Patterns of Policy Networks at the Local Level in Germany

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Abstract

Research on policy network formation has contributed to an understanding of the patterns of interaction among political actors. Belief homophily, power seeking, and opportunity structures provide explanations studied for specific policy areas. This study tests these established theories in a different environment by asking: What drives policy network formation at the local level? From a review of the literature on policy networks and local politics, the study derives nine hypotheses, which are tested for a German municipality. Information and coordination networks have been collected among its councilors through an online survey. The study identifies the drivers of their formation utilizing exponential random graph models. Findings support the effects of party membership and perceived influence. They also point to the tendency of councilors to coordinate with the mayor and they emphasize local councils as an influential opportunity structure specific to local networks.

KEY WORDS: policy networks, local politics, advocacy coalitions, resource dependence, transaction costs, local elites, exponential random graph models, Germany

Introduction

Understanding the formation of policy networks provides insights into politics. Because their structure not only represents the dynamics of the policy process, but also has important consequences for its outcomes (Howlett, 2002; Sandström & Carlsson, 2008), studying the drivers of these structures is of highest relevance for public policy research. The exchange of information and coordination of action particularly stand out among the interactions studied in this field (Weible, 2005). Research has successfully investigated the driving forces of these and further relations between actors in certain policy areas. There are insightful results within at least three strands of theory. First, the Advocacy Coalition Framework (ACF) expects supportive interaction between political actors to be driven by shared beliefs (Matti & Sandström, 2013; Weible & Sabatier, 2005). From the point of view of the Resource Dependence Theory (RDT), power matters, and influential actors are more likely to be approached (James & Christopoulos, 2018; Park & Rethemeyer, 2014). Finally, Transaction Cost Economics (TCE) highlight the expense associated with networking activities and point to occasions facilitating initiation and cultivation of contacts (Fischer & Sciarini, 2016; Leifeld & Schneider, 2012). Unfortunately, results of these studies identify different dynamics of network formation at work. This is not necessarily contradictory, as the respective studies are limited to specific political systems and...
policy domains frequently applying further constraints to acquiring sectoral network dynamics. However, which drivers of policy network formation are valid in which context remains a relevant research problem.

This study contributes to this puzzle by studying policy network formation at the local level. Although this does not entail comparing different contexts of application, it provides insights on a new setting, in which the validity of the three competing explanations is uncertain, because they were neither intended for nor tested in this setting. Studies on local communities relying on social network analysis are not new (Hunter, 1953; Laumann & Pappi, 1976). Yet, the interaction of political actors within the formal institutional boundaries of a local council remains a research gap for several reasons. In local politics, place is reassigned a decisive role, because policies are localized and the political arena is no longer bounded by topics or institutional settings, but by the community itself, in which people interact beyond boards and issues (McDonnell, 2020). The role of parties is more ambiguous than in national political systems and assigned offices could pre-structure relationships like those between councilors and the mayor (Lapuente, 2010; Vergani, 2014). Finally, the selected setting is cross-sectoral by nature as local politicians are confronted with a diversity of issues (Mortensen & Seeberg, 2016). All these aspects constitute important differences from the established perspectives on policy networks within policy areas, because they are generally limited to one domain, less bound to institutional roles, and almost always indifferent to a spatial dimension. Explaining the patterns of social interaction in this new context is, therefore, a relevant task. What drives policy network formation at the local level?

To address this question, the study provides insights from a single case study of a German municipality in Lower Saxony. Following a positional boundary specification approach (Laumann, Marsden, & Prensky, 1983), data has been collected among elected councilors including the mayor via an online survey. In particular, local politicians were asked to indicate on a complete list of their colleagues, from whom they receive information on local politics and with whom they coordinate in pursuing their goals. The resulting networks of information and coordination are explained by exponential random graph models applying a Markov Chain Monte Carlo Maximum Likelihood Estimation. This allows to identify the drivers of network formation, while controlling for endogenous dynamics prevalent in social networks. Although the results are not generalizable beyond the case study because of effects at the level of the municipality, they lay the foundations for understanding the specific conditions under which local political actors interact. This way, assumptions of the three rivaling theories on policy network formation are tested in a new environment. Effects of local parties, offices, and issues extend them to gain first insights into how policy networks form at the local level.

**Theories of Policy Network Formation**

Policy networks can be conceived as a representation of relations or interactions between actors in the policy process. The debate on this subject originates in the 1950s in the United States, where close sectoral ties between members of congress, interest groups, and administration were regarded as the common and most successful venue of policy making (Carter, 1964; Lowi, 1969). However, because of their exclusionary character, these subgovernments or “iron triangles” were discussed rather critically (Gais, Peterson, & Walker, 1984). A far more open type of collaboration was sketched
by the notion of issue networks in the 1970s arguing that policy making is open to new participants and that its subject is important (Heclo, 1978). Issue networks form among those involved with a specific policy rather than sector-wide and they form related to a specific cause rather than for an indefinite time. Despite their different views, these contributions all share an interest in understanding how relationships between actors shape the policy process. In the 1990s, the growing manifoldness of network models spurred contributions organizing and structuring the material (Jordan & Schubert, 1992), but it also stimulated critical assessments (Dowding, 1995): Do these networks really make a difference or are they nothing more than illustrative metaphors?

Studies taking up this problem needed to move beyond a conceptual approach and engage with empirical analysis. Tools were available. The methodological strand of research on social network analysis, even going back to the 1930s, provided strategies of inquiry for relational data based on graph theory (Moreno, 1953). While there were important early applications in the field of political networks (Laumann & Pappi, 1976), of which some will be reviewed in the next section, the empirical study of network structures at that time also profited from significant progress in respective techniques (Wasserman & Faust, 1994). Generally, these contributions are able to establish a link between the networks’ structures and their performance in the policy process (Howlett, 2002; Sandström & Carlsson, 2008; Schneider, Scholz, Lubell, Mindruta, & Edwardsen, 2003). This study follows these contributions on policy networks in assuming that they make a difference for the policy process and its outcomes. Yet the research interest here is not how networks shape politics and policies, but in explaining their structure by identifying drivers of their formation. Therefore, the remainder of this section focuses on reviewing theories of policy network formation.

In policy process research, the importance of cooperative or conflictive relations between political actors is highlighted by the ACF providing concepts for grasping and assumptions for understanding them (Sabatier, 1987). Advocacy coalitions consist of actors with shared beliefs on political issues, who coordinate with each other in pursuing their goals (Jenkins-Smith, Nohrstedt, Weible, & Ingold, 2017). They are studied within policy subsystems, which limit the scope of a study by setting boundaries regarding relevant issues and geographical scope (Nohrstedt & Weible, 2010; Weible & Heikkila, 2016), e.g., road safety in Canada. Subsystems are open to a plurality of actors, who vary in their relevance and role in the policy process (Weible & Ingold, 2018). At the same time, subsystems do not include all actors interested in these issues in any way, but only those willing and able to invest resources. These stakeholders, it is assumed, hold different views on the subsystem’s issues captured by the notion of beliefs. Conceptually, beliefs are organized in belief systems, which are differentiated into three types (Jenkins-Smith et al., 2017). Fundamental normative positions on how the world should be are reflected in deep core beliefs, which are expected to be highly stable for actors over time. Positions on the general course regarding certain political issues manifest in policy core beliefs. Finally, secondary beliefs address the instrumental aspect of how to pursue a certain political goal. Advocacy coalitions are expected to reliably concur on policy core beliefs (Sabatier, 1987). This congruence is regarded as more important than shared deep core beliefs, partly because the latter cannot be specified within a subsystem, but also due to issues of measurement (Jenkins-Smith, Silva, Gupta, & Ripberger, 2014). Defining beliefs is a difficult task
and varying solutions may account for inconsistent empirical results (Weible, Ingold, Nohrstedt, Henry, & Jenkins-Smith, 2020).

Building on these foundations, the ACF has provided tools to address critical questions in policy process research, most importantly on policy change (Leifeld, 2013) and policy learning (Bandelow, Vogeler, Hornung, Kuhlmann, & Heidrich, 2019). What is missing in this short overview is the element of coordination among members of an advocacy coalition; the latter is only defined via shared beliefs without considering the equally essential collective action within these groups (Schlager, 1995). This perspective makes the ACF a promising starting point for understanding policy networks. By linking belief systems with actual behavior of political actors within and across coalitions, the first is expected to explain the latter. The ACF would posit that cooperative interaction is higher among those with shared beliefs and that conflictual interaction is higher among those with disparate beliefs. This is regarded as the ACF’s belief homophily hypothesis of policy network formation (Jenkins-Smith et al., 2017).

A rivaling approach toward explaining the formation of policy networks is rooted in management and organizational research. The RDT has taken up the task of understanding relations that businesses build with their environment by considering differences in respective power (Pfeffer & Salancik, 1978). Every company depends on certain resources including funds, facilities and labor, but also raw materials, knowhow and site conditions. Because a single company is unable to acquire all these resources independently, it depends on its environment (Hillman, 2005). A relationship of dependence is characterized by the degree to which a firm has control over resources that another requires. Acknowledging the multiplicity of resources, these relationships are multiplex and dependence can turn out to be interdependence of two companies. At the same time, it has a dimension of power imbalance, which increases with asymmetries in access to resources critical for the other. In such a constellation, organizations will be interested in gaining control over resources by building up relationships; therefore a dependent actor will seek to side with those regarded as being in charge of critical resources in order to reduce uncertainty and ultimately to survive (Casciaro & Piskorski, 2005). There are several subjects explained by this including mergers, joint ventures, and the composition of boards (Hillman, Withers, & Collins, 2009). Although the ACF acknowledges varying resources, it focuses on its assumption that actors hold different beliefs and interact according to them. In contrast, actors within the RDT are rational and vary only in terms of resources. Maximizing the latter, therefore, drives the emergence of organizational networks. This is regarded as the RDT’s power-seeking hypothesis of policy network formation.

There is considerable literature on network analysis, building on and utilized by RDT (Kwak, Feiock, Hawkins, & Lee, 2016; Park & Rethemeyer, 2014), but what is of interest for this study is its utilization for policy networks as an alternative to the ACF’s notion of belief homophily (Weible, 2005). This is not to say that mechanisms identified by these theories need to contradict each other. Both mechanisms could be drivers of the formation of a network, but also none of them. The debate concerning which is empirically valid under which circumstances is far from settled. Without referring to RDT, early attempts toward uncovering the drivers of policy network formation provide evidence that belief homophily is more important than power seeking in cases of Californian marine and Swiss climate policy, although power seeking is also a relevant dynamic subordinated to the ACF (Ingold, 2011; Weible & Sabatier, 2005). These
findings are generally affirmed by research explicitly relying on RDT hypotheses considering cases of Californian regional planning and Swedish carnivore policy assessing the influence of power seeking to be secondary to belief homophily (Henry, 2011), very limited (Matti & Sandström, 2013) or non-existent (Matti & Sandström, 2011).

Moreover, there are also studies backing the RDT to varying degrees. Although perceived influence in Swiss climate policy has no effect, formal power structures are driving collaboration jointly with belief homophily (Ingold & Fischer, 2014). Resources operationalized as access to expertise and external influence are contributing to collaborative interactions in U.S. marine policy, while the same study negates such an influence for shared beliefs (Calanni, Siddiki, Weible, & Leach, 2015). Similarly differentiating, findings on friend-foe interactions point out an influence of organizational resources, but no effects for resources at an individual level (Elgin, 2015). Focusing solely on RDT, policy network formation driven by power seeking has been ascertained in the educational policy of some U.S. states (Park & Rethemeyer, 2014). Regarding collaboration in the U.K. banking reform, there is evidence of both power seeking in terms of influence reputation and belief homophily in terms of preference similarity, driving network formation collaboratively rather than constituting effects contradicting each other (James & Christopoulos, 2018).

There is a third conception of drivers of policy network formation that challenges the reviewed approaches by the notion of efficiency. It takes up assumptions going back to the tradition of TCE, which has largely contributed to an understanding of shifts between modes of competition and hierarchy by pointing out the associated expense (Williamson, 1985). Using markets implies transaction costs. Getting products from one place to another and forming value chains with unknown or potentially unreliable suppliers requires time, expertise, and money. From a network perspective, transaction costs may be regarded as the expenses associated with forming social relationships with others (Feiock, 2007). Of interest for network formation are conditions, which facilitate tie formation and thereby lower the transaction costs. Opportunity structures identify such occasions in which collecting information, monitoring agreements, and building trust is comparatively easier (Leifeld & Schneider, 2012). They can be differentiated in relational, social, and institutional opportunity structures (Fischer & Sciarini, 2016; Laumann & Pappi, 1973), of which only the latter identifies external conditions. Members of committees, who meet each other regularly at a certain time and place for a specific purpose anyway, provide a popular example (Leifeld & Schneider, 2012). Networking becomes easier, because the others are there anyway, which makes it efficient to interact with them. This is regarded as the TCE’s opportunity structures hypothesis of policy network formation.

How much explanatory power is assigned to opportunity structures in empirical studies of policy networks? Their relevance is highlighted in the case of German toxic chemicals policy, explaining information exchange, while no effect is observed for belief homophily (Leifeld & Schneider, 2012). Open venues have been highlighted as contributing to the emergence of dominant coalitions by reducing transaction costs in a study differentiating Swiss decision-making processes on varying issues (Fischer, 2015). However, in the same context, results are mixed regarding the influence of institutional opportunity structures on network formation, which may depend on the relevance of a specific institutional setting for policy outcomes (Fischer & Sciarini, 2016). Effects of co-participation in associations and forums on relationships between
actors have been demonstrated for stakeholders concerned with pollution of the Rhine River (Herzog & Ingold, 2019). Because the characteristics of institutional opportunity structures are a question of definition and operationalization, conceptual progress like the notion of “policy forums” (Fischer & Leifeld, 2015) is helpful to study their effects. Finally, actors may be able to select both: with whom they interact and in which institutional structures they participate. Both processes could be “dynamically coupled” (Hamilton, Lubell, & Namaganda, 2018). Actors and institutions may, therefore, be conceptualized as a bipartite network and studied within the Ecology of Games Framework (Lubell, 2013; Lubell, Scholz, Berardo, & Robins, 2012).

The debate on drivers of policy network formation remains open and ongoing. There is evidence for all the hypotheses discussed in the literature: belief homophily in the ACF, power seeking in the RDT, and opportunity structures in the TCE. These effects do not need to be contradictory, but may be complements in an understanding of policy network formation (James & Christopoulos, 2018). The three theories share an interest in the politically relevant drivers of network dynamics referring to contents of policies and worldviews, to resource-based power structures as well as to institutional contexts of policy making. From a network-analytic point of view, they are also all interested in exogenous factors rather than in dynamics stemming from the network structure itself like Social Capital Theory (Henry, Lubell, & McCoy, 2011).

There are two pathways for further research. One focuses on refining and relating aspects of the different frameworks like different layers in belief systems (Weible et al., 2020), influence associated with institutional roles and structural positions (Ingold & Leifeld, 2016),, and characteristics of institutional opportunity structures (Fischer & Leifeld, 2015). Moreover, a different research strategy may seek to investigate the validity of hypotheses in different empirical settings and contexts. This study mainly follows this second strategy by investigating local politics as an environment of policy network formation. Which hypotheses hold within the boundaries of a municipality? While all theories may possibly shed light on local network formation, answering this question requires considering local politics itself and potential dynamics complementing those developed from the policy network studies.

**A Relational Approach toward Local Politics**

Research on local politics deals with questions on institutions, policies, and political processes under the specific conditions of municipalities. In a local community, participation in politics may be considered easier compared to the increasing professionalization at higher levels like the state. This is sometimes coupled with a strengthened participation of citizens, an attribution of more inclusive and more vivid democracy or with the idea that the municipality is the place to learn democratic politics (McDonnell, 2020). In this context, the role of specific local party structures is of particular interest. Institutional constituents like councils, mayors, and administrations generally comprise new local political systems establishing rules of interactions varying from those of the state. Furthermore, local policies are sometimes regarded as more tangible and factual issues compared to their statewide counterparts. All these topics share a tendency of understanding local politics in analogy to concepts and findings at the national level. Are results from a different context valid for the local level and if not, what is different in local communities?
Although this article does not aim to contribute to all those elaborated strands of research simultaneously, it is suggested that research on local politics would profit from a relational perspective. Local politics may be reflected by the way individual and corporate actors relate to each other while favoring or opposing certain political decisions. Such an approach is highly auspicious for understanding local politics. At the same time, it is not new at all, but was successfully developed half a century ago. It goes back to the relational concept of power, which is interesting in understanding local policy making, because in identifying local leaders and their interactions, one grasps those social relations in which policies evolve and prevail. The term “Community Power Structure” (Hunter, 1953) condenses this idea in a research subject: a relational social structure to identify in a local community to map its politics. Similarly, following attempts to answer the question “Who Governs?” (Dahl, 1961) researchers have focused on influential actors shaping local politics. The critical task of how to identify them became the subject of methodological reflections in the 1970s, highlighting social network analysis as an insightful path of inquiry (Laumann & Pappi, 1973). They go hand in hand with empirical applications of these techniques in studied municipalities. Among them is the German municipality “Altneustadt,” for which the local elite was delineated and studied regarding its relationships and respective influence (Laumann & Pappi, 1976).

Despite the insightful results provided by studies relying on social network analysis and focusing on local communities, there is a shift of attention in the literature in the 1990s. Network studies increasingly focused on delineating their research subject according to policy areas. This coincided with an increasing interest in policy network formation (König & Bräuninger, 1998), which is still influential for the most part of policy network literature. However, there is a critical difference whether a network is delineated according to a political issue or a local community. In order to revitalize a relational approach toward local politics, three prominent subjects of local politics research are briefly reviewed: parties, offices, and issues. All of them comprise a relational dimension, which may contribute to explaining dynamics in local policy making. Respective sets of hypotheses formulate these assumed influences and relate them to the three general hypotheses familiar from literature on policy networks. Like Altneustadt, the case study of this investigation is located in Germany, which makes it helpful to take characteristics of the German local political system into account.

In what way do parties structure and organize local politics? Generally, local political processes may be examined according to whether parties are involved in them (Copus, 2004). Empirical answers naturally vary according to political systems and the different parties within a system. Political subcultures developed by local parties may vary even regionally within the same state for the same party (Vergani, 2014). A relevant related issue is the degree to which local parties resemble a party system at the national level (Kjaer & Elklit, 2010a), and there is evidence that institutional structures are likely to influence the formation of local party systems (Kjaer & Elklit, 2010b). In this context, electoral groups constitute an alternative form of organization limited to the local level. Also referred to as “independent local lists” (Holmmond, 2008) and of increasing relevance in Germany (Angenendt, 2018), scholars are interested in why people vote for them. Finally, local party politics are also studied with a specific focus on their role within the institutional system, especially the council. In the case of Germany, research on coalition formation has recently shown that the
ideological positions of parties are relevant in this process even at the presumably factual-oriented local level (Debus & Gross, 2016).

Against this background of research on local parties, we expect parties to exert an influence on policy network formation at the local level. Parties vary from advocacy coalitions in several respects (Weible & Ingold, 2018), although from a policy-seeking perspective, one would expect members of the same party to share beliefs on local policies. However, they may provide a more formal and more stable strategical alliance structuring interactions in local politics as a dynamic of party homophily. At the same time, belief systems are expected to be relevant for the local level as well given their relevance in policy network studies. Therefore, effects of party membership and of shared beliefs are expressed in a first set of hypotheses. They follow the terminology of social network analysis by differentiating two actors from the perspective of one, i.e., ego, regarding the other, i.e., alter. Forming a tie refers to interacting with each other.

**Hypotheses Set 1: Local Parties and Belief Homophily**

1. If ego and alter are both members of the same local party, they are more likely to form a tie.
2. The less ego and alter vary in their deep core beliefs, the more likely they are to form a tie.
3. The less ego and alter vary in their policy core beliefs, the more likely they are to form a tie.

In Germany as in most cases, local political systems are no states. They do not exert state authority or pass laws, but fulfill certain tasks for the state, although some extent of self-government is generally granted and for German municipalities it is even assured by the constitution. Local politics dealing with these tasks unfold in the interplay of two local institutions. The municipality's council decides on local policies, whereas the administration, which is generally led by the municipality's mayor, organizes and implements these policies. Both institutions receive attention in local politics research. A critical source of the mayors’ legitimacy is through direct elections to office, which has been a popular local constitutional reform (Sweeting & Hambleton, 2020) implemented in German states as well (Wollmann, 2004). However, the mayors’ relations to the council matter and become critical if there are majorities opposing a mayor’s policy program. The same is true for being the head of administration responsible for its efficient work in line with legal requirements. Different patterns of organization and especially bureaucratization are an insightful associated issue of research (Lapuente, 2010). Studies focusing on the role of councilors rather discuss challenges like professionalization and issue overload (Bussu, 2015). Regarding the German councilors, there is evidence that the perception of their role as members of a parliament influences the way in which they control the executive counterpart (Egner, 2014). In the case of municipalities in North Rhine-Westphalia with directly elected mayors, a generally continuing politicization along party lines can be observed (Bottom & Reiser, 2014), which is in line with the strong role of German local parties discussed before.
Again, it is beyond the scope of this paper to portray the debate on council–mayor relations completely. Yet, in light of the debate on policy network formation, local institutional structures identify elected offices associated with certain competencies. Similarly, RDT is pointing to influential positions in corporations (Hillman et al., 2009). A second set of hypotheses, therefore, complements the power-seeking assumption with suggestions of influential positions in local politics. The mayor is an actor in control of critical resources and represents the administration. Chairs representing fractions within a local council similarly constitute an outstanding position. Local offices and power seeking can both reasonably be assumed to drive network formation and are, therefore, subsumed in the following.

**Hypotheses Set 2: Local Offices and Power Seeking**

4. If alter is the municipality’s mayor, ego is more likely to form a tie.
5. If alter is the chair of a political group in the council, ego is more likely to form a tie.
6. If ego regards alter to be influential, ego is more likely to form a tie.

Besides local parties and offices, a third topic interesting for local politics is local agendas. In what way are they different from federal agendas and what does this imply for agenda setting? At first sight, they are different because they are localized: streets, parks, pools, and libraries are built, maintained, and operated at certain places. Public services are provided for specific areas. Even issues like sports, schools, and welfare are to some degree localized in a certain district. This raises questions of local agenda setting. Varying content and extent of local agendas within a state call for explanations, for example, inquiring the role of a local council’s committees in channeling problems (Mortensen & Seeberg, 2016). Similarly, local institutional settings can be considered a factor in policy punctuation for different issue areas (Kwon & Gonzalez-Gorman, 2019). Cross-financing and decision making may pose further dependencies in the German multilevel system (Scheller & Walker, 2017).

Those politically active in a local community will unavoidably be confronted with several issues and need to focus on some of them. Being involved in some issues instead of others may contribute to actors interacting with each other. Similarly, the council’s committees as one of the prominent opportunity structures (Fischer & Sciarini, 2016) are organized according to local issues and can be expected to facilitate interaction. Furthermore, in some political systems there is another opportunity structure specific to the local level. If districts elect local councils dealing with issues concerning the district only, they provide a subsystem occasion for interaction, which could be relevant for network formation. All three assumptions are collected in a third set of hypotheses on local issues and (local) opportunity structures.

**Hypotheses Set 3: Local Issues and Opportunity Structures**

7. The more local policies ego and alter both work on, the more likely they are to form a tie.
8. The more committees ego and alter both sit on, the more likely they are to form a tie.
9. If ego and alter both sit on the same local council, they are more likely to form a tie.

It is important to note that all hypotheses are formulated in a general expression of policy networks at the local level in Germany without a specification of actors or interactions to observe in such a network. Because hypothetically it is possible that all factors explain some part of dynamics of local network formation, explanations do not contradict each other. The remaining part of this study first introduces the German case study including definitions of nodes (the actors) and edges (the interactions) as well as an operationalization of the applied concepts. Subsequently, hypotheses are tested for the case and results are discussed regarding their implications for both the insights a network analytic approach provides to grasp local politics and the insights this environment opens up on policy network formation.

Case, Data, and Methods

The developed hypotheses are investigated for social networks among local politicians in a single case study of a municipality in Lower Saxony, Germany. In order to ensure the anonymity of individuals, who have participated in the inquiry, the municipality is given the pseudonym Trielingerholz. It has between 5,000 and 20,000 inhabitants and thereby falls in the classification range of a small city. Most neighboring municipalities are smaller or of a similar size as Trielingerholz, but there is also a significantly larger and economically more important municipality close by. The council of Trielingerholz consists of 26 councilors elected in the Lower Saxonian local election of September 2016, plus the mayor being a member ex officio. There are two parties A and B and one electoral group C represented in the council. There are also further parties with only a small number of representatives below the threshold for forming a fraction. The parliamentary groups of party A and party B hold a majority of seats in the council enabling them to outvote the electoral group C. The council of Trielingerholz has organized work in committees dealing with common local policies like municipal development, schooling, sports, and the local fire brigade. Trielingerholz consists of several districts and each of them has its own local council. These local councils have a budget and hold decision-making competences regarding those issues, which are limited to their jurisdictions and for which neither council nor mayor are responsible. Vague specifications regarding the number of parties, committees, and local councils contribute to the protection of anonymity.

The first step in gathering relational data on social interactions consists in the question of who is actually part of the network. This is known as boundary specification problem (Laumann et al., 1983) and is solved by either setting criteria on who to include or by developing such criteria during data collection, for instance by asking respondents who they regard as relevant. Rather than using such a reputational approach, this study follows the former strategy known as the positional approach. Accordingly, a member of the local policy network investigated in this study is defined as a member of the council. This has several methodological advantages. There is a full list of network actors available. Avoiding snowball sampling allows for a coherent and standardized cross-sectional collection of data. Furthermore, due to
their public role, critical information on network actors is publicly available. However, there are also risks involved in this approach. It comes at the cost of ignoring latent stakeholders, which could potentially be influential in shaping local policy processes. It would also be preferable to include those involved in businesses and civil society, which are regarded as relevant stakeholders in classical studies on local elites (Dahl, 1961). Nonetheless, a boundary specification resting on council membership is justified at least as a first step toward a relational inquiry of local politics. All participants are elected representatives of their municipality. This makes them very likely to be an active part of the community taking a stance on public issues and engaging in local projects and initiatives. They are also the final authority of decision making in local policy making.

The other decisive issue in social network analysis involves specifying the type of interaction or defining the network’s edges. The study focuses on information and coordination networks, which have proven highly insightful in previous studies (Leifeld & Schneider, 2012; Matti & Sandström, 2011). On the one hand, an information network maps relations of persons communicating with each other and exchanging information. Because knowledge on relevant issues can be critical in politics, the flow of information between actors involved in policy making is highly interesting. Exchanging such knowledge and views on an issue can, therefore, be regarded as a cooperative relationship. A coordination network, on the other hand, displays relations of actors coordinating their course of action with each other in order to maximize their effect regarding a certain goal. Although it may be evident, it is important to notice that such an alignment of strategies equally constitutes a cooperative interaction as coordination sometimes signifies interactions more generally. Yet, the degree of cooperation varies between information and coordination networks. The first is a weaker, less demanding type, while the latter requires a closer, trust-based relationship. Actors are expected to share information more generously, while coordinating political action rather restrictively. Combined, both types of network can resemble dynamics of a policy process more comprehensively (Weible, 2005). Furthermore, both networks address real interactions, not mere evaluations of relations. Because respondents are asked to remember their actions rather than assessing relationships based on general impressions, validity of data is expected to be higher compared to cases like ally networks (Weible & Sabatier, 2005). Finally, as both interactions are continuously applied in recent studies in policy analysis and public administration (Hegele, 2018; Parsons, 2020), this choice enhances the compatibility of results.

Data collection was carried out by an online survey conducted among the 27 members of the council of Trielingerholz in 2018. During the survey period of 24 days, respondents were given online access to the German questionnaire and were reminded twice via email. Of the 27 members of the council, 15 participated in the survey (56%). Given that questions collecting network data ask for sensitive information in a time-consuming way, the response rate is comparatively satisfactory. At the same time, most techniques of social network analysis require full network information. Although there are strategies to deal with missing data like symmetrization and imputation (Koskinen, Robins, Wang, & Pattison, 2013), it is not ensured that requirements are met in this case. The small number of nodes provides only limited material, making it risky to infer characteristics of unobserved nodes from those available. Similarly, symmetrization is no solution, because information flows
can be unidirectional and coordination attempts can be one-sided as well. However, as important variables are fully captured by the observed data, all network information is truncated to the 15 respondents in the dataset.

The information and coordination networks of the council members of Trielingerholz constitute the two dependent variables of the network analysis. The information network is operationalized by asking respondents to indicate on a complete list of their colleagues, from whom they receive information. The coordination network, on the other hand, resulted from the respondents indicating on a complete list of council members, with whom they coordinate to pursue their goals in local politics. Both networks exhibit directed and dichotomous edges, because the relation is assessed by one councilor regarding another and either confirmed or denied. In a graph, this is represented by present or absent arrows. Data on several further variables have been recorded either by manual coding from public sources or by a corresponding survey question. The node attribute party contains the respondent’s party affiliation for parties A and B and electoral group C. Other parties are not represented in the dataset. The node attribute mayor indicates the mayor of Trielingerholz and chairs of the council’s fractions are identified by chair. Each councilor sits on one or more committees dealing with specific policy areas. Membership count varies between one and three. The variable shared committees constructs a network covariate relating all participants according to the number of committees they have in common. It is represented by the undirected valued edge between ego and alter realizing values of zero, one, or two. Likewise, the membership of councilors in one of the local councils is recorded. The network shared local evaluates every dyad, i.e., each pair of participants, according to their joint membership in a local council. This information is dichotomous, because each councilor can belong to one local council.

Belief systems were differentiated only for policy core and deep core beliefs without capturing secondary beliefs as they are assumed to be less stable and more specific to the selected subsystems (Weible et al., 2020). Policy core beliefs are studied for three selected issue areas central to a sustainable development of Trielingerholz. Respondents were asked to position themselves regarding conflictual policy choices on a five-point spectrum ranging from in favor of A to in favor of B, with somewhat in favor of A/B and neither nor as intermediate steps. The studied policy preferences were (a) building new houses vs. preserve open spaces, (b) motorized private transport vs. bikes and public transport, and (c) prevent local wind and biogas plants vs. support local renewable energy production. The network covariate policy core distance displays the sum of the absolute values of the differences between ego and alter on the policies. Each difference ranges from zero to four, whereby the indicator can realize values between zero (perfect agreement) and twelve (maximum distance).

Following recent suggestions of ACF literature (Jenkins-Smith et al., 2014; Ripberger, Gupta, Silva, & Jenkins-Smith, 2014), deep core beliefs are conceptualized by relying on four general cultural worldviews developed by Cultural Theory (Douglas & Wildavsky, 1982). Derived from positive vs. negative evaluations of “group” affiliation and “grid” structures differentiating social roles, they differentiate hierarchist, egalitarian, individualist, and fatalist worldviews. Instead of capturing their elements in several items, we operationalize them in combined statements (Trousslet, Gupta, Jenkins-Smith, Silva, & Herron, 2015). The four worldview statements utilized also
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rely on previous work on indicators integrating most of the aspects covered by them (Ripberger et al., 2014; Wildavsky & Dake, 1990). Respondents were provided a numerical 5-point scale ranging from “do not agree at all” to “agree completely” to position themselves regarding each worldview. Again, data are organized as network covariate. Deep core distance equals the sum of the absolute values of the differences between ego and alter on worldviews with zero indicating identical worldviews. A maximum of 16 is only realized by opposite scores of ego and alter for all worldviews implying polarized positions on a single dimension, e.g., egalitarian-individualist vs. hierarchist–fatalist for grid.

The respective focus of the local political work of each councilor is identified by the respondents’ self-assessment of being involved in local issue areas. For each of ten presented local issues, they were asked to state whether they had been involved in it within the last 6 months. The network covariate shared issues sums up the policy areas for which both respondents in a dyad gave a positive answer. This undirected valued edge, therefore, potentially realizes values between zero and ten, although empirically no councilor was involved in more than eight topics. Finally, an influence reputation network has been part of the survey operationalized by asking respondents to indicate on a complete list, who they regard as influential. The resulting directed and dichotomous network is considered as a network covariate indicating the reputation attributed to alter by ego.

Explaining network formation has recently relied on methodological advances in inferential network analysis (Cranmer, Leifeld, McClurg, & Rolfe, 2017), most importantly regarding exponential random graph models (ERGM). In a network, the assumption of independence of observations is violated by definition, because relations between elements constitute the network in the first place. This limits applicability of conventional statistical techniques like regression models (Cranmer & Desmarais, 2011). To address this problem, the ERGM departs from explaining attributes of individual observations by other attributes and instead seeks to understand network structures by allowing for inference on the network generating process (Lusher, Koskinen, & Robins, 2013). This is achieved by modeling exogenous and endogenous network effects. Exogenous effects are observed in addition to the network structure. They may be based on node attributes of ego, alter or both nodes of a dyad, but they may also be based on networks providing an additional relational information for every dyad of the observed network. Endogenous effects are based on assumptions concerning dynamics within a given network assessing effects of given or absent edges on network formation. Common endogenous effects include activity (initiating ties, e.g., outgoing people), popularity (receiving ties, e.g., esteemed people), reciprocity (returning ties, e.g., favors), and triadic closure (ties resulting from shared ties with a third party, e.g., a friend of a friend is a friend). Although these effects allow for operationalization of relevant concepts like trust (Berardo & Scholz, 2010; Henry et al., 2011), they are not the focus of this article. Controlling for them ensures that the exogenous drivers are not concealing dynamics within the network.

An ERGM takes the following general form (Cranmer et al., 2017, p. 240):

$$ P(N, \theta) = \frac{\exp \{ \theta^t h(N) \}}{\sum_{N^* \in \mathcal{N}} \exp \{ \theta^t h(N^*) \}} $$
where $N$ is the observed network, $\mathcal{N}$ is the universe of potential permutations of $N$ with constant node count, $h(N)$ signifies a vector of network statistics of $N$, for example, the edge count, and $\theta$ refers to a corresponding vector of unknown parameters for weighting $h(N)$. As the model has only one observed network available, it requires alternatives against which it can estimate coefficients. This is achieved by simulating a high number of networks from all possible networks with the same amount of nodes. Because this universe is very large also for small numbers of nodes, the limited number of cases in this study does not restrict the model’s applicability. In any random graph, edges may be changed by an algorithm according to selected network statistics in $h(N)$. These statistics operationalize theories of network formation and are available for the observed network, which allows for an approximation of the simulated ones. By iteratively sampling from the resulting distribution it becomes possible to estimate $\theta$. In this study, ERGMs are estimated according to the Markov Chain Monte Carlo Maximum Likelihood Estimation (MCMC-MLE). This includes the risk that simulations are led astray by the network-generating algorithm resulting in model degeneracy. However, degeneracy would point at deficiently specified models and, therefore, call for an improvement by theoretical reconsideration. ERGMs are estimated in R (R Core Team, 2019) relying on the packages statnet (Handcock et al., 2018; Hunter, Handcock, Butts, Goodreau, & Morris, 2008) and btergm (Leifeld, Cranmer, & Desmarais, 2018), while visualization is carried out in ggplot2 (Wickham, 2016) utilizing GGally (Schloerke et al., 2018). Multicollinearity is assessed by a variance inflation factor calculated from ERGM parameters (Duxbury, 2018).

Results

Before studying drivers of network formation, a brief characterization of both networks of interest in Table 1 provides an overview on the empirical subjects. There is no difference in the number of nodes, because all respondents answered both questions and no one dropped out of the survey between them. The information network has a slightly higher edge count, which is in line with the assumption that sharing information is less conditional than coordinating strategies. This is reflected in the density, which reports the proportion of realized edges in a network. The dyadic reciprocity shows the proportion of mutual ties, i.e., those cases in which a pair of respondents name each other in a network question. It is higher for the coordination network, which is plausible, because adjusting actions should generally include both participants. In the case of information, it is plausible that one councilor is the source, while another is the receiver. However, information also flows in both directions quite frequently. Both networks are visualized in Figures 1 and 2, highlighting the respondents’ party affiliation and identifying the mayor.

Table 1. Descriptive Statistics for the Information and Coordination Networks

|                  | Information | Coordination |
|------------------|-------------|--------------|
| Node count       | 15          | 15           |
| Edge count       | 91          | 78           |
| Network density  | 0.43        | 0.37         |
| Dyadic reciprocity | 0.57      | 0.71         |
To understand the formation of information and coordination networks among the councilors of Trielingerholz, we estimate an ERGM for each network, respectively. Although this study has formulated hypotheses on exogenous effects, the following endogenous effects are included to control for these dynamics of social network formation: edges and reciprocity, as well as geometrically weighted popularity, activity, two paths, and triadic closure. On the one hand, hypotheses are operationalized by edge covariates for deep core distance, policy core distance, reputation, shared issues, shared committees, and shared local. On the other hand, node attributes are utilized for operationalization including popularity effects for mayor and chair as well as a homophily term for parties. The latter is controlled for by popularity and activity effects for the two smaller parties A and C compared to the base B. Both MCMC-MLE converge twice within three iterations for the information and within two iterations for the coordination network. The models’ results are displayed in Table 2. By exponentiating coefficients, it is possible to interpret them as odds ratios. Values above one indicate that the tie formation is more likely under the condition specified by the term, while values below one show a reduced chance of tie formation. There are no serious indications of model degeneracy in either case. The goodness of fit suggests that simulated networks represent the empirical ones satisfactorily, although one may observe minor deficits for capturing out-degree in the information network. A test for multicollinearity, which could be suspected for local party affiliations and belief distances, yields unobtrusive results for all terms. All diagnostics are available in the Online Appendix.

Regarding the first set of hypotheses on local parties and belief homophily, we find evidence for party membership being an important driver of network formation, whereas there is no evidence for an effect of belief homophily. Hypothesis 1 is
supported by both models. Ego is more likely to refer to alter as a source of information by the factor 13, if both are members of the same party. As described above, this is calculated as $\exp(2.54) = 12.68$. Although this is a notable effect, it is considerably stronger for coordination. Here, shared party membership increases chances that ego coordinates political activities with alter by the factor 81. However, policy network formation in the council of Trielingerholz provides no evidence for the ACF’s notion of belief homophily. For hypothesis 2, which assumes deep core beliefs to structure social networks, no evidence is found for information and coordination. Similarly, both models do not observe significant effects for homophily in terms of policy core beliefs as presumed by hypothesis 3. Local parties matter, but belief homophily cannot be substantiated.

The second set of hypotheses has suggested local offices and power seeking dynamics as drivers of policy network formation. Whereas reputation in the form of attributed influence is a strong predictor of tie formation, no such effects can be shown for local offices with an important exception. The mayor of Trielingerholz is at the heart of coordinative efforts of councilors. If alter is the mayor, the chance that ego seeks to coordinate with alter is enhanced by the factor 26. This confirms hypothesis 4 in terms of coordination. The picture varies, when looking at information exchange. Here, no significant effect is observed for the mayor. Hypothesis 5, attributing a prominent role to the chairs of the fractions, is also not confirmed. It can neither be stated that they are more likely to be regarded as a source of information, nor that they are more appealing in terms of coordination. Notwithstanding these inquiries for specific local offices, the proposition of the RDT that influence is a driver of network formation is confirmed. Significant effects are observed for hypothesis 6. If ego regards alter to be influential, the chances of forming an information tie rise by the factor 24. The same holds for the
coordination network, although the chances for tie formation are enhanced only by the factor 10 in this model. Reputation is confirmed as a critical factor, but among the local offices only the mayor is relevant and only in terms of coordination.

Finally, assumptions formulated by the hypotheses set on local issues and opportunity structures are not confirmed for local issues, but provide evidence for an effect of one of the two studied opportunity structures. Hypothesis 7, which assumes that tie formation is driven by joint involvement in local issues, cannot be confirmed by the analysis. There is no evidence that ego and alter are more likely to form a tie the more subjects of local politics they have in common. Among the opportunity structures investigated, the membership in the council’s committees does reflect topical organization of local politics and as for hypothesis 7, there is no evidence that could substantiate hypothesis 8. It cannot be stated that two councilors are more likely to exchange information or to coordinate activities the more committees they both sit on. Results are different for the local councils, the opportunity structure specific to local politics as a localized subsystem institution. In the case of joint membership, a positive significant effect is observed as expected by hypothesis 9. If ego and alter both sit on the local council of their district, the chances that ego regards alter a source of information are enhanced by the factor 5. A similar effect is observed for coordination, making tie formation more likely by the factor 4. Neither issues nor committees drive network formation, but local councils do.

**Discussion**

The study of policy network formation among the councilors of Trielingerholz has provided first results contributing to an understanding of policy networks in local
politics. Several restrictions apply in interpreting them. First, although it is reasonable that the observed dynamics possess some validity for similar municipalities in Lower Saxony, no generalization is possible based on Trielingerholz. Furthermore, although the response rate of 56% is substantial for a standardized survey including network questions, it is obviously not perfect, imposing internal restrictions on conclusions based on the results. We can only study the network-generating process observed. However, those variables for which specific cases are inevitable, like mayor or chair, capture them. Those variables for which distributions of respondents can be compared with the council’s population like party, shared committees, or shared local, capture the respective empirical pictures well, although the largest party is somewhat underrepresented.

The study does not provide evidence for belief homophily being a driver of local policy network formation. Neither the conceptual differentiation in deep core vs. policy core nor the differentiation of the dependent networks in information vs. coordination indicate such an effect. The results for the local case call the ACF’s main hypothesis on network formation into question. While this is in line with some findings on national subsystems (Leifeld & Schneider, 2012), it also poses a difference to studies backing belief homophily in that context (Henry, 2011; Matti & Sandström, 2013). These findings may be associated with the presumably less conflictual character of the local political context not as organized along ideological lines as national policy domains. From this point of view, results would also back findings that effects of belief homophily are pronounced in conflictual environments, while they are less relevant in consensual contexts (Gronow, Wagner, & Ylä-Anttila, 2020). In this respect, the local community of Trielingerholz may share attributes with groups formalized as agreed upon partnerships, in which the ACF similarly lacks explanatory capacity (Calanni et al., 2015). At the same time, a politicized local context, in which beliefs are highly polarized, e.g., because of an infrastructure project, could bring back in belief homophily (Elgin, 2015; Vogeler & Bandelow, 2018).

Regarding the role of local parties in Germany, the study shows that party membership matters when approaching others for information or coordination. The effect is stronger for the latter, underlining different degrees of cooperation associated with both kinds of interaction. These results strengthen studies portraying local politics in Germany as a rather politicized field (Bottom & Reiser, 2014; Debus & Gross, 2016), in which parties take over a crucial role in structuring policy processes. Do parties simply substitute belief systems? Not necessarily. Understanding a party as a group of people with the same political beliefs is a reasonable conception, but it is similarly plausible to understand a party as an opportunity structure. More research is needed to address such an ambiguous role of local parties.

The case study has further provided evidence for an influence of power-seeking dynamics in local information and coordination networks, highlighting the effects of varying resources as suggested by the RDT. This backs findings pointing to such a driver in financial and educational policy (James & Christopoulos, 2018; Park & Rethemeyer, 2014). These environments may be regarded conflictual, but they are also characterized by a scarcity of resources, while divergent results on perceived influence in climate policy (Ingold & Fischer, 2014) would strengthen the reasoning that belief homophily prevails over perceived influence in conflictual settings.
As the covariate edges and the dependent network are collected subsequently in the online survey, results need to be evaluated with some caution regarding survey design, although there are no indications for any question order effects.

There is no support for the assumption that chairs pose resourceful alters with whom to interact. The mayor, however, has a special role regarding coordination of activities. This highlights a difference in the patterns of the information and coordination networks. The mayor does not fulfill the role as the main communicator of local politics, but councilors have a tendency to seek mutual understanding with the head of administration. Regarding council–mayor relations (Bussu, 2015; Egner, 2014; Lapuente, 2010), this draws a rather cooperative picture pointing to a strong position of the mayor within the municipality. While this may be regarded in line with a coordinating role of officials in consensual contexts (Gronow et al., 2020), such an interpretation has its limits, because the effect of party homophily for coordination is still higher than the popularity effect of the mayor. Moreover, this underlines that both parties and mayor, matter for coordination in local politics in Germany, thereby resembling results for coalition formation in the same context (Debus & Gross, 2016). In addition to the above-mentioned support for previous research strengthening RDT perspectives, the results for the mayor also provide evidence for studies, which emphasize the effect of formal over perceived power structures (Elgin, 2015; Ingold & Fischer, 2014).

Finally, the results do not substantiate expectations regarding a structuring effect of issues on local policy networks. There is no evidence that councilors are any more likely to interact with those colleagues working on the same issues. With regard to opportunity structures, the results do not support the conventional case of committees, but provide evidence for a localized version specific to the local level. On the one hand, neither information nor coordination is more likely among councilors sitting on the same committees. This is somewhat in line with recent studies in different contexts offering mixed findings for institutional opportunity structures rather than a clear confirmation of their influence (Fischer & Sciarini, 2016). On the other hand, this case study highlights effects that local councils exert on network formation. In both models, the influence is small but significant. These findings provide support for recent efforts to distinguish policy forums above and below the actor’s level of action (Hamilton et al., 2018). Subsystem opportunity structures matter and are associated with spatial proximity in Trielingerholz. There may be further occasions of interaction relevant for local politics, which still need to be addressed.

**Conclusion**

This study has combined strands of research from policy networks and local politics to develop a relational approach toward local politics. What drives policy network formation at the local level? The article has tested nine hypotheses for a municipality in Lower Saxony, Germany, collecting data via an online survey among local politicians. Interactions of interest have been defined as information and coordination. Actors being part of the network have been limited to members of the municipality’s council. Results show that party membership is relevant for forming ties of information and coordination in the studied municipality. For the mayor popularity effects can be
shown for coordination, but not for information. Regarding the applicability of theories of policy network formation at the local level, the assumption by the RDT that perceived influence of alter enhances chances that ego seeks interaction is substantiated in both models. Although the role of opportunity structures derived from TCE is not confirmed for committees, local councils constitute a subsystem institution exerting a minor, but significant influence. Lacking evidence in support of belief homophily may indicate a limited applicability of the ACF at the local level. However, these results are limited to Trielingerholz, do not undermine insights provided for subsystems at the national level and need to be substantiated for local politics.

Further research is needed in several respects. A verification of results in further case studies would allow for a stepwise generalization of these insights and enable scholars to address municipality-level effects like size, dominant issues, or constitutional specifications. A comparative perspective would also be valuable across different contexts of policy network formation to investigate systematically why the explanatory capacity of theories varies over settings. In addition, methodological challenges include raising the response rate and verifying effects for issues and policy core beliefs making sure that their operationalization captures discourses and viewpoints at stake in the studied municipality. Regarding parties, their role as a community of faith vs. a formalized opportunity structure needs further inquiry. The role of mayors is likely to be determined by personal as well as by institutional factors. Finally, local councils may not be the only relevant opportunity structure. In-depth studies could consider further occasions: the local pub, the sports club, or the parish council.

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