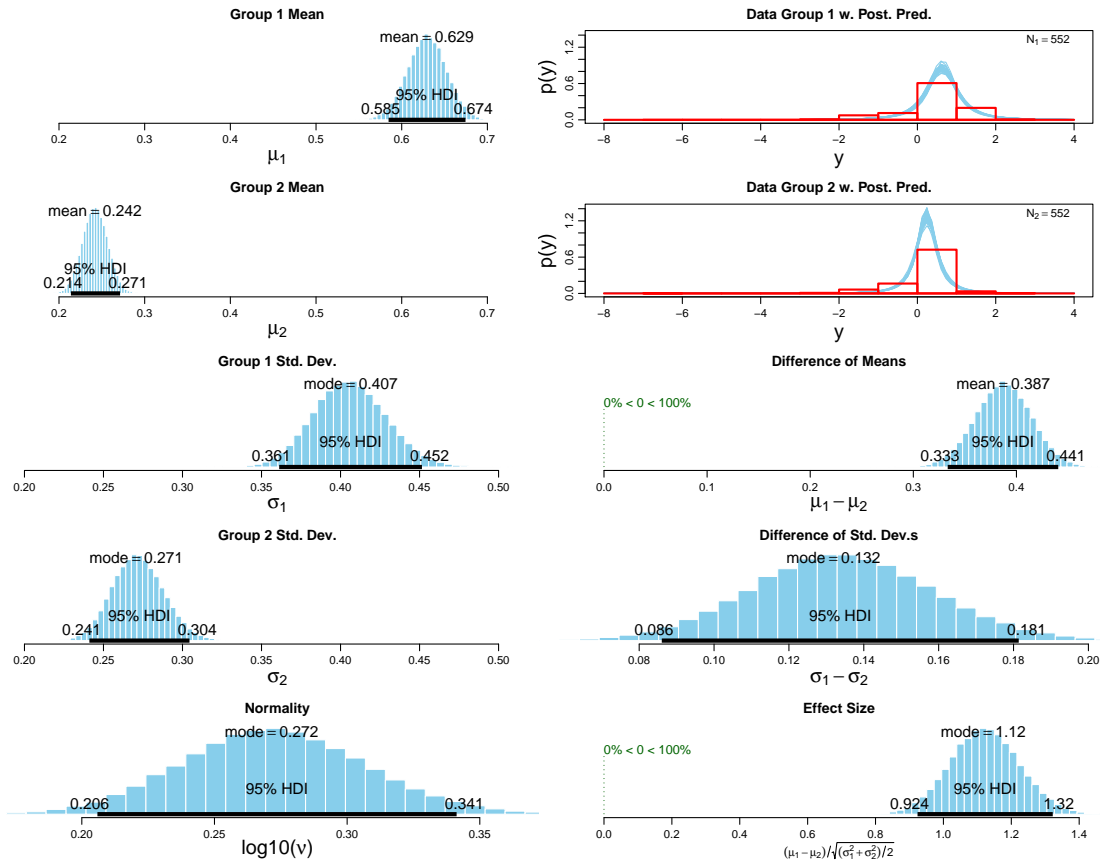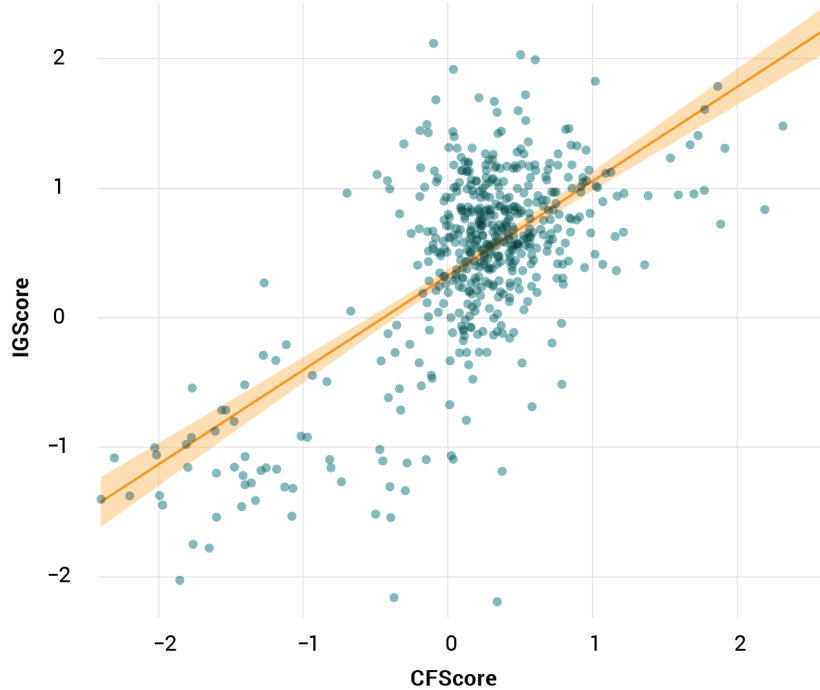

Figure 10: Full results for BEST test of CFscore and IGscore distributions

of many groups in contemporary congressional politics. Thus, while IGscores and CFscores are comparable, they reflect differing trends in interest group behavior as they are based

Figure 11: IGscore vs CFscore for matched organizations

on different types of activity. The utility of each will depend on the specific hypotheses of interest to the researcher, and the set of interest groups being analyzed. When analyzing the proximity of a group's revealed preferences to either other groups or members of Congress, however, we argue that our scores provide a variety of advantages over existing measures.

G: Correct Classification Figures for IGscores

In spite of the fact that groups vary considerably in terms of the number of bills on which they take positions, our IGscores exhibit considerable accuracy in their ability to predict groups' (and legislators') actual position-taking behavior. Using legislators' and groups' ideal point estimates and bill-specific yea/nay cutpoint estimates generated simultaneously during the estimation process, one can assess whether our model correctly projects a yea/nay vote for each specific bill in the data set. We find that, across legislators and groups of different ideological persuasions and organizational types, our scores exhibit consistently high correct vote classification rates.

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Figure 12

Average Percent Correctly Predicted, by Legislator/Group IGscore
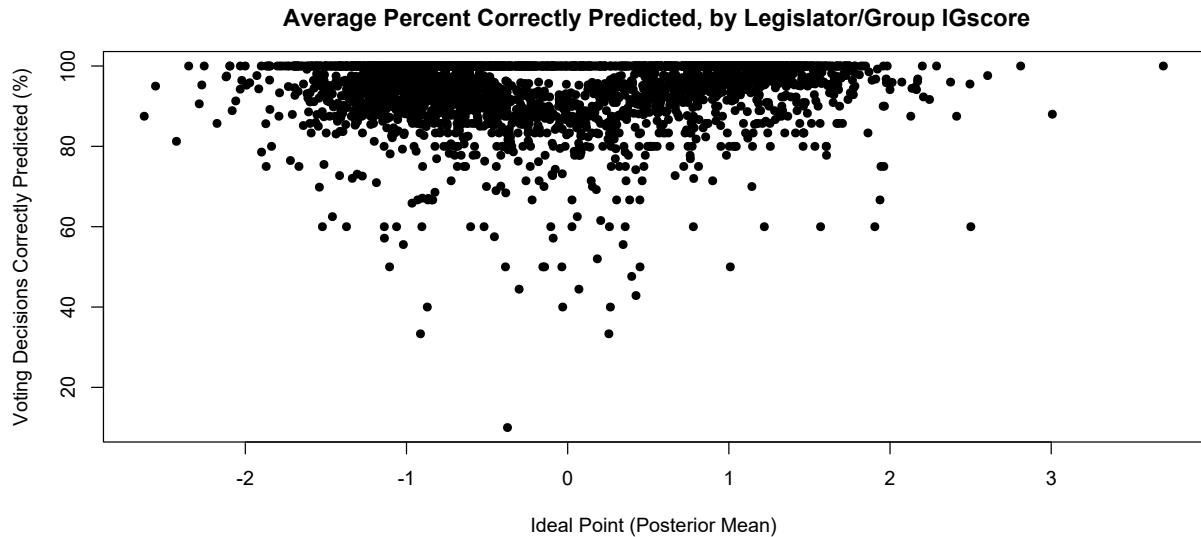

Figure 12 provides a summary of these correct classification rates, displayed by legislator ideal point. As the figure displays, most classification rates cluster between 85 and 100 percent, with a grand mean of approximately 95 percent accuracy. As with many other ideal point estimates [e.g., Bonica, 2013], correct classification rates are slightly lower for actors with moderate IGscores (particularly legislators), but even these rates remain quite high.

Figure 13 displays a comparison plot for correct classification rates between legislators and interest group IGscores. Both sets of actors exhibit high correct classification rates, with legislators exhibiting an average correct classification rate of 92.97 and interest groups an average rate of 95.83 percent. The difference between the two means is significant at the $p < .05$ level, though it is interesting to note that *interest groups* present the stronger correct classification rates—not legislators. This suggests that the single preference dimension recovered in the estimation process classifies interest group preferences especially efficiently, even though the appellation "special interest" implies that a single preference dimension may not accurately capture groups' preferences. This is not to say that all groups experience this high level of correct classification; indeed, interest groups exhibit a much larger variance in correct classification rates than do legislators. However, this is most likely a function of

Figure 13: Average Correct Classification Rates, between Legislators and Interest Groups
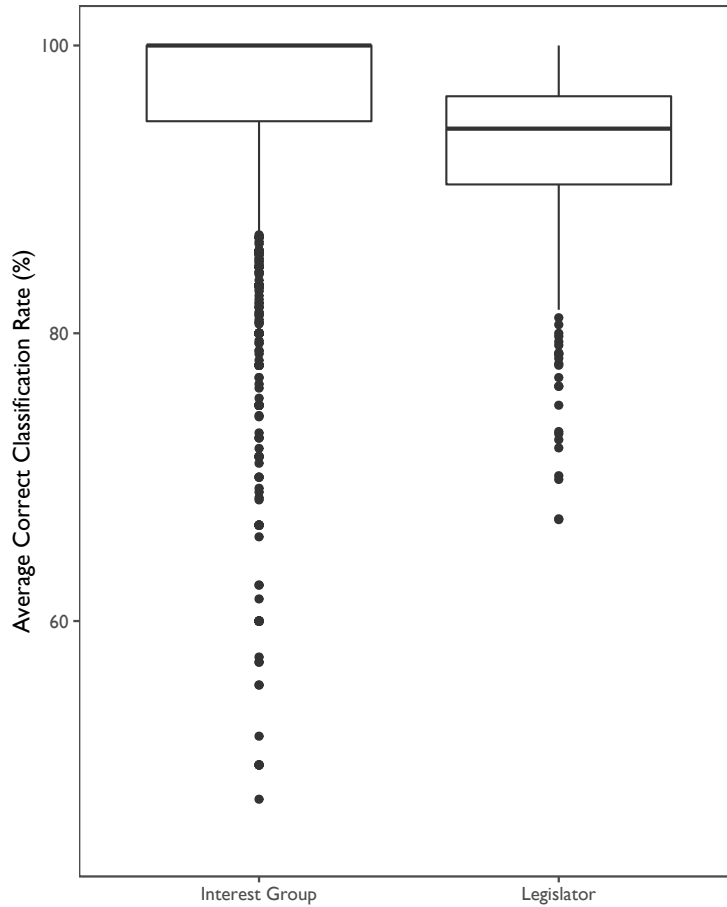
groups' great variance in the total number of positions taken in our data (relative to the large number of roll calls taken by legislators), rendering some estimates more precise than others.

Of course, despite the strong correct classification rates for interest groups' IGscores, it is possible that specific types of interest groups do not receive such efficient IGscores. Nevertheless, among the SVB group categories applied to our data, we find few differences in the correct classification rates across categories. Table 5 presents the average correct classification rate of IGscores within each interest category. In each case, classifications are accurate at rates higher than 90 percent (unions exhibit the lowest rates, at 90.9 percent), with some categories achieving an average correct classification rate as high as 97.6 percent (identity

Table 5: Correct Classification Rates by Group Type

Category	Average Percent Correct
Corporations	96.215
Occupational Associations	95.211
Trade and Other Business Associations	95.483
Foreign	100.00
Education	94.174
Health	96.756 [a]
Identity Groups	97.588
Public Interest	94.846
Social Welfare or Poor	96.030
State and Local Governments	91.398
Unions	90.902
Other	95.139

[a]*Average percentage of votes correctly predicted by IGscores, by interest group type. These categories are drawn directly from SVB's categorization schema.*

groups). Moreover, in spite of the fact that some studies have pointed to the pragmatism (and consequent preference dissembling) of business interests [Broockman, Forthcoming], our IGscores classify corporations and trade associations at slightly *more* accurate rate than other types of groups (and legislators).

Taken together, these results add to our confidence in the reliability of our preference estimates for legislators and interest groups. Moreover, the results underscore the ability of the single dimension underlying our estimates to accurately classify and predict actual position-taking.

H: Justifications of *a priori* expectations for interest group pairs

Below we detail the reasoning behind our selection of left/right pairs of interest groups across seven distinct issue areas. We selected pairs of organizations for which we had strong prior reasons to expect distinguishable revealed preference scores. We detail our expectations for these pairs below.

"Women's Issues" Organizations. The Feminist Majority Foundation (FMF), describes

its mission as "... to advance women's equality, non-violence, economic development, and, most importantly, empowerment of women and girls in all sectors of society," and outlines its broad-based progressive principles, including issues beyond a narrow gender equality focus like criminal and environmental justice[6]. The Independent Women's Forum (IWF), on the other hand, purports to "improve the lives of Americans by increasing the number of women who value free markets and personal liberty." We expect the FMF to be significantly to the left of the IWF.

Pro-Israel/Jewish Identity Organizations The American Jewish Committee is the oldest Jewish advocacy organization in the United States and purports to focus on global issues. The AJC also works against antisemitism, and for numerous civil rights causes. We expect this "dean of Jewish organizations" to be relatively moderate.[7] Focused primarily on strengthening and defending the defense relationship between the U.S. and Israel, the American Israel Public Affairs Committee (AIPAC) has in recent years increasingly aligned with the Republican Party. [8][9] We expect AIPAC to be to the right of the AJC.

Medical Associations. The American College of Physicians (ACP) is the specialist organization of internal medicine physicians, with a focus on patient care (as internists tend to be primary care physicians). We expect the ACP to be relatively moderate. On the other hand, the Association of American Physicians and Surgeons (AAPS) is a conservative organization formed, according to its director, "to fight socialized medicine and to fight the government takeover of medicine."[10] We expect the ACP to be to the left of the AAPS.

Lawyers Associations. Here, we focus on three different organizations. The American Association for Justice (AAJ) (formerly the Association of Trial Lawyers of America) was originally founded by a group of attorneys involved in workers compensation litigation in the 1940s. In recent years, the organization has been vocally critical of the influence of

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[6]http://www.feminist.org/welcome/mandp.asp
[7]https://www.nytimes.com/1990/02/13/us/jewish-group-faces-reorganization.html
[8]https://www.newyorker.com/magazine/2014/09/01/friends-israel
[9]https://www.washingtonpost.com/lifestyle/style/jeremy-ben-ami-winning-a-place-at-the-table-for-j-st
2015/03/26/1acb118e-d33e-11e4-8fce-3941fc548f1c_story.html?utm_term=.4fae93021985
[10]http://www.nytimes.com/2011/01/19/business/19physicians.html

"big corporations" and has sparred with the U.S. Chamber of Commerce.[11] Conversely, the American Center for Law and Justice (ACLJ) was founded by Jay Sekulow, a commentator for the Christian Broadcasting Network and Fox News and current member of President Trump's legal team. We expect the AAJ to be left of center and the ACLJ to be right of center. We also include the American Bar Association, the largest single lawyers organization, which we expect to be more moderate than either of these organizations.

Labor Unions. The International Brotherhood of Teamsters endorsed Ronald Reagan in 1980 and 1984, and was the only major labor union to do so.[12] The teamsters have similarly been comparatively ready to praise or meet with President Donald Trump,[13][14] and reportedly flirted with endorsing him for the 2016 election before endorsing Hillary Clinton.[15] On the other hand, American Federation of State, County and Municipal Employees (AFSCME) endorsed Clinton early[16] and publishes jointly with the Democratic-aligned Center for American Progress.[17] Thus, although both organizations are unions, we expect AFSCME to be to the more liberal than the teamsters union.

Gun Rights. While we expect the National Rifle Association (NRA) to be quite far to the right, we expect the Gun Owners of America (GOA) to be even more conservative. The GOA bills itself as the "'no compromise' gun lobby."[18] The GOA occasionally rates members of Congress more stringently than the NRA and was publicly critical of John McCain during his presidential campaigns.[19]

Environmental Conservation. Ducks Unlimited is a waterfowl and wetlands conservation organization focused on the preservation of habitats that are valuable to sportsmen, working through public/private partnerships with "private individuals, landowners, agencies, scien-

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[11] https://wvrecord.com/stories/510590671-atla-drops-trial-lawyer-adds-justice-to-name
[12] http://www.nytimes.com/1988/08/15/us/teamsters-chief-swiftly-asserts-control.html
[13] https://teamster.org/news/2017/01/hoffa-withdrawal-tpp-right-choice-us-trade-policy
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[16] https://www.afscme.org/news/press-room/press-releases/2015/afscme-endorses-hillary-clinton
[17] https://www.afscme.org/news/publications/gay-and-transgender-discrimination-in-the-public-sector
[18] https://www.gunowners.org/protect.htm
[19] https://www.gunowners.org/mccaintb.htm

tific communities and other entities."[20] On the other hand, Greenpeace stresses the use of "non-violent confrontation" and tends to work outside of existing political institutions[21]. We expect both Ducks Unlimited and Greenpeace to register as liberal under our measure, but for Ducks Unlimited to be considerably more centrist than Greenpeace.

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[20]http://www.ducks.org/About-DU
[21]http://www.greenpeace.org/usa/about/

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