

The Workshop on the Frontiers of Statistical Analysis
and Formal Theory of Political Science

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Abstracts

三輪洋文 (学習院大学, with 小椋郁馬 (Georgetown University) and 飯田健 (同志社大学))

Conjoint Experiment on the Understanding of Party Identification among American Voters

There has been much debate among scholars of American public opinion on what the concept of party identification represents. Many studies in this area have utilized public opinion surveys like ANES to test implications derived from theories of party identification. However, they have not fully examined how American voters themselves interpret terms used in opinion polls, such as “Democrat” and “Republican”, and whether their understandings of these words match the scholarly conceptualizations of party identification. To address this problem, we conducted a conjoint survey experiment with U.S. citizens to see how they understand these terms. The result shows that multiple aspects are reflected in the meaning of words “Democrat” and “Republican”, such as socialization experience, social identity, support for the party’s policy position, and voting for the party. Our study indicates that theories of party identification should take into consideration such heterogeneous perceptions among voters.

今井耕介 (Princeton University · 東京大学, with 江上尚輝(Princeton University))

Causal Interaction in Factorial Experiments: Application to Conjoint Analysis

Estimating causal interaction effects is essential for the exploration of heterogeneous treatment effects. In the presence of multiple treatment variables with each having several levels, researchers are often interested in identifying the combinations of treatments that induce large additional causal effects beyond the sum of separate effects attributable to each treatment. We show, however, the standard definition of causal interaction effect, typically estimated with the standard linear regression

or ANOVA, suffers from the lack of invariance to the choice of baseline condition and the difficulty of interpretation beyond two-way interaction. We propose an alternative definition of causal interaction effect, called the marginal treatment interaction effect, whose relative magnitude does not depend on the choice of baseline condition while maintaining an intuitive interpretation even for higher-order interaction. The proposed approach enables researchers to effectively summarize the structure of causal interaction in high-dimension by decomposing the total effect of any treatment combination into the marginal effects and the interaction effects. We also establish the identification condition and develop an estimation strategy for the proposed marginal treatment interaction effects. Our motivating example is conjoint analysis where the existing literature largely assumes the absence of causal interaction. Given a large number of interaction effects, we apply a variable selection method to identify significant causal interaction. Our exploratory analysis of a survey experiment on immigration preferences reveals substantive insights the standard conjoint analysis fails to discover.

<http://imai.princeton.edu/research/int.html>

福元健太郎 (学習院大学)

Non-Ignorable Attrition in the Matched-Pair Design

In the matched-pair design, experimenters make pairs of two units, each of which shares similar values of matched-on variables, and randomize treatment assignment within each pair. What if outcomes of some units are missing not at random? First, the unitwise deletion estimator deletes missing units alone. Second, the pairwise deletion estimator deletes the other units in the same pairs as well. Some scholars argue that the pairwise deletion estimator is unbiased, though critics claim that it is not the case if missing is not at random and that the unitwise deletion estimator is more efficient. I show that (1) the pairwise deletion estimator can be biased and (2) the unitwise deletion estimator can be less efficient. (3) I also propose adjusted Neyman variance estimator. (4) Finally, I prove that the pair variance estimator of the pairwise deletion estimator is unbiased in the super-population perspective.

堀内勇作(Dartmouth College, with Peter John (University College London))

Opportunities in Parliament and Political Careers: A Natural Experiment in the United Kingdom

Why do some politicians acquire more posts and achieve faster career progress, while others do not? We argue that it is the opportunity for members of parliament (MPs) to develop and demonstrate their effectiveness as lawmakers and politicians that would help them develop political careers. By leveraging a natural experiment in the United Kingdom where randomly selected twenty are given an opportunity to bring in legislation in each session, we show that winning the ballot *decreases* the probability of getting a new post among less experienced MPs, while it *increases* the probability among more experienced MPs. This finding raises a concern about the functioning of representative democracy, because whether or not MPs can seize the randomly assigned new career-boosting opportunity hinges on the non-randomly generated pre-existing opportunity gap.

笠松怜史 (東京大学)

Game Theoretic Analysis of Positive and Negative Campaign for Policy

This paper constructs and analyzes election model where two candidates choose the degree of policy, positive and negative campaign for policy to maximize their own probability of winning an election. We obtain three interesting results. First, symmetric equilibrium policy is more extreme than voters' welfare maximization policy. This results from candidates' incentive to advertise exaggeratingly their own upside since voters' awareness is imperfect. Second, increasing voters' awareness for policy decreases the degree of innovation and voters' welfare. In Japanese election, the youth are not interested in election because he considers youth voice does not reach politics. However, we consider all of voters should monitor candidates' policy to improve welfare. Finally, negative campaign for policy should not be regulated because voters' welfare without regulating this is more than with regulating. Past literature consider downside of negative campaign. However, we take an example which negative campaign for policy should not be regulated.

岸下大樹 (東京大学)

More than Obstruction: When Filibuster is a Credible Signal

Filibuster is often regarded as just an attempt to prevent a bill which is undesirable for a minority

party. However, in reality, a minority party tries to attract public awareness and send a message to voters through filibuster. I show that (i) when there exists mass media, filibuster can be a credible signal such that a majority party intentionally misrepresents a policy which is desirable for voters. The credibility of this message depends on a status quo policy and partisanship. Due to this role as a signal, (ii) filibuster can be beneficial even for the majority of voters. Overall, (iii) this study demonstrates that a minority party and mass media are complementary in creating a credible signal: these two monitors enhance monitoring ability of each other in the derived equilibrium.

勝又裕斗 (東京大学, with 野田俊也(Stanford University))

Ballot Box or Lottery Box? On the Indeterminacy of Winners under the Single Non-Transferable Vote

We study the strategic voting in M -seat multi-member districts under the single non-transferable vote (SNTV). We find that under a wide range of parameters, SNTV fails to discriminate a loser from winners in that his probability of winning does not converge to zero even when the number of voters increases, in contrast to single-member districts (SMD). This is because (1) voters do not always vote for their most favorite candidates if they are clear winners, and (2) the most effective way to kick their least favorite candidate out is to vote for the first runner-up: Such strategic voting increases the first runner-up's vote share, leading to an equilibrium where the vote share of top $M+1$ candidates are the same in the limit. To test these theoretical predictions, we analyze Japanese election data utilizing regression discontinuity design and find that the vote share of the first runner-up is closer to the last winner under SNTV than SMD.

和田淳一郎 (横浜市立大学, with 鎌原勇太(横浜国立大学) and 粕谷祐子(慶應義塾大学))

The State of Malapportionment in the World

Malapportionment violates one of the fundamental principles of democratic government, namely, "one person, one vote." It also leads to undesirable governance in several ways. Despite its importance, relatively little research exists. We provide the most extensive dataset of malapportionment currently available: data accumulated from 112 countries and 279 elections. This dataset compares the following measures of malapportionment: (1) the Loosemore-Hanby index-based measure provided in Samuels and Snyder (2001), called MAL; (2) the ratio of

largest-to-smallest districts, or the max-min ratio (MaxMin); and (3) α -divergence, which employs the Kullback-Leibler divergence, often used in information geometry. We demonstrate several superior properties of alpha-divergence over conventional measures. Further, by using alpha-divergence, we decompose the components of malapportionment into three stages: apportionment, districting, and special districts such as those for overseas territory or minorities. Based on this decomposability, we identify several covariates that influence each stage of malapportionment by using beta regression modeling.

安中進（早稲田大学, with 東島雅昌（東北大学））

Democratization and Human Development

Comparativists have long debated whether democracy advances human development. Recent studies suggest that the stock of democracy is more important than the level of democracy to predict infant mortality rates, an often-used measure of human development. Extant cross-national work is derived, however, from panel regressions that fail to deal with three problems: They do not correct for historical trends in infant mortality and democratization, employ country-fixed effects on data with a short time-horizon, and do not explore long-term impacts of democratization on infant mortality. Using a newly collected panel data of infant mortality covering from 1800 to 2010, we revisit this debate. Applying Error Correction Models, we find that democracy has a long-run negative impact on infant mortality. Our analysis also suggests that after expanding the time horizon and taking change in the dependent variable, stock of democracy does not have a statistically significant impact on infant mortality.

久保浩樹（大阪大学, with Royce Carroll（University of Essex））

Dimensionality, Contexts, and Ideological Linkages between Parties and Voters

How does the complexity of political space affect how parties represent citizens and politicians? In this paper, we argue that the dimensionality of left-right perceptions can limit the incentives for parties to pursue policy positions in line with the spatial location of their supporters. To examine this hypothesis, we investigate the nature of left-right placement of political parties in the CSES data in depth. First, by using a multi-dimensional scaling method, we uncover the latent dimensions behind individual left-right survey responses in each of 44 countries. Second, we calculate representation

gaps using the Aldrich-McKelvey method to corrects DIF errors in left-right placement. We calculate the gap between party positions and their supporters by comparing the positions of the median party supporter and these party positions and then we analyze how the context of high issue dimensionality can affect the observed gap between parties and voters. These findings illuminate the causal mechanisms behind how both institutions and ideological structures shape party competition and democratic representation.

松本朋子 (名古屋大学) ・ 岡崎哲二 (東京大学)

Change in Membership and Ranking of the Elites over Phases of Democratization

This paper, questioning an assumption of previous studies that the impact of democratization on social mobility is constant, reveals how reformers' strategies to recruit and rank government elites change from democratic transition phase to its consolidation phase. At first, the reformers need to recruit talented activists out of non-elite group in order to contend against the elites of the former regime. Once establishing the new regime, however, the reformers have no urgent need to find hidden talents anymore; besides, they have an incentive to let the former elites in the new elite group in order to alleviate the former elites' discontent with the new regime. After the democratic transition phase, therefore, the former elites are reintegrated into the elite group and the hierarchy within the elites again comes to reflect social stratum of the former regime. We test the hypotheses using the data of 3,000 post-Meiji Restoration elites in Japan.

宇治梓紗 (京都大学, with 鈴木基史 (京都大学))

Spatial Correlates of Carbon Diffusion in an Interdependent World

Diffusion is an integral part of the emission of carbon dioxide and holds a solution to the problem of excess emissions. In essence, diffusion represents spatial dependence through connectivity between states and it significantly affects their national and global reduction efforts. However, diffusion has received limited attention from international relations analysts in their study of climate change. Using spatial modeling, we investigate the effects of economic activity, state power, and international governmental organizations on diffusion and uncover that, on average, diffusion negatively affects states' emission efficiency. Furthermore, emissions by states engaged in competitive trading activity represent a major source of negative diffusion. This result holds even if

international and domestic countervailing factors are incorporated into the analysis. In addition, an in-sample simulation analysis confirms that negative diffusion can be transformed into positive diffusion by ingenious coalition formation. Our finding has a significant implication for the 2015 Paris Agreement: under universal participation, its basic formula of intended nationally determined contributions can be enriched by also considering spatial interdependence.