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## THE UNIT OF ANALYSIS, THE NATURE OF POLICY SPACES AND THE MODEL APPROACH

Thomas König

### ABSTRACT

The evaluation of formal models generates questions about the unit of analysis, the nature of the policy space and the kind of criteria to be applied for comparative testing. Do we study decision-making at the proposal level or do we explore the policy space of a set of proposals across multiple sectors? Can we reduce the policy space of the unit of analysis and if so, how do we reduce it? And how do we test formal theories – should we use point predictions offering multiple criteria or do we have proceedings which control for robustness and the level of assumptions?

**KEY WORDS** • comparative politics • European integration • evaluation • formal models

In his article ‘On the Dimensionality of European Union Legislative Decision-Making’, Thorsten Selck (2004: 203) aims to clarify the dimensionality of the European Union (EU) legislative policy space. Using the DEU data on legislators’ policy positions gathered by expert interviews on 66 Commission proposals across multiple sectors (Thomson et al., 2006), he begins by employing dimensionality-reducing techniques and concludes that this approach is ‘not appropriate for generating a decreased number of underlying dimensions for the data at hand and that a one- or two-dimensional policy space cannot be detected’ (Selck, 2004: 203). He also quotes previous works, i.e. my own with Pöter (2001), Tsebelis (2002) and others, that have applied this technique.<sup>1</sup> In the study with Pöter, we applied these techniques to the proposal level as the unit of analysis of EU legislative politics. We conceptualized that member states, the Commission and the European Parliament usually bargain and vote on the issues of a single proposal rather than taking action across multiple proposals and sectors. This is an important boundary specification for political analysis that can affect further analyses and findings – whether they are explorative in terms of mapping

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1. Tsebelis (2002) cites previous findings of my work on the EU legislative policy space, which have been published in the German language (König, 1997).

the EU policy space or analytical in terms of modelling the process/outcomes of EU legislative decision-making.

Our concept of using the proposal level as the unit of analysis corresponds to Selck's second part, in which he applies one- and multi-dimensional spatial models of legislative choice for comparing their explanatory power of making point predictions. In these models, legislators' expected utilities are measured by their distance between the location of their ideal policy position(s), the status quo and the draft proposal on specific issues of Commission proposals. If the distance between the required number of actors' ideal positions and the status quo is higher than their distance to the draft proposal, these models predict a change of the status quo by adopting the proposal. Adding or subtracting issues from this unit of analysis is likely to change actors' distances, their expected utility and thus the outcome (Tollison and Willet, 1979). In addition to these utility and outcome effects, a modification of the number of dimensions can also affect the analysis of agenda-setting power and discretionary power of bureaucrats and judges (Tsebelis, 2002). This means that the findings – whether they are explorative or analytical as well as policy/outcome- or institution/regime-oriented – crucially depend on such boundary specifications. However, the question remains: why should one apply dimensionality-reducing techniques to 66 Commission proposals across multiple sectors when there is consensus among scholars about the unit of analysis?

In the following, I do not want to defend factor, principal component or item-non-response analysis. These techniques have many pros and cons and a rich literature on the usefulness of this type of analysis for the study of social phenomena already exists. In essence, principal component analysis tries to reduce the information of the variables into a smaller set of structurally non-correlated components.<sup>2</sup> Other techniques, such as unfolding (Pool, 1998) and multi-dimensional scaling (Borg and Lingoes, 1987), also map actors' policy positions into policy spaces using specific algorithms for calculating the (dis)similarities between the alternatives. Rather than

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2. Principal component analysis (PCA) involves a mathematical procedure that transforms a number of (possibly) correlated variables into a (smaller) number of uncorrelated variables called *principal components*. The first principal component accounts for as much of the variability in the data as possible, and each succeeding component accounts for as much of the remaining variability as possible. The mathematical technique solves for the eigenvalues and eigenvectors of a square symmetric matrix with sums of squares and cross products. The eigenvector associated with the largest eigenvalue has the same direction as the first principal component. The eigenvector associated with the second largest eigenvalue determines the direction of the second principal component. The sum of the eigenvalues equals the trace of the square matrix and the maximum number of eigenvectors equals the number of rows (or columns) of this matrix.

discussing the methodological (dis)advantages of each method, my concern is the application of these techniques to the same unit of analysis. I completely agree with Selck (2004: 210) that it is useful to start with theory rather than grouping the data with a great loss of information about the data structure. However, it surprises me that Selck recommends rejecting these techniques because he cannot identify a reasonable number of dimensions in the complete DEU data consisting of 66 proposals with 162 issues. Looking for the dimensionality of this sample suggests that legislators take actions across the 66 Commission proposals covering multiple sectors – a concept which is shared neither by Selck nor myself and others. This leads me to the impression that Selck has compared ‘apples with oranges’ when drawing conclusions from using principal component analysis for the 66 proposals in my study with Pöter, which uses the proposal as the unit of analysis and applies these techniques to this level.

However, this does not mean that we cannot learn about the nature of policy spaces from a comparison of these two studies. In the analysis with Pöter (2001), we used data from my earlier study on a few Commission proposals that I had gathered on legislators’ policy positions using document analysis on the Council’s minutes. These protocols document the legislative decision-making process from the beginning of the Commission’s initiative until the adoption of the proposal by the Council, if necessary with reference to the European Parliament’s viewpoints. The minutes list the statements and amendments of the actors involved, mostly of the member states and the Commission according to a specific coding scheme, which has been developed by the Council secretariat. From this coding scheme, we are able to extract many dichotomous policy scales and a large number of issues: in the König and Pöter (2001) study, there are between 14 and 24 issues at the proposal level (<http://www.uni-konstanz.de/eup/issues.htm>). We focused on the ongoing theoretical controversy among spatial scholars on the influence of the European Parliament under the cooperation procedure and we were aware of the fact that the dimensionality of the policy space might bias our findings. In order to avoid a discussion about the ‘correct’ dimensionality for comparison, we reduced these multiple issues on the proposal level and we also evaluated the competing claims at the issue level. At the issue level, we computed the predicted outcome by an issue-by-issue analysis, while we only illustrated the competing views’ predictions at the dimensional level.<sup>3</sup> The idea was to use the proposal as the unit of analysis and to offer

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3. Although factor analysis is widely used in political science, the transformation of dichotomous scales into Euclidean measures is problematic and risks serious over-interpretation of the distances between the actors. Item-response models seem better suited for handling of binary data (Treier and Jackman, 2002).

insights into the models' explanatory power which would be relatively independent of the nature of the policy space.<sup>4</sup>

In the DEU data of Selck, respectively Thomson et al. (2006) study, however, expert data were generated on scales of conflict between the actors involved. Experts were asked to mention the most extreme positions of the legislators, which were subsequently coded as zero for the most conservative and 100 for the most progressive position in relation to the status quo (Selck, 2004: 218). The experts located the positions along a one-dimensional continuum and, on average, this method produced a total sample of 15 proposals with one, 27 with two, 17 with three, five with four, three with five and two with six dimensions. Compared to the data from the Council minutes, it seems that the experts were aggregating the more detailed discussions to a smaller number of dimensions. However, how these experts aggregated the more detailed information remains an open question. In many cases, their expertise also produced issues with dichotomous scales, which are less suited for spatial analyses according to Selck's (2004: 215) findings. At this point, one can hardly say whether the minutes of the Council or the expert information provide more valid data on legislators' policy positions. An interesting empirical question would be whether expertise and document analysis lead to similar data and results. But the comparative view unsurprisingly reveals that the two sources produce different types of data, even though both contain a high number of dichotomous and sometimes trichotomous issues which renders the application of spatial models difficult.

Independently of graphical or computational applications, both datasets have required further reduction. This is also true for Selck's analysis in which cases with a dimensionality higher than three are manipulated: 'Higher dimensional spaces are reduced for computational reasons' (Selck, 2004: 215). As an exclusion criterion, he proposes the calculation of the mean salience of each issue in the proposal over all the actors and then the inclusion of only the three issues with the highest salience. Like reducing the policy space through statistical proceedings, it seems that Selck's procedure is problematic with regard to inter-personal utility comparison in extracting three issues, the orthogonal dimensionality of the issues as well as the overall consequences of subtracting issues. From a methodological point of view, Selck uses listwise deletion which is appropriate if the deleted cases are a subsample of the overall sample. However, the saliency results rather reveal that the deleted issues differ from the sample because actors have weighted them differently. Rather than subtracting information about the policy space using the average salience of all actors, it could be interesting to assess whether the policy space of the higher dimensional proposals can be

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4. Statistically, both principal component and multi-dimensional scaling led to similar results.

reduced using dimension-reducing tools of analysis and whether this (again?) leads to similar results. It is possible that Selck will retain most of the information about the data structure – which might refute his argument, hence calling the appropriateness of these methods into question.

In addition to discussing the unit of analysis and the nature of policy spaces, I also want to discuss the modelling approach and, in particular, the comparative evaluation of formal theories. My central argument is that there is a trade-off between predictive precision and statistical evaluation. In general, the evaluation of competing models is a difficult task because various criteria can be applied to the empirical fit, the logical coherence and the parsimony or robustness of theories. For this reason, it seems useful to begin differentiating a general interpretation of modelling from more specific terminology, which only refers to the formalized set of assumptions. Since the more general interpretation includes the components of the process generating data, the handling and application to the formalized considerations, its ability to predict seems to be the only way to test a model's explanatory power. According to Morton (1999), deterministic models based on a complete data-generating process should count the errant observations or, if these are stochastic in nature, use observations to calibrate parameters or compute statistical likelihood functions. A partial data-generating process requires the specification of plausible control variables and/or stochastic components. Selck's general modelling approach is closer to complete data-generating and deterministic models, even though he controls for the level of the scale by Wilcoxon's signed rank test. Testing for predictive power, Selck (2004: 215) uses absolute mean error statistics, which measure how far off the model is on average. Other criteria would be the errant/hit rate (how often a model hits the outcome) and the kernel density (referring to the distribution of the point predictions away from the status quo) etc., which have produced mixed results in the evaluation of point predictions (Achen, 2006).

In Selck's context of spatial modelling, theoretical debates focus on the interpretation of the specific arrangements, in particular the sequencing of the legislative game, the preference profile of the actors and the nature of the policy space. It is thus an important but ambitious goal to evaluate empirically the explanatory power of different spatial models. Like Selck, many scholars are attracted to point predictions because they make precise statements about the real world. My own experience is that a trade-off between predictive precision and statistical evaluation exists which makes it extremely difficult to evaluate these kinds of models using point predictions. Empirically, and as discussed earlier, we rarely have adequate data containing the specific Euclidean distances between the actors involved. Although further assumptions on the handling of the data are required which might fundamentally bias the findings, these risks are seldom reflected in the final evaluation. From a theoretical viewpoint, these theories belong to

the same class of models but they use different assumptions for making predictions, such as assuming decision-making under a closed rule, a powerful agenda-setter with gate-keeping rights, the one-shot behaviour of fully informed actors, and oftentimes they disregard relevant institutional arrangements, such as the conciliation committee. Again, it is a difficult task to qualify the level of these assumptions but any evaluative exercise should try to acknowledge them in terms of a loss in degrees of freedom. Finally, a major statistical deficit is that one can apply a number of different criteria that rarely provide for measures of statistical robustness. In the end, the researcher can still decide whether to choose a model that is close to the average outcome, hits the outcome more often, fits the distribution etc. Because comparative evaluations often fail to (or cannot) take these aspects sufficiently into account, we decided only to illustrate the predictions of competing spatial models at the one- and two-dimensional level (König and Pöter, 2001).

In my view, these questions about the unit of analysis, the nature of the policy space and the evaluation of the modelling approach are crucial for understanding legislative decision-making. Like Selck, I believe that EU legislative decision-making can currently best be explained at the proposal level and that higher-dimensional models are more sophisticated than lower-dimensional ones. Regarding the mapping of the policy space, it remains an empirical question to determine how many issues are decided within a proposal. In some cases, proposal issues are linked and sometimes particular issues are excluded from the negotiation table. In the Council, so-called technical groups are sometimes established with limited power to find solutions for specific topics. Selck has, however, decided to use the proposal level for his modelling approach and presented an insightful analysis that raises further discussion about measuring and modelling. And he has also made a correct suggestion for further policy analysis, namely to start with theory.

This brings me to my final remark, which goes back to the early modelling literature on the US Congress (Shepsle, 1989; Shepsle and Weingast, 1981) in which committee systems helped to explain why legislative decision-making is not chaotic and arbitrary, and allowed for outcome prediction. A committee system can be viewed as a structural constraint on the decision-making process, which partitions the multi-dimensional nature of proposals into lower (single) issue policy spaces. This corresponds to the organization and documentation of the Council, according to which the Council is separated into working groups, in which the member states and the Commission discuss issue by issue rather than deciding simultaneously on the whole proposal. Similarly, the conciliation procedure might reduce higher-dimensional policy spaces to a conflict line between the majorities of the two chambers, the Council and the European Parliament. Considering these institutions

might help to apply less sophisticated models which use fewer assumptions for making predictions.

### REFERENCES

- Achen, C. (2006) 'Evaluating Political Decision Making Models', in R. Thompson, F. Stokman, C. Achen and T. König (eds) *The European Union Decides*. Cambridge: Cambridge University Press.
- Borg, I. and J. Lingoes (1987) *Multidimensional Scaling*. Heidelberg: Springer.
- König, T. (1997) *Europa auf dem Weg zum Mehrheitssystem*. Wiesbaden: Westdeutscher.
- König, T. and M. Pöter (2001) 'Examining the EU Legislative Process: The Relative Importance of Agenda and Veto Power', *European Union Politics* 2: 329–51.
- Morton, R. (1999) *Methods and Models*. Cambridge: Cambridge University Press.
- Pool, K. (1998) 'Non-parametric Unfolding of Binary Choice Data', manuscript, Carnegie Mellon University.
- Selck, T. (2004) 'On the Dimensionality of European Legislative Decision Making', *Journal of Theoretical Politics* 16: 203–22.
- Shepsle, K. (1989) 'Studying Institutions: Some Lessons from the Rational Choice Approach', *Journal of Theoretical Politics* 1: 131–47.
- Shepsle, K. and B. Weingast (1981) 'Structure-induced Equilibrium and Legislative Choice', *Public Choice* 37: 503–19.
- Thompson, R., F. Stokman, C. Achen and T. König (2006) *The European Union Decides*. Cambridge: Cambridge University Press.
- Tollison R. and T. Willet (1979) 'An Economic Theory for Mutual Advantageous Issue Linkage in International Negotiations', *International Organization* 33: 425–49.
- Treier, S. and S. Jackman (2002) 'Beyond Factor Analysis. Modern Tools for Social Measurement', paper presented at the Midwest Political Science Conference, Chicago.
- Tsebelis, G. (2002) *Veto Players: How Political Institutions Work*. Princeton, NJ: Princeton University Press.

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