

Research Note

From Process to Structure: Developing a Reliable and Valid Tool for Policy Network Comparison

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Abstract

One of the major shortcomings for the use of Social Network Analysis (SNA) in comparative public policy research is the lack of valid, reliable and – maybe most important for people not really familiar with SNA – practical procedures to generate comparable network data. In this research note, we suggest an easy to follow, non-technical solution for transferring information from decision-making case studies into policy networks. Focusing on the actors' participation in decision-making processes, we visualize in a first step the description of a policy process in an 'Actor-Process-Event Scheme' (APES). In a second step, the data formalized in the APES can be transformed into two matrices on a) the actors' event participation and b) the process links between the actors. Joining the two matrices allows us finally to analyze the decision-making process in the form of a policy network. Furthermore, the generated network data can be used for more formalized comparative methods.

Keywords: *Decision-making process, policy network, social network analysis, Swiss foreign policy*

Introduction¹

Over the last two decades the concept of policy networks has gained of both importance and acceptance in political science. After a first phase characterized

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by a rather uncritical use of the term and concept, it has become clear that for comparative studies a metaphorical understanding of policy networks does not add much to empirical and cumulative research (Dowding 1995; Van Waarden 1992: 49). On the one hand, the scholarly discussions made it clear that policy networks – if understood as an approach to describe relations between political actors within a policy domain – are not a theory in itself. For empirical research geared towards hypotheses testing one has to combine the concept of policy networks with middle-range theories of the state and public policy-making. On the other hand, empirical studies of a more rigid form fell into the trap of applying Social Network Analysis (SNA, for an introduction see: Serdült 2002; Scott 2000; Trezzini 1998; Wasserman/Faust 1995) to the concept of policy networks without clarifying the link between theory and SNA as a (quantitative) method with indicators such as the density of networks or the centrality of actors. Too much time and effort was put into data gathering and the refined use of social network analysis (John/Cole 1995: 306) to the effect that comparative research was only possible for very few cases or (the few) large and well funded research teams.

However, we think the concept of policy network is important for comparative political science research and that policy networks should be treated as a variable in a theoretical model on political processes. Moreover, SNA can and should be applied more often in order to produce data useful for comparative analysis such as Qualitative Comparative Analysis (QCA, see Ragin 1998). In case one agrees on these premises, the question arises how to generate data on policy networks in an efficient but valid and reliable manner. In our view, one of the major shortcomings for the use of social network analysis in comparative public policy research is the lack of *practical* procedures to generate comparable cases, especially for people not familiar with SNA.

As many other policy researchers we did case studies within a research project, based on the analysis of archival records (Reh 1995) and guided interviews (Kvale 1996). The project was mainly financed by the Swiss National Science Foundation and has explored the domestic aspects of Swiss foreign policy-making processes.² Within two years we have established well documented and detailed case studies. The case studies are basically narrative thick descriptions focusing on actor's event participation during the decision-making process. But – as generally with a comparative case

² The research project leading to this paper was supported by the Swiss National Science Foundation (SNF research grant no 4042-46410). The project was part of an extensive research project within the scope of a national research program on «Foundations and Possibilities of Swiss Foreign Policy» (NRP42, see Goetschel 2000 and Goetschel et al. 2002). Our research project lays stress on consideration of domestic policy factors that affect the decision-making process in Swiss foreign policy (Klöti et al. 2003, 2000; Hirschi et al. 1999).

study design – the descriptive material from the case studies is hardly enough to come up with a meaningful comparison.

In this paper we try to overcome the difficulties for political scientists usually applying a narrative, process-oriented case study approach to integrate the concept of policy networks as one variable among others to a set of hypotheses. For this purpose, we propose that out of well documented case studies about the political process one can develop the structural configuration of political actors in the sense of a policy network by applying some rather simple transformations to an Actor-Process-Event Scheme (APES). We are currently at the first stage of this task and would like to lay out the basic idea for a tool we develop further in future versions of this paper.

Step One: The Actor-Process-Event Scheme (APES)³

We assume that it is possible to derive a structure – understood as relations between nodes – from process. Every process understood as a sequence of linked events contains the information necessary to derive an underlying structure. In SNA there are many applications based on this idea under the name of *affiliation networks* or *actor-event networks* (Wasserman/Faust 1995: 291ff.; Jansen 2003: 102). For our purposes, we propose that event participation of political actors in an event of the decision-making process on the one hand and process links connecting these events on the other hand are sufficient indicators in order to operationalize the structure of a the decision-making process in the sense of a policy network. In fact, as many social network researchers before us we regard event participation to be basic information in order to study affiliation networks (see Wasserman/Faust 1999: 295-296). In more practical terms, it becomes necessary to systematically extract information on a) political actors, b) process links, and c) events from a case study about a decision-making process.

By agreeing in advance on the events of a decision-making procedure (defined by institutional characteristics and the rules of the political system under study) and the political actors or groups of political actors (such as: the President, the executive, public administration, interest organizations etc.), a descriptive case study can be transformed into an APES in which the political actors interact by a) event participation and b) procedural (institutional) linkages.

³ The Actor-Process-Event Scheme in its current version was developed within the NRP42 research project and is also based on work of team members Ulrich Klöti (1984) and Thomas Widmer, as well as previous research within other projects, especially see Buser (1984).

APES-Components

The APES is a graphical interface linking the participating actors with the chronological sequences of the decision-making process. It runs within a two-dimensional space, spanned by an axis with the involved governmental and non-governmental actors on the vertical reference line and a timeline in the horizontal that separates the policy process into different stages and events.

In the *actor dimension*, the scheme's focus is on corporate actors (Coleman 1974), which are distinguished along political hierarchy levels and organizational distinctive features. According to our data on foreign policy decision-making processes, there are – on the top level – the international actors. On the subordinate levels, there are the domestic actors, subdivided in national governmental agencies, parliament and parliamentary committees, governmental actors from hierarchically subsidiary jurisdictions, and domestic non-governmental bodies.⁴ However, the arrangement of the actors and the distinction between different groups of actors can be different, according to the process under investigation.

In the *process dimension*, the scheme is based in principle on the concept of the “policy cycle” (see Howlett and Ramesh 1995: 9-15), in that the scheme deals either with the outflow of a complete policy cycle or with one or more specific stages of the policy cycle of a political program or problem.⁵ To simplify matters, the scheme used in this paper is phase focused, in that it illustrates the process stages of policy formulation and decision-making (decision-making in the broader sense, in delimitation to policy implementation). In spite of entitled criticism on this “stage heuristic” and the limits of its application (Sabatier 1999: 6-7), the concept serves here a useful purpose by dividing the very complex policy process into discrete stages (see also Parsons 1995: 79-81). Nevertheless, we have to concretize these stages and adjust them to empirically observable events in order to generate a scheme of the policy process under investigation: The definition and selection of the *crucial events* within the policy process depends on the one hand on parameters of the political system and on the other hand on specific characteristics of the policy process under investigation. Therefore, the definition and containment of the relevant events of the policy

⁴ So far the APES aggregates all parliamentary actors, namely the political parties. In a next version we will list event participation of all political parties separately.

⁵ In this model, *agenda-setting* refers to the process by which problems come to the attention of governments; *policy formulation* refers to the process by which policy options are formulated within the government; *decision-making* refers to the process by which the governments adopt a particular course of action or non-action; *policy implementation* refers to a process by which governments put policies into effect; *policy evaluation* refers to the processes by which the results of policies are monitored by both state and societal actors, the result of which may be reconceptualization of policy problems and solutions (Howlett and Ramesh 1995: 11).

process has to be done in accordance with the specific characteristics of the object of investigation. Taking into account the domestic and international dimension of the decision-making processes the following process events are crucial for our analysis of decision-making processes in Swiss foreign policy:⁶

- 1) *inner-administrative preliminary investigations*, defined as preparatory work within the administration, before a first draft of a political program/measure or a statement on a policy problem is available;
- 2) *development of preliminary draft*, defined as assessment of results of inner-administrative preliminary investigations, leading to a first draft of a political program/measure or policy statement;
- 3) *consultations outside the administration*, defined as inclusion of actors from outside the public administration in the process of discussing/developing an appropriate political program/measure;
- 4) *consultations within the administration*, defined as inclusion of other actors from inside the public administration (besides the agency in charge) in the process of discussing/developing an appropriate political program/measure;
- 5) *international negotiations*, defined as a process in which authorized negotiators bargain with international partners;
- 6) / *consultations between departments/ministries / and proposal to the government*, defined as the submission of an elaborated proposal for a political program/measures from the department/ministry in charge with the dossier to other departments/ministries ("Mitberichtsverfahren") and the deciding governmental authority (in Switzerland normally the Federal Council);
- 7) *decision of the government (Federal Council)*, defined as authoritative decision of the responsible governmental body (in Switzerland the Federal Council), normally based on a proposal of the department in charge and the results from the consultations between other departments, on a) negotiation positions, b) signing, c) adoption of a message to the parliament, or d) ratification;

⁶ In Switzerland, usually an expert group from the federal administration prepares draft legislation which is then presented to the different federal departments for comment. The text is passed to the Federal Council, which in turn engages in a consultation process with the public, including political parties and cantonal authorities. Every proposition or bill destined to become federal law has to be approved by a relative majority in both chambers of parliament. In general, laws may be challenged by the people if 50'000 signatures to this effect are collected (obligatory referendum in the case of an amendment to the constitution); the question is then settled through a national referendum (see Linder 1994; Klöti 1984). Analyzing decision-making processes on foreign policy issues, specific events on the international political level have to be taken into account, too (Spinner 1977).

8) *initialization of an international treaty*, defined as an event on the international political level on the occasion of the termination of the international negotiations (on a technical level);

9) *signing of an international treaty*, defined as an event on the international political level on the occasion of the fixation of the subject terms of the international treaty;

10) *session of the parliamentary committees*, defined as a phase in which the responsible parliamentary committee(s) debate and decide on the proposed program/measure;

11) *parliamentary session*, defined as debate and decision-making on the proposed program/measure in the parliamentary plenum;

12) *ratification of an international treaty*, defined as an event on the international political level on the occasion of the proclamation of the definitive volition according to international law.

Information

A “thick description” of a policy process, as we generally find in case studies (Yin 1994; 1993), is the source material of an APES. The thick description is a detailed narration of the incidents within and around the defined crucial events of the policy process, with particular attention to the involvement and non-involvement of governmental and non-governmental actors. Actors participating actively in a specific event of the policy process are indicated in the scheme with a black bullet (●), whereas only passively involved actors are marked with a gray bullet (●). The distinction between active and passive participations has to be defined by the researcher. In our analysis of decision-making processes in Swiss foreign policy, an actor is actively participating, if at least one representative of the actor is directly taking part in the specific event under consideration. An actor’s involvement in a specific event is passive, if the actor is only informed about the procedure and/or the results of the specific event, without being directly involved in that event. Actors that are participating together in an event are linked (symbolized as: ●—●).

Whether an actor is a participant in the event or not (and if yes, in which way) can only be judged on previously defined criteria. For our analysis, two sources for tracing empirical evidence have been relevant: 1) empirical evidence for actor-participation in written documentation about the specific events (such as protocols, negotiation reports or file notes), based on a document analysis of governmental and non-governmental sources (Widmer and Binder 1997: 223-4; Reh 1995); 2) information given by the political actors themselves, based on

interviews with representatives of participating and non-participating actors (Kvale 1996; Meuser and Nagel 1991).

Finally, a dashed line (----) symbolizes the course of the policy process. The dashed line links the actors in charge (indicated by a triangle ▲) with the object of the policy process (the political program/measure or the dossier on a specific policy problem, in our example the international treaty that is under consideration) on the occasion of the specific events of the policy process.

Data

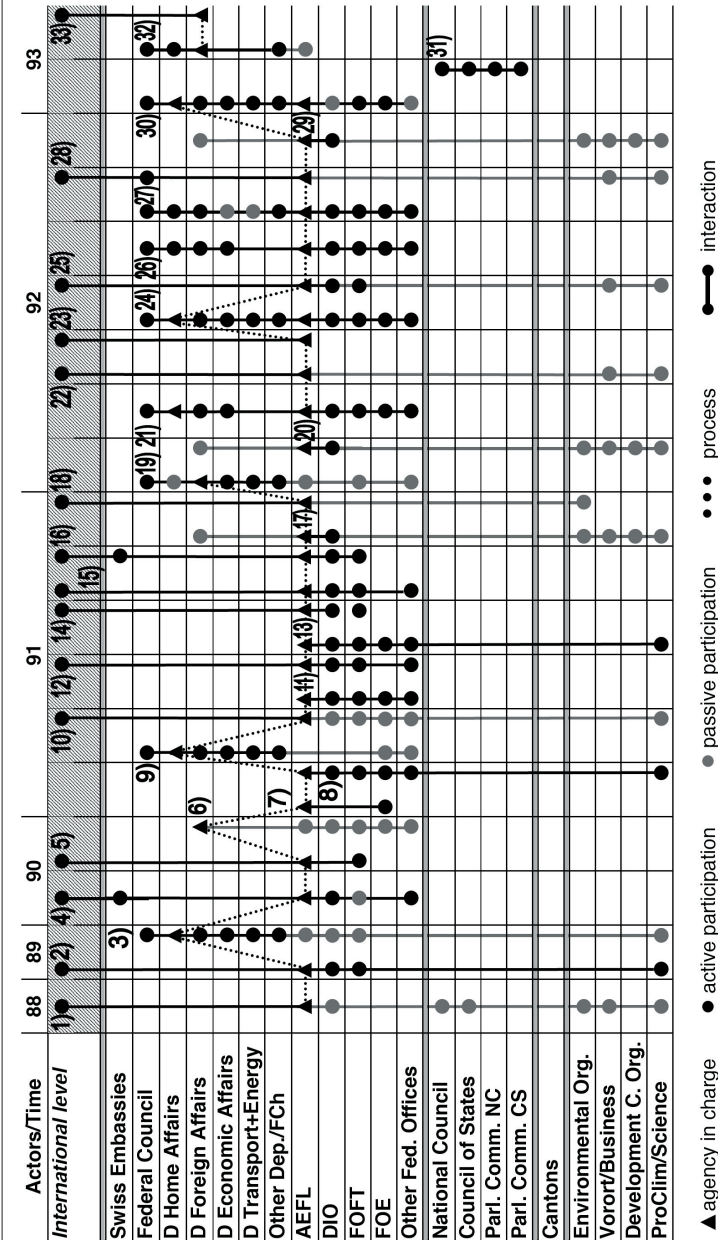
Our empirical data derives from three research projects that have been conducted at the Department of Political Science of the University of Zurich, dealing with domestic decision-making processes on Swiss foreign policy issues.⁷ We illustrate our data with one case only, the 1992 UN Framework Convention on Climate Change; a next version of this paper is supposed to include all seven cases and hence a comparative chapter. Data collection is based on archival records and expert interviews.

The United Nations Framework Convention on Climate Change (UNFCCC) was signed at the Earth Summit in Rio de Janeiro in June 1992 and came into force on 21 March 1994, after 50 states (among them Switzerland) have ratified the international agreement. In Switzerland, an intensive inner-administrative negotiation process on the country's position towards international climate policy has preceded the ratification of the UNFCCC. The response to climate change was organized through several committees, operating at various levels. An Interdepartmental Working Group (IWG) on the Evolution of the Climate System was set up in 1989 (event 3 in the corresponding APES, see Figure 1). The agencies in charge with the dossier (mainly the Agency for the Environment, Forests and Landscape and the Directorate for International Organizations in the Federal Department of Foreign Affairs) have consulted from time to time representatives from the civil society (especially of environmental organizations and the energy industry; events 1, 17, 20, 28, and 29 in Figure 1), but only scientific circles (ProClim) have been incorporated continuously in the decision-making process (events 2, 8, and 13). However, the Federal Council has been hardly involved in the preparatory work. Only in the run-up to the international conference, the policy process has shifted from the administrative onto the

⁷ See footnote 1. In addition to the empirical data from the NRP42 project, two diploma thesis on domestic decision-making processes on foreign policy issues are at our disposal (Vögeli 2003; Hirschi 2000). All these case studies are based on an comparative case study design (Yin 1994 & 1993; King et al. 1994: 43-46) and have been conducted according to the same procedure.

governmental level (events 19, 21, 24, 26, 27, and 30).

Figure 1: Actor-Process-Event Scheme of the Swiss ratification of the UN Framework Convention on Climate Change 1992



Events:

- | | |
|--|--|
| 1) Expert talks IPCC | 18) 4 th negotiation round INC |
| 2) IPCC working group sessions | 19) Decision Federal Council: Participation of NGOs |
| 3) Founding of IWG | 20) 2 nd NGO hearing |
| 4) 1 st PrepCom session | 21) Decision Federal Council: 4 th PrepCom session |
| 5) Preparatory meeting Geneva | 22) 5 th negotiation round INC/1 |
| 6) Coordination meeting IKEH | 23) 4 th PrepCom session |
| 7) Bilateral talks FOE-AEFL | 24) Decision Federal Council: 5 th neg. round INC/2 |
| 8) Preparation INC | 25) 5 th negotiation round INC/2 |
| 9) Decision Federal Council: Participat. Rio | 26) Decision Federal Council: Participation Rio |
| 10) 1 st negotiation round INC | 27) Decision Federal Council: Signing of the treaty |
| 11) Session of sub working group 'climate' | 28) Signing of the treaty |
| 12) 2 nd PrepCom session | 29) 3 rd NGO hearing |
| 13) 7 th + 8 th IWG sessions | 30) Decision Federal Council: Message to Parliament |
| 14) 2 nd negotiation round INC | 31) Parliamentary Decision |
| 15) 3 rd PrepCom session | 32) Decision Federal Council: Ratification |
| 16) 3 rd negotiation round INC | 33) Ratification |
| 17) 1 st NGO hearing | |

Step Two: From Actor-Process-Event-Scheme to Policy Network

After having established the APES as an intermediate step to gather the information we need out of the descriptive case study, we can prepare the next stage of the transformation from procedural to structural data. The APES serves us to create two distinct data matrices: matrix a) containing data about event participation (two mode actor-event matrix) and matrix b) containing data about the procedural links between political actors (one mode actor-actor matrix). For data entry and transformations we used UCINET 6 for Windows (Borgatti et al. 2002).

Event participation

Matrix a) with the predefined actors in the rows and the events in the columns is generated by filling the cells with a value of one (1) in case an actor did actively or passively participate in an event, with a value of zero (0) in case an actor did not participate. We then transform this actor-event matrix into an actor-actor matrix applying the adequate procedure in UCINET 6 for Windows (Data..> Affiliations - row mode). This transformation creates a matrix containing symmetric relations between all pairs of actors participating in one form or another in the decision-making process. Since reflexive ties do not make sense here, the diagonal of the resulting matrix can be set to zero (Transform..> Diagonal - New diagonal value=0). As an example (see Annex, matrix a): a value of 5 in the cell 6-7 of matrix a) means that both actors 6 (Department of Transport and Energy) and 7 (Agency for the Environment, Forestry and Landscape) jointly participated in five events.

This whole transformation assumes that there was interaction between all actors participating in an event. We are aware that this is a rather problematic assumption given that a distinction could be made between active and passive participation and that event participation does not necessarily lead to interaction with all actors. In a further version of this procedure, we could eventually weight the two modes of participation. But even then the main assumption can be criticized for good reason. However, we hold that the resulting matrix a) serves as a good approximation in order to reflect one important aspect of the policy network concept.

Procedural links

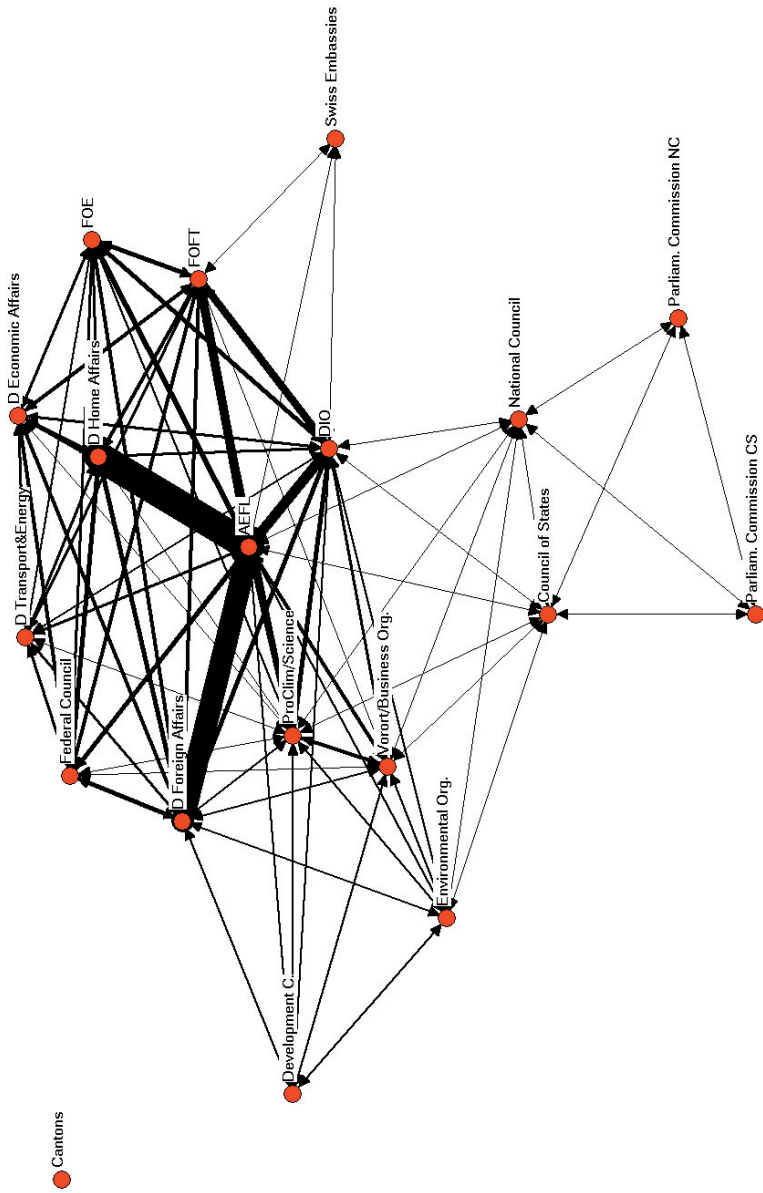
Matrix b) with the predefined actors in the rows and the columns is generated by filling the cells with the sum of all process links. In case an actor has a process link with another actor we attribute a value of one (1), in case there is no process

link a value of zero (0). The resulting matrix can be asymmetric and has the same size as the transformed matrix a). As an example (see Annex, matrix b): a value of 2 in the cell 7-4 of matrix b) means that altogether there are two process links leading from actor 7 (Agency for the Environment, Forestry and Landscape) to 4 (Department of Foreign Affairs).

Because we regard both dimensions represented in matrices a) and b) as important in order to reflect the structure of the decision-making process in the form of a policy network, we suggest not to just sum up the two matrices but to multiply them. Computationally, the multiplication of the matrices gives what we regard an adequate weight to the process link matrix b), which otherwise would only play a minor role not compatible with our understanding of the importance of process links in a decision-making process. As a result, actors with process links become much more weight in the resulting matrix. Before multiplication, we create additional multiplier matrices in which all zeros (0) in matrix a) and b) have – for mathematical reasons – to be set to a value of one (1) (Transform..> Recode..). The multiplication itself can conveniently be done in UCINET (Transform..>Matrix Operation). For computational reasons we then multiply matrix a) with the transformed version of matrix b) (all 0 set to 1) and vice versa we multiply matrix b) with the transformed values of matrix a). With the help of the transformed multiplier matrices we make sure not to lose entries in the original matrix a) without counterpart in matrix b). In order to join the two resulting matrices we simply take the average (Transform..>Matrix Operations).

The multiplication of matrix a) and b) is supposed to represent the policy network derived from procedural data extracted from the original descriptive case studies with the help of an APES.

Figure 2: Policy network of the Swiss ratification of the UN Framework Convention on Climate Change 1992 (valued graphs)



The policy network regarding the Swiss ratification of the UN Framework on Climate Change in Figure 2 visualizes the strong interaction between the agency in charge (Agency for the Environment, Forests and Landscape) and the two mainly involved Federal Departments (of Foreign and Home Affairs) in the core of the network.⁸ The Federal Council is rather in the periphery of the policy network, as well as the parliament and organizations of the civil society are. Thus, the policy network illustrates the inner-administrative character of the analyzed decision-making process adequately. Once the final data matrix is established we can compute standard SNA measures such as the density of the network or degree centralities for all actors.

Conclusions

We presented but a first step in the direction towards a reliable, valid and practical tool to produce policy network data out of political process data. The proposed procedure provides an easy to follow, not too technical solution to develop structural data out of process data from case studies about political decision-making. In principle, this procedure can be applied to decision-making processes in any political system.

Along the procedure we made several important procedural and conceptual decisions probably affecting the end result. In a future paper, we would like to add the empirical data from the other six cases we have at hand and also test whether changes in the procedure lead to the same or at least similar results. The question whether the proposed procedure leads to valid and reliable results is still open and needs to be assessed in the future.

⁸ For the sake of convenience and as a graphical illustration only, we display a slightly rearranged MDS solution of the geodesic distances as provided in network drawing program NetDraw (Borgatti et al. 2002).

Matrix a): Event participation, actor-by-actor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0
2	0	0	9	9	8	6	9	6	7	6	0	0	0	0	0	0	1	0	2
3	0	9	0	9	8	6	8	6	7	6	0	0	0	0	0	0	0	0	1
4	0	9	9	0	8	6	12	10	8	7	0	0	0	0	0	3	3	3	4
5	0	8	8	8	0	6	7	6	7	6	0	0	0	0	0	0	0	0	1
6	0	6	6	6	6	0	5	4	5	4	0	0	0	0	0	0	0	0	1
7	2	9	8	12	7	5	0	21	19	11	1	1	0	0	0	4	7	3	13
8	2	6	6	10	6	4	21	0	17	10	1	1	0	0	0	4	5	3	9
9	2	7	7	8	7	5	19	17	0	10	0	0	0	0	0	0	1	0	5
10	0	6	6	7	6	4	11	10	10	0	0	0	0	0	0	0	0	0	3
11	0	0	0	0	0	0	1	1	0	0	0	2	1	1	0	1	1	0	1
12	0	0	0	0	0	0	1	1	0	0	2	0	1	1	0	1	1	0	1
13	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
16	0	0	0	3	0	0	4	4	0	0	1	1	0	0	0	0	0	4	3
17	0	1	0	3	0	0	7	5	1	0	1	1	0	0	0	4	0	3	7
18	0	0	0	3	0	0	3	3	0	0	0	0	0	0	0	3	3	0	3
19	0	2	1	4	1	1	13	9	5	3	1	1	0	0	0	4	7	3	0

Matrix b): Procedural links between actors, actor-by-actor

[illegible]

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Von Prozessen zu Strukturen: Entwickeln eines reliablen und validen Verfahrens für den Vergleich von Politiknetzwerken

Eine der grössten Schwächen der Sozialen Netzwerkanalyse in der vergleichenden Politikwissenschaft ist das Fehlen von einfach handhabbaren, aber trotzdem validen und reliablen Verfahren zur Generierung von Netzwerkdaten. In dieser Forschungsnotiz schlagen wir ein Verfahren vor, mit dem Informationen aus qualitativen Fallstudien über Entscheidungsprozesse in quantifizierbare Daten zur Analyse von Politiknetzwerken transformiert werden können. In einem ersten Schritt visualisieren wir anhand der Akteursbeteiligung an einzelnen Prozessereignissen den Entscheidungsprozess als ‚Akteur-Prozess-Ereignis-Schema‘ (APES). In einem zweiten Schritt übertragen wir dann die im APES formalisierten Daten in zwei Matrizen: a) zur Ereignis-Partizipation der einzelnen Akteure und b) zu den Prozess-Verbindungen zwischen diesen Akteuren. Das Verschmelzen der beiden Matrizen erlaubt uns schliesslich, den Entscheidungsprozess in der Form eines Politiknetzwerks zu analysieren. Über die fallinterne Analyse hinaus können die so erzeugten Netzwerkdaten mit formalisierten Methoden fallübergreifend verglichen werden.

Des processus aux structures: Développement d’une procédure valide et fiable pour la comparaison des réseaux politiques

Le plus grand désavantage de l’analyse de réseaux utilisés en politique comparée réside dans le manque de procédures simple mais néanmoins valide et fiable afin de créer des données en termes de réseaux. Dans cette note de recherche, nous proposons une procédure permettant le transfert d’information émanant d’études de cas qualitatives sur des processus de décision en données quantifiable pour une analyse de réseaux politiques. Dans un premier temps nous visualisons le processus de décision à l’aide d’un schéma acteur-processus-événement (APES) - la participation aux événement du processus en étant la base. Dans un deuxième temps, nous transférons les données formalisée en deux matrices: a) contenant la participation des acteurs aux événements et b) contenant les liens du processus entre les acteurs. La fusion des deux matrices nous permet finalement d’analyser le processus de décision sous forme de réseaux politique. En plus de l’analyse d’un seul cas, les données en termes de réseaux peuvent-être comparée à d’autres cas.

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