Online Appendix for "Towards a General Methodology of Bridging Ideological Spaces"

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Apply Bridging Method to UTAS 2009 dataset

In this section we analyze the UTokyo-Asahi Survey (UTAS), fielded in Japan during the House of Representatives election in 2009.[1] At each election, UTAS contains two sets of surveys—voters and candidates—that share an identical set of policy questions. All policy questions are answered on an ordinal scale and are thus compatible with OOC. The voter survey randomly samples 3000 respondents from Japan's list of registered voters' and responses are filled out using a mail-in questionnaire. The response rate is 69.5% (N=2085) in 2009. The candidate survey is sent to all congressional candidates in a given election. The response rate is 94.8% (N=1303) in 2009.[2]

Figure 1 maps bridged ideal points for members/supporters of two major parties in 2012

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[1]UTAS is conducted by Masaki Taniguchi of the Graduate Schools for Law and Politics, the University of Tokyo and the Asahi Shimbun. The original dataset is available from the survey's website (http://www.masaki.j.u-tokyo.ac.jp/utas/utasindex.html).

[2]Ideal points are not calculated for voters and candidates with insufficient number of responses. The final result for UTAS 2009 includes 1298 candidates and 1976 voters.

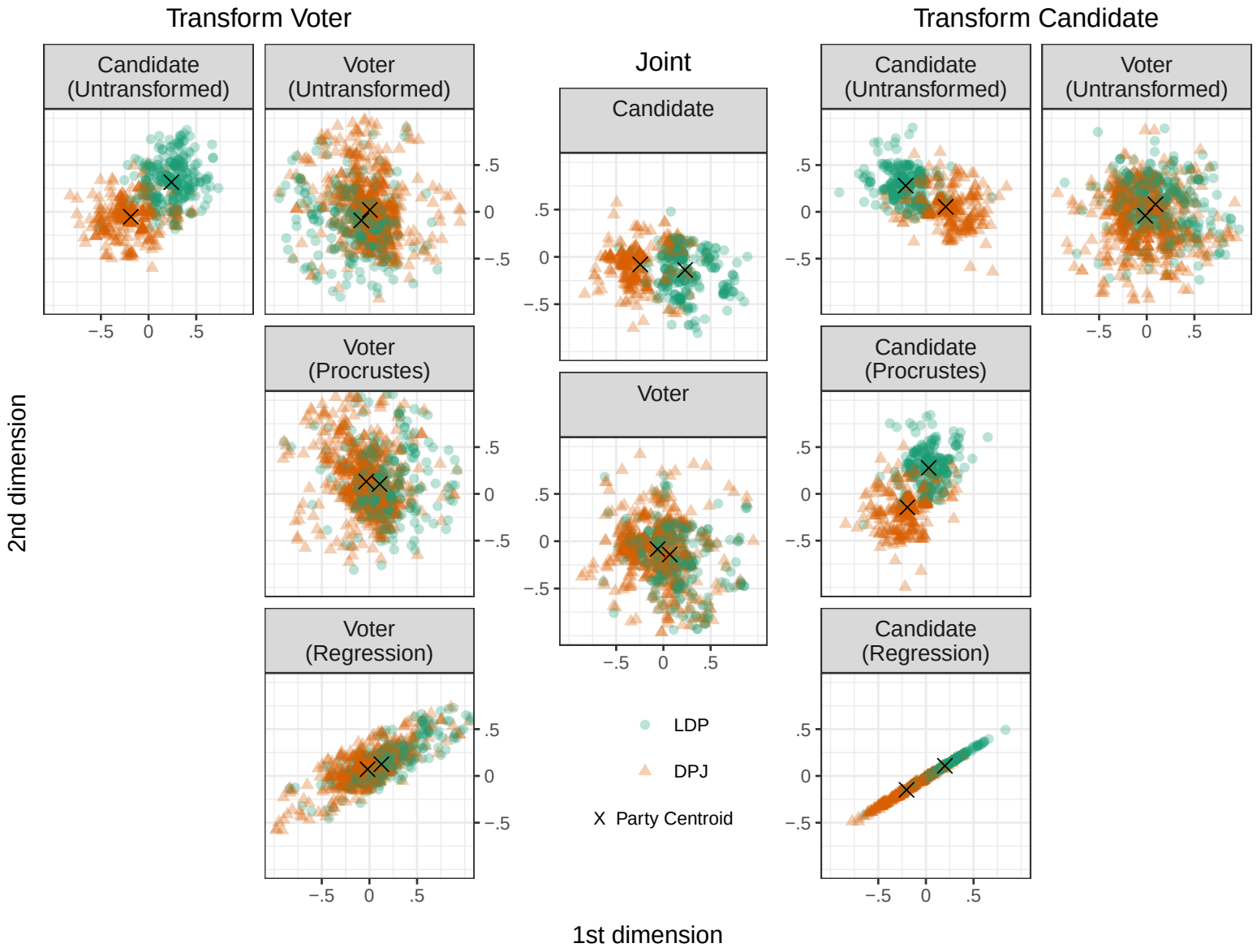

Figure 1: Comparing Bridging Results for Japanese Candidates and Voters (UTAS 2009)

Table 1: Distances between LDP and DPJ Centroids by Candidates and Voters (UTAS 2009)

Group	Type	Transformation	Distance
`Candidate`	Joint		0.478
	Transform `Voter`	Untransformed	0.563
	Transform `Candidate`	Untransformed	0.477
		Procrustes	0.477
		Regression	0.478
`Voter`	Joint		0.142
	Transform `Voter`	Untransformed	0.143
		Procrustes	0.143
		Regression	0.155
	Transform `Candidate`	Untransformed	0.163

election – Liberal Democratic Party (LDP) and Democratic Party in Japan (DPJ).[3] Similar to the figure in the main text (UTAS 2012), it demonstrates that the derived ideal points are highly data-driven, i.e., ideological space differ significantly when separately- and jointly-scaled. Furthermore, the issue with regression transformation persists—the transformed configuration is highly compressed and uninformative. As shown in bottom panels of the figure, regression transformation tends to project ideal points as a line rather than space.

In terms of differentiating between parties, Figure 1 and Table 1 calculate and map party centroids. The result suggests that Procrustes-transformation bridging does a comparable job at differentiating party centroids with other methodologies.

Combined Figure 1 and Table 1 further illustrate the usefulness of our methodology. Compared with the 2005–2006 Senate Representation Survey, the UTAS 2009 results again demonstrates that two or more dimensions may be needed to understand latent dimensional spaces. Whereas in the American situation the first dimension cleanly splits partisans, ideological division in Japanese parties tend to require two dimensions, as illustrated by LDP positioning in top-right and DPJ in bottom-left. Single dimension is not sufficiently informative in the Japanese case.

[3]Ideal points for other party members/supporters and independents are suppressed from the figure to avoid confusion.

Validating of the Use of Synthetic Anchors (American Senators and Voters)

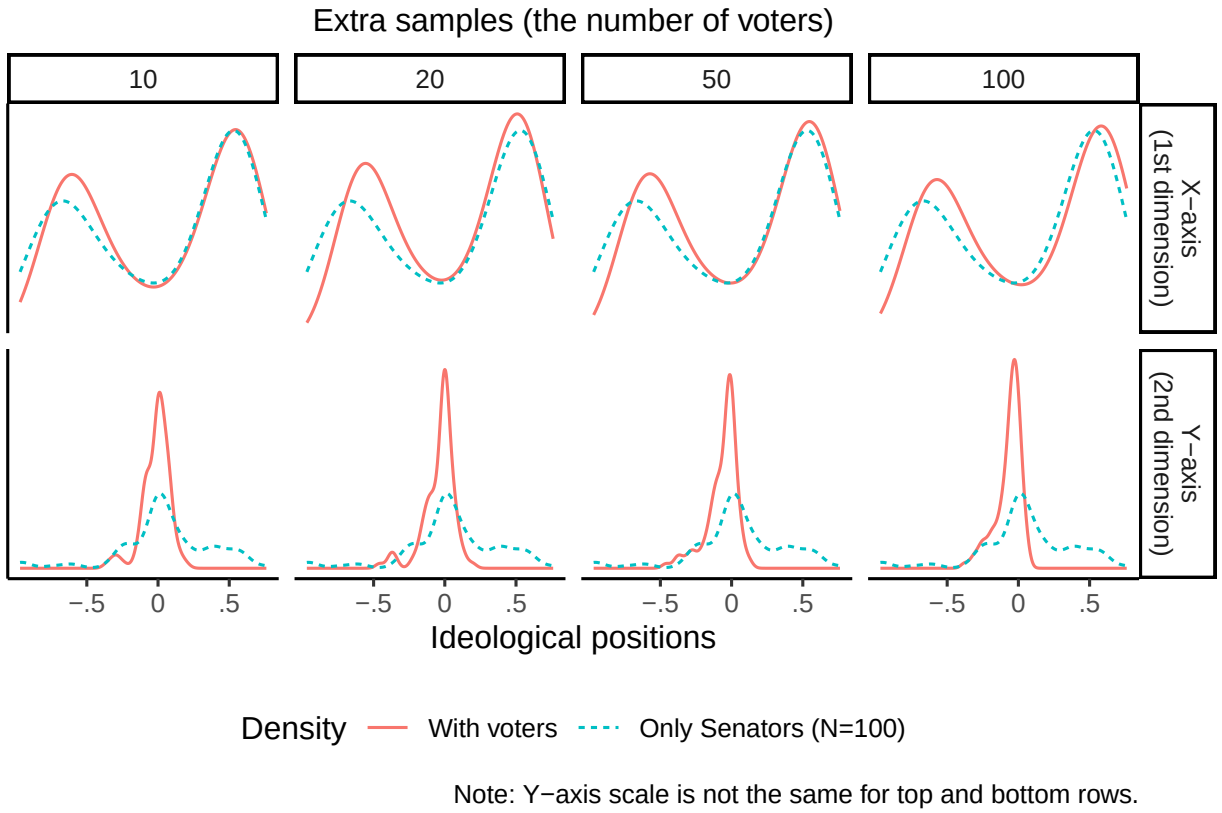

Figure 2: Density Plots of Senator's Positions with Different Amount of Extra Voter Samples

In this section, we test the assumption required for the use of synthetic anchors in Senator Representation Survey dataset. Specifically, we estimate Senators' two-dimensional ideal points (N=100) through OC by including zero, ten, twenty, fifty, and one-hundred randomly sampled voters. We repeat this procedure four-hundred times[4] and assess if distributions of Senator's ideologies changes by the inclusion of extra voter samples.

Results are presented in Figure 2. In each panel, a solid line shows the density distribution of Senators' ideal points estimated with the inclusion of extra voter samples, averaged across four-hundred experiments. A dashed line indicate the density distribution of Senators' ideal

[4]Given that there is no random sampling involved, Senators' ideal points without voter samples are only estimated once.

points without any voter samples. Given that we estimated two-dimensional ideological space, the top row shows distributions for first dimension (i.e., x-axis), the bottom row for second dimension (i.e., y-axis). Columns indicate the number of extra voter samples included in estimation.

In contrast to the experiment using UTAS 2012, for the first dimension, larger voter samples do not necessarily correlate with the distortion of Senators' ideal points. In fact, density with extra samples at the x-axis approximates the original density fairly well regardless of the size of extra voter samples included. The distortion is severer on the Y-axis (inclusion of extra voter samples makes Senators' ideology more dense at the center), but it again is not very responsive to the size of extra samples and does not change the location of the peak of distribution.

The results of the above Monte-Carlo experiment implies that the distortion caused by synthetic anchors is less severe if two groups have highly similar ideological structure. Here, American voters and politicians are expected to share the ideological structure more than Japanese voters and politicians. Therefore, in the American case, the use of synthetic anchors is validated more, if not less, than in the Japanese case.