Schwerpunkt: Contested Public Organizations

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The Organizational Interface of Science and Politics

Towards a Conceptual Framework

Abstract

Ever since the Enlightenment, „science has been associated with an ideal of speaking truth to power" (*T. M. Porter* 2006, p. 1288). Even more so today, in the face of 'Grand Societal Challenges' and 'Wicked Problems', scientific expertise seems to be an increasingly essential asset to modern politics. But in spite of extensive social scientific research on the matter, the question remains: How should we conceptualize this 'speaking truth to power'? The paper contributes to tackling precisely this research question. A conceptual framework is outlined, which explores approaching the question via *the organizational interface of politics and its knowledge-relevant environment*. By focusing on the specific instances and diverse organizational forms that process this science-politics interface, the article aims at contributing to substantiate and understand the genuinely political relevance of scientific expertise.

Key words: 'Scientization', scientific expertise, political decision-making, science-politics interface, organizational analysis

Zusammenfassung

Organisationen als Schnittstelle zwischen Politik und Wissenschaft. Vorschlag eines analytischen Rahmenprogramms

Spätestens seit der Aufklärung des 18. Jahrhunderts wird der Wissenschaft das Ideal von „speaking truth to power" (*Porter* 2006, p.1288) zugeschrieben. Eine Assoziation, welche gerade unter dem gegenwärtigen Eindruck von ‚Grand Societal Challenges' und ‚Wicked Problems' für die moderne Politik, die scheinbar mehr denn je auf wissenschaftliche Expertise angewiesen ist, erneut an Aktualität gewinnt. Doch trotz umfassender sozialwissenschaftlicher Auseinandersetzung mit dem Thema bleibt die Frage nach einer aufschlussreichen Konzeptualisierung dieses ‚speaking truth to power' soziologisch weiterhin umstritten. Der vorliegende Artikel möchte zur Beantwortung eben jener Frage beitragen. Dazu wird ein analytisches Rahmenprogramms skizziert, welches die Organisationen an der Schnittstelle von Politik und ihrer wissensrelevanten Umwelt in den Blick nimmt: Über das Studium der konkreten Instanzen und spezifischen organisationalen Konstellationen, welche die Kopplung von Wissenschaft und Politik steuern, möchte der Artikel zum Verständnis der genuin politischen Bedeutung wissenschaftlicher Expertise beitragen.

Schlagworte: Verwissenschaftlichung, wissenschaftliche Expertise, politische Entscheidungsprozesse, Organisationsanalyse

1   Introduction: The 'Scientization' of Modern Politics?

„From reports on the growth and changing character of contemporary knowledge, it is argued that we live in a 'knowledgeable society' [...]. There is increased application of scientific criteria for policy determination at the expense of the usual short-term political criteria and ideological thinking as well" (*Lane* 1966, p. 649).

What *Robert Lane* suggested half a century ago is regaining considerable momentum with regard to the characterization of society today: The 'scientization' of modern politics. Providing a seemingly objective foundation to highly complex problems, scientific research is seen and promoted as „the engine of necessary political change" (*Sarewitz* in: *Carrier/Nordmann* 2011, p. 303). Given the incremental employment of scientific advisors, experts and consultants, the growing number of commissions, independent agencies and think tanks, and the significant prominence of surveys and statistics in contemporary political decision-making, the conclusion that scientific expertise is gaining increasing political relevance in modern society does indeed seem fairly plausible.

But what exactly does this imply? How is political decision-making transforming in the wake of the revived 'knowledge society'? How, in short, can we (re)conceptualize this „speaking truth to power" (*T. M. Porter* 2006, p. 1288) in a sociologically meaningful manner? While we have come a long way since *Lane's* technocratic vision of a progressively science-based and consequentially rationalized society, moving away from a linear model towards more sophisticated approaches, it is argued here that the social-scientific comprehension of this notion of 'scientized' politics remains largely controversial even within recent sociological scholarship (II). This paper aims at contributing to understanding the particular implications and consequences of the 'scientization' of politics by developing a framework for the systematic analysis of the science-politics linkage via its organizational interface. The underlying argument will be twofold.

Firstly, I want to suggest approaching the problem of conceptualizing scientized political decision-making via the analysis of the organizational interface of science and politics (3.1). Choosing a systems-theoretical approach, both 'science' and 'politics' are conceived of as two societal spheres, confined by different modes of operation (c.f., *Luhmann* 2013). Following this line of reasoning, it is argued that a 'scientization' of politics implies a somehow intensifying entanglement or linkage of both societal spheres[1]. Thus, the question of the potentially increasing political relevance of scientific expertise essentially turns into a question of the forms and specificity of this science-politics linkage: How, in other words, is this interface as a site of inter-systemic linkage concretely processed? Therefore, an analytical framework is aimed at, which distinguishes politically relevant organizations regarding their mechanisms of linking scientific expertise to the political decision-making process, providing both a relational as well as an organizational perspective on the phenomenon.

Secondly, I want to argue for a problem-oriented approach (3.2). Based on the observation that modern politics is inherently pluralized – composed of a profoundly heterogeneous system of global governance (*Stichweh* 2015, p. 46) – it is argued that sound analysis of its 'scientization' requires systematic observation of the knowledge-relevant environment of politics: All types of institutional arrangements that process this multifunctional landscape of political decision-making shall be considered. Regarding the empirical

access, I consequently want to suggest 'following a problem' (*Kaldewey/Russ/Schubert* 2015) through the political decision-making process.

   The article is structured as follows: Building on existing sociological scholarship on the science-politics relationship in modern society, elaborated in II, a conceptual framework for analyzing the organizational interface of science and politics is presented in III. In this context the article will suggest both how to theoretically devise (3.1) and how to empirically study (3.2) this organized interface between science and politics.

2   The Science-Politics Relationship: Prevailing Theories

Within sociological research, discussions on the role of science for political decision-making look back on a long-standing history. The topic was discussed under a wide range of labels, each emphasizing different facets of the topic. Originating in controversies on the prospects of a technocracy or expertocracy in the 1960s *(Bell 1973; Habermas 1968; Lane 1966; Schelsky 1965; Touraine 1972)*, the discussion stressed the decline of the normative-political in favor of a progressive rationalization of politics (*Lane* 1966) and a general 'scientization' of civilization (*Schelsky* 1961). This prospect rendered the question of political legitimacy obsolete: science and technology would govern society based on their functionality (*Bogner/Menz* 2002, p. 388).

   More recent analyses on the impact of scientific expertise within politics can be read as a critical response to these technocratic approaches, dismissing the largely positivistic and instrumentalist tone of the early discussions. Taking a decidedly critical stance, these scholars in turn raise crucial questions on the potentially contradictory relationship of science and politics (*Bogner/Menz* 2002; *Bogner/Torgersen* 2005; *Boswell* 2008, 2012; *Haas* 1992; *Maasen/Weingart* 2006; *McCright/Dunlap* 2011; *Pielke* 2013). One important theme within recent studies is the conflicting source of political legitimacy regarding expertise and democracy, taken up quite prevalently within Science and Technology Studies (STS) (*Brown* 2009; *Brown/Lentsch/Weingart* 2005; *Jasanoff* 2005). Most notably, *Sheila Jasanoff* is playing an important role in exploring this tension between legitimacy through representation (vested in democratic elections) opposed to legitimacy through expertise (vested in authoritative knowledge-claims) (*Jasanoff* 1990, 2005). The ambiguous role of the expert is critically illuminated by a number of influential scholars in this context (*Brown* 2009; *Jasanoff* 1990; *Pielke* 2013).

   A rather different but equally insightful reading of the 'scientization' of modern politics is provided by recent governance research that points to the possibility of 'cognitive-' or 'smart governance' mechanisms, exploring the learning aptitude of modern political systems (*Folke/Schuppert/Voßkuhle* 2008; *Haas/Haas* 1995; *Strulik* 2008; *Willke* 2009). Instead of focusing on the political relevance of 'objectified' knowledge, such as expertise or scientific studies, the authors probe the general responsiveness of political structures and processes as regards the knowledge-relevant environment of politics.

   Finally, we can resort to studies critically inquiring into 'knowledge utilization' in policymaking. This strand of research originally emerged from the sociology of knowledge transfer in the 1970s, dismissing early instrumentalist accounts and pointing to the shortcomings of approaches solely ascribing a problem-solving function to scientific expertise within policy making (*Nelkin* 1975; *Weiss* 1977, 1979).[2] However, even within these more critical accounts, the idea that scientific expertise necessarily functions in a

policy-informing manner is still dominating the debate (*Boswell* 2012, p. 9). *Boswell*, and this is especially significant to the differentiation-theoretical approach of this paper, rightly points out that, despite these efforts to recognize symbolic or strategic functions of knowledge in politics, there is still a crucial „lack of systematic empirical research exploring [.] alternative functions of knowledge" (*Boswell* 2012, p. 9), as well as convincing theories on the topic, which study the specific conditions of these various functions.

Summing up, it becomes evident that while coming from largely linear and positivistic accounts of the science-politics relation in the 1960s, today we have successfully arrived at an increased social scientific awareness of „the social construction of the science-politics interface, its historical contingency, local specificity and transformation" (*Jung/ Korinek/Straßheim* 2014, p. 1). Building on precisely this constructivist stance over the social contingency of the science-politics interface, the framework developed in this contribution aims at answering to the deficit of a systematic empirical analysis as observed by *Boswell* (2012, p. 9).

3   The Organizational Interface of Science and Politics: Towards an Analytical Framework

3.1 Devising the Interface

The framework outlined and explored in this paper will draw on insights from differentiation and communication theory, fruitfully adding to the existing research on the topic presented above *(*c.f., *Luhmann* 1987*)*. The central analytical concept in this context – the organizational interface of science and politics – will be established by (1.) conceptualizing the interface as a site of inter-systemic linkage and (2.) approaching the analysis of this inter-systemic linkage via its organization(s).

1. The Interface as a Site of Inter-Systemic Linkage
To begin with, by choosing a perspective of communication- and differentiation-theory the plurality of politics can be explained by the functional differentiation of modern society (*Luhmann* 2013, p. 87): Science and politics are established and defined by their societal functioning and not for example by specific personnel (such as 'scientists' and 'politicians') or a definite geographical location (such as the White House or Reichstag) (*Luhmann* 2013, p. 87f.). Following this perspective, the increasing differentiation of modern politics goes hand in hand with intensifying interdependence and 'entanglement' with its societal environment (*Luhmann* 2013, p. 100). In essence, modern politics is highly specialized and, as a result, increasingly interdependent: It presupposes economic liquidity, operates according to a legal framework, is observed by the media, dependent on well-educated personnel and so forth – all the while being (functionally) autonomous and consequently not able to access and determine these parameters directly: „In an emergency, no system can step in for another even in a supportive or supplementary capacity. In the event of a government crisis, science cannot help out with truths" (*Luhmann* 2013, p. 99). Accordingly, a 'scientization' of politics denotes an intensifying entanglement of both societal spheres.

2. Accessing the Interface via its Organization

While various starting points are possible – informal personal networks, specific forms of interaction (such as Congressional hearings), commissioned studies and so forth – this paper explores the option of accessing the conceptualized interface of science and politics via its organization(s). This particular access seems meaningful for several reasons. Following *Luhmann* (2013, p. 142), organizations can be defined as social systems based on the operational basis of decisions. The rationale underlying this seemingly unnecessarily abstract concept of organizations is to avoid essentialist definitions of what something (in this case an organization) is. As such a perspective is necessarily dependent on the respective observer, and it tends to lead to infusible conflict regarding the fundamental essence of the observed instance (*Luhmann* 2011, p. 45). Instead, the theory of autopoietic systems asks for how the system observed – here: the organization – is reproducing itself. And regarding organizations, the answer is: they „produce decisions from decisions, and are in that sense operationally closed systems" (*Luhmann* 2013, p. 142). In this sense, we can distinguish organizations such as universities, political parties, courts, corporations or governments from families, temporary instances of interaction (such as university classes) or entire societal spheres (such as 'the economy').

Following this perspective it becomes clear that organizations are provided the option of multi-referentiality: As they emerge orthogonally to societal spheres, organizations can combine and integrate „problem perspectives from several of the function systems of society" (*Stichweh* 2015, p. 46). Therefore, every organization is an 'intermediary' organization – with or without a clear or explicit functional primacy *(Bora* in: *Tacke 2001, p. 171)*.

3.2 Studying the Interface

Based on these considerations, it becomes evident why it theoretically seems particularly instructive to analyze the political relevance of scientific expertise via the organized interface of science and politics. In the following, options for empirical operationalization will be explored and a general conceptual approach outlined. The empirical analysis suggested will be threefold:

1. 'Following a problem' through the political decision-making process.
2. Reconstructing the 'organizational interface' of the political decision-making process and its knowledge-relevant environment.
3. Developing a typology of the organizational interface.

1. The Approach of 'Following the Problems'

The first dimension to be explicated regards the type of unit in question: How to confine and operationalize 'political decision-making' in a meaningful way? After all, modern political decision-making is a highly complex and opaque undertaking, which integrates a multitude of different interests, participants and (hidden) agendas. Not only do the organizations of government and its departments and agencies or parliament and its commissions and committees supply modern decision-making processes with politically relevant expertise, but so does a hugely diverse conglomerate of independent agencies, 'quangos'/ 'quagos' (quasi-autonomous non-governmental organizations/quasi-autonomous governmental-organizations), think tanks etc. „This system of global governance consists of

many thousands of organizations, only some of them governmental, which have an auton-
omous way of looking at different domains of society […]. All of them are part of the plu-
ralization of politics" (*Stichweh* 2015, p. 46). Consequently, operationalization of political
decision-making and its relevant influences is one of the central challenges of empirical
research in this field (*Hird* 2005).

Because of these difficulties, researchers have typically focused on specific aspects of
political decision-making, such as certain types of organizations (governmental depart-
ments, congressional committees, agencies, think tanks), thematic areas (policy ideas or -
fields), decision-making stages or individual participants (for detailed studies of the
IPCC, see e.g.: *Beck* 2009; *Desmarais/Hird* 2013, p. 3). While there are good reasons for
the conduct of such in-depth analyses that shed light on particular relevant aspects of po-
litical decision-making, „the results preclude generalizing beyond specific institutions
[…]" (*Desmarais/Hird* 2013, p. 3). For a research design that is set out to generalize
across these dimensions, however, a more comprehensive approach is desirable.

To address this problem within the conceptual framework outlined here, I want to
suggest the strategy of isolating and 'following' a specific problem as the object of study
through the political process (*Kaldewey et al.* 2015). Political decision-making is conse-
quently observed via the political construction and processing of problems: When did the
respective problem first appear on the political agenda? Who „discovered" it and under
what circumstances did it become political? Did the factual circumstances of the problem
and the emergence of its discourse diverge? What does the discursive transformation of
the problem look like over time?[3] And so on.

Of course problems – as much as interests or actors – are fundamentally social. Their
discovery and transformation are socially constructed and, as utilized within this suggest-
ed methodological approach, can therefore be sociologically studied: Different stages,
phases and milestones are traced and the career of the problem – ranging from the politi-
cal discovery and its processing to the potential solution – is reconstructed.

This empirical approach promises to provide a fruitful solution to the problem of op-
erationalization. It transcends relevant dimensions regarding political decision-making
procedures and therefore provides a comprehensive cross section of the process: By strin-
gently following the political processing of a certain problem, this approach precludes an
'artificial' selection of certain variables (like relevant timeframes, governance-levels, or-
ganizations and actors) a priori: Instead, they are disclosed by the problem itself.

While this depends on the problem under investigation, the *nation state* and its political
center (government and parliament) seem to provide a productive starting point for the
analysis. Theoretically, this starting point seems productive, as we are interested in political
decision-making. And while other trans- or international governance levels are emerging as
increasingly relevant, nation states are dominating collectively binding decision-making.[4]

Furthermore, based on usually well-documented decision-making procedures, starting
from the national level of political decision-making allows for a systematic empirical ac-
cess. The idea is to reconstruct the (above-mentioned) highly pluralized knowledge-
relevant environment of political decision-making via the problem-oriented perception
and decision-making activity of precisely this political center of the nation state. To be
sure, the scope of analysis within the suggested framework is not necessarily limited to
the nation state; it rather finds its starting point here. All institutions (ranging from NGOs,
over inter- and transnational organizations to the federal level) that are formally observed
by the nation state are (technically) covered by this approach.

For the purpose of illustration, one could think of the United States of America as a potentially interesting starting point of analysis. In this specific national context, the Federal Digital System (FDsys)[5] of the U.S. Government Publishing Office (GPO) provides the comprehensive documentation of „official publications from all three branches of government" (*The Federal Digital System*, 2015). As the search options are quite extensive (provision of metadata, contextualization of documents) FDsys presents a suitable exemplary database for the compilation of a (textual) corpus of analysis serving as an analytical starting point. While this corpus of analysis meets the goal of gaining a systematic access to political-decision-making, it necessarily displays a formal side of political 'reality'. By extending out from that starting point, this stringent focus on the formal side of political decision-making can be substantiated and contextualized.

2. Mapping the 'Organizational Interface' of Politics and its Knowledge-Relevant Environment

Based on this initial corpus in a second step of analysis, both

a) the organization(s) of the political center of the nation state itself (organizations of the three branches of government), and
b) the organization(s) of the politically relevant knowledge-environment

shall be identified. By screening the selected documents, all referenced organizations, individual experts, scientists, quoted studies, advice and forms of expertise can be isolated. In the cases of non-organized types of reference, the organizational context (which the expert or scientist is associated with, or which generated the respective instance of expertise) has to be identified. As a result, both the problem-relevant organizations of the political center itself as well as the organizations that are observed and referred to within the decision-making process (and therefore constitute its knowledge-relevant environment) are included. A pool of organizations is compiled, which systematically comprises the organizational interface of politics and its knowledge-relevant environment. This pool can serve as a sound basis for a representative sample of organizations to be analyzed in more detail (3).

It is clear that the proposed framework is thereby taking a decidedly different stance from prevalent research on the role of 'boundary organizations' or 'intermediary agencies' (*Braun* 1993; *Guston* 2001): Instead of studying institutions that are known for or at least ascribed a significant role in 'bridging the gap' between science and politics a priori, I am suggesting a fundamentally problem-oriented approach to ensure systematic observation of a significant cross section of organizations processing this interface. Returning to the starting point of this chapter, this specific approach allows for comprehensive coverage of the pluralized conglomerate of both governmental organizations and independent agencies, think tanks etc. Very much in line with the observation that all organizations are intermediary organizations (see 3.1), it avoids a 'cherry-picking' of relevant (boundary-/ intermediary-/ hybrid-) organizations a priori as it constitutes a comprehensive picture of the organizational interface between politics and its knowledge-relevant environment, including not just the obvious and well-established, but also the unexpected and surprising pieces of the (organizational) puzzle.

3. Developing a Typology of the Organizational Interface

Finally, this reconstructed organizational interface can be studied and typologized regarding the question of how scientific expertise is specifically integrated into the political de-

cision-making process. Following the theoretical considerations (3.1), in this essential part of the analysis, the particular forms and specificity of the precise instances of the inter-systemic linkage between science and politics must be established. As mentioned before, the underlying assumption is that two aspects are of special interest in this context: (a) The forms in which the instances of referenced expertise appear within the political decision-making process e.g., as commissioned studies, as organizations of the political center itself, as requested expert-opinions (e.g., in Congressional hearings) or as quoted scientific findings. (b) The organizational context of the expertise referenced: As these organizations represent the interface between science and politics, analysis of how these particular instances of inter-systemic linkage are processed will be essential.

While (a) seems to be a straightforward empirical question, (b) will require theory-based organizational analysis (see also: *Greenwood/ Raynard/Kodeih/Micelotta/Lounsbury* 2011). Potential dimensions regarding this organizational analysis of the inter-systemic linkage between science and politics will be illustrated in the following.

a. Distinguishing Levels of Analysis

Very fundamentally, the distinction between two levels of social systems seems reasonable in this regard: The semantic vs. the operative[6] level of social systems. The theory of operationally closed systems

> „[…] explains that we have to distinguish an operational level and a semantic level. The system is completely unable to calculate its operations in view of some representation of its own unity, or its end, or its complexity. But it can distinguish itself and describe itself, using a few of its operations to produce self-descriptions. For instance it can say 'we'. It can refer to itself by a name" (*Luhmann* 1995, p. 175).

Consequently, this basic distinction essentially relates to the difference between the establishing and processing of identity boundaries ('*Grenzbildungsmechanismen*') vs. performative boundaries ('*Selbstselektion*') by social systems. While the semantic level of social systems refers to their self-description, the operational level corresponds to their reproduction – and the question of how operations are connected to other operations. Distinguishing both levels regarding the organizational analysis of the precise instances of the inter-systemic linkage between science and politics (see 3.) consequentially helps substantiate how scientific expertise becomes relevant to the political decision-making process. Does it influence the operational basis and consequently impact on how decisions are made, or does it rather regard the self-description and 'identity work' of the respective organizations?

b. Analyzing the Semantic Level of the Interface

At 'the semantic level' of a social system, its self-description is structured.[7] Self-description can be defined as „the production of a text or the functional equivalent of a text […] through which the organization identifies itself" (*Luhmann* 2011, p. 417). It always refers to the organizations *as an entity of all its operations*: „The system reflects on its own unity" (*Luhmann* 2013, p. 175). Self-descriptions have to provide continual identity for as broad a variety of circumstances, occasions and situations as possible – directed both inwards and outwards. This identity is produced by a variety of variables, such as name, address, a distinguished function or goal (such as a product or service) and an organizational history (*Luhmann* 2011, p. 423).

Regarding the empirical analysis of the semantic level, all forms of text that an organization produces for public use thus become relevant. Besides the organizational and departmental names (*Guggenheim* 2005, p. 149), so-called 'mission statements' and 're-

ports' (of any sort for that matter) are an integral part of the identity work of an organization and, as such, instructive to their empirical analysis (*Luhmann* 2011, p. 425). Relevant data should therefore be easily accessible via the organizational websites. By using methods of qualitative content analysis (see e.g., *Mayring* 2010), diverse types and prevalent frames of 'bundled organizational identity' can be analyzed and screened regarding the integration of scientific references. For that purpose, different groups of such scientific semantics could be clustered and examined within the organizational self-description. Possible dimensions would be:

1) The use of *quantifying semantics*: Are organizational operations increasingly presented in the form of statistics – numbers, functions and figures? (*Espeland/Stevens* 2008; *Heintz* 2007; *Porter* 1995);
2) The demonstrative display of *individual experts* with their academic backgrounds and titles: Do the organizations increasingly draw on individual – maybe prominent – expertise or consultancy to secure its identity as a whole? (*Jasanoff* 1990; *Weingart/Carrier/Krohn* 2007); or
3) The presentation of organizational operations as based on scientific methods or theories: Are organizational operations increasingly displayed as 'science based'? (*Drori/Jang/Meyer* 2006; *National Research Council* (U.S.) 2012)

Such an analysis could ascertain if, how and in what context the selected organizations use scientific semantics to describe themselves, and what role these play in constructing their identity.

c. Analyzing the Operative Level of the Interface
As already noted, at the operative level the reproduction of the social system is structured: „What actually takes place is decided on this level." (*Luhmann* 1996, p. 60). Regarding organizations, this definition essentially points to their decision-making premises ('Entscheidungsprämissen'): 'Premise' denotes a precondition that is no longer checked or questioned before its application. Therefore, these premises constitute the operative structures of organizations. These decision-making premises – due to a high degree of formalization regarding organizational procedures – are manifested (and therefore: empirically observable) in the formal structure of organizations. Consequently, analyzing the organizational interface of science and politics at the operative level implies exploring the particular forms in which scientific expertise is integrated into the formal structure of the selected organizations. This formal side of analysis thereby forms a rational complement to the semantic-level study previously suggested. The formal structures are a crucial source of empirical reality, pointing towards dominant expectations and the structural norms of modern society. It would be quite a severe misunderstanding to disqualify this dimension as superficial and sociologically insignificant. Generally, we can distinguish between decision-making-programs (a), communication channels (b) and personnel (c) (*Luhmann* 2011, p. 225). All three types of premise structure the organizational decision-making process.

Programs (a) define the factual accuracy of organizational decisions and therefore apply to the organizational tasks (*Luhmann* 2011, p. 257). In their programs, the organizational ability to integrate various problem perspectives becomes manifest in the most straightforward sense. Here, one can observe an organization's free choice between different institutional logics or societal spheres, be they economic criteria of feasibility, sci-

entific criteria for truth, *legal* criteria of right and wrong and so forth (*Lieckweg/Wehrsig* in: *Tacke* 2001, p. 40). The assignment of priorities within this programming leads to the emergence of 'economic', 'medical' or 'scientific organizations' (*Bora* in: *Tacke* 200, p. 171). For empirical observation, we can draw on task descriptions of certain positions and departments or the bylaws and mission statements of an organization as a whole.

Regarding the question at hand, the legal status of these boundary organizations should be especially instructive. Based on the above-mentioned assumption of a „pluralisation of politics" (*Stichweh* 2015, p. 46), one could retrace the potential transformation (and plurality) of the organized boundary between politics and its knowledge-relevant environment. For example, how is accountability constituted within the formal structure of these organizations and how are competences distributed? In a similar vein – and for the case of The Brookings Institution – *Critchlow* (1985, p. 62) for example observes a programmatic and operative alignment of organizational structures with the academic ideal: „Organized along the lines of an academic department in a major university […] researchers were allowed to pursue research of their own choosing with complete independence from trustee interference". Or, regarding the case of Citizens for a Sound Economy (CSE), *Rich* (2004, p. 219) notes the formation of organizations „that explicitly combine research and advocacy" as a recent development. In that sense, the exploration of potential shifts regarding novel forms of integration of scientific expertise within the programs of the organized boundary might prove insightful.

The Communication Channels (b) define the formal structure of an organization and can thus be seen as „the organization of the organization" (*Seidl/Becker/Luhmann* 2005, p. 43). Common examples are 'hierarchical' vs. 'matrix' organizations. Regarding the empirical analysis, the departmental structure (e.g., R&D departments and the like) or positions, which provide the interface between the organization and its scientific environment (e.g., posts with a distinctive and explicit scientific function) become relevant. Instead of looking at task descriptions however (as is the case regarding organizational programs), the formal integration of these units into the organizational structure becomes critical. This is crucial to point out as it becomes observable not only which departments or positions are implemented, but also if (at all), how, and to what extend they are operationally integrated into the actual decision-making process. An instructive analysis might focus on the distribution of resources (funds, personnel) and hierarchies (decision-making-authority, -competences and right of command) in order to detect organizational priority setting. Documents, which should be instructive (and usually publicly available) in this regard, are therefore organizational charts.

Personnel decisions (c) apply to decisions on organizational membership and staffing (*Luhmann* 2011, p. 287). Since all decisions are in some way attributed to a specific person who is 'in charge', the organizational personnel constitute another (final) type of decision premises. Selecting the 'right' personnel depends on the matching of organizational expectations (stated in the respective job-description) on the one hand and the expected features of a suitable person on the other (*Luhmann* 2011, p. 287). This in turn seems meaningful to the objective of identifying scientific references in the selected organizations. While it is obviously pointless 'sorting' personnel into societal systems, the analysis of staffing or recruiting strategies should be instructive. More precisely, one could analyze recruiting-, selection- and promoting-strategies within the selected organizations of the interface, which qualification criteria are being put forward (emphasized properties, skills and competences) for specific positions and which selection procedures are predom-

inantly implemented (e.g., assessment centers vs. academic appointing committees)? Since organizational membership is obviously not arbitrary – illustrated by the effort organizations put into the 'optimal' selection of its members or employees – one can assume that such an analysis could essentially detect prevalent organizational expectations that become manifest in personnel decisions.

4   Conclusion

Notions of 'Wicked Problems' or 'Grand Societal Challenges' seem to leave no doubt. The complexity of political challenges and the respective need for informed decision-making appear to be constantly increasing. It has been widely suggested that science plays a crucial part in delivering this evidence-based need for a somehow 'better' or more sound political decision-making process (*National Research Council* (U.S.) 2012, p. 50). While this scenario intuitively seems very plausible – we can witness the high political profile of scientific experts on a daily basis in the news – a need for further research remains when it comes to the systematic conceptualization of this scientific bearing on political decision-making processes.

To that end, an analytical framework was outlined that focuses on the properties and forms of the specific instances of linkage between science and politics via the organizational interface of modern political decision-making and its knowledge-relevant environment. This contribution pursued the systematic access of the science-politics relationship, building on predominantly formal structures of political reality and their organizational settings. Consequently, the goal is understanding to which distinct structural changes this notion of a 'scientization' of politics relates. The approach is set out to retrace the pluralized organized interface constituting political decision-making today, and explore its potential transformation under the condition of its diagnosed 'scientization'.

Notes

1   Opposed to, for example, implying a 'stepping in' of science for politics, in the sense of an alignment of (scientific and political) functions as reflected in Lane's observation.
2   See *Boswell* 2012 for a compelling account of these debates.
3   See *Kaldewey* et al. (2015, p. 20f.) for exemplary accounts of the 'problem careers' of Climate Engineering, Energy Security, Demographic Change and Global Health Challenges.
4   This becomes vividly clear when looking at the failure of international climate policies for example.
5   Website: http://www.gpo.gov/fdsys.
6   Also referred to as the 'operational' level.
7   It should be noted, that the term 'semantic level' is used here in a very limited sense of self-description. Sociologically the concept of 'semantics' encompasses a much broader diversity of contexts and essentially points to a form of social meaning.

Literature

Beck, S., 2009: Das Klimaexperiment und der IPCC: Schnittstellen zwischen Wissenschaft und Politik in den internationalen Beziehungen.

Bell, D., 1973: The Coming of Post-Industrial Society. New York: Basic Books.

Bogner, A./Menz, W., 2002: Wissenschaftliche Politikberatung? Der Dissens der Experten und die Autorität der Politik, in: Leviathan, 30 (3).

Bogner, A./Torgersen, H. (Eds.), 2005: Wozu Experten?: Ambivalenzen der Beziehung von Wissenschaft und Politik (1. Aufl.). Wiesbaden: VS Verlag für Sozialwissenschaften.

Boswell, C., 2008: The political functions of expert knowledge: knowledge and legitimation in European Union immigration policy, in: Journal of European Public Policy, 15 (4), pp. 471-488.

Boswell, C., 2012: The Political Uses of Expert Knowledge: Immigration Policy and Social Research. Cambridge: Cambridge University Press.

Braun, D., 1993: Who Governs Intermediary Agencies? Principal-Agent Relations in Research Policy-Making, in: Journal of Public Policy, 13 (2), pp. 135-162.

Brown, M.B., 2009: Science in Democracy: Expertise, Institutions, and Representation. Cambridge, Mass: MIT Press.

Brown, M.B./Lentsch, J./Weingart, P., 2005: Representation, Expertise, and the German Parliament: A Comparison of three Advisory Institutions, i*n:* Democratization of Expertise?, pp. 81-100. Springer.

Carrier, M./Nordmann, A. (Eds.), 2011: Science in the Context of Application (Vol. 274). Dordrecht: Springer Netherlands. (Retrieved from http://www.springerlink.com/index/10.1007/978-90-481-9051-5)

Critchlow, D.T., 1985: The Brookings Institution, 1916-1952: Expertise and the Public Interest in a Democratic Society. Northern Illinois University Press DeKalb.

Desmarais, B. A./Hird, J. A., 2013: Public Policy's Bibliography: The Use of Research in US Regulatory Impact Analyses, in: Regulation & Governance.

Drori, G.S./Jang, S.Y./Meyer, J.W., 2006: Sources of Rationalized Governance: Cross-National Longitudinal Analyses, 1985-2002, in: Administrative Science Quarterly, 51 (2), pp. 205-229.

Espeland, W.N./Stevens, M.L., 2008: A Sociology of Quantification, in: European Journal of Sociology/Archives Européennes de Sociologie, 49 (03), pp. 401-436.

Folke Schuppert, G./Voßkuhle, A. (Eds.), 2008: Governance von und durch Wissen. Baden-Baden: Nomos-Verl.-Ges.

Greenwood, R./Raynard, M./Kodeih, F./Micelotta, E. R./Lounsbury, M., 2011: Institutional Complexity and Organizational Responses, in: The Academy of Management Annals, 5 (1), pp. 317-371.

Guggenheim, M., 2005: Organisierte Umwelt. Umweltdienstleistungsfirmen zwischen Wissenschaft, Wirtschaft und Politik. Bielefeld: transcript.

Guston, D. H., 2001: Boundary Organizations in Environmental Policy and Science: An Introduction, in: Science, Technology, and Human Values, pp. 399-408.

Haas, P.M., 1992: Introduction: Epistemic Communities and International Policy Coordination, in: International Organization, 46 (1), p. 1.

Haas, P.M./Haas, E.B., 1995: Learning to Learn: Improving International Governance, in: Global Governance, 1 (3), pp. 255-284.

Habermas, J., 1968: Technik und Wissenschaft als "Ideologie"?, in: Man and World, 1 (4), pp. 483-523.

Heintz, B., 2007: Zahlen, Wissen, Objektivität: Wissenschaftssoziologische Perspektiven, in: Zahlenwerk, pp. 65-85. Springer.

Hird, J. A., 2005: Power, Knowledge, and Politics: Policy Analysis in the States. Georgetown: University Press.

Jasanoff, S., 1990: The Fifth Branch: Science Advisers as Policymakers. Cambridge, Mass: Harvard University Press.

Jasanoff, S., 2005: Judgment under siege: the three-body problem of expert legitimacy, in: Democratization of Expertise?, pp. 209-224. Springer.

Jung, A./Korinek, R.-L./Straßheim, H., 2014: Embedded expertise: a conceptual framework for reconstructing knowledge orders, their transformation and local specificities, in: Innovation: The European Journal of Social Science Research, (ahead-of-print), pp. 1-22.

Kaldewey, D./Russ, D./Schubert, J., 2015: Following the Problems. Das Programm der Nachwuchsforschergruppe „Entdeckung, Erforschung und Bearbeitung gesellschaftlicher Großprobleme", in: FIW Working Paper (No. 2).

Lane, R.E. 1966: The decline of politics and ideology in a knowledgeable society, in: American Sociological Review, pp. 649-662.

Luhmann, N., 1987: Soziale Systeme: Grundriss einer allgemeinen Theorie. Frankfurt am Main: Suhrkamp.

Luhmann, N., 1995: Why Does Society Describe Itself as Postmodern?, in: Cultural Critique, 30, pp. 171-186.

Luhmann, N., 1996: Complexity, Structural Contingencies and Value Conflicts, in: Detraditionalization: Critical reflections on authority and identity, P. Heelas, P./Lash, S./Morris P. (eds), pp. 59-71.

Luhmann, N., 2011: Organisation und Entscheidung. Wiesbaden: VS Verl. für Sozialwissenschaften.

Luhmann, N., 2013: Theory of Society. Stanford, California: Stanford University Press.

Maasen, S./Weingart, P., 2006: Democratization of Expertise?: Exploring Novel Forms of Scientific Advice in Political Decision-Making (Vol. 24). Springer.

Mayring, P., 2010: Qualitative Inhaltsanalyse. Springer.

McCright, A.M./Dunlap, R.E., 2011: The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001-2010, in: The Sociological Quarterly, 52 (2), pp. 155-194.

National Research Council (U.S.), 2012: Using Science as Evidence in Public Policy, in: *Prewitt, K./Schwandt, T.A./Straf, M.L.* (eds.). Washington, D.C: National Academies Press.

Nelkin, D., 1975: The Political Impact of Technical Expertise, in: Social Studies of Science, 5 (1), pp. 35-54.

Pielke, R. A., 2013: The Honest Broker: Making Sense of Science in Policy and Politics. Cambridge ; New York: Cambridge University Press.

Porter, T., 1995: *Trust in Numbers*. Princeton, N.J.: Princeton University Press.

Porter, T. M., 2006: Speaking Precision to Power: The Modern Political Role of Social Science, in: Social Research: An International Quarterly, 73 (4), pp.12731294.

Rich, A., 2004: Think Tanks, Public Policy, and the Politics of Expertise. Cambridge University Press.

Schelsky, H., 1961: Der Mensch in der wissenschaftlichen Zivilisation, in: Der Mensch in der wissenschaftlichen Zivilisation, pp. 5-46. VS Verlag für Sozialwissenschaften.

Schelsky, H., 1965: Auf der Suche nach Wirklichkeit: gesammelte Aufsätze. Düsseldorf/Köln: E. Diederichs.

Seidl, D./Becker, K. H./Luhmann, N., 2005: Niklas Luhmann and organization studies. Malmö; Herndon, VA: Liber; Distribution [in] North America, Copenhagen Business School Press.

Stichweh, R., 2015: Analysing Linkages Between Science and Politcs. Transformations of Functional Differentiation in Contemporary Society, in: Interfaces of Science and Policy and the Role of Foundations, pp. 38-47 Stiftung Mercator.

Strulik, T., 2008: Cognitive Governance. Beobachtungen im Kontext der Risikosteuerung des globalen Finanzsystems, in: *Schuppert, G.F./Voßkuhle, A. (Hg.),* Governance von und durch Wissen. Baden-Baden: Nomos, pp. 87-109.

Tacke, V., 2001: Organisation und gesellschaftliche Differenzierung. Springer.

Touraine, A., 1972: Die postindustrielle Gesellschaft. Suhrkamp.

Vibert, F., 2007: The Rise of the Unelected: Democracy and the New Separation of Powers. Cambridge University Press.

Weingart, P./Carrier, M./Krohn, W., 2007: Experten und Expertise, in: *Weingart, P./Carrier, M./Krohn, W.*, (eds.), Nachrichten aus der Wissensgesellschaft: Analysen zur Veränderung der Wissenschaft. Weilerswist: Velbrück Wissenschaft, 2007, pp. 293-304.

Weiss, C. H., 1977: Research for Policy's Sake: The Enlightenment Function of Social Research, in: Policy Analysis, pp. 531-545.

Weiss, C. H., 1979: The Many Meanings of Research Utilization, in: Public Administration Review, 39 (5), pp. 426.

Willke, H., 2009: Smart Governance. Complexity and the Megacity, in: *Matthiesen, U./Mahnken, G.* (eds.), Das Wissen der Städte pp. 365-378. VS Verlag für Sozialwissenschaften.

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